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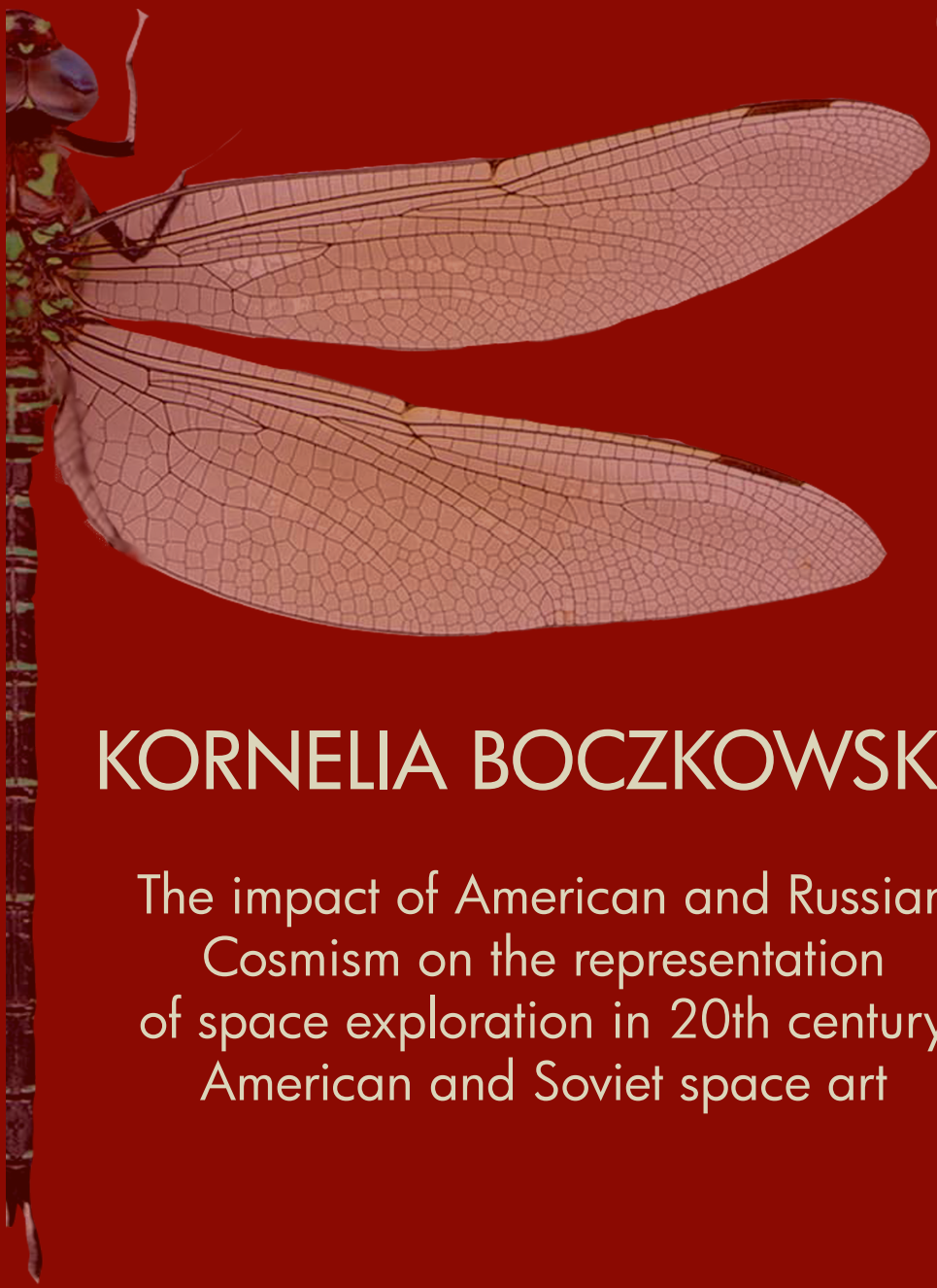

KORNELIA BOCZKOWSKA

The impact of American and Russian Cosmism on the representation of space exploration in 20th century American and Soviet space art

WYDAWNICTWO NAUKOWE UAM

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FACULTY OF ENGLISH
ADAM MICKIEWICZ UNIVERSITY OF POZNAŃ

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The aim of this dissertation is to explore and compare the impact of Russian and American Cosmism on the representation of space exploration in selected 20th century American and Soviet space art works in the context of both nations' culture and literature of the period. The source material are 200 works of American (100) and Soviet (100) space art (1944-1991) which become subject to visual content analysis whose purpose is to examine the relation between the chief assumptions of Russian and American Cosmism and the image of space exploration constructed by American and Soviet artists. The research results obtained from the study have suggested that while the investigated representation of space exploration in the Soviet works can reflect approximately 70% of primary assumptions of Russian Cosmism, its depiction in the U.S. images seems to conceptualize approximately 80% of American Cosmism's chief tenets.

KEY WORDS: Russian Cosmism, American Cosmism, American space art, Soviet space art, space exploration.

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Introduction

The aim of this dissertation is to explore and compare the impact of Russian and American Cosmism on the representation of space exploration in selected 20th century American and Soviet space art works in the context of both nations' culture and literature of the period. The source material are 200 works of American (100) and Soviet (100) space art (1944-1991) which become subject to visual content analysis whose purpose is to examine the relation between the chief assumptions of Russian and American Cosmism and the image of space exploration constructed by American and Soviet artists. By definition, the term space exploration denotes "the investigation, by means of manned and unmanned spacecraft, of the reaches of the universe beyond Earth's atmosphere and the use of the information so gained to increase knowledge of the cosmos and benefit humanity" ("space exploration, n." 2014). This definition implies that the concept does not only embrace depictions of humans and space technology in the process of exploring outer space realms, but also those of extraterrestrial landscape itself whose representation is based on the previously accumulated knowledge of science and astronomy.

Russian Cosmism, originally formulated by Fedorov[1] (1982), emerged in the late 19th century Russia as a space-oriented cultural and intellectual movement which aimed to explore the relationship between humans and the universe (see e.g. Semenova and Gacheva 1993; Young 2012). Its central premise, Fedorov's Common Task, advanced establishing a universal utopia of the resurrected both on Earth and in the entire cosmos, seen as a spiritual and scientific-technological mission to be accomplished by mankind. Some other themes common for the followers of Fedorov include i) an indissoluble and organic unity between humans and the cosmos and the cosmic nature of mankind; ii) abundant prospects of the exploration and colonization of the entire universe; iii) the presence of a supreme spirit guiding the universe in the form of God or other divine entity; iv) seeking an ultimate truth and complete integration of knowledge by means of pseudo- and parascientific methods which draw on esoteric, and occult sources; v) the emergence of new life forms and noosphere, which denotes a new dimension of human thought and

[1] The system of romanization of Russian cyrillic used throughout the present work is that of the Library of Congress (see Timberlake 2004: 25). The exception to this rule are names and titles cited in direct quotations as well as those included in the list of references.

existence as proposed by Vernadskii (see e.g. Alekseeva 2007: 5; Bashkova 2011: 16-17; Fesenkova 2003: 124-134; Obolevitch 2007: 45 124-134; Young 2012: 4). Although remaining a largely disregarded intellectual tradition of the pre- and Soviet period, many scholars argue that it gave rise and continued to shape the national space age ideology, particularly its technological utopian, mystical and occult dimensions, also manifested in contemporary media, literature, arts, film and other realms of culture (see e.g. Bashkova 2013; Deliagin and Sheianov 2011; Djordjević 1999; Harris 2008; Rogatchevski 2011; Schwartz 2011; Siddiqi 2008, 2010; Thomas 2011; Trotsky 1975).

Interestingly, Cosmism has gained its U.S. counterpart in the form of American Cosmism, as coined by Harrison (2013). Although formulated quite recently, the notion stems from Harris's space ethos (1992; see 2.2.2. for details) and offers its more elaborate interpretation, defined as "a product of science, religion, and national culture, reflected in academic and popular views about our place in the universe, space exploration, and human destiny" (Harrison 2013: 25). Therefore, the concept's wide scope encompasses a number of 20th century space exploration-related values, beliefs and practices, which are deeply embedded in the national culture and thus have shaped the public attitude toward human space endeavours as well as their representation in various cultural artifacts. As suggested by Harrison (2013), examples include the nationwide perception of spaceflight as a religious and transcendental experience, a significant role of the visionaries of space travel and national mythologies in formulating and envisioning space programme's chief objectives as well as the interplay between science, esotericism and the occult as manifested in White's Overview Effect (1987), SETI seen as a parapsychical and occultist phenomenon or some of the New Age ideas and beliefs. Similarly to Russian Cosmism, its American variation is often credited with defining and continuously shaping the nationwide rendering of space exploration ventures carried out on a large scale since the dawn of the space age era.

It is also crucial to elaborate further on some of the principal motivations behind my decision to formulate the thesis of this dissertation in its present form. First, the main reason for analyzing selected 20th century space art in light of the chief assumptions of Russian and American Cosmism is that, as implied above, both concepts prove to have exerted a significant influence over the public perception of outer space and human space efforts, as evident in many domains of the national cultures, including art, literature, film, media, etc. Hence, it seems plausible that its impact may be also observed in the works of space art which should ideally display certain qualities coincident with some of the core principles of these prevailing space age ideologies. Also, as both ideas of Cosmism can be regarded as a product of the nations' cultural, literary, philosophical and artistic traditions, investigating how it affects space art is likely to detect a wide range of cross-cultural differences in the way selected artists tend to depict the theme of

space exploration in their works. Secondly, the major cause of selecting 20th century American and Soviet space art as the primary subject of my research is determined by the fact that both academic and popular literature dealing with the topic is scarce and thus offers little information on the origins, evolution and future prospects of the genre. In the most general terms, space art can be defined as "the depiction of the universe beyond the limits of the earth" which "represents an age-old fusion of science and art" and attempts to present as well as communicate diverse concepts related to the cosmos and human-made achievements of the space age (Miller 1996: 139; Hartmann 1990: 132; see 3.1. for details). Although it may take various forms, ranging from drawings, paintings, illustrations and abstract or digital imagery, to zero-g space art, photography, sculptures, installations, videos or other contemporary artworks, I focus on representational and pictorial portrayals of space exploration as they remain the main and most widespread expression of the genre, particularly in the context of 20th century literature and culture. In particular, I choose to analyze selected works of the four leading representatives of space art in the U.S. and the Soviet Union, Chesley Bonestell and Nikolai Kolchitskii as well as Robert McCall and Andrei Sokolov as i) their works (1944-1991) appear in quantities sufficient for conducting a visual content analysis and ii) the artists can be to a large extent considered American and Soviet counterparts of each other (see 3.2.4.2. for details).

In view of the above mentioned remarks, it is vital to emphasize to a large extent interdisciplinary and innovative character of the present work. First, it is devoted to the study of an emerging field of popular culture of space and space exploration, so far explored mainly through the lens of the Cold War history and politics as well as science and technology, partly due to the prevalence of technological utopianism in the mid-20th century space race discourse (see e.g. Bell 2009; Geppert 2012; McCurdy 2011; Sage 2014). Secondly, it aims to investigate selected American and Soviet works of space art, the genre hardly explored in scholarly terms, and thus contribute to the development of academic discussion on the subject. As the number of sources can be considered insufficient, one of my foremost objectives is to collect and conduct a systematic analysis of all the available materials, including academic and popular literature, as well as to extend the present-day state of knowledge in the field with my own research results. Another equally important purpose of this dissertation is to study the impact of Cosmism on selected space art works, the task which appears to have been so far neglected as the subject of scholarly research. Furthermore, the analysis of Cosmism itself, both as the original Russian concept and its American variation, seems to be of particular importance as it has been often disregarded in academic circles. Also, investigating its influence on the representation of space exploration can be seen as a considerable challenge, especially when taking into consideration that merely few accounts on both American and

Russian/Soviet side mention, mostly implicitly, a specific relationship between Cosmism and space imagery (see e.g. Henry and Taylor 2009; Malina 1989; McCurdy 2011; Siddiqi 2008; Soluri 2008).

The present dissertation consists of four chapters. Chapter 1 attempts to define and present various views on Russian Cosmism, including its origins, evolution and impact on selected aspects of 20th century Russian and Soviet history and culture related to or depicting the national space ventures, as well as its present-day status. In the introductory parts, I examine Cosmism in the context of 19th and early 20th century Russian philosophy, culture and literature, such as the Orthodox Christianity or intellectual and artistic movements of the period, as well as elaborate on its mystic, esoteric and occult dimensions. Then I discuss both religious and scientific strands of Cosmism as well as their main representatives, including the founding father of the movement, Nikolai Fedorov, and other Cosmist thinkers, Vladimir Solov'ev, Sergei Bulgakov, Pavel Florenskii, Nikolai Berdiaev, Alexandr Sukhovo-Kobylin, Konstantin Tsiolkovskii, Alexandr Chizhevskii, Vladimir Vernadskii and Vasilii Kuprevich. The philosophers' and scientists' chief ideas are described primarily in terms of their contribution to the movement's broad theory pertaining to varied connections between man and the cosmos. Finally, as mentioned above, I elaborate on a possible influence of Cosmism on selected aspects of 20th century Russian and Soviet space exploration-related culture, such as the roots of Soviet cosmonautics and space age ideology or the media frenzy over space research, largely reflected in articles published by popular science journals and magazines since the 1920s, as well as literature, film and art of the day. I also discuss mid-20th century and later cultural trends and phenomena where the Soviet fascination with space becomes particularly well manifested. I specifically analyze selected space imagery of the Stalinist era, cosmonauts' biographies and memoirs, popular science and science fiction magazines and films, speculative science documentaries and other cultural artifacts celebrating the spirit of the space age. Lastly, I summarize the core tenets and achievements of Russian Cosmism by emphasizing the major themes common for both religious and scientific Cosmists as well as comment on the present-day status of the movement which is nurtured by numerous institutions, intellectual circles and an increasing number of academic publications on the subject.

In Chapter 2 I present the chief assumptions and propose my own extension of a recently formulated concept of Harrison's American Cosmism (2013), including its origins, major theoretical assumptions, impact on selected aspects of 20th century U.S. culture surrounding the national space ventures, as well as its future prospects as a cultural and philosophical concept. In the introductory parts of the chapter, I investigate the concepts of outer space and space exploration in light of the humanities and indicate a changing trend in academic literature on the subject, so far explored mainly through the lens of the

Cold War history and politics as well as space science and technology. I support this statement by citing some leading scholarly publications of the kind which combine historiographical with socio-cultural approaches to discussing 20th century space endeavours. Then I attempt to define a set of concepts associated with the study of American Cosmism, namely a space-oriented philosophy and philosophy of space exploration, astroculture and space ethos. In the central part of the chapter, I provide a detailed analysis of American Cosmism, as coined and described by Harrison (2013), and elaborate on its main constituents, being the religion of spaceflight, the visionaries of space travel, the role of national mythologies in envisioning space endeavours as well as the interplay between science, esotericism and the occult. I also discuss a number of space-related historical and cultural phenomena crucial for the evolution of the national space age ideology, such as astronauts' public acts and statements, White's Overview Effect (1987), Apollo nostalgia or the rise of SETI. Then I examine their representation in non-fiction and popular science literature, including astronauts' memoirs, films, documentaries, television programmes, cultural artifacts and many other dimensions of 20th century American culture. Finally, I summarize the chapter by making a compare and contrast analysis between Russian Cosmism and its American variation as well as comment on the potential Harrison's Cosmism might bring to the development of pro-space movements.

Chapter 3 outlines the history as well as the chief generic and theoretical assumptions of American and Soviet space art in the context of 20th century culture, literature as well as the major trends in space science and technology. First, I present American and Russian definitions and sub-genres of space art as well as discuss its historical background, including its appearances in science fiction and non-fiction literature, American and Soviet magazines and popular science texts as well as broadcast media, such as science fiction films and speculative science documentaries. In this context, I also mention a number of literary, political and cultural phenomena which might have exerted a substantial influence on the nature of the examined works like the 1950s astrofuturist movement, technical and scientific complexities of science fiction and popular science discourse in post-war America, the rise of NASA's institutional culture, the Soviet propaganda in space imagery, the mid-1960s cosmic enthusiasm or a gradual shift from highly idealized and speculative bourgeois Stalinist tradition to a more experimental and fact-based post-Stalinist science paradigm in depicting space themes. In the following part of the chapter, I analyze various cultural traditions which are believed to have largely shaped some distinctive generic characteristics of American and Soviet space art. In the case of the former, I investigate the Hudson River School paintings which drew on romantic concepts of the sublime and the picturesque, Turner's Frontier Thesis, Manifest Destiny, the NASA Art Programme or the IAAA's realist tradition of portraying outer space settings. In the case of the

latter, I study the status of space art in the U.S.S.R. Union of Artists, the influence of communist propaganda on visual representations of space and space exploration, censorship practices of the Soviet publishers or the Russian tradition of early popular science discourse often combined with a more optimistic and fantastical science fiction imagery. Next, I discuss the impact of 20th century advances in space research and exploration in the content of the examined imagery and attempt to establish certain differences between American and Soviet works with regard to their adherence to scientific facts as well as suggest possible reasons for such practices. Lastly, I summarize the chapter by comparing the main theoretical assumptions and achievements of American and Soviet space art as well as briefly characterize the present-day status of the genre both in the U.S. and Russia.

Chapter 4 outlines the life and work of the leading representatives of American and Soviet space art as well as presents the chief assumptions of the research methodology utilized in this work and the main research results of the study. First, I present the life and legacy of some of the most distinguishable and renowned space artists on both American and Soviet side, namely Chesley Bonestell and Robert McCall as well as their Soviet counterparts Nikolai Kolchitskii and Andrei Sokolov. Then I summarize both qualitative data and the chief criteria of a visual content analysis of selected images and then attempt to determine the impact of Cosmism on their content. In the first sections of the chapter, I feature a quantitative description of the collected materials, including a number of investigated works, their authorship, origins and the date of publication where I also apply a comparative American-Soviet perspective, as shown in numerous graphs and tables. Then I present a qualitative examination of specific coding categories used in the analysis, describe the relationship between coding categories and Cosmism and list the major reasons for their selection. Next, I employ the qualitative data to the visual content analysis of American and Russian space art which allows me to draw relevant conclusions regarding the impact of Cosmism on the content of the investigated works. This includes a statistical summary of the main research results obtained from the analysis according to coding categories, namely i) a type of scene; ii) a number, type and approximate size of extraterrestrial and remaining objects; iii) a number, approximate size and the main activity of human figures; iv) a number, type and approximate size of space technology and status symbols. In the latter part of the chapter, I attempt to interpret the aforementioned results and determine i) the extent to which Russian Cosmism might have affected the content of the Soviet space art authored by Nikolai Kolchitskii and Andrei Sokolov, and ii) the extent to which American Cosmism might have affected the content of the U.S. space art authored by Chesley Bonestell and Robert McCall. Specifically, I argue that both variations of Cosmism have exerted a considerable influence on the representation of space exploration contained in the visuals and that its impact is

more visible on the American rather than the Soviet side. In concluding remarks, I summarize the main research results, outline certain difficulties encountered while conducting the study and suggest possible reasons for the occurrence of a given paradigm in the depiction of the investigated concept. Finally, I again emphasize some general Cosmist-related distinctions between American and Soviet space art which only point out to the fact how diversely the two nations' visions of the universe can be interpreted and how distinct visual and cultural modes of representation they tend to seek inspiration from.

The research results obtained from the visual content analysis have suggested that most of the fundamental principles of Russian Cosmism and its American variation are likely to occur in the analyzed works either in a concrete or a more metaphorical visual form. Specifically, the main outcome is that while the investigated representation of space exploration in the Soviet works can reflect approximately 70% of primary assumptions of Russian Cosmism, its depiction in the U.S. images seems to conceptualize approximately 80% of American Cosmism's chief tenets. When it comes to some other distinctions between Soviet and American space art, while the former is likely to present utopian-like and often romantic or symbolic visions of outer space and space exploration, the latter tends to depict more realistic and science-based scenes of planetary landscapes and human space efforts. Also, whereas American artists drew on a specific mode of representation derived largely from the Hudson River School's paintings, their Soviet counterparts sought inspiration from science fiction and popular science discourse and ways of depicting space subjects in these literary genres. Also, the influence of the communist propaganda and the regime of Soviet secrecy become reflected in the content of numerous works many of which expose highly advanced and cutting edge devices or the cosmonauts seen as performing akin and partly deindividualized tasks. Meanwhile, American space artists excel at designing space settings whose qualities might indicate a strong influence of the frontier myth which largely contributed to the romanticization and idealization of alien planetary landscapes where the human element is largely diminished. In other words, numerous aesthetic and ideological aspects of the analyzed works can be deemed the influence of certain spin-off phenomena related to a historical exploration of the Wild West and space frontier, such as, for instance, Manifest Destiny, or other like White's Overview Effect, Apollo nostalgia or the von Braun paradigm. Specific conclusions, supported by some relevant statistics, also suggest that that the content of American and Soviet space art, somewhat affected by the ideology of Cosmism, might have been influenced by both cultural and literary context surrounding the nations' space endeavours, ranging from science fiction and popular science discourse to visual arts traditions of depicting space exploration themes.

Chapter 1

Russian Cosmism

Various ideas pertaining to the relationship between humankind and the cosmos seem to have been permeating every culture since the beginning of human civilization. Whether dreamlike or highly realistic, such visions have become persistent in numerous dimensions of national cultures which, among many other domains, promote the unexplored and unfamiliar phenomena, exposing their audiences to new, stirring concepts. One of the common pursuits, where public imagination gets particularly vivid, is popularizing space and space-related activities in an attempt to encourage human expansion into space, educate the audience about the mysteries of the universe as well as raise global awareness about the cosmos. Inspired by religion, philosophy as well as the development of science and technology, people have utilized various resources to present their own concepts about the extraterrestrial worlds and possibilities of space travel. Toward the beginning of the 20th century, such ideas began to take shape and formed a strong basis for pro-space groups and ideologies that entailed religious, ethical, technological, natural science or national culture elements. For instance, the late 19th century Russia witnessed the emergence of Cosmism, a space-oriented cultural and philosophical movement, whose aim was to explore the origins, evolution and future prospects of an intrinsic relationship between humans and the universe (see e.g. Bashkova 2013: 38-39; Dubenkov 1992: 57-58; Isakova 2004; Semenova 1993; Vladimirskii and Kislovskii 2011: 11-12; Young 2012: 4, etc.). Having been founded on the core principles of Eastern Orthodoxy, aero- and cosmonautics, transhumanism as well as mysticism and panpsychism, the thought developed into a nationwide rationale which often served as a credible explanation of the Soviet pursuit of space ventures (see e.g. Bashkova 2013; Deliagin and Sheianov 2011; Djordjević 1999; Harris 2008; Rogatchevski 2011; Schwartz 2011; Siddiqi 2008, 2010; Thomas 2011; Trotsky 1975, etc.).

1.1. Russian Cosmism: Toward a definition

In academic circles, Russian Cosmism is often considered one of the recently rediscovered intellectual traditions of the pre- and Soviet period which remains a rather interesting, creative and at the same time controversial blend of futuristic, religious, esoteric and speculative science based on idealistic materialism and utopian pragmatism (Young 2011: 127, 2012: 3). Although it is sometimes seen as one of the most prominent Russian philosophical and cultural tendencies still present in the national thought (see e.g. Alekseeva 2007: 4; Bashkova 2013: 16; Vladimirskii and Kislovskii 2011: 11-13; Semenova 1993), it seems largely ignored by equivalent Western ideological groups, such as transhumanists, immortalists or New Age[1] spiritualists who, despite sharing certain ideas and practices, remained separate movements. At the same time, although Cosmists have usually regarded themselves as belonging to no intellectual school, especially of esoteric origins, their research is often replete with occult elements. What is more, their revelatory concepts are believed to have profoundly contributed to the revival and legitimization for study of matters to a large extent discredited by international scholars since the early days of the Age of Reason (Young 2012: 6-7).

According to Gavriushin (1990: 114-115), Cosmism can be defined as a complex aesthetic-scientific and philosophical trend in European science and culture of the turn of the 20th century whose aim was to determine the role of cosmic factors in diverse earthly processes. What follows is a synthetic description of the movement given by Isakova (2004):

> В середине XIX века в России в результате взаимовлияний естественных и гуманитарных дисциплин на почве самобытной культуры России возникло своеобразное течение мысли (или по выражению Н.Н. Моисеева – умонастроение), получившее определение «русского космизма». На его формирование оказали огромное влияние русская общественная мысль, православная традиция, философия славянофильства (И.В. Киреевский, А.С. Хомяков, К.С. Аксаков), успехи отечественного естествознания (М.В. Ломоносов, Н.И. Лобачевский, И.М. Сеченов, Д.И. Менделеев, И.П. Павлов и другие), а также западноевропейские (Платон, Н. Кузанский, Дж. Бруно, И. Ньютон, Я. Беме, Ф. Шеллинг и другие) и восточные (даосизм, буддизм) философские, религиозные и мистические учения. (…) Духовный, научный и творческий потенциал русского космизма, его проективная направленность

[1] The term New Age, as used in the present work, will denote a broad cultural, philosophical and religious movement, which developed in Western nations in the 1960s; its practitioners held the belief in the coming of the Age of Aquarius that marked the beginning of a new spiritual awareness and collective consciousness ("New Age, n." 2016). For details, see 2.3.4.2.

> и оптимистический взгляд на будущее делают это течение все более привлекательным для наших современников. (…) в русском космизме человек рассматривается с точки зрения его соответствия гармоничному порядку космопланетарного целого, как часть сознательного развития природы и общества. Сама возможность рассмотрения человека в таком ракурсе говорит об уверенности русских космистов в том, что будущее человечества не бесперспективно и во многом зависит от него. (Isakova 2004)
>
> [In mid-19th century Russia, as a result of the clash between natural sciences and humanities in the Russian culture, a peculiar line of thought appeared (or as expressed by N.N. Moiseev – the frame of mind), which became known as Russian Cosmism. A number of cultural, philosophical and scientific phenomena has contributed to its formation, including the Russian social thought, Orthodox tradition, Slavophiles' philosophy (I.V. Kirieevskii, A.S. Khomiakov, K.S. Aksakov), accomplishments of domestic natural science (M.V. Lomonosov, N.I. Lobachevskii, I.M. Sechenov, D.I. Mendeleev, I.P. Pavlov and others), as well as Western European thought (Plato, Nicholas of Cusa, Bruno, Newton, Boehme, Schelling, and others) and Eastern (Taoism, Buddhism), philosophical, religious and mystical teachings. (…) A spiritual, scientific and creative potential of Russian Cosmism, its futuristic orientation and optimistic view on the future make it one of the most appealing research subjects for Russian contemporary scholars. (…) In Russian Cosmism, man is seen from the perspective of their belonging to a harmonious and orderly cosmic whole and as a part of the development of nature and society. The very possibility of considering a human being from this point of view speaks of the Russian Cosmists' belief that the future of mankind is not meaningless and depends largely on the cosmos.] [translation mine, KB]

Other contemporary Russian scholars studying Cosmism (see e.g. Abramov 2007; Abramova 1994; Alekseeva 2007; Bashkova 2003; Demin 1993; Dubenkov 1992; Fesenkova 2000; Gulyga 1982; Salmina and Kuznetsov 2010; Semenova 1982; Vladimirskii and Kislovskii 2011, etc.), tend to describe its central tenets in a similar manner, mainly by emphasizing its interdisciplinary character and an overwhelmingly holistic approach when considering the relationship between humans and the universe, here expressed by Abramova (1994: 5, as quoted in Alekseeva 2007: 6): "В широком смысле – космизм это концепция органического единства мира, во всех взаимосвязях, где нет пропасти между человеком и природой." [In a broad sense, Cosmism is the concept of an organic unity of the world, integral in its all mutual interconnections, where no gap between man and nature can be found.].[2] Similarly, Demin (1996: 1) stresses clearly

[2] Unless otherwise indicated, in-text translations without references are by the present author.

humanistic and religious inclinations of many Cosmist thinkers who consider the universe a living, intelligent and conscious entity reflecting the highest ideals of the human mind and morals. Also, while defining Cosmism, most Russian academics are likely to present it as a home-grown philosophical tendency, a socio-cultural phenomenon playing a largely marginal, yet at the same time fundamental role in the history of the national thought as well as a cultural movement in the form of a religious-scientific project. Furthermore, when analyzed from the point of view of philosophy, Cosmism might be also related to religious (rather than physical) cosmology, understood as "the religious conception of the world and particular phenomena in the world" which stems from the Greek meaning of the word cosmos denoting a regular, harmonic, orderly and beautiful living whole (Kristensen 1960: 27-28).

Generally, the chief assumptions of the movement include: i) an indissoluble unity between humans and the cosmos and the cosmic nature of mankind; ii) abundant prospects of the exploration and colonization of the entire universe; iii) achieving immortality by human beings; iv) the resurrection of the dead in a physical sense; v) the emergence of new life forms and noosphere, which denotes a new dimension of human thought and existence as proposed by Vernadskii (see e.g. Alekseeva 2007: 5; Bashkova 2011: 16-17; Fesenkova 2003: 124-134; Obolevitch 2007: 45 124-134; Young 2012: 4). These and other related premises of Cosmism correspond with some major trends of mid and late 19th century Russian culture centered around the idea of maximalism (Djordjević 1999: 105-106):

> The Russian Cosmism is in fact a specific spiritual, philosophic-scientific orientation, demonstrating encyclopedic and self-relying, synthetic expression of Russian genius, not only in the domain of thinking and imagination but also in the domain of technics and construction etc. The Russian Cosmism bears the stamp of its time. It was often an expression of a specific maximalism, developed about the middle of the last century in an effort to overcome the Russian slavery and century old backwardness. The elitist brains from all sorts of philosophy, art, social and political movements and theology acted lonesomely, in a titanesque manner, led by the noble aims, in a country in which about 90 percent of population was illiterate, living in huts. The ideas about a wholly new man and about wholly new society, a totally new world, about possible moving to other planets, found there a fertile ground, there emerged maximalists who marked the development of Russia and, in a way, that of the world all through until the present time. Entire generations were being excited by the maximalists, in whom sometimes alternated angel-like and demonic characters, many of whom were immortalized by the great Russian writers through the main characters of their works (Turgenev, Dostoevski etc.). (Djordjević 1999: 105-106)

The climate of the age was shaped by innumerable contributions to the intellectual and spiritual tradition made by a vast array of thinkers, ranging from mathematicians, physicists, economists, and scientists to writers, artists, theologians, dramaturges and poets (Djordjević 1999: 106). Various influences of domestic and Western culture that left their mark on and shaped Russian Cosmism are enumerated by Siddiqi (2010: 78-79):

> Technology, fantasy, and liberation also figured prominently in a parallel set of ideas known as a Russian Cosmism, which has fed into a nationalist discourse in current-day Russia. Cosmism resonated strongly in some Russian intellectual circles in the early twentieth century as a corpus of philosophical thought about the evolution of both humanity and the universe, and the relationship between the two. The philosophy influenced many famous Russian intellectuals in the 1920s. They included Bolshevik ideologues, scientists, writers, philosophers, poets, artists, and architects who gathered in Moscow and Kaluga, Tsiolkovskii's hometown, to discuss its attributes. Cosmism's intellectual foundations comprised a hodgepodge of Eastern and Western philosophical traditions, theosophy, Pan-Slavism, and Russian Orthodox thinking. The outcome was a nationalist and often reactionary philosophy that continues to attract the attention of many Russian intellectuals. (Siddiqi 2010: 78-79)

Despite differences, however, the major representatives of the movement all seem to have focused on the common purpose which was to explore the cosmos seen as an intelligent, higher and overarching entity. An interdisciplinary nature of Cosmism, centered around the concept of an inseparable unity between man and the cosmos, reminiscent of Anglo-American New Age mentality, is well characterized by Dubenkov (1992: 57-58, as quoted in Scalan 1994: 27):

> Cosmism is a movement in philosophy the central problem of which is human activity in its universality as testimony to the existence of another reality, a higher truth, a metahistorical perspective, transcendent panoramas. Cosmism proceeds from the idea of man as a being possessing a universality of inner content, an openness to people, to history, to being, to the universe, to God. Cosmism is a philosophy of the life, death and immortality of man and the universe, of the earthly and unearthly in their inseparable unity... To the philosophy of Cosmism there corresponds a special-cosmic-consciousness, which includes a sense of the world order, an intellectual enlightenment, a genuine exaltation, and a confidence in the eternity of life. (Dubenkov 1992: 57-58, as quoted in Scalan 1994: 27)

The earliest references to Cosmism go back to the beginnings of the 20th century, however, the first scholarly sources dealing with the theory of the movement were published as late as in the late 1980s when the original texts and materials, previously suppressed by the Soviet government, began to

reappear. Semenova (1993) emphasizes its two most prominent characteristics, namely the concept of active evolution in which humanity transforms themselves into genuine cosmic citizens as well as shifts their earth-centered perspective to a new cosmos-centered approach:

> Это идея активной эволюции, т. е. необходимости нового сознательного этапа развития мира, когда человечество направляет его в ту сторону, в какую диктует ему разум и нравственное чувство, берет, так сказать, штурвал эволюции в свои руки. Поэтому возможно точнее будет определить это направление не столько как космическое, а как активно-эволюционное. Человек для активно-эволюционных мыслителей – существо еще промежуточное, находящееся в процессе роста, далеко не совершенное, но вместе сознательно-творческое, призванное преобразить не только внешний мир, но и собственную природу. Речь по существу идет о расширении прав сознательно-духовных сил, об управлении духом материи, об одухотворении мира и человека. Космическая экспансия – одна из частей этой грандиозной программы. Космисты сумели соединить заботу о большом целом – Земле, биосфере, космосе с глубочайшими запросами высшей ценности – конкретного человека. Недаром такое важное место здесь занимают проблемы, связанные с преодолением болезни и смерти и достижением бессмертия. Гуманизм – одна из самых ярких черт этой замечательной плеяды мыслителей и ученых, но это гуманизм не прекраснодушный и мечтательный – он основан на глубоком знании, вытекает из целей и задач самой природной, космической эволюции. (Semenova 1993)
>
> [This idea of active evolution, i.e. the need for establishing a new conscious stage of development of the world, is guided by the human mind and senses being in charge of the whole process. Thus, it is possible to define it as active-evolutionary rather than cosmic. People are predestined to transform not only the external, but also their own inner world for the sake of actively-evolutionary thinking – even still imperfect and in the process of intellectual growth, yet consciously creative. It is essentially the question of empowering conscious spiritual forces, managing the matter by means of one's spirit and spiritualizing the world and man. The cosmic expansion constitutes a part of this ambitious project. The Cosmists managed to combine the protection of the larger whole – the Earth, biosphere, outer space – with the deepest demands of the highest value – namely an individual person. No wonder that the problem of overcoming illness and death as well as achieving immortality plays such a significant role in the philosophy. Humanism is one of the most striking features of these remarkable thinkers and scientists, but it is not sentimental and dreamy – it is based on a thorough knowledge deriving from the goals and objectives of the most natural, cosmic evolution.] [translation mine, KB]

Many philosophical premises of Cosmism tend to center around humankind's Common Task, as formulated by Fedorov, which presupposes an inevitable emergence of technologically- and spiritually-determined space exploration programme that would guarantee our long-term survival. Therefore, as suggested by Hagemeister (1997: 185-186), the movement skillfully combined both holistic and anthropocentric ideology in its mission to redefine the role man is supposed to play in the universe:

> Russian cosmism is based upon a holistic and anthropocentric view of the Universe which presupposes a teleologically determined—and thus meaningful—evolution; its adherents strive to redefine the role of humankind in a Universe that lacks a divine plan for salvation, thus acknowledging the threat of self-destruction. As rational beings who are evolving out of the living matter of the Earth, human beings appear destined to become a decisive factor in cosmic evolution—a collective cosmic self-consciousness, active agent, and potential perfector. Cosmic evolution is thus dependent on human action to reach its goal, which is perfection, or wholeness. By failing to act correctly, humankind dooms the world to catastrophe. According to Cosmism, the world is in a phase of transition from the biosphere (the sphere of living matter) to the noosphere (the sphere of reason). During this phase the active unification and organization of the whole of humankind (or living matter endowed with reason) into a single organism is said to result in a higher planetarian consciousness capable of guiding further development reasonably and ethically (in line with cosmic ethics), changing and perfecting the Universe, overcoming disease and death, and finally bringing forth an immortal human race. (Hagemeister 1997: 185-186)

Originally, the implementation of such a project, also known as Storming of Heavens, aimed to find solutions for eliminating Russian slavery and national backwardness. Therefore, the focus of Cosmism was on a teleological effort and active evolution whose ultimate goal was to transform the world in a genuinely spiritual and physical sense. In other words, esoteric knowledge needs to be replaced with exoteric and traditional occult wisdom, usually seen as mere pseudoscience, and should evolve into mainstream philosophy, theology, art, literature and science (Young 2012: 9).

1.1.1. Cosmism in the context of 19th and early 20th century Russian philosophy, culture and literature

Cosmism as a school of thought displayed numerous tendencies that reflect some of the mainstream themes present in 19th and early 20th century Russian philosophy. Young (2012: 1-26) argues that the movement can be seen as a product of the national philosophical, cultural and literary traditions of that time,

particularly i) the Slavophiles' appeal for autocracy, nationality and orthodoxy in the context of a special historiosophical mission Russia is supposed to accomplish in Europe and in the world; ii) the Russian tradition of thought as a call for action realized in the ongoing search for an ultimate truth, freedom and ideals; iii) the totalitarian cast of mind, defined as a tendency to seek universal solutions encompassing the whole mankind rather than an individual, which leads to the emergence of a truly unified cosmic wholeness. Also, Young (2012: 27-35) emphasizes the role of Orthodox Christianity and religious traditions in shaping the Russian spirituality, especially i) eschatologism understood as the belief in the Kingdom of God and universal resurrection; ii) the ongoing presence of or the need to seek the Kingdom of God on Earth realized through meditative practices, a special characteristic of Russian monastic life, as well as the saints serving as living examples of active Christianity and collaborative spirit whose task is to spiritualize the empty cosmos; iii) the nationalistic tradition of the Third Rome which implies that the Russian people are chosen and predestined to perform a special role in the world's history, namely to "embody, preserve, defend and put into action God's absolute, Orthodox truth"; iv) the Russian folklore which goes back to the pre-Christian pagan and ancient Slavic practices but still remains a frequent source of inspiration for many Cosmists; some of its influences include the belief in human ability to control and regulate nature, exercise supernatural powers, operate in different dimensions of space and time or modify evolutionary processes both on Earth and beyond.

As mentioned above, Russian Cosmism was often presented in contrast to 19th century Western intellectual culture centered around egalitarianism, individualism and isolationism. The Cosmists' Russianness is emphasized by many scholarly sources which suggest that certain neo-Slavophile and nationalist tendencies are clearly evident in theoretical and ideological premises as well as an intergalactic and universal scope of their grand visions (see e.g. Bashkova 2013: 4-15; Semenova 1993; Young 2012: 9-10, etc.). Drawing on Chaadaev's *Filosoficheskie pisma* [Philosophical letters] (1903) or Berdiaev's *Russkaia idea* [The Russian idea] (1948), some writings contain ideas which might seem to pertain to the Slavic penchant for expansion, wholeness, unity, universality and spirituality. Following a selection of Chaadaev's views, Cosmists believed that Russia, located just between the Western and Eastern civilizations, could offer a novel and broad outlook on the surrounding reality by combining these extreme cultural traditions. Many Cosmist thinkers, including Fedorov, Berdiaev, Florenskii or Vernadskii, grounded their projects in the national thought and took inspiration from literary, philosophical and artistic depictions of the Russian soul, the concept denoting spiritual and existential characteristics of the common people. It becomes evident in the philosophers' main line of thought which proposes seeking universal unity, wholeness and harmony in

overcoming multiple contradictions as well as humanity's major problems and concerns, such as death, discontinuity or disintegration.

Also, as suggested by Young (2012: 177), Russian Cosmism both largely contributed to and benefited from the so-called Promethean theurgy, the term coined by George L. Kline (1968) and advancing the view that any philosophical doctrine should propose a creative action rather than a mere reflection and provide mankind with a sense of destiny. Its ethos permeated 19th century Russian artistic, literary, cultural, social and political life as well as left its mark on the Cosmist thought, specifically affecting the following phenomena of culture (Young 2012: 177-192): i) Symbolism, represented by Blok, Mendeleeva, Briusov or Bielyi, whose premise was that art should demonstrate a life-creating approach to depicting the surrounding reality rather than that of observation, representation and interpretation; ii) cultural immortalism which implied the ongoing search for salvation and eternity; iii) God building advanced by the pre-revolutionary movement of Dmitrii Merezhkovskii's followers and Marxist antimaterialist intellectuals, also known as god seekers (*bogoiskateli*), whose goal was to revive a religious and spiritual character of the Russian Revolution; iv) redirecting erotic energy, the ideology common among many intellectuals, including Berdiaev, Bielyi, Turgeneva, Blok or Mendeleeva, who attempted to engage in celibate relationships; v) technological utopianism practiced by Acmeists (Mandelstam, Akhmatova, Gumilev), Futurists (Khlebnikov, Maiakovskii), Imaginists (Esenin) and Biocosmists (Ogenko) who valued a scientific and technical education more than studying humanistic disciplines; vi) occultism, as it developed in the Silver Age Russia, which rediscovered and sought inspiration from spiritualism, Theosophy, Freemasonry, Rosicrucianism as well as popular mysticism practiced through somnambulism, palmistry, astrology, fortune-telling, seances, hypnotism, dream interpretation or the use of Tarot. Young (2012: 191-192) argues that many of the aforementioned themes can be found in Cosmism, whose representatives were often affected by Promethean theurgy, encompassing symbolist, immortalist, god-building, Hyperborean, technological utopianist or occult ideas. As one shall observe, certain traces of all these concepts are evident in numerous Cosmist writings which emerged in the late 19th century Russia, a period particularly dynamic and rich in new intellectual, philosophical and cultural influences.

1.1.2. Mystic, esoteric and occult dimensions of Cosmism

What made Russian Cosmism special in a variety of religious and philosophical writings of that time, were its mystical, esoteric and occult facets (see e.g. Fesenkova 2003: 120-123; Rosenthal 1997; Scalan 1994; Young

2011, etc.). As argued by Rosenthal (1997), the occult seems to have been intrinsically bound with prerevolutionary, Soviet and post-Soviet culture, exerting a significant influence on a literary, artistic, philosophical, scientific or even political discourse. What is more, it still appears to prevail in contemporary Russia, where the supernatural, psychism and magic play a surprisingly important role not only in spiritual life, but also in intellectual and academic debates. Scanlan (1994: 27) points out that New Age mentality and spirituality are vivifying in modern Russia which might be visible in an unprecedented interest in astrology or ubiquitous presence of paranormal activity, confirmed by the results of a recent survey in which most participants claimed that they believed in some supernatural forces ("Religion and politics in postcommunist Russia" 1994: 56). According to White and McAllister (1997: 243),

> Alternative ideologies, including supernatural ones, had certainly become well established by the late communist period. The main television services had begun to incorporate an 'astrological forecast' for the following day, and many newspapers – including the popular trade union daily Trud – contained a regular column of advice on such matters. Bookstalls in underground stations reflected the same emphases: there was Nostradamus and Madame Blavatskaya, L. Ron Hubbard and the Tibetan Book of the Dead as well as Emmanuelle and the Marquis de Sade. A large majority (64 per cent), according to the polls, were pleased that newspapers and journals had begun to give a greater degree of attention to mysticism, unorthodox medicine and extrasensory perception. More than half thought those with a special gift could fore-tell the future (50 per cent) and cure the sick by television psychotherapy (57 per cent); and substantial minorities believed in witchcraft (35 per cent) or communication with the dead (11 per cent). If this was a Christian society, it was also one that incorporated many older and more diverse beliefs and values. (White and McAllister 1997: 243)

With respect to literature, a similar trend has been observed; one of the contemporary studies found out that approximately 39% of Russian nonfiction writings published in the 1990s contained elements associated with the occult (Dubin 1998: 22-32). Etymologically denoting a hidden or covered dimension, the term is frequently used synonymously with "esoteric" which signifies a group of beliefs or ideas preserved for and comprehended only by a select few ("esoteric, adj." 2013). Meanwhile, for the purpose of this study, the occult will stand for "various theories and practices involving a belief in and knowledge or use of supernatural forces or beings" which remain in opposition to rational, measurable or scientific evidence ("occultism, n." 2013). As suggested by a number of sources, such influences have been present in Russia for the past centuries. For instance, the practice of folk magic and sorcery was common and widely accepted not only in pre- but also

post-Petrine times, as suggested by fiction as well as proto-scientific, scientific and medical texts which offered astrological, superstitious or alchemical explanations for natural phenomena and human daily activities. This initially included the use of spells, casts, charms or protective devices, partly popularized by Peter the Great himself, which later evolved into learned esotericism spread by 18th century Freemasonry whose goal was to construct a better world and humanity by means of esoteric research and rituals (Young 2012: 36-44). Along with Masonic ideas, the Rosicrucian movement seems to have largely contributed to the prevalence of esotericism under Catherine the Great and became particularly appealing to young and influential aristocrats. Although seen as a serious political threat to the state, rosicrucianism successfully spread their theological doctrines based on secret knowledge of esoteric truths reaching back to the ancient past before Christ. The Rosicrucian worldview, in Russia promoted especially by Nikolai Novikov's circle, advanced the vision of a utopian, otherworldly empire inhabited by a perfect human race free from poverty, slavery, religious institutions or despotic regimes as well as able to practice Masonic rituals (Artemyeva 2009: 63-85). Rosenthal (1997: 7) offers a concise explanation for the ongoing popularity of occult themes in pre-revolutionary Russia:

> The vogue of the occult that arose in late nineteeth-century Russia was a response to such Europe-wide trends as the fading appeal of institutionalized Christianity, (…) [and] a series of shocks peculiar to Russia or most intensely felt there. First there was Russia's diplomatic isolation and subsequent defeat in the Crimean War (1854-55). Then the abolition of serfdom in 1861 contributed greatly to the decline of gentry while at the same time it left the peasants disappointed. The perceived inadequacy of the emancipation settlement was a major factor in the development of the revolutionary intelligentsia, men and women committed to abolishing the autocracy and instituting a just society, although they disagreed on exactly what a just society entailed and how to achieve it. (…) The government-sponsored industrialization drive of the 1890s transformed the economy at a pace unprecedented in Europe, creating numerous dislocations and undermining long-established social and political structures and the beliefs that sanctioned them. Not only Orthodoxy, the state religion, but Populism, the agrarian socialism based on the peasant commune – the ruling idea of the intelligentsia – was called into question. For some people, Marxism filled the ideological vacuum. Others sought answers in occult doctrines and, around the turn of the century, the Christian eschatology, frequently combining the two. Russia's unexpected defeat in the Russo-Japanese War (1904-5) and the Revolution of 1905 confirmed and exacerbated the sense of an all-pervasive crisis and the imminent end of the old world. (Rosenthal 1997: 7)

Such social moods could have somehow incited the revival and spread of a nationwide interest in esotericism and mysticism. Numerous occult practices or beliefs were cultivated by pre-revolutionary thinkers, including writers, artists or philosophers, who clearly rejected both the official ideology of state and church institutions as well as materialistic and positivist approaches to mundane experience and knowledge promoted by intelligentsia. Many public figures sought inspiration in the emergence of new occult doctrines in France and the rest of Europe which drew on Spiritualism, Anthroposophy or Theosophy and combined such influences with indigenous occult practices of rural Russia (Rosenthal 1997: 7-8). As argued by Rosenthal (1997: 8-9), a rediscovery and popularization of 19th and 20th century Russian occultism has its roots in i) the French occult revival, initiated by a defrocked Catholic priest Eliphas Levi, which promoted medieval practices of magic, alchemy, palmistry, astrology and tarot cards; ii) Spiritualism, a doctrine particularly popular in England, Germany and Russia, which implies a continuous existence of the dead and human ability to summon and communicate with them by means of mediums; iii) Theosophy (distinct from theosophy which denotes a divine wisdom or speculative mysticism), founded by Elena Blavatsky, which stands for a world religion advancing one eternal truth or the Secret Doctrine and incorporating elements of occultism, Buddhism, Christianity and Hinduism; iv) Anthroposophy, founded by Rudolf Steiner and defined as a spiritual science and a Christianized version of Theosophy, which proposes that the birth of Christ was the central event in the evolution of the universe. These doctrines, popular throughout Europe, were adapted to various cultures, yet they particularly took root in German Romanticism and Theosophical movements in Ireland and England which emphasized the role of Celtic myth and folklore as an alternative to dominant English cultural heritage. Meanwhile, in Russia the aforementioned Western schools of thought were often combined with apocalypticism, messianism as well as mystic and gnostic aspects of Orthodoxy that evolved in the 6th century and were later reinforced at the turn of the 17th century by Boehme's teachings which deeply influenced Vladimir Solov'ev or early 20th century art and philosophy (Rosenthal 1997: 9-10).

Most importantly, however, Russian esoteric thought has exerted a considerable influence on the development of Cosmism whose focus was on a man's active role in shaping the human cosmic evolution in a physical, spiritual and socio-historical sense (see e.g. Semenova 1993; Young 2011, 2012). At the beginning of the 20th century, Rudolf Steiner, the Rosicrucian thinker, noted that Russians demonstrated a higher sensitivity to and awareness of spiritual truths and doctrines that would become universal for the next generations (see e.g. von Maydell 1997: 153-167). The late 19th century representatives of the esoteric thought, including Georgii Gurdjieff,

Helena P. Blavatskii, Petr D. Uspenskii or Nikolai and Helena Roerich, did indeed notably contribute to its international development (Young 2011: 127). Some of their ideas might have been utilized by the Cosmist movement, which focused on discussing many esotericism-related issues like the emergence of a new, higher level of mankind, the attainment of omnipotence and immortality by humans, the resurrection of the dead, an inevitable influence of astral phenomena on the human existence or the spiritualization and humanization of the material world. Some of the major thinkers whose works contained these and akin themes include the rocket scientist Konstantin Tsiolkovskii, the visionary Nikolai Fedorov, the Silver Age poet Vladimir Solov'ev, the scientist Vladimir Vernadskii, the philosophers Nikolai Berdiaev and Pavel Florenskii or the heliobiologist Alexandr Chizhevskii (Young 2011: 127).

1.1.3. Religious and scientific Cosmists

Most scholars argue that there exist two partly opposing and partly complementary strands of Cosmism, namely i) a religious Cosmism, represented by Vladimir Solov'ev or Pavel Florenskii, which took a more contemplative and passive form; ii) a scientist/scientific Cosmism, represented by Nikolai Fedorov, Konstantin Tsiolkovskii, Alexandr Chizevskii or Vladimir Vernadskii, which promoted a highly active and more pragmatic approach to philosophical musings (see e.g. Abramov 2007; Alekseeva 2007: 5; Fesenkova 2000, 2003: 203-204; Isakova 2004; Obolevitch 2007: 46; Rarot 2005: 184, Semenova 1993; Stepin 2005: 362; Young 2012: 92-176). Also, while the former elaborated on the concept of an inseparable cosmic unity between the universe and mankind, the latter concentrated on scientific achievements and technological aspects of space exploration and human evolution. This division is sometimes extended to the third poetical trend of the movement, represented by Vladimir Odoevskii or Sergei D'iachkov (Stepin 2005: 362). Many of these thinkers, however, expressed views which transcended the boundaries of the aforementioned strands of Cosmism and touched upon issues grounded in both religion and humanism as well as science and technology.

The core principles of religious Cosmism stem from the Eastern Orthodox doctrines as well as the Greek philosophy of science, especially Plato's religious teachings which, in contrast to a classical physicalist paradigm of thought, proposed the interconnectedness of the universe and human existence (Obolevitch 2007: 46). Reviving the ontology of integral vision remained one of the chief tasks of religious Cosmists promoted particularly by Nikolai Fedorov who put forward the idea of unity between the soul and the cosmos mainly in terms of resurrection and regulation, the achievement of which should prevent nature from destructiveness and

thoughtlessness (Stepin 2005: 362). The philosopher offered his own conception of nature's self-reconstruction, raising of the dead and the human mind going out to outer space, understood in both physical and metaphorical sense. Fedorov's philosophy of the Common Task appears to have much in common with anthropocosmism, developed by N. Kholodnyi and N. Umov and opposed to anthropocentrism, which considered mankind an organic part of the universe, unified and seeking connections with the surrounding world seen as a living, conscious and intelligent organism (Fesenkova 2000: 71; Stepin 2005: 363). Similarly, scientific Cosmism, close to its religious counterpart in both the origins and mainstream ideology, has largely benefited from the Russian and Western thought, specifically that of Nikolai Fedorov and Henry Bergson (Obolevitch 2007: 47). Particularly Fedorov is credited with imprinting the most underlying idea on the course of its development; he clearly opposed Christian beliefs and maintained that human beings are able to overcome death as well as to resurrect themselves and their ancestors merely by means of science and technology rather than the power and will of God (Rarot 2005: 188). Interestingly, some of the philosopher's works give precise pseudo-scientific and scientific accounts of how mankind should permanently inhabit the cosmos by changing the electromagnetic field of the Earth, regulating its motion and finally transforming it into a kind of spaceship.

I shall continue the study of Russian Cosmism by portraying life and thought of Nikolai Fedorov, widely believed to be the founder of the movement and a precursor of transhumanism. The philosopher's futuristic and radical ideas, including the eventual achievement of perfection and immortality by human beings, resurrection of the dead or space colonization, laid the foundations for the movement's future development and influenced many Russian great thinkers, such as a mystic Petr Uspenskii, a scientist and rocket engineer Konstantin Tsiolkovskii or the writers Lev Tolstoi and Fedor Dostoevskii.

1.2. Nikolai Fedorov and the Common Task

Nikolai Fedorovich Fedorov (1829-1903), a Russian Orthodox Christian philosopher and obscure Moscow librarian, is believed to have given rise to Russian Cosmism (see e.g. Semenova 1982; Young 1979, 2011, 2012, etc.). His thought, combining the elements of both religious and scientist stands of the movement, was published posthumously (1906-1913) in two volumes titled *Filosofiia obshchego dela* [The philosophy of the common task],[3] and

[3] Unless otherwise indicated, translations without references are by the present author.

rediscovered as late as in the second half of the 20th century, when various scholars recognized its unprecedented depth and scope (Semenova 1982: 17). Seen as a precursor of transhumanism, Fedorov developed one of the major aspects of Cosmists' ideology, including the resurrection of the dead and humanity's attainment of physical immortality by the use of advanced technologies as well as scientific methods. The impact of his writings can be observed in subsequent Russian philosophy and culture; for example, many works of Nikolai Berdiaev, Lev Tolstoi, Fedor Dostoevskii, Valerii Briusov, Andrei Belyi, Vladimir Maiakovskii, Boris Pasternak or Andrei Platonov clearly show their influence (Young 2011: 128). In his 1915 essay, "Religiia voskroshenia (Filosofiia obshchego dela N. F. Fedorova)" [The religion of resusciative resurrection (N. F. Fedorov's philosophy of the common task)], Berdiaev (1989, 2002) extols the value of Fedorov's contribution to national thought through his idea of universal salvation which expresses the essence of the Russian spirit:

> Николай Федорович Федоров – гениальный самородок, оригинал и чудак. Это характерно русский человек, русский искатель всеобщего спасения, знающий способ спасти весь мир и всех людей. В недрах России, в самой народной жизни немало есть таких людей, но в лице Федорова этот русский тип нашел свое гениальное выражение. Ведь поистине это характерная черта русского духа – искать всеобщего спасения, нести в себе ответственность за всех. Западные люди легко мирятся с гибелью многих. Западные люди больше дорожат утверждением ценностей, чем всеобщим спасением. Но русскому духу трудно примириться не только с гибелью многих, но даже нескольких и одного. Каждый ответственен за весь мир и всех людей. Каждый должен стремиться к спасению всех и всего. И русская душа ищет способов всеобщего спасения, вырабатывает планы и проекты спасения, то социальные, то научные, то моральные, то религиозные и мистические. В этом русско-славянском прожектерстве всемирного спасения своеобразно сочетаются фантазерство с практическим реализмом, мистика с рационализмом, мечтательность с трезвостью. (Berdiaev 1989)
>
> Nikolai Fedorovich Fedorov – was a man of innate genius, original and quaint. This was a characteristically Russian man, a Russian seeker after universal salvation, knowing a way to save the whole world and all mankind. In the bosom of Russia, in the depths of the life of the people there are but few such, and in the person of Fedorov this Russian type found its expression with genius. This is indeed truly a characteristic feature of the Russian spirit – to seek after universal salvation, to bear within oneself a responsibility for all. Western mankind readily reconciles itself to the perishing of many. And Western mankind holds in esteem values, other than of an universal salvation. But for the Russian spirit it is difficult to become reconciled not only with the perishing of many, but even of several, or

> even of one. Each is responsible for the whole world and for all mankind. And the Russian soul seeks after ways of universal salvation, it works out plans and projects of salvation, here social, there scientific, then moral, then religious and mystical. In this Russo-Slavic working out of projects of universal salvation there is a curious combining of the fantastic with the practical and the real, of the mystical with rationalism, of the visionary with stark sobriety. (Berdiaev 2002)

Nikolai Fedorov was born in the southern Russia in a prominent and illustrious Gagarin family as an illegitimate son of a prince and an unknown woman from lower ranks of Russian nobility. The philosopher's childhood environment and upbringing affected his views and quality of writing; he always employed the perspective of the outsider when addressing certain issues and seemed to have possessed an intimate and secret knowledge of both the highest and lowest social strata (Young 2011: 128). Also, he firmly believed in the need to literally restore brotherhood and kinship of all mankind as well as ensure their resurrection which should guarantee the purest form of both spiritual and physical unity as well as eternity. Such concepts were included in *The philosophy of the common task* (Fedorov 1982: 90-91, 1990):

> Вопрос о небратстве, т. е. разъединении, и о средствах восстановления родства во всей полноте его и силе (до видимости, очевидности) и вопрос об объединении сынов (братство) для воскрешения отцов (полное и совершенное родство), конечно, тождественны между собою и противоположны прогрессу, вечному несовершеннолетию (т. е. неспособности к возвращению жизни отцам, как нравственной, а не чувственной зрелости, так как таковая только в этом и заключается), но последнее выражение вопроса, т. е. вопрос об объединении для воскрешения, определеннее. А чтобы очертить вопрос еще полнее, нужно прибавить к последнему выражению, что это объединение сынов для воскрешения отцов есть исполнение не своей лишь воли, но и воли Бога отцов наших, также нам не чуждой, что оно дает истинную цель и смысл жизни, что в нем именно выражен долг сынов человеческих и оно есть результат «знания всеми всего», а не сословного знания; в нем — в воссоздании, в замене рождения воскрешением, питания творчеством — мы и чаем чистейшего (бессмертного) блаженства, а не комфорта. (Fedorov 1982: 90-91)
>
> The question of lack of brotherhood, that is, disunity, and that of how to restore kinship in all its fullness and force (visibly and evidently), and the question of uniting the sons (brothers) for resurrecting the fathers (complete and full kinship), are obviously one and the same. Both are contrary to progress, which is perennial puerility, that is, the inability to restore life. One should add that the union of sons for the resuscitation of the fathers is the fulfillment not merely of their own will but of that of the God of our fathers — which is not alien to us and

> gives a true purpose and sense to life. It expresses the duty of the sons of man and is the result of 'knowledge of all by all', not of class knowledge. In re-creation, in substituting resurrection for birth and creativity for nutrition, we achieve the purest eternal beatitude as opposed to mere material comfort. (Fedorov 1990)

According to Fedorov, nature, which inevitably brings death and disintegration, is supposed to unite all humanity in pursuit of finding solution to these problems. Therefore, the philosopher's Common Task can be considered nothing else than an attempt to restore integrity and wholeness as well as prevent individuals from decomposing into separate particles, known as ancestral dust. The restoration of life to all ancestors who have already departed should become the mission of subsequent generations which would result in an impeccable harmony between all religions as well as all branches of science, arts and other forms of human activity. The completion of this grand project, as proposed by Fedorov in the late 19th century, could be accomplished through genetic engineering, cloning and manned space travel which would enable the reconstitution of human organisms to survive and nourish on air and sunlight (autotrophy) in the farthest corners of the universe unable to sustain life. What is more, in order to participate in the act of resurrecting the dead, everyone, regardless of their creed, should practice active Christianity, that is genuinely follow Christ in deed by obeying moral principles as well as Christian ideals of brotherhood, generosity and unselfish love. In other words, only through following the icon of resurrected Christ, is mankind able to reconstruct themselves and transform the universe into a genuine paradise (Fedorov 1982).

On the other hand, the role of science and technology in restoring life in corpses seems equally important and by many considered radical at that time. Thus, Fedorovism was often criticized for advocating necromancy as well as occult practices, associated with 18th century Freemasonry. Vladimir Solov'ev wrote to Fedorov that "since the time of the appearance of Christianity your 'project' is the first forward movement of the human spirit along the path of Christ. For my part I can only regard you as my teacher and spiritual father", yet at the same he expressed his deep concern about ethical aspects of the philosopher's idea of reviving the dead (Young 1979, as quoted in Young 2011: 130). Instead, Solov'ev proposed his own solution in which resurrection must become an entirely spiritual act performed by means of meditation, prayer and fasting whose practice would help develop immortal souls that would create the adequate new bodies for themselves. Unsuprisingly, Fedorov remained equally critical of Solov'ev's and Dostoevskii's mysticism and their disposition for probing the hidden and occult rather than the open and real, the latter concepts being more grounded in the Western esoteric tradition (Young 2011: 130).

Most importantly, however, it is the cosmos that seems to provide the answer to mankind's major concerns. Fedorov's futuristic idea of humans becoming the crew of Spaceship Earth, thus invoking not only their physical, but also mental omnipresence as well as resurrection of all the living and dead entities, would guarantee the revival of man's memory, consciousness and historical knowledge that would otherwise remain unknown. What follows is the philosopher's belief concerning the role mankind is supposed to play in the universe, as expressed in *The philosophy of the common task* (Fedorov 1982: 565, 1990):

> Земля — кладбище, и, как имеющая историю, она заключает в себе большее содержание, чем все миры, такой истории не имеющие. До сих пор сознание, разум, нравственность были локализированы на земной планете; через воскрешение же всех живших на земле поколений сознание будет распространяться на все миры вселенной. Воскрешение есть превращение вселенной из хаоса, к которому она идет, в космос, т. е. в благолепие нетления и неразрушимости. Пи в чем так не выражаются глубина и богатство премудрости, как в спасении безграничной вселенной, в спасении, выходящем из такой ничтожной пылинки, как земля. Обитаемость одной земли и необитаемость других миров есть требование высшего нравственного закона. Если мир не есть произведение слепого случая, то между множеством умерших поколений и множественностью миров дано возможное целесообразное отношение, дабы из одного праха земного, от единой крови произвести всех обитателей всех миров. Но если бы даже мир и был произведением случая, то разумное и чувствующее существо не могло бы не воспользоваться множественностью сил для оживления стольких лишившихся жизни поколений. (Fedorov1982: 565)

> The Earth is a cemetery which, possessing history as it does, contains within itself more substance than all those worlds which have no history. Till now consciousness, reason and morality were localised on planet Earth; by resurrecting all the generations who have lived on this Earth, consciousness will be disseminated to all the worlds of the Universe. Resurrection is the transformation of the Universe from that chaos towards which it is moving into cosmos – into the greatness of incorruptibility and indestructibility. Just how profound and abundant wisdom is, is nowhere better expressed than in the salvation of the infinite Universe, a salvation which originated in that insignificant speck of dust, the Earth. The highest moral law requires that only the Earth, and no other worlds, should be populated. If the world is not a product of blind chance, then an expedient relationship between the many dead generations and the multitude of worlds is possible, and this would mean that all the inhabitants of all the worlds could be created just from one blood and earthly dust. But were the world to be a product of chance, even then a rational, sentient being could not avoid making use of the multitude of forces to revivify so many generations deprived of life. (Fedorov 1990)

It seems that Fedorov's thought has made a considerable contribution to the development of Russian Cosmism as known today. Being a radical pragmatist, Fedorov is considered an investor of the philosophy of the Common Task and action which opposes any form of theoretical metaphysics, Gnosticism, meditative mysticism or passive and contemplative knowledge. The Cosmist school owes to Fedorov the concept of mankind's Common Task, resurrection of past physical forms, immortality of the soul and infinity of life, regulation of nature and transhumanism based on Vernadskii's idea of autotrophic and self-sustainable man, the supremacy of mind and technology or radical transformation of human condition on Earth and beyond. At the same time, his theories have profoundly affected a religious strand of the movement in which he instilled the notion of active Christianity, sacrifice and spiritual self-awareness, understood as a collective and universal rather than personal experience that transcends the boundaries of naturalism and materialism. As put by Berdiaev (1989, 2002):

> Но за «проектом» этим скрыта праведная воля человека, созревшего для совершеннолетней жизни, новое религиозное сознание, сознание – имманентное. На философии общего дела сказались все противоречия мысли XIX века, все смешения в нем ветхого и старого с новым и грядущим. В XX веке философия будущего выделит истинное зерно «философии общего дела» и отбросит ветхую оболочку. И во всяком случае явление Федорова будет признано знаменательным для духа России, для ее сокровенных стремлений и чаяний. (Федоров был характерно русским мыслителем, дерзновенным выразителем русской печали о горе, страдании и смерти людей, русских исканий всемирного спасения. Он – великий человеколюбец, взор которого обращен не только к будущему, но и к прошлому, к страданиям прошлого.). (Berdiaev 1989)

> But beyond this "project" is concealed the rightful will of man, ripened for the maturing of life, a new religious consciousness, a consciousness that is – immanent. All the contradictory thoughts of the 19th century spoke of a philosophy of the common task, all mixing up in it the old with the new and that to come. And in the 20th century the future philosophy will work at extracting the true kernel of the "philosophy of the common task" and toss away the old trappings. In any case, the appearance of Fedorov has to be acknowledged as remarkable for the spirit of Russia, for its hidden strivings and expectations. (Fedorov was a characteristically Russian thinker, boldly expressing the Russian sorrow over the grief, the suffering and death of people, of Russian searchings for universal salvation. He – is a great lover of mankind, whose outlook is oriented not only towards the future, but also to the past, to the sufferings of the past.). (Berdiaev 2002)

As Young (2012: 10) put it, Fedorov had "a twenty-first century heart and a medieval heart" as he combined religious and esoteric speculations with materialistic science- and technology-grounded theories. Some of his ideas were often contradictory and publicly ridiculed, such as the project of genetic engineering, space travel, universal immortality, brotherhood of men or resurrection of the dead, often seen as an interdisciplinary synthesis of Christian, Russian, socialist, fantastic and technoscientific influences. Also, some scholars argue that parts of Fedorov's research bear a strong resemblance to occult and magical practices common among 18th century Russian Freemasonry although the philosopher himself never mentions esoteric or Masonic literature in his writings (Young 1997: 172-173). Berdiaev goes even further, noting that Fedorov always presented himself as a positivist thinker as well as opposed the mystical, illusory and spiritual experience and considered it inferior to the real and rational science. What is more, the accumulation of knowledge should be a truly democratic process, open for the whole brotherhood of people, not only a carefully selected enlightened fraction of society so that the eventual victory over nature and eternal perishing could be achieved (Berdiaev 1989, 2002):

> Учение о воскрешении можно назвать позитивизмом, но позитивизмом, относящимся к действию (...). Позитивизм действия предшественником своим имеет не мифологию, не мифическое искусство, ибо мифология есть произведение особого класса жрецов – народ же имеет культ, жертвоприношение, что и есть мифическое искусство, и воскрешение есть превращение его в действительное. Позитивизм действия есть не сословный, а народный. (Berdiaev 1989)

> The teaching about resuscitation can be termed positivism, but it is a positivism that relates to action (...). The positivism of action in its antecedents possesses no mythology, no mystical art, since mythology is the product of an especial class of pagan-priests – the people however have a cult and sacrificial offering which also is a mystical art, and the resuscitation is a transforming of it into something active. Positivism of action is not a matter of class, but of the people. (Berdiaev 2002)

Nevertheless, as proposed by Young (1997: 173), certain obscure traces of occult themes might include Fedorov's concept of a hidden reality, the elimination of temporality and transformation of matter, the recovery of lost and secret knowledge, the attainment of complete enlightenment or utopian perfection of the human race. Petr Uspenskii, one of the Russian most well-known esotericists greatly inspired by the philosopher's writings, explained esoteric dimensions by a reference to the outer and inner circle of humanity. What follows is a fragment of Uspenskii's famous work, *V poiskakh chudesnogo: Fragmenty neizvesnogo ucheniia* [In search of the miraculous:

Fragments of an unknown teaching] (1949), which recounts his meetings and various associations with Georgii Gurdjieff, an influential spiritual teacher who promoted esoteric Christianity and the Fourth Way, a self-devised method for enabling one's transcendence to a higher state of consciousness (Uspenskii 1992, 1949):

> Внутренний круг называется «эзотерическим». Он состоит из людей, которые достигли высочайшего уровня развития: каждый из них обладает индивидуальностью в самой полной степени, т.е. неделимым Я, всеми формами сознания, возможными для человека, полным управлением состояниями сознания, всецелым знанием, доступным человеку, свободной и независимой волей. (...) Следующий круг называется «мезотерическим», или средним. Люди, которые принадлежат к этому кругу, обладают всеми качествами, присущими членам эзотерического круга: единственная разница здесь в том, что их знание имеет более теоретический характер. Это, конечно, относится к знанию космического масштаба. Они знают и понимают многое такое, что не находит выражения в их действиях; они знают дольше, чем делают. (...) Третий круг называется «экзотерическим», т.е. внешним, и представляет собой внешний круг внутренней части человечества. Принадлежащие к этому кругу обладают многими особенностями, свойственными людям, входящим в эзотерический и мезотерический круги; ни их космические знания носят более философский характер, т.е. более абстрактны, чем знания мезотерического круга; член мезотерического круга вычисляет, а член экзотерического круга созерцает. Их понимание не выражается в действиях. (Uspenskii 1992)

> The inner circle is called the esoteric; this circle consists of people which have attained the highest development possible for man, each one of whom possesses individuality in the fullest degree, that is to say, an invisible I, all forms of consciousness possible for man, full control over these states of consciousness, the whole knowledge possible for man, and a free and independent will. (...) The next circle is called the mesoteric, that is to say, the middle. People who belong to this circle possess all the qualities possessed by the members of the esoteric circle with the sole difference that their knowledge is of a more theoretical character. This refers, of course, to knowledge of a cosmic character. They know and understand many things which have not yet found expression in their actions. They know more than they do. (...) The third circle is called the exoteric, that is the outer, because it is the outer circle of the inner part of the inner part of humanity. The people who belong to this circle possess much of that which belongs to people of the esoteric and mesoteric circles but their knowledge is of a more philosophical character, that is to say, it is more abstract than the knowledge of the mesoteric circle. A member of the mesoteric circle *calculates,* a member of the exoteric circle *contemplates*. Their understanding cannot be expressed in actions. (Uspenskii 1949)

Uspenskii's remarks seem to have much in common with Fedorov's idea of the circle within the circle which is reflected in his Common Task and presupposes humanity to seek for a projected ideal reality within ordinary reality. The main difference, however, lies in the fact that Fedorov considered his version of a hidden dimension not only accessible for all, but also constituting a universal mission centered around the notion of regulating nature (Young 1997: 174).

Despite drawing certain amount of criticism, Fedorov's revolutionary concepts of the Common Task and gathering dust were praised by some of the leading philosophers as well as writers of his day, such as Tsiolkovskii, Dostoevskii, Tolstoi or Solov'ev, and still remain one of the greatest legacies in the history of Russian thought (Semenova 1982: 5-8). Moreover, it seems undeniable that most of his ideas laid solid foundations for the development of Russian Cosmism, particularly its scientific and religious dimensions, which adopted numerous aspects of the philosopher's futuristic project, including mankind's common cause to struggle against death, the achievement of immortality and eternal happiness, revival of the dead in both physical and spiritual sense, the infinity and universality of knowledge or the emergence of self-creating, renewable and mind-controlled entity, all of which should be realized by means of inevitable space colonization.

1.3. Religious Cosmists

Vladimir Solov'ev, Sergei Bulgakov, Pavel Florenskii and Nikolai Berdiaev, known as the leading philosophers of the late 19th century Russian Religious Renaissance, are believed to best represent the main line of thought in the study of religious Cosmism and their doctrines seem to have much in common with Fedorov's grand visions and ideas. Each of these thinkers, although differing in their main philosophical stances to a lesser or greater extent, created works whose focus can be clearly related to the core principles raised in intellectual discussions of Cosmism.

1.3.1. Vladimir Solov'ev

In academic circles, Vladimir Solov'ev is often seen as the father of religious Cosmism. An Orthodox priest, poet, literary critic and, most importantly, one of the most prominent Russian philosophers, Solov'ev was under a huge influence of Fedorov to whom he responded: "I accept your 'project' completely and without any discussion. Since the time of the appearance of Christianity, your 'project' is the first forward movement of the human spirit along the path of Christ. For my part I can only regard you as my teacher and spiritual father"

(Radlov 1909: 345, as quoted in Young 1994: 63). At the same time, however, the philosopher appears to have rejected strictly scientific and technological matters which lie at the heart of his master's ideas. Instead, he chose to develop several Fedorovian themes in a more spiritual and less Russocentric manner, emphasizing that cosmic unity and universal resurrection should be accomplished by means of religious and mystical experience as well as acquiring the holy wisdom. In particular, Solov'ev resigned from Fedorov's concepts of genetic engineering, physical resurrection or space travel and offered mankind different solutions on how to achieve immortality – through active goodmanhood, reading poetry as well as embracing ecumenism, love and eternally feminine Sophia (Young 2011: 133-134).

The chief Cosmist thought in Solov'ev's religious utopian system is centered around the idea of spiritual resurrection which strives for one's internal perfection modeled on that of the Christ of the Gospels mentioned in the philosopher's second letter to Fedorov (Solov'ev 1910: 346-347, as quoted in Young 2012: 100):

> The task of resurrection not only as a process but even in the goal itself is something conditional. The simple, physical resurrection of the dead cannot, in its own self, be the goal. The resurrection of people in the same state in which they strive to devour each other – to resurrect man in a stage of cannibalism – would be both impossible and utterly undesirable. This means that the goal is not the simple resurrection of man in his personal organic structure but the resurrection of man in the form he ought to take, namely, in that stage in which all his parts and separate units do not exclude and change each other. (...) Consequently, in salutary religion and in the church we have not only elements and a prototype of the resurrection and the future Kingdom of God but also a present (practical) path and actual means toward this ends. Therefore, our task must have a religious and not scientific character, and it must rely on the believing masses and not on disputatious intellectuals. (Solov'ev 1910: 346-347, as quoted in Young 2012: 100)

Nevertheless, despite his true belief in the necessity of completing the resurrection task over a long period of time, Solov'ev clearly rejects the most technological and scientific aspects of Fedorov's project and argues that an individual spiritual development should be attained through exercises and disciplines proposed by the world's religions. Achieving immortality and victory over death is a natural consequence of one's attainment of spiritual perfection in its fullest sense; yet the philosopher does not give any specific details on how the whole project should be conducted. What he envisions, however, is humanity's growing brotherhood based on evolving personal spiritual powers needed to overcome death, chaos and disintegration. Solov'ev speaks of resurrection as a part of the greater mission of all-unity which presupposes a complete harmony between mankind and nature infused

and replete with divine spirit. What is more, he resigns from the idea of regulating nature and instead proposes a reincarnation of divine love on a universal scale in the form of a Christian androgyny, embracing the entire world and all human beings. The wholeness of love would not only eliminate the separation of sexes and their prescribed roles, which remain one of the main driving forces behind the disintegration of mankind, but would also create the true human being, defined as a higher unity of both feminine and masculine elements free of disruption and disparity (Young 2012: 102-103). In one of his major works, *Smysl liubvi* [The meaning of love] (originally published between 1892 and 1893), Solov'ev elaborates further on the matter, presenting the resurrection by love as an alternative to Fedorov's plan for technological resurrection (Solov'ev 2013, 1985: 83-84):

> Истинная же духовная любовь не есть слабое подражание и предварение смерти, а торжество над смертью, не отделение бессмертного от смертного, вечного от временного, а превращение смертного в бессмертное, восприятие временного в вечное. Ложная духовность есть отрицание плоти, истинная духовность есть ее перерождение, спасение, воскресение. (Solov'ev 2013)

> True spiritual love is not a feeble imitation and anticipation of death, but a triumph over death, not a separation of the immortal form from the mortal, of the eternal from the temporal, but a transfiguration of the mortal into the immortal, the acceptance of the temporal into the eternal. False spirituality is a denial of the flesh; true spirituality is the regeneration of the flesh, its salvation, its resurrection from the dead. (Solov'ev 1985: 83-84)

As quoted above, Solov'ev proposes, against the Neoplatonic idea of the mundane and the ideal world, the all-unity between the physical and the spiritual; following Fedorov, he rejects the concept of disembodied spiritual fulfillment. Similarly to his idea of maintaining balance between masculine and feminine elements in every individual, a divine Christian love must embrace both matter and spirit, which also includes a transformation of a purely sexual into a higher plane relationship. One's existence should harmonize with both earthly social and cosmic life so that the part and the whole, manifested in each aspect of internal and external environment, could form an impeccable unity. Solov'ev calls this phenomenon a living syzygic relation, a mystical union which can be defined as follows (as quoted in Clowes 2004: 122):

> the link [of individual members of society] with whole social spheres – local, national, and, ultimately, with the universal [sphere] – needs to become still more internationalized, complete, and significant. This connection of the active, human, personal principle with the idea of total unity embodied in the social, spiritual-corporeal organism must be a live syzygial one. [The individual] must neither

> conform to the social sphere not dominate over it but [rather] coexist with it in loving interaction, to serve it as an active, fertile principle (…) and to find in it a fullness of vitality and potentiality. (as quoted in Clowes 2004: 122)

Solov'ev's syzygy (*sizigiia*) is also known as *vseedinstvo*, which denotes a total unity and presupposes overcoming dualism between material and eternal principles, inherent in Western philosophical systems, and establishing a close merger between physical, physiological, psychological, social as well as spiritual, mystical and cosmic realms of existence in the name of a divine and unconditioned love (Clowes 2004: 123). However, as mentioned before, the philosopher did not suggest taking any practical tasks to accomplish his project of spiritual resurrection; therefore, a syzygy cannot be seen as an agenda calling for any specific action. Yet one of very few steps supposedly leading to humanity's spiritual unification was an attempt at ecumenism, particularly at a reconciliation of the Orthodox and Catholic churches. Indeed, Solov'ev tried to establish dialogue with certain Catholic high officials, including Bishop Strossmayer, which did not only fail, but was also harshly criticized by many public figures in Russian religious, literary and political life (Young 2012: 106). Hence, syzygial existence seems to have perpetuated many of his principles and beliefs where the unity of the cosmos remained the most crucial goal of Christian activity and thought.

Vladimir Solov'ev, one of the most prolific thinkers of the Russian Religious Renaissance of the turn of the 20th century, exerted a huge influence on Silver Age literary works of Dostoevskii or Tolstoi, a generation of symbolist poets, such as Aleksandr Blok or Andrei Belyi, as well as philosophical writings of Sergei Bulgakov, Pavel Florenskii, Nicolas Berdiaev or Nikolai Losskii. Most importantly, however, it cannot be denied that Solov'ev's thought did affect religious Cosmism to a large extent; the philosopher himself was greatly inspired by Fedorov's grand project of universal resurrection. The major themes later adopted by Cosmists include the concept of syzygy, spiritual resurrection and the belief in the presence of higher reality beyond the mundane existence.

1.3.2. Sergei Bulgakov and Pavel Florenskii

Sergei Bulgakov and Pavel Florenskii were both the theologians and the major followers of Solov'ev's thought who developed the spiritual rather than the scientific strand of Russian Cosmism. Marxists in their youth, they both turned to Russian Orthodoxy as adults and, after having rejected shallow materialism, they rediscovered mystical merits and spiritual depths of the Church.

Sergei Bulgakov, educated as an economist, formulated his own idealistic and sophiological theory of Fedorov's regulation of nature in his 1912 work, *Filosofiia khaziaistva* [A philosophy of economy], which contained an alternative philosophy that eliminated Marxism's disregard for man's individual dignity. The ideology, regarded as an instance of classic liberalism, advocated the freedom of conscience and speech (*glasnost'*), the abolition of autocracy, national self-determination as well as the establishment of democratic rules and a constitution. From the perspective of Christian orthodoxy, the thinker asserted the concept of spiritual unity achieved through the Holy Spirit, transcending all the national differences, as well as scripture, prayer, worship, the sacraments and adherence to moral precepts: "Thus there exists even now a certain spiritual unity within the Christian world, although this is not expressed in any formulae. But we should add to this mystical, adogmatic unity of the Christian world the reality of its dogmatic oneness" (Bulgakov 2003: 60). As such principles would be difficult to implement on the Russian soil, Bulgakov proposed a deep philosophical and spiritual notion of sophic economy which should be underlying the society's quest for perfection and management of the cosmos. In the preface to the 2000 English edition of her book, Catherine Evtuhov (2000: 13-14) attempts to provide a concise characterization of the term which remains the main idea behind Bulgakov's work:

> Bulgakov (...) saw human history as a contingent process, developing in the conditions of a fallen world. Although we must constantly work to reflect the model provided by Sophia in our daily existence, we have no guarantee that this labor will bring us any closer to a perfect existence. The end of the world will come, as we know from Scripture; but the realization of the life of the future age remains ultimately independent of the earthly goals of mankind. Christianity provided Bulgakov with a means for avoiding the construction of but another utopia: a sophic economy was not a paradise to be achieved on earth but a constantly present vision inspiring us to work for the restoration of the harmony of nature and culture that humanity had lost in the Fall. (...) Another, related, essential characteristic of the sophic economy was its emphasis on process rather than on ends. Bulgakov, despite his rejection of economic materialism as a comprehensive view of the world, believed that it had discovered an essential insight in its emphasis on labor. In other words, apart from being a vision of society, Bulgakov's sophic economy was also anethic but one that prescribed joyful labor in Sophia as an antidote to the grim eking out of existence that was so prevalent in life and accepted as necessary by Marxism and other economic doctrines. Sophia's constant radiant presence could endow work with meaning and beauty, and the constant, joyful creation of one's own life gave meaning to existence. (Evtuhov 2000: 13-14)

Most importantly, however, Evtuhov (2000: 14-15) notes that Bulgakov's work shifts the human earthbound perspective to a spiritual dimension of their existence which is essential in pursuit of Divine Sophia that stands for an ultimate truth: "Bulgakov's sophic economy includes what is perhaps the single characteristic that the many variants of the modernist rejection of positivism had in common: a new attention to things beyond the material world, an effort to look beyond physical reality to essences invisible to the naked eye".

Although Bulgakov modeled his cosmic thought on Solov'ev's ideas, there are certain differences between the two philosophers' ways of thinking. While Solov'ev suggested that a mystical embracing of Sophia, the holy wisdom, should be confined to saints or poets who have advanced to a higher stage in their evolution towards deitypersonhood, Bulgakov regarded Sophia as "divine spirit at work throughout the human world, the presence that informs and directs the 'economy' (in the sense of 'management') of the cosmos" (Young 2011: 134). Also, it was the notion of sophianism, God's windom, that was coined under the influence of Solov'ev, here characterized by Berdiaev in his 1929 essay, "O sofiologii" [Concerning sophiology]:

> Софиологическое богословствование о. С. Булгакова означает возврат к священному, божественному космосу, восстановление органически-мистической связи между Богом и тварным миром. В мире и человечестве отображена и действует Пресвятая Троица и, прежде всего через Премудрость Божию. Вершина софийности, премудрости творения явлена в Приснодеве Марии, в Божией Матери. Без софийности твари, без явления премудрой, девственной женственности невозможно было бы боговоплощение и богочеловечение. Софиология переходит в мариологию. (Berdiaev 1929)

> The sophiological theological efforts of Fr. S. Bulgakov signify a return to the sacred, the Divine cosmos, the restoration of the organic-mystical connection between God and the creaturely world. In both the world and in mankind there is reflected and acts the Most Holy Trinity and it is foremost through the Wisdom of God. The summit of the sophianic aspect, of creation's wisdom, is manifest in the Ever-Virgin Mary, the Mother of God. Without the sophianic aspect of the creature, without the manifestation of the wise, the virginal femininity, there would be impossible the Incarnation of God and God-Manhood. Sophiology carries over into Mariology. (Berdiaev 1929)

Not surprisingly, his proposals of spiritual economy were considered radical and rejected by both Marxists and the Orthodox Church which accused him of heresy for his views on Divine Sophia. What is more, in 1922, Bulgakov, along with approximately 160 prominent intellectuals of his day, including

Berdiaev, was expelled by the Soviet government, mostly for his controversial writings about sophic economy. Bulgakov eventually settled in Paris where he established the St. Sergius Orthodox Theological Institute and remained active in the field of Russian Orthodoxy as the professor of Dogmatic Theology.

Pavel Florenskii, a Russian Orthodox priest, mathematician and philosopher, was Bulgakov's close friend, also known as the Russian da Vinci (Pyman 2010: 18), due to his vast array of interests, including occultism, mysticism, religion, folklore, art or electrical engineering. What might seem contradictory to some of his views is that he became an active advocate of the Soviet government after the revolution, working in the state's service by supervising the electrification project in rural Russia and teaching workers mathematics. Around that time, he was also a prolific writer, publishing strictly scientific monographs and articles on dielectrics, physics or electrodynamics. Simultaneously, Florenskii used to write more humanistic, philosophical and theological papers dealing with symbolic reality, mystic connotations of holy names, Christian love, ancient Russian and Western religious art or a concealed meaning of Russian icons (Pyman 2010: 138-139). In one of the greatest works on Orthodox spirituality, *Stolp i utverzhdenie istiny* [The pillar and ground of the truth] (1914), the thinker introduced the concept of pneumatosphere (the sphere of spirit) which derives from Vernadskii's noosphere and can be seen as a prefiguration of Lotman's notion of semiosphere[4] coined in the 1970s and 1980s. The book, being a series of twelve letters written to Christ, symbolically called a brother or friend, has three basic controlling ideas: i) it criticizes Western rationality, proposing a symbolist approach to its epistemology; ii) it discusses a mutual metaphysical relationship between human beings and God, based on true love, seen as brotherly friendship and a self-transcending identity; iii) it explores the concept of Sophia, God's wisdom, first introduced to Russian religious philosophy by Solov'ev and developed by Florenskii in the context of Russian culture where it symbolizes the mystical and universal church as well as the unity of all creation (Gustafson 1997: 14-21).

Under a strong influence of Solov'ev, Florenskii developed his own idea of passive, feminine Sophia, understood as God's conception of and love for all the living entities, as well as the doctrine of salvation, which should be seen as a process, encompassing the individual in relation to the whole cosmos. Therefore, Sophia can be considered a genuinely cosmic vision and

[4] Semiosphere is the concept, one of the basics of contemporary semiotics, was formulated by Iurii Lotman in 1982 and denotes the whole set of semiosic/semiotic relations within living matter or culture life. Lotman (2005: 205) defines the notion as "the semiotic space, outside of which semiosis cannot exist".

symbol of deep ecological concerns centered around preserving original beauty, purity and unity of nature, perceived as God's creation and paradise (Florenskii 1914: 350-351, 1997: 253):

> Если София есть вся Тварь, то душа и совесть Твари, – Человечество, – есть София по преимуществу. Если София есть все Человечество, то душа и совесть Человечества, – Церковь, – есть София по преимуществу. Если София есть Церковь, то душа и совесть Церкви, – Церковь Святых, – есть София по преимуществу. Если София есть Церковь Святых, то душа и совесть Церкви Святых, – Ходатаица и Заступница за тварь пред Словом Божиим, судящим тварь и рассекающим ее надвое, Матерь Божия, – «миру Очистилище», – опять-таки есть София по преимуществу. Но истинным знамением Марии Благодатной является Девство Ее, Красота души Ее. Это и есть София. (Florenskii 1914: 350-351)

> If Sophia is all of Creation, then the soul and conscience of Creation, Mankind, is Sophia *par excellence*. If Sophia is all of Mankind, then the soul and conscience of Mankind, the Church, is Sophia *par excellence*. If Sophia is the Church, then the soul and conscience of the Church, the Church of the Saints, is Sophia *par excellence*. If Sophia is the Church of the Saints, then the soul and conscience of the Church of Saints, the Intercessor for and Defender of creation before the Word of God, Who judges creation and divides it in two, the Mother of God, Purifier of the World, is, once again, Sophia *par excellence*. But the true sign of Mary Full of Grace is Her Virginity, the beauty of Her soul. This is precisely Sophia. (Florenskii 1997: 253)

Meanwhile, another Cosmist notion of pneumatosphere, which stems from panpsychism and Vernadskii's noosphere, denotes a sphere of spirit or soul constantly affecting the biosphere and inhering all the matter (Young 2012: 132). The concept lies at the core of a semiotic process of transformation of a material object through its symbolic function which might be applied, for instance, to the study of Orthodox icons. Florenskii maintained that iconography, the greatest and most divine kind of artistic activity, represents a higher, heavenly and spiritual art as it incorporates the unearthly, transcendent themes, such as largely naïve and unrealistic depictions of the saints. In *Ikonostas* [Iconostasis], Florenskii defines an icon and the saint's face as windows to another world, a higher, divine dimension and the boundary between the visible, earthly existence and the unseen, heavenly and glorious kingdom of God (Florenskii 2000, 1985: 219-220):

> Алтарная преграда, разделяющая два мира, есть иконостас. Но иконостасом можно было бы именовать кирпичи, камни, доски. Иконостас есть граница между миром видимым и миром невидимым, и осуществляется эта алтарная преграда, делается доступной сознанию сплотившимся рядом святых,

> облаком свидетелей, обступивших Престол Божий, сферу небесной славы, и возвещающих тайну. Иконостас есть видение. Иконостас есть явление святых и ангелов — агиофания и ангелофания, явление небесных свидетелей, и прежде всего Богоматери и Самого Христа во плоти, — свидетелей, возвещающих о том, что́ по ту́ сторону плоти. Иконостас есть сами святые. И если бы все молящиеся в храме были достаточно одухотворены, если бы зрение всех молящихся всегда было видящим, то никакого другого иконостаса, кроме предстоящих Самому Богу свидетелей Его, своими ликами и своими словами возвещающих Его страшное и славное присутствие, в храме и не было бы. (Florenskii 2000)

> The wall that separates two worlds in an iconostasis. One might mean by the iconostasis the boards or the bricks or the stones. In actuality, the iconostasis is a boundary between the visible and invisible worlds, and it functions as a boundary by being an obstacle to our seeing the altar, thereby making it accessible to our consciousness by means of its unified row of saints (i.e., by its cloud of witnesses) that surround the altar where God is, the sphere where heavenly glory dwells, thus proclaiming the Mystery. Iconostasis is vision. Iconostasis is manifestation of saints and angels – *angelophania* – a manifest appearance of heavenly witnesses that includes, first of all, the Mother of God and Christ Himself in the flesh, witnesses who proclaim that which is from the other side of mortal flesh. *Iconostasis* is the *saints themselves*. If everyone praying in a temple were wholly spiritualized, if everyone praying were truly to see, then there would be no iconostasis other than standing before God Himself, witnessing to Him by their holy countenances and proclaiming His terrifying glory by their sacred words. (Florenskii 1985: 219-220)

What is more, the cosmic quality of icons derives from the artist's mystical experience manifested and captured within the real and material layer of paintings which remain a symbolic signifier of the deepest reality of life and a true source of contemplation. Therefore, their main task is not merely to create a visual imitation of the depicted scene, but also to present the essence of the higher realm which brings the viewer closer to an image of the Kingdom of God.

Yet pneumatosphere can be observable not only in the investigation of Orthodox icons; Florenskii's whole research was replete with its various manifestations, particularly in his attempt to combine esoteric Christian spirituality with advanced mathematics, for instance, that of discontinuity (Young 2012: 122). In his view, the cosmos seems to be a unified whole, a fluid entity of subatomic matter and antimatter, abounding with transcendent spiritual energy. Furthermore, the concept, understood as a complete and harmonious wholeness, implies that it always remains beyond comprehension and humans, unable to grasp its meaning, can only seize upon separate

strands of the holistic truth, usually synonymous with Sophia. It seems that the human perception and encounter with Sophia, often manifested as our experience of the heavenly in the earthly existence or the world soul, may be realized merely through living experience, particularly friendship and brotherly love rather than solitude. Maintaining contact with the other is needed to enter the cosmos as well as allow the cosmos to enter oneself (Young 2012: 126-127).

Although Florenskii was actively supporting the Soviet government, in 1928 he was accused of agitation, arrested and exiled to a labour camp in Nizhny Novgorod. The official cause was that the philosopher argued clearly in favour of the existence of the Kingdom of God in intellectual discussions about the theory of relativity, geometry and the movement of light. After a few years, he was released and allowed to return to Moscow. In 1937, however, he was arrested again, sentenced to death and executed, this time on a ridiculous suspicion of conspiring with a professor of canon law, Pavel Gidiulianov, to overthrow the Bolshevik government and restore a fascist state with the help of Nazi (Pyman 2010: 153-154). Despite a clear falsehood of the charges against Florenskii, it cannot be denied that his views could have been seen as ideologically opposing the existing government. Indeed, some scholars point out the "otherness" of the thinker, emphasizing, on the one hand, his partly modern and technologically advanced inclinations, and, on the other hand, a medieval and spiritual nature of his worldview (Young 2012: 133). Leonid Sabaneev, a Russian musicologist, composer and scientist, characterized Florenskii as an ascetic scholar deeply engaged in the study of mystic and esoteric doctrines (Sabaneeff 1961: 313, as quoted in Young 2012: 133):

> He lived in his own closed, ascetic, intensely intellectual world and in the world of his secret "spiritual exercises". He never talked about it, and when I questioned him he would give some evasive answer or none at all. Yet I had good reason to assume that he at times engaged in Yogic exercises and was well acquainted with Hindu mysticism. In his tastes and psychological attitudes he seemed close to the early medieval Gnostics, much closer probably than to pure and naive Orthodoxy. (Sabaneeff 1961: 313, as quoted in Young 2012: 133)

Florenskii's thought, often classified as belonging to a religious strand of Cosmism, aimed to transform the world in a truly spiritual sense. It is this idea which makes his philosophical work close to Fedorov's visionary project of the Common Task and the central themes of the Russian Religious Renaissance.

1.3.3. Nikolai Berdiaev

Nikolai Aleksandrovich Berdiaev is commonly believed to be the best known and one of the greatest modern Russian philosophers. Although the thinker strongly opposed to being classified to any particular intellectual school, his writings show quite evident influences of various tendencies of thought, including Cosmist, platonic, symbolist or Christian existentialist philosophy. Born into a noble family in 1874 in the province of Kiev, Berdiaev was initially interested in combining neo-kantianism with Marxism and was actively engaged in the socialist movement for which he was arrested in 1898. Later, he turned to Vladimir Solov'ev's theories in his philosophical contemplations, probing the concept of a Christian world, and began publishing in the new journal, *Voprosy zhizni* [Problems of life], founded jointly with Sergei Bulgakov. During that time, Berdiaev wrote numerous books and articles dealing with a wide range of religious, social and historical themes, including the distinction between spirit and nature, human mystical and spiritual experience of God's presence, symbolism, the concept of rebellion and freedom in religious philosophy, the problem and distortions of personality or a historical significance of Russia and the nation's natural characteristics interpreted in light of Slavophiles' doctrines (Young 2012: 134-135). Christian existentialist philosophy, often replete with messianic and nationalistic influences, made a large contribution to the emerging notion of the Russian soul whose descriptions can be frequently encountered in literature of the Silver Age, particularly in Nikolai Gogol's, Ivan Turgenev's, Fedor Dostoevskii's and Lev Tolstoi's works.

It is commonly argued that Berdiaev's Cosmist themes might have been inspired by Plato's thought. The philosopher believed that there exists the distinction between the unreal, visible mundane world and the real, yet unseen cosmos based on creativity and freedom whose creation remains an ultimate Christian mission to be accomplished by the whole mankind. This idea seems to be inseparably connected with the theory of human personality, seen as a spiritual and transcending category of which the cosmos constitutes merely a part and whose unconscious elemental ground is truly tellurgic. Above all, however, Berdiaev admitted that he was under a strong influence of Fedorov's teachings about active and masculine Christianity, yet he did not propose any specific project of resurrection or action as it would restrict rather than encourage human freedom. What is more, he clearly criticized the philosopher's Common Task for its idea of resurrecting the dead as it seemed focused on restoring the past rather than building the future. Still, he agreed with Fedorov that death should be overcome, yet not by material, but spiritual means, namely by developing a full potential of an individual's soul. In his essay, "Religia voskroshenia" [The religion of resusciative resurrection], Berdiaev (1989, 2002) presents his own vision of resurrection understood as a truly mystical experience:

> Федоров же требует физического, грубо-материального воскрешения мертвых. Он – верующий православный христианин – философствует, как чистый материалист. Ахиллесова пята Федорова – в его религиозном материализме, совершенно наивном. Он противоестественно соединяет два материализма – материализм религиозный и материализм научный. Так затемняется истинное зерно великой и дерзновенной идеи воскрешения, в которой есть непреходящая духовная правда. Федоров все время черпает из двух источников. Образ его мыслей двоится. Временами кажется, что он не признает ни духа, ни иного мира, а только этот мир, прикованный к физической телесности. Если бы Федоров был более обращен к жизни духовной, то он не мог бы видеть единственную и исчерпывающую цель жизни в воскрешении отцов. Есть еще самоценная жизнь личности, ее индивидуальная судьба, ее духовная жизнь – жизнь творчески-положительная. Федоров очень суживает смысл тайны искупления. Искупление для него целиком исчерпывается воскресением. Но искупление есть также новое рождение человека; оно имманентно и трансцендентно разом. И само воскрешение стоит в зависимости от духовного рождения и возрождения – рождения нового человека во Христе. (...) Воскресение может быть только мистическим, в плоти мистической. (Berdiaev 1989)

> Fedorov demands a physical, coarsely material resuscitation of the dead. He – as a believing Orthodox Christian – philosophises like a pure materialist. The Achilles' heel of Fedorov – is in his religious materialism, which is totally naive. He conjoins contrary in nature two dualisms – a religious materialism and a scientific materialism. Thus he blocks off the light from the seed of the great and daring idea of resuscitation, in which there is an enduring spiritual truth. Fedorov draws constantly from two different sources. The manner of his thought is twofold. At times it would seem, that he acknowledges neither spirit, nor another world, but rather only this world, chained down to a physical corporeality. If Fedorov were more oriented to the spiritual life, then he might therein see the sole and exhaustive aim of life in the resuscitation of the fathers. There is a value in itself in the life of the person, its individual fate, its spiritual life – a positive-creative life. Fedorov very much narrows down the meaning of the mystery of redemption. Redemption for him is completely replaced by resurrection. But redemption is likewise a new birth of man; it is both immanent and transcendent all at once. And the resuscitation itself is dependent upon spiritual birth and regeneration – the birth of the new man in Christ. (...) Resurrection can only be mystical, in a mystical flesh. (Berdiaev 2002)

Therefore, unlike Solov'ev's concept of universal brotherhood or Bulgakov's plan for implementing sophic economy, his doctrine, partly in line with Fedorov's, advanced creative philosophy and the emergence of the Epoch of Creativity, both directed toward the future. The creative act remains the core principle of Berdiaev's philosophy and, in his view, makes a stark contrast

particularly with Fedorov's resurrection project which seems clearly past-oriented (Berdiaev 1989, 2002):

> Мы подходим к последнему и коренному вопросу, который ставит религия воскрешения. Федоров призывает к исключительной активности человека, он верит, что человек может управлять вселенной. Но признает ли Федоров творчество человека? Воскрешение умерших предков само по себе еще не творческое дело – слишком обращенное назад, а не вперед. Творческая задача жизни не может ограничиться воскрешением, т. е. воссозданием погибшего бытия. (Berdiaev 1989)

> We arrive at a final and deep-rooted question, which the religion of resuscitation presents. Fedorov appeals to the exclusive activity of man, he believes, that man can direct the universe. But does Fedorov acknowledge the creativity of man? The resuscitation of dead forefathers in itself is still not a creative deed – it is too much oriented backwards, and not forward. The creative task of life cannot be organised around resuscitation, the recreation of a being that has perished. (Berdiaev 2002)

What is more, creativity, free from any influences that could inhibit it, such as family life or reproduction, should be fused with spirituality and sanctity which reflects the Russian ongoing search for theurgic energy characteristic particularly for cultural, artistic and literary endeavours in early 20th century Russia.

Also, some of Berdiaev's works are devoted to the national themes often preoccupied with the messianic destiny of the Russian people, the mission of Orthodox Christianity as well as the idea of universal salvation and resurrection. The philosopher made a considerable contribution to the development of the Russian Soul, the concept present in 19th century literary and cultural discourse and used to depict spiritual qualities of the nation. More importantly, however, the notion seems to constitute one of the core premises of Cosmism which implies a clear distinction of the Russianness (*otechestvennyi*) with its existential, esoteric and eschatological tendencies from the Western philosophical tradition grounded in empiricist, narrow-minded and rationalist principles.

1.3.3.1. A nationalist dimension of Cosmism: Berdiaev and the Russian Soul

It seems that some diverse influences forming the ideological basis of Russian Cosmism might have contributed to its contradictory nature, which, as Young points out (2012: 4), serves as a carrier of certain characteristics of Berdiaev's Russian soul (*russkaia dusha*), the concept denoting the nation's spirituality whose presence can be often seen in the works of literature and culture. It was

first introduced to the public discourse as a literary phenomenon by Nikolai Gogol and a literary critic Vissarion Belinskii who jointly coined the term in the 1840s as a result of the 1942 publication of Gogol's *Mertvye dushi* [Dead souls]. Originally intended to signify landowners' loss of soul when exploiting their serfs, the meaning was later modified by Belinskii who paved the way for its new dimension, namely that of a national soul, permeating the lives of common people. This novel and rather optimistic concept of Russian identity emphasized the nation's historical youth, its mission to save Europe from itself by following the traditional wisdom of the peasant and potential to build a glorious future free of the government's and European influence (Williams 1970: 574). In *Taras Bulba* (1835), Gogol (2002: 209, 2011: 120) provided one of the earliest descriptions of the Russian soul:

> Вы слышали от отцов и дедов, в какой чести у всех была земля наша: и грекам дала знать себя, и с Царьграда брала червонцы, и города были пышные, и храмы, и князья, князья русского рода, свои князья, а не католические недоверки. (…) Бывали и в других землях товарищи, но таких, как в Русской земле, не было таких товарищей. Вам случалось не одному помногу пропадать на чужбине; видишь – и там люди! также божий человек, и разговоришься с ним, как с своим; а как дойдет до того, чтобы поведать сердечное слово, – видишь: нет, умные люди, да не те; такие же люди, да не те! Нет, братцы, так любить, как русская душа – любить не то чтобы умом или чем другим, а всем, чем дал бог, что ни есть в тебе (…). (Gogol 2002: 209)

> You have heard from your fathers and grandfathers in what honour our land has always been held by all. We made ourselves known to the Greeks, and we took gold from Constantinople, and our cities were luxurious, and we had, too, our temples, and our princes—the princes of the Russian people, our own princes, not Catholic unbelievers. (…) There have been brotherhoods in other lands, but never any such brotherhoods as on our Russian soil. It has happened to many of you to be in foreign lands. You look: there are people there also, God's creatures, too; and you talk with them as with the men of your own country. But when it comes to saying a hearty word—you will see. No! they are sensible people, but not the same; the same kind of people, and yet not the same! No, brothers, to love as the Russian soul loves, is to love not with the mind or anything else, but with all that God has given, all that is within you. (Gogol 2011: 120)

Certain references to the concept can be often encountered in the works of Ivan Turgenev, Lev Tolstoi or Fedor Dostoevskii. As suggested by the latter, the Russian soul signifies a set of inner qualities which constitute the nation's identity and behaviour patterns, closely connected with Eastern Orthodox and Christian merits of depth, suffering, compassion and strength. Such ideas

were expressed, for instance, in Dostoevskii's *Dnevnik pisatelia* [Diary of a writer]: "Я думаю, самая главная, самая коренная духовная потребность русского народа есть потребность страдания, всегдашнего и неутолимого, везде и во всём Этою жаждою страдания он, кажется, заражен искони веков. Страдальческая струя проходит через всю его историю, не от внешних только несчастий и бедствий, а бьет ключом из самого сердца народного." [I think that the most basic and the most rudimentary spiritual need of the Russian people in the need for suffering, ever-present and unquestionable, everywhere and in everything. It seems that the *narod* has been infected with this thirst for suffering since the beginning of time. This stream of suffering runs through its all history, not only summoned by external misfortune and poverty but welling up like a spring from the very heart of the people.] (Dostoevskii 1873: 61).

In the 19th century the concept stood in opposition to European materialist, work-oriented, pragmatic and rationalist values, thus making the Russians superior over the West (Williams 1970: 573). Historically, the emergence of the Russian soul coincided with the appearance of Russians and Americans in the European collective consciousness – both nations were seen as fresh and innocent except that the latter was young and had a bright future rather than bleak past (Williams 1970: 587). Among the major factors that might have influenced its shape was German romanticism which instilled both individualism and messianism in the nation's collective soul as well as Russian nationalism seen as a creation of the state and the Orthodox church.

As suggested by Williams (1970: 574), traditional Russian nationalism extols "the glories of the Tsars of Moscow, the achievements of Peter the Great, and of the Orthodox church as the sanctuary of religious truth passed on from Rome and Constantinople to the 'Third Rome', Moscow". Moreover, it is deeply rooted in the myth of Holy Russia which envisions the country as the land of the chosen people with their ruler, the Christ-like Tsar, and whose various motifs can be often found in the works of the Slavophiles, Pushkin or Tiutchev. After the Russian victory over Napoleon in 1812, nationalism placed more emphasis on idealizing common people, particularly the peasantry and *mir*, the "heart and soul" of society representing numerous virtues, such as life, creativity, freshness, and imagination (Williams 1970: 574). Also, German romanticism and idealism might have incited the Slavophiles to reject the Western values. Particularly, the writings of Schelling and Schiller, popular in the early 19th century Russian intellectual circles, were not only replete with enthusiasm about the Eastern civilizations, including China and India as well as new nations like the Slavs or Americans, but also envisioned a great purpose for Russia, which helped vivify the national consciousness. What follows is Berdiaev's comment on the relationship between the Russian Slavophile

thought and German romanticism published in his work *Istoki i smysl russkogo kommunizma* [The origin of Russian communism] (1990: 26-27, 1960: 27-28):

> Подобно немецким романтикам, русская мысль стремится к целостности и делает это более последовательно и радикально, чем романтики, которые сами утеряли целостность. Целостность христианского Востока противополагается рационалистической раздробленности и рассеченности Запада. (...) Психологически русская ортодоксальность и есть целостность, тоталитарность. Русские западники, которым чужд был религиозный тип славянофилов, увлеклись гегельянством, которое было для них столь же тоталитарной системой мысли и жизни, охватывающей решительно все. (...) Русский молодой человек, принадлежавший к поколению идеалистов 30-х и 40-х годов, исповедывал тоталитарное шеллингианство или тоталитарное гегельянство в отношении ко всей жизни, не только жизни мысли и жизни социальной, но и жизни личной, в отношении любви или чувства природы (...). (Berdiaev 1990: 26-27)

> Like the German romantics, Russian thought strove after wholeness and did so more consistently and radically than the romantics, who themselves lost wholeness. The wholeness of the Christian East is set in opposition to the rationalist fragmentariness of the West. (...) Psychologically, Russian orthodoxy is wholeness, totalitarianism; the Russian Westernizers to whom the religious type of Slavophile was alien, were influenced by Hegelianism, which to them was simply a totalitarian system of thought and life embracing absolutely everything. (...) A young Russian, belonging to the idealist generation of the 'thirties and 'forties, professed a totalitarian Schellingism or totalitarian Hegelianism in relation to the whole of life, not only the life of thought and social life, but also personal life, in relation to love or natural feeling. (...). (Berdiaev 1960: 27-28)

One of Schelling's greatest followers, Prince Vladimir Odoevskii expressed similar, yet more radical views, suggesting that Europe had sold its soul through a constant pursuit of rapid industrialization as well as economic and scientific progress. The philosopher's major novel, *Russkie nochi* [Russian nights] (2008 [1844]), contains an optimistic vision of Russia becoming a savior of the West dying from *pustodushie* (an empty soul), as put in the heroes' words (Odoevskii 2008: 149-150, 1965: 210-211):

> Все явления природы суть символы одно другому: Европа назвала русского избавителем! в этом имени таится другое, еще высшее звание, которого могущество должно проникнуть все сферы общественной жизни: не одно тело должны спасти мы – но и душу Европы! Мы поставлены на рубеже двух миров: протекшего и будущего; мы новы и свежи; мы непричастны преступлениям старой Европы; пред нами разыгрывается ее странная, таинственная драма, которой разгадка, может быть, таится в глубине русского духа; мы – только свидетели; мы равнодушны, ибо уже привыкли

> к этому странному зрелищу; мы беспристрастны, ибо часто можем предугадать развязку, ибо часто узнаем пародию вместе с трагедиею... (...) Велико наше звание и труден подвиг! Все должны оживить мы! Наш дух вписать в историю ума человеческого, как имя наше вписано на скрижалях победы. Другая, высшая победа – победа науки, искусства и веры – ожидает нас на развалинах дряхлой Европы. (Odoevskii 2008: 149-150)

> All phenomena of nature are symbols of one another: Europe called the Russian a savior! This name contains in itself another, still loftier calling, the power of which must penetrate all the spheres of social life: we must save not only the body of Europe, but her *soul* as well! We are placed on the border of two worlds: the past and the future; we are young and fresh; we are not privy to the crimes of the old Europe. Its strange, mysterious drama unfolds before us, the clue of which perhaps lies hidden in the depth of the Russian spirit; we are only the witnesses; we are indifferent, because we are accustomed to this strange sight; we are impartial, because often we can frequently guess the ending, because we frequently recognize the parody together with the tragedy. (...) Great is our calling and difficult is our task! We have to revive everything. We have to enter our spirit into the history of human mind, as our name is entered on the rolls of victory. Another, higher victory – the victory of science, art, and faith – is awaiting us on the ruins of enfeebled Europe. (Odoevskii 1965: 210-211)

As presented above, some early manifestations of the Russian soul were not oriented toward the past and nostalgic feelings, but they clearly demonstrated futuristic inclinations. In mid-19th century, the concept gained new dimensions centered around, as suggested by Gogol, the religious beliefs and customs of the peasantry. The Russian defeat in the Crimean War and the bankruptcy of Nikolai I's government were one of the driving factors that led to the Emancipation Reform of 1861 and final liquidation of serfdom. The notion was not only popular in literary works, but also in the public discourse. *Pochvenniki*, enthusiasts of the soil, or editors of *Moskvitianin* [Muscovite], the old Slavophile journal, expressed their strong interest in the life and wisdom of the peasants through frequent references to folklore, nature, instinct and conscience (Williams 1970: 582). These themes continued until the beginning to the 20th century, mostly in the form proposed by Dostoevskii and the Slavophiles, who kept the myth alive, inspiring many European intellectuals, particularly in Germany and England. Such thinkers, often dissatisfied with secularism, cynicism, materialism and prosperity of the Western civilization, turned to Russian nationalism to search for inspiration and means with which to fight the ills of their own nations. A partly idealized portrait of innocent, spiritual and innately good-natured Russia, popularized mainly through literature in translation, opposed that of the West, which was considered to be in moral and physical decline as a result of World War I and

the era of imperialism (Williams 1970: 585). For example, Oswald Spengler, a German philosopher, historian and great enthusiast of Dostoevskii, probed the distinction between the Russian soul and West European civilization in one of his major works, *Der Untergang des Abendlandes* [The decline of the West] (1991: 272):

> The contrast between Russian and Western, Jew-Christian and late-Classical nihilisms is extreme – the one is hatred of the alien that is poisoning the unborn Culture in the womb of the land, the other a surfeited disgust of one's own proper overgrowths. Depths of religious feeling, flashes of revelation, shuddering fear of the great awakening, metaphysical dreaming and yearning, belong to the beginning, as the pain of spiritual clarity belongs to the end of a history. In these pseudomorphoses they are mingled. Says Dostoevsky: "Everyone in street and marketplace now speculates about the nature of Faith". So might it have been said of Edessa or Jerusalem. Those young Russians of the days before 1914 – dirty, pale, exalted, moping in corners, ever absorbed in metaphysics, seeing all things with an eye of faith even when the ostensible topic is the franchise, chemistry or women's education – are the Jews and early Christian of the Hellenic cities, whom the Romans regarded with a mixture of surly amusement and secret fear. (Spengler 1991: 272)

A similar concept is presented in Berdiaev's *Novoe srednevekov'e. Razmyshlenie o sud'be Rossii i Evropy* [The new middle ages. Consideration of the destinies of Russia and Europe] (1924) where the philosopher reflects on the spiritual crisis of European civilization in the wake of World War I and the Russian Revolution. In particular, he contrasts the despiritualization of the West, as evident in the writings of Nietzsche and Marx which spread the idea of disintegration of humanism, with Russian spiritual renascence of the early 20th century, characterized by the coexistence of largely opposing ideologies, such as Marxism and Idealism, aestheticism and mysticism, atheism and Orthodoxy or positivistic materialism and Christian metaphysics (Lampert 2002: 11). Both Nietzsche and Marx violate the Christian value of the person; while the former denies it by substituting man for the Overhuman (*Übermensch*), Marx replaces individualism with the social collective and the proletariat. Therefore, the coming of what Berdiaev calls the dark ages, may cease the European monopoly of culture and give way to Russia which, situated between the East and Western civilization, is supposed to carry out its special historical mission of purifying and bringing a spiritual rebirth to the world's nations (Berdiaev 1924).

Undeniably, it was through faith and mysticism that the Russian soul connected with Eastern Orthodox Christianity. While Dostoevskii often probed this inherent relationship in his works, Tolstoi extolled an unprecedented contribution of plain Christian ascetics to some inner qualities

spiritual of the nation. In a non-fiction book, *Tsarstvo Bozhie vnutri vas* [The kingdom of God is within you] (1894), first published in Germany after having been banned in his home country, Tolstoi gave vent to his radical Christian anarchist thinking and proposed a new organization for society grounded in a literal interpretation of Christ's teachings. What follows is the writer's belief that it is Christian theology understood as a highly personal and intimate religious experience rather than the Orthodox church that laid the foundations for the modern Russian soul (Tolstoi 2013, 1984: 76-77):

> Учение каждой церкви, с его погашение и таинств, исключает Христово учение; больше всего учения Православной Церкви с ее идолопоклоннической обряды. (…) Несмотря на их суеверное отношение к иконам, housespirits, реликвии, и фестивали с венками из листьев березы, там до сих пор всегда было в народе глубокого нравственного и гостиной понимание христианства, которого никогда не было в Церкви в целом, и которые только встречаются в ее лучших представителей. (…) Люди продвигаются к осознанию моральной, живущих бок христианства. И тогда церковь приходит вперед, а не заимствования из людей, но ревностно внедряя в них окаменелые формальности потухшего язычества и стремление засунуть их обратно в темноту, из которого они появляются с таким трудом. (Tolstoi 2013)

> The teaching of every Church, with its redemption and sacraments, excludes the teaching of Christ; most of all the teaching of the Orthodox Church with its idolatrous observances. (…) In spite of their superstitious regard for icons, house-spirits, relics, and festivals with wreaths of birch leaves, there has still always been in the people a profound moral and living understanding of Christianity, which there has never been in the Church as a whole, and which is only met with in its best representatives. (…) The people are advancing to a consciousness of the moral, living side of Christianity. And then the Church comes forward, not borrowing from the people, but zealously instilling into them the petrified formalities of an extinct paganism, and striving to thrust them back again into the darkness from which they are emerging with such effort. (Tolstoi 1984: 76-77)

Still, many Slavophiles emphasized the role of Orthodox aesthetics in the creation of the Russian soul. For instance, Berdiaev, in his 1918 book *Sud'ba Rossii* [The fate of Russia], elaborates on the Russian spirit, innately bound with Orthodoxy, as well as its fundamental basis which lies in the conflict between spiritual satiety and spiritual hunger, the latter one being the source of the nation's mysticism and messianism. In arguing so, the philosopher invoked Dostoevskii and his ideal of a traditional, conservative, utopian and Christianized Russia where faith in God and adherence to moral principles

were supposed to ensure the nation's survival and return to Peter the Great's model of open, yet autocratic state (Berdiaev 1918: 246-347, 2007):

> В лице Достоевского воплощена эта религиозная антиномия России. У него два лика: один обращен к охранению, к закрепощению национально-религиозного быта, выдаваемого за подлинное бытие, - образ духовной сытости, а другой лик – пророческий, обращенный к граду грядущему, – образ духовного голода. Противоречие и противоборство духовной сытости и духовного голода – основное для России, и из него объяснимы многие другие противоречия России. Духовная сытость дается пассивной отдачей себя женственной национальной стихии. Это не есть еще насыщение Божественной пищей, это все еще натуралистическое насыщение. Духовный голод, неудовлетворенность натуралистической национальной пищей, есть знак освобождения мужественного начала личности. То же противоречие, которое мы видим в национальном гении Достоевского, видим мы и в русской народной жизни, в которой всегда видны два образа. Духовная сытость, охранение старого, бытовое и внешне-обрядовое понимание христианства – один образ народной религиозной жизни. Духовный голод, пророческие предчувствия, мистическая углубленность на вершинах православия в иных сторонах нашего сектантства и раскола, в странничестве – другой образ народной религиозной жизни. Русская мистика, русский мессианизм связаны со вторым образом России, с ее духовным голодом и жаждой божественной правды на земле, как и на небе. Апокалиптическая настроенность глубоко отличает русскую мистику от мистики германской, которая есть лишь погружение в глубину духа и которая никогда не была устремлением к Божьему граду, к концу, к преображению мира. (Berdiaev 1918: 246-347)

> In the figure of Dostoevsky was embodied this religious antinomy of Russia. He had two faces: the one oriented towards the guarding, towards attachment to the national religious lifestyle, of being caught up in the genuine lifestyle, – an image of spiritual repleteness, and the other face – prophetic, oriented towards the city to come, – an image of spiritual hunger. The contradiction and the conflict between spiritual satiety and spiritual hunger – is fundamental for Russia, and from it can be explained many an other contradiction of Russia. Spiritual satiety provides for the passive surrender of oneself to the feminine national element. This is not still a being full with the food of God, this is all but a natural being full. Spiritual hunger, unsatisfied by the nationalistic national fare, is a sign of the liberation of the masculine principle of the person. The same contradiction, which we see in the national genius of Dostoevsky, we see also in Russian popular life, in which always there are two faces seen. The spiritual satiety, the safe-guarding of the old, the lifestyle and the external-ritualistic understanding of Christianity, – is one image of the religious life of the people. The spiritual hunger, prophetic presentiments, mystical absorption at the summits of Orthodoxy among some

> sides of our sectarianism and schismatics, in the wont for wandering – is another image of the religious life of the people. The Russian mysticism, the Russian messianism is connected with the second image of Russia, with its spiritual hunger and thirst for God's truth on earth, just as in Heaven. An apocalyptic mindset profoundly distinguishes Russian mysticism from the German mysticism, which is but an immersion into the depths of the spirit and which never was a striving towards the city of God, towards the end-time, towards the transfiguration of the world. (Berdiaev 2007)

Berdiaev also notes that the Russian soul has yet another characteristic trait, namely that of passivity and femininity which results, on the one hand, in a mental suffering, uncertainty and inability to act in everyday life, and, on the other, in a constant pursuit of the ultimate, final and absolute truth, freedom and love (Berdiaev 2005: 279, 2007):

> Но русская апокалиптическая настроенность имеет сильный уклон к пассивности, к выжидательности, к женственности. В этом сказывается характерная особенность русского духа. Пророчественная русская душа чувствует себя пронизанной мистическими токами. В народной жизни это принимает форму ужаса от ожидания антихриста. В последнее время эти подлинные народные религиозные переживания проникли и в наши культурные религиозно-философские течения, но уже в отраженной и слишком стилизованной, искусственной форме. Образовался даже эстетический культ религиозных ужасов и страхов, как верный признак мистической настроенности. И в этом опять нет того мужественного, активного и творящего духа, который всего более нужен России для выполнения мировой задачи, к которой она призвана. Россия пророческая должна перейти от ожидания к созиданию, от жуткого ужаса к духовному дерзновению. Слишком ясно, что Россия не призвана к благополучию, к телесному и духовному благоустройству, к закреплению старой плоти мира. В ней нет дара создания средней культуры, и этим она действительно глубоко отличается от стран Запада, отличается не только по отсталости своей, а по духу своему. (Berdiaev 2005: 279)

> But the Russian apocalyptic mindset has a strong tendency towards passivity, towards waiting it out, towards femininity. In this is expressed a characteristic trait of the Russian spirit. The prophetic Russian soul senses itself pervaded by mystical currents. In the life of the people this assumes the form of a fear of the Anti-Christ. In recent times these authentic religious experiences of the people have penetrated into our cultural religio-philosophic currents, though but in a mirrored and too stylised, artificial form. There was even formed an aesthetic cult of religious frights and terrors, as a true sign of a mystical disposition. And in this again there is no masculine, active and creative spirit, which Russia has need of

> most of all for the fulfillment of the world tasks, to which it is called. The prophetic Russia has to pass over from expectation to creation, from acute terror over to spiritual boldness. It is all too clear, that Russia is not called to felicity, to bodily and spiritual well-being, to attachment to the old flesh of the world. Within it there is no gift for the building of an average culture, and in this it is deeply distinct from the lands of the West, it is distinct not only in its backwardness, but also by its spirit. (Berdiaev 2007)

The popularity of the Russian soul waned in the 1930s, to a large extent due to the Soviet regime's suppression of the theme as well as increased state of knowledge about the country brought about by Western travelers, philosophers and writers. For instance, D. H. Lawrence was openly disgusted with "these self-divided, *gamin*-religious Russians who are so absorbedly concerned with their own dirty linen and their own piebald souls we have had a little more than enough" (Davie 1965: 99, as quoted in Williams 1970: 586-587). Nevertheless, the international recognition of the concept as a genuinely Russian quality and signifying the nation's spiritual and historical potential attests to its ongoing validity and timelessness. Although not uniquely Russian in origin, the idea remains mainly associated with Russians who have chosen and popularized this phrase more than anything else in order to express their essential characteristics (Williams 1970: 588).

Berdiaev's views expressed in his major work, *Russkaia idea* [The Russian idea] (1948) are centered around the country's cultural geography as well as bipolar nature of its literature and thought, appear to convey a similar message:

> Русский народ есть в высшей степени поляризованный народ, он есть совмещение противоположностей. (...) [О]н в высшей степени способен внушать к себе сильную любовь и сильную ненависть. (...) По поляризованности и противоречивости русский народ можно сравнить лишь с народом еврейским. И не случайно, именно у этих народов сильно мессианское сознание. Противоречивость и сложность русской души, может быть, связана с тем, что в России сталкиваются и приходят во взаимодействие два потока мировой истории – Восток и Запад. Русский народ есть не чисто европейский и не чисто азиатский народ. Россия есть целая часть света, огромный Востоко-Запад, она соединяет два мира. И всегда в русской душе боролись два начала, восточное и западное. (Berdiaev 2009: 4-5)

> The Russians are a people in the highest degree polarized: they are a conglomeration of contradictions. (...) They are as a people capable in the highest degree of inspiring both intense love and violent hatred. (...) In respect of this polarization and inconsistency the Russian people can be paralleled only by the Jews: and it is not merely a matter of chance that precisely in these two peoples there exists a vigorous messianic consciousness. The inconsistency and

> complexity of the Russian soul may be due to the fact that in Russia two streams of world history – East and West – jostle and influence one another. The Russian people is not purely European and it is not purely Asiatic. Russia is a complete section of the world – a colossal East-West. It unites two worlds, and within the Russian soul two principles are always engaged in strife – the Eastern and the Western. (Berdiaev 1948: 1)

Certain fragments might be reminiscent of Frederick Jackson Turner's frontier thesis, particularly the philosopher's remarks considering the impact of physical and spiritual geography on the Russian soul (Berdiaev 2009: 4-5, 1948: 1):

> В душе русского народа есть такая же необъятность, безгранность, устремленность в бесконечность, как и в русской равнине. Поэтому русскому народу трудно было овладеть этими огромными пространствами и оформить их. У русского народа была огромная сила стихии и сравнительная слабость формы. Русский народ не был народом культуры по преимуществу, как народы Западной Европы, он был более народом откровений и вдохновений, он не знал меры и легко впадал в крайности. У народов Западной Европы все гораздо более детерминировано и оформлено, все разделено на категории и конечно. Не так у русского народа, как менее детерминированного, как более обращенного к бесконечности и не желающего знать распределения по категориям. В России не было резких социальных граней, не было выраженных классов. Россия никогда не была в западном смысле страной аристократической, как не стала буржуазной. (Berdiaev 2009: 4-5)

> There is that in the Russian soul which corresponds to the immensity, the vagueness, the infinitude of the Russian land, spiritual geography corresponds with physical. In the Russian soul there is a sort of immensity, a vagueness, a predilection for the infinite, such as is suggested by the great plain of Russia. For this reason the Russian people have found difficulty in achieving mastery over these vast expanses and in reducing them to orderly shape. There has been a vast elemental strength in the Russian people combined with a comparatively weak sense of form. The Russians have not been in any special sense a people of culture, as the peoples of Western Europe have been, they have rather been a people of revelation and inspiration. The Russians have not been given to moderation and they have readily gone to extremes. Among the peoples of Western Europe everything has been much more prescribed and formulated, everything has been classified in categories, and that finally. The case has not been the same with the Russians. They have been less at the mercy of the prescribed life, more accustomed to facing infinitude, and unwilling to recognize classification by categories. The various lines of social demarcation did not exist in Russia; there were no pronounced classes. Russia was never an aristocratic country in the Western sense, and equally there was no bourgeoisie. (Berdiaev 1948: 1)

Interestingly, Berdiaev (2009: 5, 1948: 1-2) notes that a contradictory nature of the Russian people gave rise to a distinct set of national characteristics, including the ongoing search for God, spiritual truths, higher awareness and universalism:

> Два противоположных начала легли в основу формаций русской души: природная, языческая дионисическая стихия и аскетически-монашеское православие. Можно открыть противоположные свойства в русском народе: деспотизм, гипертрофия государства и анархизм; вольность; жестокость, склонность к насилию и доброта, человечность, мягкость; обрядоверие и искание правды; индивидуализм, обостренное сознание личности и безличный коллективизм; национализм, самохвальство и универсализм, всечеловечность; эсхатологически-мессианская религиозность и внешнее благочестие; искание Бога и воинствующее безбожие; смирение и наглость; рабство и бунт. (Berdiaev 2009: 5)

> Two contradictory principles lay at the foundation of the structure of the Russian soul, the one a natural, dionysian, elemental paganism and the other ascetic monastic Orthodoxy. The mutually contradictory properties of the Russian people may be set out thus: despotism, the hypertrophy of the State, and on the other hand anarchism and licence: cruelty, a disposition to violence, and again kindliness, humanity and gentleness: a belief in rites and ceremonies, but also a quest for truth: individualism, a heightened consciousness of personality, together with an impersonal collectivism: nationalism, laudation of self; and universalism, the ideal of the universal man: an eschatological messianic spirit of religion, and a devotion which finds its expression in externals: a search for God, and a militant godlessness: humility and arrogance: slavery and revolt. (Berdiaev 1948: 1-2)

The traces of such an ideology can be clearly visible in the writings of Solov'ev, one of the greatest Russian philosophers who influenced the Silver Age of literature and art as well as thinkers who directly contributed to the development of Cosmism, including Vernadskii, Fedorov, Tsiolkovskii or Florenskii. For instance, in the view of Berdiaev, Fedorov's Common Task embodied the essential characteristics of the Russian soul whose ongoing mission is to seek universal salvation for all mankind, whether it be completed by technological, scientific, moral, religious or mystical means (see 1.2. for details). Also, Berdiaev (1989, 2002) interestingly comments on the Russian grieving, sadness and sick consciousness which lies at the very core of the national longing for salvation of both the living and those who have departed:

> Вся философия Федорова – не творческая, а хозяйственная, не легкая, а тяжелая. Это философия трудовой заботы. (...) И в этом есть что-то характерно русское, русская безрадостность, подавленность нравственной совестью, не допускающей свободной и даровой творческой избыточности,

> русское искание общего дела, дела спасения. (…) Болезнь русской совести, печалование о розни людей и гибели людей, жажда спасения людей и Царства Божьего здесь, на земле – все это выразилось у Федорова необыкновенно сильно, без всякого надрыва и раздвоения. (Berdiaev 1989)

> The whole philosophy of Fedorov – is not creative, but economic, not light but burdensome. This is a philosophy of toilsome care. (…) And in this there is something characteristically Russian, the Russian lack of joy, the stifling by the moral consciousness, not permitting of a free and talented creative abundance, the Russian searching for a common task, the task of salvation. (…) The sickness of the Russian conscience, the grieving over people departed and people perished, the thirst for the salvation of mankind and the Kingdom of God here, on earth – all this was expressed by Fedorov with an extraordinary intensity, without any sense of strain or quibbling. (Berdiaev 2002)

Here again it becomes evident that Berdiaev partly disapproves of Fedorov's Common Task as it deprives the nation of its penchant for a genuinely free and creative act. On the other hand, however, it seems to correspond well with the inner qualities of the Russian conscience, characterized by the lack of joy, overwhelming grief over all humanity and inability to perform an inventive, independent action.

It cannot be denied that Nikolai Berdiaev, one of the leading Silver Age philosophers, made a substantial contribution to the evolution of religious Cosmism, specifically through the implementation of a spiritual resurrection project, seen as a spin-off of Fedorov's Common Task. His vision of a new, paradisiacal world based on the principles of freedom, creativity, sanctity, active eschatology and spiritual development, left a permanent mark on the ideology of the movement where the thinker rejects most aspects of technological utopianism and scientific immortalism. At the same time, Berdiaev emphasizes that creative genius should be realized in a highly spiritual context which clearly reflects the influence of a Promethean theurgic energy, popular in Russian cultural, literary, social and political life at the turn of the 20th century. Interestingly, this line of thought, devoid of any practical proposal for taking a specific course of action, suggests a strong need to develop and implement a scientifically and technologically oriented method that would allow to realize Fedorov's grand project of physical and spiritual resurrection.

1.3.4. Conclusion

As it has been shown, the main representatives of religious Cosmism, including Vladimir Solov'ev, Sergei Bulgakov, Pavel Florenskii and Nikolai Berdiaev, seem to have shared some common themes that clearly linked them

to Fedorov's thought. Particularly, it appears that their main doctrines are ideologically grounded in the concept of ubiquitous unity, whether one considers Solov'ev's or Berdiaev's idea of spiritual resurrection, Bulgakov's sophic economy pursued in the management of the cosmos or Floreskii's pneumatosphere and his views on Divine Sophia. On the other hand, it should be noted that a religious strand of Cosmism, no matter how significant it might be to the evolution of the whole movement, rejects all the dreams about space conquest by advanced scientific and technological means. Such a materialistic approach, yet often combined with mystic and esoteric influences, seems to have been more endorsed and cultivated by scientific Cosmists, specifically by Konstantin Tsiolkovskii, Vladimir Vernadskii, Aleksandr Chizhevskii and Vasilii Kuprevich. All these thinkers sought inspiration in Fedorov's utopian vision of regulating nature, perfecting the human race and overcoming mortality which should be achieved through scientifically and technologically determined rather than spiritual methods.

1.4. Scientific Cosmists

The following section will discuss the Cosmist doctrine of five Russian scientists, including Aleksadr Sukhovo-Kobylin, the forerunner of scientific Cosmism, Konstantin Tsiolkovskii, an iconic figure of the movement widely known as the father of the Soviet rocketry science and space programme as well as Aleksadr Chizhevskii, Vladimir Vernadskii and Vasilii Kuprevich. Their writings tend to include clear references to Fedorov and his thought, in particular the philosopher's contention that death and eternal disintegration of the human body and spirit, seemingly inevitable, can be soon averted and replaced with a highly optimistic vision of mankind's immortality.

1.4.1. Alexandr Sukhovo-Kobylin: The forerunner of scientific Cosmism

According to Young (2011: 132), Cosmist tendencies had been displayed by many Russian thinkers even before Fedorov, among whom Alexandr Sukhovo-Kobylin played a considerably significant role. Commonly known as a wealthy aristocrat and an amateur playwright, he wrote a famous trilogy of satirical plays depicting the prevalence of greed, corruption and bribery in the Russian judicial system of that time – *Svad'ba Krechinskogo* [Krechinskii's wedding] (1850-1854), *Delo* [The case] (1861), and *Smert' Tarelkina* [The death of Tarelkin] (1869). However, what is perhaps a less noted fact about Sukhovo-Kobylin, is that he developed his own Cosmic philosophy in which he elaborated

on the notion of telluric or earthbound as well as solar and sidereal man, inhabiting the solar system and the entire universe, respectively. From these three stages of human evolution, only the third one, synonymous with attaining perfection and harmony, would provide mankind with the absolute freedom. In his 1899 philosophical work, titled *Filosofiia dukha ili sotsiologiia* [The philosophy of spirit or sociology], the playwright suggests that humanity should strive to become sidereal and thus achieve their ultimate goal by means of evolving smaller, lighter and insect-like bodies, growing wings, acquiring the skill of flying and aerial self-propulsion as well as turning to vegetarianism (Sukhovo-Kobylin 1899). Young (2011: 133) elaborates further on Sukhovo-Kobylin's eccentric ideas in the following way:

> Sukhovo-Kobylin believed that humanity in its present telluric stage is too much a captive of gravity and the senses. He writes: "If the Divine is spirit, and spirit spaceless, then humans, approaching the Divine, should consume our spaciousness, i.e. reduce our body, and by this reduction of the body become more and more spiritual, i.e. free ourselves from the burden and fetters of space. We see this in the animal world in the form of flying insects, who, owing precisely to their reduced size, i.e. their proximity to spirit, are wonderfully mobile. A fly in one second flies over approximately one hundred times its own length. If a human could attain that same degree of physical freedom which a fly has attained, one could move with great speed one hundred times one's length, race almost two hundred meters (yards) in one second, i.e. move through space with the velocity of a cannon ball" (Sukhovo-Kobylin, in *Kosmizm* 1993). In our self-directed evolution, then, according to Sukhovo-Kobylin, the further we evolve, the smaller our bodies should become, and as we approach divinity we will also approach a vanishing point of spaceless invisibility. The Divine is invisible, and we shall also become invisible, essentially bodiless, as we approach the goal of perfect, spiritualized, universal humanity. (Young 2011: 133)

Sukhovo-Kobylin contends that by negating gravity and other laws guiding nature, people should pave the way for their spiritualization and subjectivization which would lead toward ideal humanity, God as well as achieving the state of absolute freedom, divinity and perfection both in material and spiritual sense. In one of his essays, the philosopher comments on the bicycle as a means of transportation which could enable the so-called horizontal flight, seen as the first step toward flying, and a considerable reduction of man's spaciousness (Sukhovo-Kobylin 1899):

> Все эти современные изобретения суть не иное что, как шаги, совершаемые человечеством по пути его субъективизации, одухотворения. Горизонтально летящий на велосипеде человек – это уже движущийся к форме ангельской, высший человек. Через изобретение этих машин

> горизонтального летания человек подвигнулся к лику ангельскому или к идеальному человечеству. Всякому мыслящему существу понятно, что велосипед – это и суть те механические крылья, почин или зерно будущих органических крыльев, которыми человек несомненно порвет связующие его кандалы теллурического мира и изойдет своими механическими изобретениями в окружающий его солярный мир. (Sukhovo-Kobylin 1899)
>
> [All these contemporary inventions are nothing else than steps taken by humanity on the path of its subjectivization, spiritualization. A man flying horizontally on a bicycle is already closer to the form of the angel, the supreme human. Through the invention of these machines of horizontal flight, a man moves toward an angelic state or the ideal humanity. Every thinking human being can understand that the bicycle represents precisely those mechanical wings, the starting point or kernel of the future organic wings, by means of which they will undoubtedly break the fetters confining it to the telluric world, and escape into the surrounding solar world.] [translation mine, KB]

As quoted above, for the thinker, acquiring the ability to fly and widening humans' perspective would not only ensure that they would no longer remain earthbound. He also suggests that by reducing the size of their bodies, they would gradually become invisible, God-like creatures, thus giving rise to the emergence of universal, spiritualized and ideal humanity.

It appears that Sukhovo-Kobylin's ideas, often considered pre-Cosmist, have made a unique contribution to the development of Russian Cosmism, particularly his concept of a three-stage human evolution with an ultimate goal of attaining a complete physical and spiritual harmony with God and the cosmos. As argued by Young (2012: 20), these unusual beliefs of both mystical and scientific nature might have influenced some major thinkers of the movement who developed their own speculations in an akin manner. Such influences are often manifested in their futuristic visions centered around the idea of regulating nature, mankind's resurrection, immortality and inhabiting the entire universe or the emergence of noosphere and the goodman.

1.4.2. Konstantin Tsiolkovskii

Konstantin Tsiolkovskii, Fedorov's diligent student and follower, is considered the pioneer of Soviet cosmonautics and rocket science as well as one of the leading figures in the history of Russian thought. His contributions to the development of Russian Cosmism seem to be unquestionable. He did not only conduct a groundbreaking mathematical and scientific research, but also wrote theosophical treatises on the relationship between mankind and

the cosmos as well as elaborated on the notions of *atom-dukh* (atom spirit), panpsychism and other issues inspired by Fedorov's teachings (Alekseeva 2007; Hagemeister 2007). From the perspective of the space age history, Tsiolkovskii's mathematical formulas laid the groundwork for the 1957 launch of the first artificial satellite, Sputnik 1, as well as for Yurii Gagarin's first manned spaceflight (Young 2011: 132).

Also known as the author of fantastic and science fiction narratives depicting interplanetary travels and space adventures, Tsiolkovskii effectively promoted the idea of colonizing the solar system and beyond, perpetuating such images in the public mind and imagination. The motif of space voyages to extraterrestrial worlds became particularly popular toward the end of the 19th century, when the scientist produced a few fictional stories, like *Na lune* [First on the moon] (1893), *Grezy o zemlie i nebe* [Dreams of the earth and the heavens] (1895) or *Vne zemli* [Beyond the earth] (1920) (see 3.2.1. for details). However, Tsiolkovskii's career as a prose writer made only a minor contribution to the popularization of such highly futuristic visions of man in space. Even more enthusiasm for space exploration and rocket science was incited by his technical and philosophical papers, published in large quantities as tracts or pamphlets particularly after the collapse of the Soviet Union. As many of them were theosophical, panpsychist or gnostic in orientation, the thinker, although frequently classified as a scientific Cosmist, seems to have equally impacted both strands of the movement. In one of his pamphlets, *Monizm vselennoi* [The monism of the universe] (1925), he describes himself as follows:

> Я не только материалист, но и панпсихист, признающий чувствительность всей Вселенной. Это свойство я считаю неотделимым от материи. Всё живо, но условно мы считаем живым только то, что достаточно сильно чувствует. Так как всякая материя всегда, при благоприятных условиях, может перейти в органическое состояние, то мы можем условно сказать, что неорганическая материя в зачатке (потенциально) жива. (Tsiolkovskii 1925: 7)
>
> [I am not only a materialist but also a panpsychist, recognizing the sensitivity of the entire Universe. I consider this quality inseparable from matter. Everything is alive, but we consider alive only that which possesses a sufficiently strong sense of feeling. Since all matter can, under favourable circumstances, convert to an organic state, we can conditionally say that inorganic matter is alive in embryo (potentially).] [translation mine, KB]

Inspired by Fedorov's philosophy of the Common Task and anthropocosmism, Tsiolkovskii (1925) elaborated on monism as follows: "Мы проповедуем монизм во вселенной – не более. Весь процесс науки состоит в этом стремлении к монизму, к единству, к элементарному

началу. Ее успех определяется степенью достижения единства. Монизм в науке обусловлен строением космоса." [We preach monism in the universe, and no more. The whole process of science consists of this striving toward monism, unity, and the elementary beginning of life. The success of science is determined by the level of approaching unity. Monism in science comes from the structure of the universe.] In particular, Tsiolkovskii firmly believed that peripatetic atoms constituted the basic building elements of the cosmos and were able to coalesce into various combinations, thus making reincarnation and immortality of different life forms possible (Lytkin, Finney and Alepko 1995: 371). This utopian thinking was dependent on the realization of technocratic ideas which helped envision mankind moving to outer space and expanding into the realms beyond the solar system. This would enable them to become the master the universe and citizens of a genuinely cosmic civilization as well as control nature. Fulfillment of Tsiolkovskii's futuristic vision would guarantee the eventual attainment of universal happiness as well physical and spiritual eternity by human beings (Tsiolkovskii 2006: 224-225):

> Сейчас люди слабы, но и то преобразовывают поверхность Земли. Через миллионы лет это могущество усилится до того, что они изменят поверхность Земли, ее океаны, атмосферу, растения и самих себя. Будут управлять климатом и будут распоряжаться в пределах Солнечной системы, как и на самой Земле. Будут путешествовать и за пределами планетной системы, достигнут иных солнц и воспользуются даже материалом планет, лун и астероидов, чтобы не только строить свои сооружения, но и создавать новые живые существа. (Tsiolkovskii 2006: 224-225)
>
> [Today, men are weak and yet they transform the Earth's surface. In millions of years their might will increase to the extent that they will change the surface of the Earth, its oceans, the atmosphere and themselves. They will control the climate and the solar system just as they control the Earth. They will travel beyond the planetary system, reach other Suns and use resources of planets, moons and asteroids not only to build their new facilities, but also to create new living entities.] [translation mine, KB]

Also, this is where religious and scientist traditions of Russian Cosmism clearly appear to merge. On the one hand, Tsiolkovskii's view of space explorations seems to undergo a highly technocratic and rational scenario; yet on the other hand, the philosopher firmly believed in the idea of the atom spirit, perpetuating all dimensions of space and time as well as every single particle of the cosmos (Alekseeva 2007: 129-130). The latter, more teleological vision, presupposes the emergence of self-perfecting humanity whose ultimate goal is to evolve into higher spiritual beings and outgrow their

basic material needs. As pointed out by Young (2012: 151-152), unlike Fedorov's, Tsiolkovskii's project reveals its inhumane aspects as it requires people to eliminate those who might be considered defective, deleterious and unsuited to perfect themselves. Consequently, the future generations and their rulers should consist only of the most advanced speciments of mankind in terms of their scientific, intellectual and spiritual capabilities.

As mentioned above, the atom spirits or ethereal beings constitute the basic elements of the surrounding reality. Such an approach is strictly in line with the thinker's view of metempsychosis which proposes that the human atom spirit does not cease to exist with one's physical death but it prevails and becomes reincarnated in some other dimension and form of fresh being (Young 2012: 152). In this way, existence, both in macrocosmic and microcosmic sense and in all its manifestations, continues and the mind expands, accumulating knowledge as well as contributing to a greater extension of the universe; death can be no longer considered an obstacle but the path to self-perfection and endless prosperity. In one of his last essays, "Kosmicheskaia filosofiia" [Cosmic philosophy] (1935), Tsiolkovskii (1993) gives a concise summary of the main premises of his space-oriented philosophy:

> Резюмируем изложенное:
> А. По всей Вселенной распространена органическая жизнь.
> Б. Наиболее важное развитие жизни принадлежит не Земле.
> В. Разум и могущество передовых планет Вселенной заставляют утопать ее в совершенстве. Короче, органическая жизнь ее, за незаметными исключениями, зрела, а потому могущественна и прекрасна.
> Г. Эта жизнь для каждого существа кажется непрерывной, так как небытие не ощущается.
> Д. Всюду в космосе распространены общественные организации, которые управляются «президентом» разного достоинства. Один выше другого, и таким образом нет предела личному или индивидуальному развитию. Если нам непонятно высок каждый зрелый член космоса, то как же непостижим «президент» первого, второго, десятого, сотого ранга?
> Е. Бесконечность истекшего времени заставляет предполагать существование еще ряда своеобразных миров, разделенных бесконечностями низшего порядка. Эти миры, усложняясь, оставили часть своего вещества и часть своих животных в первобытном виде. (Tsiolkovskii 1993)

> [Let us summarize the foregoing:
> A. Organic life is spread across the universe.
> B. The most important progress of life will not occur on the earth.

> C. The reason, mind and power of the most advanced planets in the Universe are predestined to sink it in perfection. In short, organic life of the cosmos, with few exceptions, remains mature, and therefore powerful and beautiful.
> D. Life for each creature seems to be continuous and there is no non-existence.
> E. Throughout the whole universe, there exist social organizations controlled by the "president" of varying merit. One remains higher than the other, and thus there are no limits to personal or individual development. If we do not understand each high and mature member of the cosmos, how incomprehensible is "president" of the first, second, tenth or hundredth rank?
> F. The infinity of past time forces us to assume the existence of a greater number of idiosyncratic and independent worlds separated by eternities of a lower order. These worlds, as they became complex, left a part of their matter and a part of their animal world in a primitive form.] [translation mine, KB]

However complex and incomprehensible this might sound, Tsiolkovskii's grand vision of the monistic cosmos and self-perfecting humanity proved highly inspiring not only for various generations of space enthusiasts, but also for the major representatives of Russian Cosmism. What is more, through his combination of clearly esoteric, spiritual and religious influences with strictly scientific and technologically grounded facts, the philosopher became one of the leading and most influential figures of the movement. Grier (2003: 70) summarizes Tsiolkovskii's unprecedented contribution to the Cosmist thought:

> Konstantin Tsiolkovskii, the Russian pioneer in rocket science and the theory of space travel, is also usually connected with the theme of cosmism. Tsiolkovskii did not restrict his interests to the merely technical engineering side of the problem, but also presented it as the true path toward "eternal bliss" or the "Kingdom of God". Like Fedorov, Tsiolkovskii regarded the pursuit of science and technology, rather than the rituals of the church, as the true path to the religious redemption of humanity. Like Vernadskii, he considered the cosmos fundamentally a living being. Even those parts of it that we regard as "inorganic" are in truth composed of "sensate atoms" that are merely "sleeping" in their inorganic appearances. (Grier 2003: 70)

Tsiolkovskii's intellectual legacy, whether it be the basics of cosmonautics, spacecraft, rocketry, aviation, aerodynamics, medicine, biology or space-oriented philosophy, gnosticism and theosophy, seems unquestionable in terms of its high academic quality as well as theoretical and practical implications for space research and exploration. Particularly, Tsiolkovskii's visionary ideas exerted a considerable influence on the works of Aleksadr Chizhevskii, a noted biophysicist and founder of heliobiology.

1.4.3. Aleksandr Chizhevskii, Vladimir Vernadskii and Vasilii Kuprevich

Following Tsiolkovskii's views, Aleksandr Chizhevskii believed in a vast influence outer space exerted on human existence since the beginning of life on Earth which should be understood as a truly cosmic phenomenon created by a dynamic interplay of terrestrial and extraterrestrial forces. A Belarusian scientist, also known as the sun-worshipper, engaged particularly in the study of solar energy, such as, for instance, the functional interdependence between man's behaviour, including war, revolution or epidemic processes, as well as the fluctuations and activity of the sun (Chizhevskii 1971; Djordjević 1999: 106-107; Stepin 2005: 364). The original theory was included in his PhD thesis titled *Fizicheskie faktory istoricheskogo protsessa* [Physical factors of the historical process] (Chizhevskii 1924, 1971: 14):

> С точки зрения современной науки, все самые разнообразные и разнохарактерные явления на Земле – и химические превращения земной коры, и динамика самой планеты и составляющих ее частей, атмо-, гидро- и литосферы, протекают под непосредственным действием Солнца. (...) Влияние Солнца на живые организмы, при современном состоянии знания, еще не может быть выражено одною универсальной формулою, поэтому придется кратко перечислить эффекты влияния солнечного света на составные части животного организма: на клетки, ткани, мышцы, кровь и т. д. Так например, ультрафиолетовые лучи последовательно сперва возбуждают, а затем угнетают клетки, что объясняется раздражением плазмы клеток (Herte). Под влиянием света происходит повышение окислительных процессов в клетках (Qumcke) и усиление газового обмена живой мышечной и нервной ткани (Moleschott, Fubini). (Chizhevskii 1924)

> From the point of view of contemporary science, all the various and different phenomena: the chemical transformations of the earth's crust, the dynamics of the planet itself and its atmo, hydro and lytho spheres take place under the direct action of the sun. On the equator, all chemical processes are of the maximum activity. (...) The influence of the sun upon live organisms cannot be formulated by contemporary science in one universal formula, and therefore the effects of sunlight upon the different components of a living organism must be enumerated. For example, ultra violet rays affect the oxidating processes in the cellular tissues (Quincke) and increase the exchange of gasses in the living muscular and nervous tissues (Moleschott, Fubini). (Chizhevskii 1971: 14)

Interestingly, the aforementioned processes triggered by the solar energy also tend to affect certain historical events that occur due to human universal

social activities. Basing his hypothesis on the research pursued by the world-renowned scientists, the scholar argues (Chizhevskii 1924, 1971: 19-20):

> Количество исторических событий и, главное, степень интенсивности их развития стремятся во всех подробностях следовать изменениям кривой Солнцедеятельности (…) Если бы ход исторических событий был предоставлен всецело самому себе и ни один из космических факторов не влиял бы на него, мы никогда бы не обнаружили в нем закономерных колебаний более или менее точного периода и их одновременности на всей территории планеты. Из сказанного следует заключить, что есть некоторая внеземная сила, воздействующая извне на развитие событий в человеческих сообществах. (…) Итак, мы пока должны допустить, что электрическая энергия Солнца является тем внешним естественным фактором, который оказывает влияние на ход исторического процесса. (Chizhevskii 1924)

> The number of historical events, and more so, the intensity of their development has a tendency to follow in the detail the changes of the curve of sunspot activity (…) If the development of historical events were left by itself, no definite period in its regular fluctuations nor simultaneous advent of it over the entire world, could ever be observed. Therefore, we must assume that there exists a powerful factor outside our globe, which governs the development of events in human societies and synchronizes them with the sun's activity; and thus, we must also assume that the electrical energy of the sun is the super-terrestrial factor which influences historical processes. (Chizhevskii 1971: 19-20)

Chizhevskii's views, considered radical by the Bolshevik Party as they contradicted the official theories maintained by the Soviet government as to the causes of the Russian revolutions of 1905 and 1917, led to his arrest and exile to a labor gulag in the Ural mountains. After having completed eight years of rehabilitation, he returned to Moscow where he turned to medical analysis and began working on aero-ionic therapy under the USSR State Planning Organization (Golovanov 1969: 8-10). Nevertheless, the scholar's solar cycle hypothesis did not only lay solid foundations for a novel solar-earth research, but also provided a scientific proof and factual evidence for the Cosmists' philosophical reflections on both material and spiritual integrity of terrestrial and extraterrestrial phenomena.

The idea of the unity of the universe, particularly from the perspective of humans affecting outer space, was also profoundly elaborated by Vladimir Vernadskii, especially in his concept of noosphere, which became one of the most crucial assumptions of Russian Cosmism. Vernadskii thought of mankind as an inherent part of biosphere and its consciousness as well as intelligence were to play an unprecedented role in evolution processes, eventually resulting in the development of biosphere into noosphere (Stepin

2005: 364). The emergence of human cognition was supposed to give rise to global consciousness, the phenomenon currently being researched by the Princeton Global Consciousness Project, and vital to comprehend the elementary cosmic principles of life and Earth's mind-sphere. Additionally, the Russian school presupposed the advent of technosphere whose strong scientific basis was to serve as a universal binding force and prerequisite for an inevitable technological progress of humanity. The 20th century, regarded by the scholar as the time of scientific atomism, can be characterized by men developing their own kind of energy which would enable them to actively transform the biosphere and spread their influence to the surrounding space in the form of cosmic particles or cosmic radiation (Jones 2012: 14). This is how Vernadskii (1997, 2012: 18) himself viewed the role of biogeochemical energy produced by living organisms:

> Биогеохимическая энергия живого вещества определяется прежде всего размножением организмов, их неуклонным, определяемым энергетикой планеты, стремлением достигнуть минимума свободной энергии – определяется основными законами термодинамики, отвечающими существованию и устойчивости планеты. (…) У человека эта форма биогеохимической энергии, связанная с разумом, с ходом времени растет и увеличивается, быстро выдвигается на первое место. Этот рост связан, возможно, с ростом самого разума – процессом, по-видимому, очень медленным (если он действительно происходит) – но главным образом с уточнением и углублением его использования, связанным с сознательным изменением социальной обстановки, и, в частности, с ростом научного знания. (…) Ее изменение является основным элементом, приведшим в конце концов к превращению биосферы в ноосферу явным образом, прежде всего – созданием и ростом научного понимания окружающего. (Vernadskii 1997)

> The biogeochemical energy of living matter is determined primarily by the reproduction of organisms, by their unremitting endeavor (determined by the energetics of the planet) to achieve a minimum of free energy — determined by the fundamental laws of thermodynamics corresponding to the existence and stability of the planet. (…) With Man (…) the form of biogeochemical energy connected to reason grows and expands with time, rapidly moving to the fore. This increase is possibly related to the growth of reason itself—a process which seems to occur very slowly (if at all) but is chiefly connected to its honing and deepening in using it to consciously transform the social environment, and is especially due to the growth of scientific knowledge. (…) Its [Man's] explicit transformation is a fundamental element leading ultimately to the transformation of the biosphere into the noösphere, first and foremost, through the creation and growth of the scientific understanding of our surroundings. (Vernadskii 2012: 18)

Thus, most importantly, recognizing the significance and implementing noosphere should guarantee a radical breakthrough in man's worldview which would bring various social, ecological and psychological implications. This is how Roginskii, Perchenok and Borisov (1993: 415) comment on certain cultural and mental changes proposed by Vernadskii:

> In the social-psychological aspect, the transition to the noosphere presupposes, in Vernadskii's view, "the community of all humanity, of humans as brethren"; in the same vein, when referring to science of the future, he speaks of "new forms of scholarly brotherhood". One can clearly trace through his works belonging to different years the author's interest in "the comradely, brotherly element" in scientific organizations of the past and the present, which pave the way to the noosphere; As Vernadskii saw it, brotherhood should become the principle of relations between scholars and subsequently between all people on earth. (Roginskii, Perchenok and Borisov 1993: 415)

The idea of brotherhood can be also analyzed in its political dimension where it signified Vernadskii's liberal circles of close friends engaged in a number of social formations, including communists, populist *narodniki* or simply the followers of Tolstoi's Christian anarchist thought. Yet in more cultural terms, the concept might be seen as a rising religious and spiritual movement as proposed by the scientist in his *Nauchnaia mysl kak planetnoe iavlenie* [Scientific thought as a planetary phenomenon] (Vernadskii 1991, 1997: 51-52):

> Примерно за две с половиной тысячи лет назад «одновременно» (в порядке веков) произошло глубокое движение мысли в области религиозной, художественной и философской в разных культурных центрах: в Иране, в Китае, в арийской Индии, в эллинском Средиземноморье (теперешней Италии), появились великие творцы религиозных систем – Зороастр, Пифагор, Конфуций, Будда, Лао-цзы, Махавира, которые охватили своим влиянием, живым до сих пор, миллионы людей. Впервые идея единства всего человечества, людей как братьев, вышла за пределы отдельных личностей, к ней подходивших в своих интуициях или вдохновениях, и стала двигателем жизни и быта народных масс или задачей государственных образований. Она не сошла с тех пор с исторического поля человечества, но до сих пор далека от своего осуществления. Медленно, с многосотлетними остановками, создаются условия, дающие возможность ее осуществления, реального проведения в жизнь. Важно и характерно, что эти идеи вошли в рамки тех бытовых реальных явлений, которые создались в быту бессознательно, вне воли человека. В них проявилось влияние личности, влияние, благодаря которому, организуя массы, она может сказываться в окружающей биосфере и стихийно в ней проявляться. (Vernadskii 1991)

> Approximately two and a half thousand years ago, "simultaneously" (with an accuracy of several hundred years) a deep movement of religious, artistic, and philosophical thought took place in various cultural centers: in Iran, China, Aryan India, in the Hellenic Mediterranean (in what is now Italy). The great creators of religious systems emerged: Zoroaster, Pythagoras, Confucius, Buddha, Lao-tse, Mahavira. Their influence embraced millions of people and still lasts. It was for the first time that the idea of the unity of all the mankind, the idea of human brotherhood transcended the limits of separate personalities approaching it in their intuitions or inspirations. Now this idea became the motor of everyday and social life of the masses; became the purpose of the state units. Since then, this idea did not leave the historical field of the humanity, nor did it come nearer to its realization. Slowly, with many-hundred-year stops, the conditions are being created that enable its putting into life and realization. It is important and very peculiar that these ideas became introduced into the frame of the real everyday phenomena that emerged in the everyday life unconsciously, without man's will. In these ideas, revealed is the influence of the personality: owing to that influence, the idea can manifest itself in the surrounding biosphere and show itself in it spontaneously. (Vernadskii 1997: 51-52)

Vasilii Kuprevich, commonly considered to be the follower of Russian Cosmism closely related to Fedorov and his fellow thinkers, was a Belorusian botanist, biologist and a longtime president of the Belarusian Academy of Sciences. His contribution to the movement, particularly its scientific strand, remains unprecedented in terms of examining the problem of prolonging the human lifespan. Similarly to Fedorov, Kuprevich believed that death could be prevented and that mankind's immortality was just a matter of time. By arguing so, he posited that as certain plants had been alive for several thousands of years, the same rule might also apply to the longevity of man's existence. He also suggested that death must be seen as a purely historical phenomenon indispensable for maintaining natural evolution of living organisms as the new births could only occur due to the olds' passing away. However, as human beings had reached a stage where it was no longer needed for sustaining change and development, people's eternal perishing would be averted by means of advanced science and technology, for example, by rendering human cells self-renewable or eliminating genetic defects. Such ideas, being evident traces of transhumanism, were expressed in the philosopher's essay, titled "Dolgoletie: Realnost mechty" [Longevity: The reality of dream] (Kuprevich 1993, as quoted in Young 2012: 173):

> Смерть противна натуре человека. Мечту свою о вечной жизни люди воплотили в мифы о бессмертных богах. Вероятно, человек интуитивно понимал, что века, на протяжении которых шла эволюция, потрачены зря,

> если жить ему всего 50-70 лет. Церковь обещала ему бессмертие там, на небе. Затем философы убеждали его, что жить – это значит все время умирать и мечта об очень долгой жизни – метафизика. (Kuprevich 1993)
>
> Death is against human nature. People embodied the dream of eternal life in myths about the immortal gods. Probably man intuitively understood that ages of ongoing evolution would be wasted if one could live only 50-70 years. The church promised man immortality up there, in heaven. Then philosophers convinced him that to live means to be dying all the time, and the dream of a very long life – that's metaphysics! (Kuprevich 1993, as quoted in Young 2012: 173)

In many of his writings Kuprevich contends that humans, having achieved a high level of biological, social and intellectual evolution, are not only predestined to play a special role in the cosmos but are also able to free themselves from any physical restrictions through noospheric endeavours. He maintains that in order to attain immortality, mankind should remain open to questions brought about by empirical and mystical investigations as well as disciplines not necessarily proposed by mainstream science. What is more, the emergence and adoption of noosphere could lead to the evolution of the psyche, understood as the process of gaining higher consciousness and awareness of the self, including the need of reproduction and ongoing quest for eternity (Young 2012: 174-175). Still, death ought to be combated not only as a biological, but also as an emotional and intellectual obstacle; an undisturbed longevity must be assured by a radical change in scholarly and common people's attitude toward life which would lead to rediscovering an ultimate truth long contained in popular religions, myths and legends, often largely ignored by mainstream science (Young 2012: 172).

In this way, Kuprevich, despite his strong opposition to being classified as belonging to some specific intellectual school of thought, is widely believed to represent the immortalist strand of Russian Cosmism and, similarly to his predecessors, including Fedorov, Tsiolkovskii, Vernadskii or Chizhevskii, produced works that can serve as the model for present-day scientific Cosmists. Although accused of practicing pseudosciece and conducting research aimed to revive an alchemical pursuit of some "elixir of immortality", the philosopher continued his research into the unknown, examining transcendent and mystical powers of the human mind.

1.4.4. Conclusion

All the prominent thinkers representing the movement of scientific Cosmism advanced greatly varied and original conceptions, bearing chiefly on the ideology of scientific immortalism, panpsychism, technological utopianism as

well as universal monism. Although in diverse forms, Tsiolkovskii, Vernadskii, Chizhevskii and Kuprevich all shared the ongoing dream to probe both physical and spiritual relationship between man and the cosmos as well as bestow humanity with a special task of exploring the universe and travelling to its farthest frontiers. They also pondered about a mutual interdependence between humanity, cosmic energy as well as the questions of science and technology which did not only contribute to the intellectual discussions of Cosmism, but also later evolved to such an extent that they might have partly stimulated the first space exploration efforts. Djordjević (1999: 107) comments on a great potential of scientific Cosmists' projects, whether realistic or not:

> These projects aroused unprecedented hopes of quick transformation of human life, society, instigating old hopes that some of the problems facing humanity might be solved much quicker with the breakthrough into the cosmic expanses. Looking at this specific "storming the heavens", the elan in a country which had given birth to marvelous creators, dreamers and such men who materialized many of these dreams, but which at present is in a nightmare, facing various catastrophes which are converging (social, economic, moral, ecologic, demographic, national, governmental), one may put a number of questions, philosophic, scientific and other, taking into account the traversed roads and the perspectives. (Djordjević 1999: 107)

He continues by summarizing the greatest achievements of the Russian Cosmists which lie in the novel nature of their thinking patterns that combine both theory and practice as well as integrate common regularities in pursuit of envisioning a new conception of the world seen as a truly unified whole (Djordjević 1999: 107):

> The creative genius of the Russian Cosmists moved from the vague images and visions, across the more or less developed theoretical systems, all the way until the final act which led to the great changes. The novelty in the creation of these thinkers, who tried their hands both in theory and practice, consists first of all in their thinking style, in their striving for the integrality of the conception of world as a whole, in which the phenomena of most different kind possess some common foundations and regularities. They were searching just for these common foundations and regularities; striving to transcend partial approaches they boldly set about solving even the most complicated, the so called bordering questions of human existence. In a society bearing a semifeudal character great dreamers set themselves exceptional aims, conceived utopias, tending to a total remodeling of the existing. (Djordjević 1999: 107)

Drawing on Djordjević's claim, it seems that scientific Cosmists' thought constitutes a number of transcending themes, most of which are in line with

the canon of the movement. However, one of the key issues that makes it different from its religious counterpart is the emphasis on an active and technologically-determined evolution led by enlightened scientists who would govern and shape humanity's future. Vernadskii's concept of noosphere, an emerging spirit permeating the biosphere, Chizhevskii's speculative theory of cosmic energies and their continuous impact on human evolution or Kuprevich's ideas on how to overcome death by means of advanced science and technology remain the most crucial concepts for a great array of Cosmist speculations until today.

1.5. Cosmism and its impact on selected aspects of 20th century Russian and Soviet culture

Some scholars argue that the roots of Soviet cosmonautics and space age ideology stem mostly from the Orthodox Christianity and Russian Cosmism (see e.g. Deliagin and Sheianov 2011; Djordjević 1999; Gorin 2000; Harris 2008; Richers and Ruthers 2011; Rogatchevski 2011; Siddiqi 2000, 2008, 2010; Schwartz 2011; Thomas 2011; Vail and Genis 2001, etc.). Siddiqi (2008, 2010) argues that an unprecedented interest in human spaceflight in 1920s Russia, observable in a rising number of amateur societies and the widespread coverage of the topic in contemporary media, literature, arts, film and other realms of popular culture, can be attributed to technological utopianism as well as the Cosmist mystical occult tradition. Both ideologies shared akin language, iconography and objectives, including the moral imperative to transform humanity and take control over the natural world by the use of technological and spiritual means (Siddiqi 2008: 260, 2010: 78-79). The visionaries of the Soviet space programme, such as Fedorov or Tsiolkovskii, are believed to have laid foundations for some of the outlandish ideas advanced by space enthusiasts during the New Economic Policy (NEP) era (Gorin 2000: 13-16). For instance, it is often argued that the dreamlike projects of Cosmists could have inspired a group of amateur physicists-technicians, like Kibalcic or Korolev, whose work demonstrated visible effects in early space programme, particularly in the form of rocket plans or formulas of the first spacecrafts or space stations. After the Bolshevik revolution of 1917, the vision of exploring outer space became one of the chief priorities not only for the newly established government, but also for skilled individuals who sought inspiration in the Cosmist ideas and often attempted to put them into practice. The case of Nikolai Kibalcic, the revolutionary anarchist, bomb-maker and one of the terrorists planning an attempt on Czar Aleksadr II, well illustrates this tendency. He is remembered primarily for manufacturing dynamite as well as producing a revelatory project of a rocket-powered flying

machine which could enable flights into space. These groundbreaking, yet unrealized plans were discovered in the files of the imperial secret police almost forty years after the scientist's execution (Djordjević 1999: 107).

Another representative of messianism in early 20th century Russian thought was Sergei F. Korolev, best known as the USSR chief constructor and rocket pioneer as well as a man of exceptional energy and extraordinary intellect (Djordjević 1999: 107). His research projects, to a large extent inspired by the Cosmist ideas and designed under Tsiolkovskii's surveillance, were largely endorsed by the government and utilized in the Second World War scientific enterprises (Siddiqi 2000). Specifically, the scientist is accredited with making a few major discoveries in the field of early space exploration which were long kept in secrecy by the Soviet leaders. More interestingly, even after the Nobel Prize Committee proposed to award Korolev for his vast contribution to the Soviet space programme, Khrushchev turned down the honour for the sake of maintaining harmony in the Council of Chief Designers (Djordjević 1999: 107). What is more, Korolev was only one of numerous unknown scientists whose work did not receive due attention in the early Bolshevik era. In fact, in the post-war years there were many contributors to the success of the Soviet space programme, including Fredlik Tsander[5] or Aleksandr Shargei (Iurii Kondratiuk)[6], the former inspired by Tsiolkovskii, who continued realizing their projects despite facing the shortage of technology and other means necessary for their accomplishment (Gorin 2000: 14-16). The devotion of such people, whether self-driven or forced, played a substantial role in triggering the early space age.

Here, a renowned group of Soviet scientists known as GIRD (Group for the Study of Reactive Motion) should be also mentioned. Organized in 1931 and based in Moscow, it engaged in research activities investigating various facets of modern rocketry which led to developing new rocket engines and founding the world's first professional and government-sponsored rocketry programme. In contrast to other amateur and largely independent societies, GIRD pursued goals strongly endorsed by the Soviet leaders who emphasized the need to use the military potential of aircraft technology, especially piloted rocket planes

[5] Fredlik Tsander (1887-1933) was a Russian German pioneer of the Soviet rocket science. He is credited with designing GIRD-X, the first liquid-fueled rocket launched in the Soviet Union, and largely contributed to the country's early space research by founding the Society for Studies of Interplanetary Travel and publishing theoretical papers on the possibility of orbital and interplanetary flight, including that to Mars, or food production for space travel (Erickson 2010: 568-569).

[6] Aleksandr Shargei (Iurii Kondratiuk) (1897-1942) was a Ukrainian and Soviet pioneer of astronautics mostly famous for developing the first known Lunar Orbit Rendezvous (LOR), later utilized in the actual plans for the first moon landings, and proposing some revolutionary ideas on the mechanics of spaceflight and the use of liquid-fueled rockets (Erickson 2010: 561).

(CIA, Scientific Intelligence Report 1959: 2). In 1953, the academician A. N. Nesmeianov, the President of the USSR's Academy of Sciences, in a speech to the World's Peace Council in Vienna, said that "science has reached the state when it is feasible to send a stratoplane to the moon, to create a artificial earth satellite" (CIA, Scientific Intelligence Report 1959: 2). These words were the first public statement that the Soviet spaceflight programme, later administered by the Interagency Commission for Interplanetary Communications founded in 1954, officially came into existence.

These and other individuals and research groups were one of the visible effects of the rise and prevalence of the 1920s space fad which could have resulted from the clash of two distinct traditions: technological utopianism (international, materialist, pragmatist, modern, urban) and Cosmism (nationalist, spiritual, pastoral, archaic, Russian) (Siddiqi 2008: 262). The spread of the former ideology was the consequence of a rapid economic development combined with massive peasant migration to urban areas and demobilization after the civil war. Undeniably, the evolution of technology contributed to the growth and popularity of utopian visions (Siddiqi 2008: 263):

> In the 1920s, technology played a major role in the social conjuring, debating, and enabling of utopias. Prominent voices of the scientific and technical intelligentsia, as well as Bolshevik leaders, engaged in this discourse, and indeed, their pronouncements reflected the same types of tensions between naiveté and pragmatism emblematic of broader NEP culture. Lenin's fascination with the rapid electrification of Russia, industrial Taylorism, and the construction of modernized railroads in Russia were certainly all practical, but they also carried with them an underlying idea that technology itself was a possible panacea. (Siddiqi 2008: 263)

In the NEP years, spaceflight was widely considered a highly unattainable fantastical and utopian vision as well as one of the most common manifestations of the "fantasy of liberation" (Siddiqi 2008: 264). On the other hand, however, a rapid development of 20th century aviation technology promised that humanity would soon set off on distant voyages beyond the Earth's atmosphere and liberate themselves from "the signifiers of the past—social injustice, imperfection, gravity, and ultimately, the Earth" (Siddiqi 2008: 265). A similar vision was advanced by Cosmism; the spirit of Cosmism resonated strongly among many Russian intellectual circles, including Bolshevik ideologues, philosophers, scientists, writers, poets and artists, who often organized both public and more informal meetings to discuss diverse aspects of the Cosmist thought. According to Siddiqi (2008: 288), both technological utopianism and the movement of Cosmism shared a wide range of characteristics:

> Technological utopianism and Cosmism shared a number of basic elements: both were utopian, both relied on the notion that humanity needed complete control over nature, and both afforded technology a prominent role in the realization of their ultimate goal of transforming society. In their language and iconography, technological utopians spoke with the same evangelical tones as their spiritual compatriots. Like the Cosmists, utopians were obsessed with the future imperatives of humanity and paid fealty to technology, travel, and Tsiolkovskii. In advocating the science of space exploration in the 1920s, "believers" not only used the language of mysticism—the most obvious meeting point between science and religion—but also shared many of the same rationales, goals, and ideologies. (Siddiqi 2008: 288)

As mentioned before, a number of space-enraptured and short-lived societies were established in the 1920s Russia, including the first Soviet space club called the Society for the Study of Interplanetary Communications, founded in 1924 in the wave of media coverage of the topic of human spaceflight (Gorin 2000: 17). The public fascination with such themes was sparked by Oberth and Goddard's article, "Is utopia really possible?", published in *Izvestiia* [News] and soon followed by the printing of Tsiolkovskii's prerevolutionary works which excited an equally palpable optimism about the cosmos (Siddiqi 2004: 98-99). Among other communities devoted to pursuing space fad was a Section on Reactive Motion formed by the Science Society of the prestigious Zhukovskii Military Air Engineering Academy. The section conducted numerous public lectures and debates which served both popularizing and educational functions; the audience was familiarized with the most recent and groundbreaking theories on rocket building (Siddiqi 2008: 269). In addition to organizing meetings, the members published a variety of academic papers, opened bookstores and constructed self-designed rockets engines or other technological devices.

Meanwhile, a number of more informal groups of space advocates organized exhibitions which promoted the cause of manned space missions among the public in a more entertaining form and exposed certain mystical dimensions of the whole enterprise (Siddiqi 2008: 274). Examples might include a 1925 small exhibition of artifacts related to human spaceflight in Kiev or a 1927 world's first international exhibition on space travel in Moscow founded by the Association of Inventors, called the World's First Exhibition of Models of Interplanetary Apparatus, Mechanisms, Instruments, and Historical Materials (Gorin 2000: 20). The latter was a massive display open to visitors for two months which offered numerous attractions, such as the construction of a huge imagined planetary landscape designed by Arkhipov with a somewhat misleading title *Lunar Panorama* (Siddiqi 2008: 276-177).

The media frenzy over space research and exploration continued well into the 1920s. Disseminating various information about the prospects of human spaceflight was mostly in the hands of popular science journals and magazines which acquainted the readers with the most landmark achievements in science and technology. The titles, which constituted a fifth of all titles that came out between 1921-1927, were so popular among urban masses that publishers faced difficulties in living up to the demand for works in the field (Brooks 1989: 168-169). One of the most frequently read included *Nauka i znanie* [Science and Knowledge], *Priroda i liudi* [Nature and People], *Vestnik znaniia* [Journal of Knowledge], *Mir prikliuchenii* [World of Adventure], *Tekhnika i zhizn* [Technology and Life], *Tekhnika molodezhi* [Technology for Youth] or *Znanie-sila* [Knowledge is Power] (Siddiqi 2010: 89-90). Siddiqi (2008: 272-273) presents his main research results obtained from the study of popular science literature of the period:

> Space and space-related topics constituted a significant, although by no means major, slice of the popular science literature. Based upon an in-depth search through the popular science literature in early twentieth-century Russia, my research suggests that the number of articles on spaceflight published between 1923 and 1932 (inclusive), the key years spanning the space fad, amounted to nearly 250 articles and more than thirty books. Compared with the other pressing topics of the day, this output did not represent a great number, but that so many works on space exploration were published on such an arcane subject is in and of itself a striking result. By comparison, in the United States, only two nonfiction monographs on spaceflight appeared in the same period. Only in Germany, the single Western nation with a vocal spaceflight community, were there comparable levels of media attention. (Siddiqi 2008: 272-273)

The early Soviet fascination with space could be also found in literature, film and art of the day. Some of the most famous works, such as Tsiolkovskii's science fictions stories, Tolstoy's novel *Aelita* [Aelita] (1923) and its film adaptation directed by Protazanov (1924), Malevich's suprematist paintings or the Amaravella group's graphics and paintings, endorsed the belief that space travel was an inevitable part of humanity's future (Gorin 2000: 20; Siddiqi 2008: 277, 2010: 97-107). Such a trend in artistic representations of the cosmos prevailed until the beginning of the Cold War. Since the 1950s, space themes became omnipresent in the Soviet popular culture and, akin to their American counterparts which have left a vast visual legacy, they lavishly appeared in popular magazines, literature, film, art, music, posters and numerous advertising slogans. In the next decade marked by cosmic enthusiasm, Soviets used to regard outer space and spaceflight missions mostly in terms of certain political, social and cultural changes characteristic for this historical era (Vail and Genis 2001: 25, as quoted in Maurer, Richers, Rüthers and Scheide 2011: 4):

> For the Soviet person, the cosmos was also the symbol of total liberation. Stalin had been unmasked, Solzhenitsyn had been printed, transistor radios were finally available, there was talk about initiative and critique. Travelling to the cosmos seemed the logical conclusion of the process of liberation and the beginning of a period of freedom. (Vail and Genis 2001: 25, as quoted in Maurer, Richers, Rüthers and Scheide 2011: 4)

Such symbols are clearly visible in political posters of the period. The figures of revolutionary Soviet thinkers were often depicted with cosmic elements in the background, such as the sun symbolizing enlightenment, Mars serving as the epitome of utopian world and, most importantly, the red star, an iconographic metaphor for Khrushchev's space age policy objectives (Richers and Ruthers 2011: 230). As Richers and Ruthers point out (2011: 230), space imagery was to a large extent unrealistic as most artists cherished a limitless freedom in their portrayals of outer space, space technology and other related motifs. Various visual representations of the cosmos during the Thaw provided space for escapism which largely contributed to the development of utopianism and cosmic enthusiasm as well as gave rise to a unique quality of the national space-oriented culture that combined scientific explanations with dreamlike visions, imaginative legends and fantastic myths (Schwartz 2011).

The outset of cosmic enthusiasm was marked by the launch of Sputnik which ensured the Soviet leadership in opening space to humans followed by a series of firsts that had a physical encounter with the final frontier. In the mid-1960s, akin to most space travelers' biographies and memoirs, popular science journals highly contributed to the construction of the cosmonauts' public image which personified heroism, glory, friendship and the promise of a prosperous future. Many periodicals, including *Technology for the Youth* or *Science and Life* considerably increased their circulations, attracting more attention from the readers and inciting their interest by popularizing cosmonautics, space age competition and technological novelties which connoted different symbolic meanings, rooted in Russian Cosmism and communist ideology. Schwartz (2011: 237-238) argues that popular science journals spread the idea of spaceflight portrayed as the mission accomplished to conquest the cosmos as well as place where humans contact alien civilizations and gain knowledge crucial to unravel the mysteries of the universe, mankind and life on Earth. Numerous stories advancing the existence of other intelligent beings in the universe were often written in a manner of pseudo- science, regarded, however, as credible theories seriously analyzed by academics, writers, engineers, space enthusiasts and laymen. In the late 1960s, such discussions moved to special journal sections devoted to fantastic deliberations, yet the trend continued in most periodicals; for

example, *Knowledge is Power* established their own committee for alien contacts whose task was to collect and investigate all the materials that reported on close encounters.

The reason for such themes being widespread in Russian popular culture of space lies, according to Schwartz (2011: 238), in the fact that "the scientific field was extremely politicized during the late Stalin period, proclaiming a fundamental difference between Western and Soviet science, between an idealistic and a materialistic conception of scientific thinking" as a result of which "whole fields of scientific research and theoretical questions were totally rejected as bourgeois idealism". During the Thaw, half-realistic, fantastic, esoteric or even supernatural hypotheses were seriously discussed by renowned scientists and journalists who frequently proposed unreliable scenarios offering solutions to overcome the restrictions of nature and enable human colonization of outer space. The Soviet science paradigm often combined two opposite strands, namely a materialistic, advancing technological achievements of the cosmonautics, and a more imaginary one providing room for unlimited speculation based on mystic legends or wonders to a large extent grounded in scientific facts. Thus, the 1960s public discourse about space promoted by popular science magazines and periodicals was mostly founded on scientific fantasy stories (*nauchnaia fantastika*), the Soviet counterpart of science fiction genre which depicted highly futuristic scenarios, including human colonization of the cosmos, utopian society, time travel or encounters with extraterrestrial life (Siddiqi 2010: 97-98). Literary texts presenting such fictional worlds were often based on Michel Foucault's concept of other spaces (heterotopias) and re-presented utopias having some characteristics of the real sites that can be found within a given culture. Examples may include Ivan Efremov's novel *Tumannost Andromedy* [Andromeda nebula] (1957) as well as Arkadii and Boris Strugatskii's science fiction stories *Izvne* [From beyond] (1958) and *Chastnye predpolozhenia* [Special assumptions] (1959), published in *Technology for the Youth* and *Knowledge is Power*.

Also, imagery in the form of popular music and film industry made a significant contribution to space-oriented culture of the Soviet period, promoting, in opposition to its American counterpart, a collective, utopian and futuristic character of space exploration endeavours. The 1960 song "Chetyrnadtsat minut do starta" [Fourteen Minutes Before the Launch], written by Vladimir Voinovich and composed by Oscar Feltsman, was famous for being performed live by the cosmonauts Andrian Nikolaev and Pavel Popovich onboard their spaceship in a 1962 television broadcast and was later quoted in Khrushchev's political speech (Rogatchevski 2011: 252). The lyrics emphasize the idea of the space travelers' heroism, patriotism, inevitable success in travelling to the farthest parts of the universe by means of highly

advanced technology as well as their loyalty and dedication to Earth seen as the cradle of humanity. A similar ideology was often presented in early Soviet science fiction films, such as *Kosmicheskii reis* [Cosmic voyage] (1936), *Nebo zovet* [The sky calls] (1959), *Planeta bur* [Planet of the storms] (1962) or *Tumannost Andromedy* [Andromeda nebula] (1967), which all expose a collective sense of duty manifested in constant attempts to ensure safety of the whole team, successfully accomplish the space mission and finally return home (Siddiqi 2010: 100-103). Such visions tended to reflect some of the main characteristics of cosmic enthusiasm thriving in the 1950s and 1960s Soviet Russia, here commented by Siddiqi (2008: 289):

> Overall, this futuristic rhetoric had some common characteristics. Most of it was utopian, drawing from the technological utopianism of the 1950s. It privileged visionary improvements over the practical and mundane; wonder and dreaming trumped cold and rational benefits. In addition, the future brought about by new Soviet cosmic capabilities would only have peaceful intentions, in contrast to American militaristic ambitions in space which were said to be dangerously driving up tensions across the globe. According to Soviet space commentators, space technology was a neutral force, which in the hands of the socialist nation could be harnessed for the benefit of all humankind; capitalists could not be trusted to ensure a peaceful future. Furthermore, partly because of the utopian tinge, future prognostications were rather general; public spokespersons rarely alluded to specific programmes or projects but instead used language that was vague. Here, the future was both impending (which raised the hope for the current young generation that they would reap these benefits) and distant (for we could never know the entire range of benefits of the glorious Soviet space programme). (Siddiqi, 2008: 289)

Meanwhile, after two decades of cosmic enthusiasm prevailing in popular culture, numerous representations of a glorious future in outer space began to be gradually replaced with literary and visual images invoking a sense of nostalgia. The post-Sputnik era of the late 1960s brought a series of spectacular defeats to the public, such as the loss of the moon race to Americans or death of Sergei Korolev in 1966 and Iurii Gagarin in 1968, the latter still shrouded in mystery. Such traumatic and often unexplained events ignited suspicion, skepticism, stagnation, uncertainty over the future and a general realization of lost chances and expectations, particularly among space enthusiasts. These and akin feelings were expressed in an emerging counternarrative of the history of the Soviet space programme published in *samizdat* dissident literature and press, which was reproduced and distributed illegally in the 1970s among Soviet intelligentsia. Examples may include a Hungarian, *Washington Post* and later Soviet sensational publications which revealed that Korolev had been imprisoned from 1940 to 1953 or Leonid Vladimirov's book *The Russian space bluff: The inside story*

of the Soviet drive to the moon (1971) which presented previously suppressed theories pertaining to the origins of the national space programme. A broader disillusionment was caused by a common belief that the Soviet initially unbeatable lead in spaceflight achievements failed to fulfill the dream about humans traveling to the moon; this carefully constructed and popularized utopian vision remained only a nostalgic memory in the collective mind. What is more, Bach points out (2002: 547) that the loss of cosmic enthusiasm was replaced with a modernist nostalgia for the future reinforced particularly after the collapse of the Soviet Union, which can be defined as "less a longing for an unredeemable past as such than a longing for the fantasies and desires that were once possible in that past".

The motif of the past was reinforced during annual conferences commemorating life of the former Soviet space programme's heroes who died sudden and unexpected deaths, or annual meetings dedicated to space history and organized by the Academy of Sciences' Commission for the Development of Scientific Contributions of the Pioneers of the Mastery of Space. Elements of melancholy and nostalgia for cosmic enthusiasm appeared in numerous publications recounting a series of anniversaries and jubilees of historic moments or figures related to the space age era as well as expressing unfulfilled expectations toward the unknown future (Siddiqi 2008: 297-298). Many artifacts are still popular in Russian everyday life, such as Tsiolkovskii's house-museum where visitors can sit at the scientist's desk with a pencil and some writings or a recently rebuilt memorial museum in Gagarin City opened by President Medvedev in 2008. Nostalgic rituals are also well preserved in Zhytomir Cosmonautics Museum located in Sergei Korolev's home town, which, along with the city's administration and military forces, organizes annual celebrations of the hero's birthday (Thomas 2011: 100-103). Other space age artifacts commemorating the most famous space pioneers often appear in modern Russia, like a set of iconic stamps of Gagarin issued in 1991 or the 2001 postage stamps depicting the cosmonauts Titov and Tereshkova.

20th century Russian and Soviet representation of space exploration tends to be subject to recurrent myths most of which are still celebrated in contemporary public life. Numerous anniversaries related to the space age era are not only held regularly, but also attended by a great number of participants, including the 50th anniversary of Sputnik and Laika's spaceflight, the 150th anniversary of the space visionary and grandfather of cosmonautics Konstantin Tsiolkovskii or the centennial of the chief Soviet spacecraft designer and rocket engineer Sergei Korolev. What is more, Korolev and Gagarin conferences are organized each year and offer an array of attractions, such as the speeches of veteran cosmonauts dressed in their ceremonial uniforms, ethnic Russian dances or unveiling the Soviet space

explorers' portraits and monuments which all provide a patriotic and hero-worshipping atmosphere. Such activities can be considered remnants of the cosmonaut myth which has always played a significant role in the public rhetoric of space, particularly in the Khrushchev's era known for its endeavours to de-Stalinize the country, recreate the original revolutionary ideals and lay the foundations for a communist utopia. What followed were numerous state-sponsored enterprises, such as organizing events celebrating the Soviet space achievements, founding the mausoleums and disseminating space-related iconic images through a variety of media, especially newspapers and magazines, posters, postcards and finally television.

According to Thomas (2011), certain influences of Cosmism have played a considerable role in the formation of a distinct and unique *kul'tura kosmosa* (culture of the cosmos). They can be clearly observable in both early Soviet space industry as well as contemporary Soviet and Russian culture. Some of Fedorov's, Tsiolkovskii's and other Cosmists' concepts might have given rise to the Soviet space programme in both empirical and ideological sense. They inspired space enthusiasm among many great scientists, engineers and thinkers, including Korolev or Kibalcic, as well as incited a mystical sense of the significance of the cosmos and the human-space relationship, expressed in the use of rituals (e.g. pilgrimages to Gagarin's home town or nationwide celebrations of various space age anniversaries) or icons and Orthodox imagery (e.g. the presence of icons onboard of the International Space Station) (Thomas 2011: 145). Today, the Cosmist thought, except for serving as a continuous driving force behind the present-day visionary projects related to space research and exploration realized in both psychical and psychic sense, remains an important theoretical basis for various specialists operating in the field of transhumanism, scientific anabiosis or cryonics (Young 2012: 231). It seems that the spirit of Cosmism prevails in a number of diverse forms, yet perhaps its most prominent contribution to the Russian/Soviet and international pre-space age, space age as well as contemporary culture is that of opening the human mind up to seemingly unattainable, mystic or even occult experiences which bring hope for the ultimate survival of the species.

1.6. Concluding remarks. The present day status of Cosmism

The central premise of Russian Cosmism was establishing a universal utopia of the resurrected both on Earth and in the entire cosmos, seen as both spiritual and scientific-technological mission to be accomplished by human beings. Nikolai Fedorov, widely considered to be the father of the movement, gave rise to its main line of thought centered around the philosophy of the

Common Task generally understood as the abolition of death and active resuscitation of the past generations. This is the ideology that Fedorov's fellow Cosmists continued to elaborate on and develop in their own divergent directions, either accepting or rejecting certain aspects of the thinker's teachings.

Some of the themes common for both religious and scientific Cosmists include the pursuit of active rather than passive knowledge and a sense of wholeness as well as the belief in an intrinsic, mutual interconnection between man and the cosmos and the presence of a supreme spirit guiding the entire universe in the form of God or other divine entity. Also, most Cosmist thinkers tend to seek an ultimate truth and complete integration of knowledge, the present state of which, they claim, is inadequate and should be extended. Specifically, they look for the hidden wisdom across space and time dimensions by means of pseudo- and parascientific methods; therefore, many of them sought inspiration from esoteric, and occult sources. Furthermore, the spirit of Russianness and Russian soul seem to permeate numerous ideas and theories formulated by the philosophers; *otechestvennyi*, denoting a homegrown, native quality, is thought to be one of the most appealing characteristics of Cosmism until today and can be read as an alternative to Western European and American rationalist, empiricist and positivist values prevailing in social, cultural and political life (Young 2012: 235-236).

The national orientation of most Cosmists also includes the glorification of typically Russian ideals of nationalism, autocracy and Orthodoxy which lie at the core of the nation's soul epitomizing the wisdom, vitality and natural simplicity of the peasant as well as depth, emotional sensitivity and suffering of the Russian people following its ideal of Christ. The implementation of such concepts clearly differ among individual thinkers. For instance, Fedorov maintained that the government should be the Russian autocrat exercising authoritarian power when realizing the universal Common Task project. Solov'ev and religious Cosmists believed that Fedorov's mission ought to be accomplished by the godman who has possessed an incredibly advanced level of spiritual knowledge and personal development. Yet representatives of a scientific strand of the movement proposed their own ideas; Berdiaev, for example, asserted that the task is to be completed by the great creative artist with a substantial freedom, a vision distinct from Tsiolkovskii's or Vernadskii's, who contended that mankind's future would be shaped by the leading men of genius skilled in modern science and technology (Young 2012: 238-239). On the other hand, however, the Cosmist worldview has a twofold nature; clearly Slavophile influences, including the adherence to conservative, mystical, religious and utopian principles, are often combined with Western progressive, pragmatic, realistic, materialist and scientific approach to the surrounding reality. Therefore, the

whole movement may be seen as a genuine synthesis of certain opposing trends of both Russian and Western thought, such as dialectical materialism and mysticism, technological utopianism and Spiritualism, scientific and spiritual immortalism or futurism and emphasis on the past and tradition.

Except for the ongoing preoccupation with the theme of overcoming death and restoring life to all the ancestors, most Cosmists are concerned with uniting all realms of human experience that might seem disparate, such as science, art, religion, progress, tradition as well as scholarly disciplines or esoteric and occult knowledge. Fedorov, Tsiolkovskii, Chizhevskii, Solov'ev or Florenskii made a large contribution to the latter, having attempted to revive popular mysticism, including astrology, magic or alchemy and, most importantly, transform such investigations into highly respectable and socially accepted domains of science as well as incorporate them into certain branches of philosophy, theology or more technical academic subjects (Young 2012: 240). What is more, their study enriched the field of Western esotericism, offering a valuable extension to the curriculum of educational institutions offering degrees and diplomas in the area, as well as attempted to build the gap between esoteric and exoteric knowledge.

Another important contribution of the Russian Cosmists, particularly emphasized by Semenova (1993), is their ecosophic orientation, advanced specifically by Fedorov, Bulgakov, Florenskii and Berdiaev. To some extent in line with the Western ecology movement, it presents the view that natural environment of the Earth is being threatened by industrial and military actions pursued primarily to increase wealth and comfort of selected fractions of the world's population. However, according to Semenova (1993), most Cosmists do not represent the core assumption of ecosophism which is a humble acceptance of equal rights among all living and non-living beings realized as the return to a harmonic and peaceful symbiosis between humanity and nature. Such a worldview also implies mankind's approval of their mortality seen as a natural and unchangable act and any attempts to improve nature as well as regulate or eliminate death should be strictly forbidden. Furthermore, in ecosophic view, human beings are supposed to remain in or return to a stage of infancy rather than evolve into more advanced and mature God-like creatures guiding their own fate.

As mentioned at the beginning of the chapter, Russian Cosmism was heavily suppressed during the Soviet period as some of its central tenets were considered both political and ideological threat to the state; many religious Cosmists, including Bulgakov or Berdiaev either worked in exile or were eventually sentenced to death like Florenskii. The fate of their scientific counterparts was more favourable as the work of Tsiokovskii, Chizhevskii, Vernadskii or Kuprevich was honoured for its contribution to a newly-emerging field of space research and exploration. Yet on the other hand, some

of their speculations, particularly those which contradicted the main principles of dialectical and orthodox materialism, were heavily criticized and had to be kept unpublished (Young 2012: 219). Only with the revival of Russian Cosmism in the 1980s, many of these previously suppressed works could come out and initiated the emergence of new waves of Cosmist activities and research that flourish in various forms until today.

The present-day status of the movement is nurtured by numerous institutions and intellectual circles which continue to develop some of the major Cosmist themes and ideas. Young (2012: 219-226, 229-234) mentions the most significant centers and groups of individuals preoccupied with preserving and spreading the Cosmist thought: i) the N. F. Fedorov Museum-Library in Moscow (chartered in 1993 by Svetlana Semenova and her daughter Anastasia Gacheva) whose collections are devoted to Fedorov's life and research; also, the institution is responsible for sponsoring academic publications and conferences on the Russian Cosmists as well as the nationwide promotion of their concepts in post-Soviet Russia through celebrating Cosmist- and space age-related anniversaries, organizing public events or administering Fedorov's website; ii) the Tsiolkovskii Museum and Chizhevskii Center in Kaluga which organize annual conferences devoted to presenting and discussing research on Tsiolkovskii's and Chizhevskii's scientific and philosophical heritage; iii) Institute for Scientific Research in Cosmic Anthropoecology (ISRICA) in Novosibirsk (founded in the early 1990s under the auspices of the Russian Academy of Sciences) which investigates human telepathic communication with animate, inanimate and extraterrestrial objects, as well as perception of space and time examined from the perspective of esotericism and Vernadskii's theory of noosphere; the institute's leading scientists, including Vlail Kaznacheev and Aleksadr Trofimov, conduct experiments on the relationship between the power of magnetic field and the likelihood of telepathic communication or devise methods to induce and expand a shamanic cosmic consciousness in the examined subjects through the so-called Kozyrev Mirror; iv) Hyperboreanism, seen as an offshoot of today's Cosmism and founded by Valerii Demin in the 1990s, which proposes a Russian alternative version of the Hyperborean theory and postulates that the Indo-Europeans' and other peoples' original homeland is located in the polar regions; selected common themes of both movements include the belief in the restoration of a lost ancient paradise where mankind would attain a complete physical and spiritual perfection as well as all realms of human experience and dimensions of space and time would eventually unite harmoniously; v) scientific immortalism, today represented primarily by Igor Vishev and Danila Medvedev, which advances the implementation of physical, material and technological solutions to the problem of death; despite having more in

common with traditional transhumanism, clear links with Cosmism include the ongoing search for scientific and technological means that would allow to attain prolongation of human lifespan as well as eventual immortality.

Also, another interesting and one of the most recent pseudo-scientific projects which draws on the Cosmist metaphysical ideology, in particular Vernadskii's noosphere, is Nookosmologia (Noocosmology or New Russian Cosmology) founded by Russian military specialists, Alexei Iu. Savin, Boris K. Ratnikov, Georgii G. Rogosin and Dmitrii N. Fonarev. The leading expert and academician, Alexei Savin, claims to have developed a "method of metacontact (channeling) with the highest spiritual beings of our Universe" due to which "Noocosmology receives new knowledge, yet unknown on our Earth" and spreads it through publishing books, articles and interviews (Nookosmologia 2014). As cited on their main website, Noocosmology's mission can be defined as follows:

> Binding concepts of other sciences, Noocosmology (New Russian Cosmology) is leading towards new discoveries and deeper knowledge about Cosmos. (…) Site mission is to spread scientific approach towards understanding of Integrity of Man and Cosmos using young science — Noocosmology; to form new type of conscious in the society, which will help to unite all people in the world and show them the way to happiness, which allows preserving our planet from destruction by people. (Nookosmologia 2014)

The rising popularity of Russian Cosmists since the 1980s may be also observed in the field of academic and popular science publications which made a substantial contribution to the nationwide intellectual discussions related to the history and philosophy of the movement. Svetlana Semenova, one of the leading scholars of Cosmism, has been engaged in the study of Fedorov's ideas already in the 1970s. In 1982, she edited a volume collection of his major writings followed by an array of academic articles investigating the thinker's biography and philosophical heritage. In 1988, Semenova, in collaboration with other scholars, organized the first annual conference called Fedorovian Readings (*Fedorovskiee chteniia*) which served as a forum for presenting and discussing papers on Fedorov's and Cosmist thought. Selected titles of the past conferences include Cosmism as a Paradigm of the Noospheric-Ecological View and the New Political Thinking, Toward a Peaceful Development of the Cosmos, The Search for Extraterrestrial Civilizations: Gnoseological Difficulties, Cosmic Psychology, From Egocentrism to a Systemic Worldview or Globalization and the Noosphere (Young 2012: 221). Also, the meeting gave rise to a range of post-conference publications now considered one of the most prominent sources dealing with the theory of Cosmism, such as *The common task: Papers presented at the first Fedorovian Readings* (1990) or *Russian cosmism and the contemporary*

world: Collection of articles (1990) (Hagemeister 177: 185). Other significant volumes include Gacheva and Semenova's complete collection of the movement's religious and scientific representatives and themes, titled *Russkii kosmizm: Antologiia filosofskoi mysli* [Russian cosmism: An anthology of philosophical thought] (1993), which includes both a selection of several Cosmist thinkers' original writings as well as an introduction to the anthology, comments and notes provided by the editors.

Also, as noted by Thomas (2011: 15), V. I. Sevastianov can be deemed another important contributor to the popularization of the Russian Cosmist thought. Just before the dissolution of the Soviet Union, he managed to convince the USSR Institute of Philosophy of the Academy of Sciences to issue a seven hundred page volume discussing Fedorov's philosophy in great detail. Also, due to Sevastianov's efforts, numerous aspects of Russian Cosmism, particularly Fedorov's and Tsiolkovskii's ideas, were widely debated in a special seminar series, A Weapon-free Space – the Area of Peaceful Cooperation in the 21st Century. One of the main points raised during the meeting was the significance of cosmonautics for a steady development of the present-day Russia. Young (2012: 222) additionally emphasizes the significance of such publications whose emergence is often reported not only in major Russian academic journals, but also in newspapers, magazines and on televisions broadcasts which only attests to the fact that the Cosmist thought is generally considered part of the mainstream intellectual and scholarly heritage.

Interestingly, Russian Cosmism has gained an increasing popularity among more informal or even eccentric circles and societies of pseudo-scientific origins. In the recent years, different Cosmist-related institutions have been established to praise the intellectual heritage of various individuals and groups ideologically connected with the movement. Examples might include i) a Museum of Cosmic Art in Karelia, founded by a self-proclaimed Cosmist philosopher and poet Iurii Linnik, who has gathered a considerable collection of paintings created by the Amaravella group of artists inspired by Cosmism (1923-30); ii) the Theosophist movement which has largely contributed to the revival of long-standing cosmic and esoteric traditions in Kaluga; iii) a widely understood occult subculture in Russia which includes the followers of Petr Uspenskii, Georgii Gurdjieff, Daniil Andreev (speculative historiosophy), Lev Gumiliev (biocosmism and ethnogenesis) or Porfirii Ivanov, the Messenger of the Cosmos (environmentalism, pacifism, vegetarianism); iv) ufologists and parapsychologists preoccupied with the search of extraterrestrial intelligence and traces of supernatural activity; v) noosfera, an umbrella term for a group of institutions and organizations, including the N. D. Zelinsky Center for the Protection of the Noosphere or an Unorthodox Noosphere University, which offers courses in noospheric culturology (Hagemeister 177: 199-201). Today, Russian Cosmism is often

seen as a counterpart of the Western New Age movement as both have their roots in occult, esoteric, pseudoscientific and utopian thinking. Some parts of Fedorov's and his fellow Cosmists' theories were later echoed in James Lovelock's or Gregory Bateson's holistic and organic concepts of Gaia, planetarian consciousness or ecology of the mind.

Hagemeister (1997: 201-202) comments on contemporary character of Russian Cosmism often ideologically close to a new humanistic religion and post-industrial patriotism:

> There is something specifically Russian in contemporary cosmism when one considers it as a type of neo-God-building destined to take the place of discredited Western materialistic communism, replacing it with an autochthonous, pseudoscientific religion of the superman. Such an attempt has been made by the "post-industrial patriots", a group of prominent Moscow scientists who propagate a "new humanistic religion" that incorporates allusions to Fedorov, Teilhard de Chardin, and Vernadskii; in their view, this "metaphysics of the common task", a metaphysical doctrine of the "universal cosmic project", is the only ideology capable of conveying to humanity its "historic and cosmic mission", thus overcoming the "cosmic absurdity of human existence". The image of humanity spreading its "noocratic" rule over the universe, whence it can fulfill the "universal cosmic plan" of turning itself into an almighty immortal organism, thus attaining the status of God, is an image that quickly reveals its unmistakably totalitarian character. Even Fedorov's world-delivering common task was totalitarian: no one had the right to be excluded or forgotten, no one could withdraw from the magnificent project. Tsiolkovskii, too, while scheming to eradicate all evil and suffering and to make every last atom happy, outlined in gloating pedantry the complete extermination of all deleterious and useless forms of plant and animal life declaring a "battle against the procreation of defective people and animals". (Hagemeister, 1997: 201-202)

Despite being frequently criticized for its Western origins and occult inclinations, Cosmism is still widely referred to as a genuinely homegrown cultural, philosophical and cosmological doctrine. Many contemporary critics, including Arsenii Gulyga, regard the movement as "one of the greatest discoveries of human culture" and a typically Russian "active-evolutionary, noospheric, cosmic thinking" which should be considered the "pride of [the Russian] national science" capable of providing solutions for some of the most urgent problems facing the world (Gulyga 1989: 34). Also, as argued by Grier (2003: 71), due to its distinctively national characteristics and unusual sphere of research interests, it has never become a mass philosophical or cultural movement. Furthermore, today it often serves as an ideological basis for messianism and Eurasianism for numerous Russian thinkers and intellectuals, who attempt to redefine the country's post-communist role in contemporary societies.

Although largely unknown in the West, Russian Cosmism should be praised for its unprecedented contribution to the present-day cosmological thought which only in the past mid-century began to probe deeper into the questions of spirituality, futurism, esotericism, ethics and science in relation to outer space and human destiny. The universal resurrection project, proposed by Fedorov and his followers, still remains a current and productive trend for today's generation of philosophers, academics and various individuals seeking inspiration in the movement's principal assumptions and ideas. Focusing on the role mankind is supposed to play in the evolution of the universe understood in both physical and spiritual sense, many Cosmists' works are often criticized for being unsystematic and inconsistent with each other as well as excessively utopian and highly improbable in terms of their scientific and technological premises. On the other hand, such features contribute to their distinctively interdisciplinary character and demonstrate their immense intellectual depth and wide scope of interests grounded in disciplines dealing with purely theoretical and humanistic as well as greatly advanced techno-scientific matters. Most importantly, however, the Russian Cosmists continuously inspire their readers to question not only the problem of death, but also that of disintegration as well as to realize an urgent need to implement the concept of universal monism to all realms of human activity, including time dimensions, ethnic identities, political ideologies or religions. In the Cosmist view, mankind's task is to look farther and deeper into the unknown until they manage to embrace the universe with a whole mind and address the most complex issues from this new, divine perspective.

Chapter 2

American cosmism

Diverse ways of thinking about outer space in America have been constantly shaped by the forces of national culture and continue to affect political, social and cultural life, including the works of literature, art, film or various forms of entertainment. According to Harrison (2012), such ideas, especially those that emerged throughout the 20th century, "may speak more to imagination than to science and technological feasibility, and can be characterized as religious quests", thus shaping and redefining, akin to the Russian Cosmist movement, the relationship between humans and the universe. In post-war America, many concepts of this kind developed and promulgated due to the rise of the U.S. programme as well as concerted effort of a number space advocacy groups and individual space enthusiasts, including science fiction and popular science writers, rocket scientists and visionaries of spaceflight, such as Wernher von Braun or Robert Goddard. As put by McCurdy (2011: 308):

> These people formulated an exciting vision in which humans moved off of the Earth, explored the Moon and planets, established settlements, and eventually departed for other stars. In constructing this vision, advocates took fantastic images, some drawn from science fiction, and laid them upon ideas already rooted in American culture, such as the myth of the frontier. The resulting vision of space exploration had the power to excite and entertain or, as in the case of the Cold War, to frighten. The vision prevailed over lesser alternatives and moved onto the national agenda not so much as a result of its technical superiority but because it aroused the imaginations of people who viewed it. (McCurdy 2011: 308)

Such visions advanced highly unrealistic and almost fantastical scenarios which promised the inevitable coming of the age of space travel which would enable humans to revolutionize and move beyond the Earth, build robotic spacecraft, establish space stations and colonies as well as travel further into the Solar System in an attempt to spread the human element and search for extraterrestrial intelligence. With time, most of these prophesies failed to come true and fulfill the public expectations, thus bringing about the nationwide disillusionment with space ventures. However, the idea that

"space travel would rekindle the frontier spirit as humans left Earth and colonized the cosmos" continued to prevail in U.S. culture, yet in a more realistic form rooted in homegrown traditions of westward expansion and frontierism which laid foundations for characteristically American set of values and beliefs (McCurdy 2011: 309). These and similar concepts influenced the emergence and development of the U.S. space-oriented cultural and philosophical movement, often known as space ethos (Harris 1992) or American Cosmism (Harrison 2013), the latter of which can be seen primarily as a variation of the Russian Cosmist thought.

2.1. Outer space and space exploration in light of the humanities

It cannot be denied that throughout most of the 20th century the subject of outer space and space exploration has been explored particularly through the lens of the Cold War history and politics as well as scientific and technological achievements of the space age. Some remarkable examples of historicizing the topic can include Goldsen's *Outer space in world politics* (1963), Schauer's *The politics of space: A comparison of the Soviet and American space programs* (1976), McDougall's *The heavens and the earth: A political history of the space age* (1985), Chaikin's *A man on the moon: The triumphant story of the Apollo space program* (1994), Schefter's *The race: The uncensored story of how America beat Russia to the moon* (1999) or Brzezinski's *Red moon rising: Sputnik and the hidden rivalries that ignited the space race* (2007). However, judging from a number of academic and popular culture publications, it appears that in the recent years there has been a gradual shift toward applying a more humanistic, social or cultural approach to presenting space efforts.

In the introduction to *Space travel and culture: From Apollo to space tourism*, Bell (2009: 4) implies that the subject of outer space and space exploration has been mostly neglected by humanities partly due to the prevalence of technological utopianism in the mid-20th century space race discourse where "Apollo stand s now as a future that never happened, or a history that seems not to connect with our present". Yet an increasing number of resources indicate that space race should be understood as an abundant source of socio-cultural production rather than a kind of human enterprise serving mainly scientific, technological or political and propagandistic purposes. For example, Bell's edited collection of chapters includes papers which deal with outer space from the perspective of the Cold War society and culture and investigates its various representations in 20th century media.[1]

[1] Examples include Kohonen's "The space race and Soviet utopian thinking", Llinares's "Idealized heroes of 'retrotopia': History, identity and the postmodern in Apollo 13" or Henry and Taylor's "Re-thinking Apollo: Envisioning environmentalism in space".

Other major publications which combine historiographical with socio-cultural approaches to 20th century space endeavours are McCurdy's *Space and the American imagination* ([1997] 2011) or Geppert's *Imagining outer space: European astroculture in the twentieth century* (2012). While the former concentrates on tracing the way the U.S. nationwide vision of space travel was constructed in the popular mind, the latter presents selected aspects of the cultural history of the space age and SETI in the West European imagination. At the same time, both attempt to interrogate the "heterogeneous array of images and artifacts, media and practices that all aim to ascribe meaning to outer space while stirring both the individual and the collective imagination" (Geppert 2012: 8).[2] Some other recently published books, edited collections or articles presenting a wide array of humanistic as well as society- and culture-oriented themes in the context of space exploration embrace Dick's *Remembering the space age* (2008), Harris's *Space enterprise: Living and working offworld in the 21st century* (2008), Launius and Dick's *Societal Impact of Spaceflight* (2007), Poole's *Earthrise: How man first saw the earth* (2008), Maurer, Richers, Rüthers and Scheide's *Soviet space culture: Cosmic enthusiasm in socialist societies* (2011), Siddiqi's *The red rockets' glare: Spaceflight and the Russian imagination, 1857-1957* (2010), Andrews and Siddiqi's *Into the cosmos: Space exploration and Soviet culture* (2011), Hersch's *Inventing the American astronaut* (2012), Neufeld's *Spacefarers: Images of astronauts and cosmonauts in the heroic era of spaceflight* (2013), Launius's *After Apollo: The legacy of the American moon landings* (2013), Tribbe's *No requiem for the space age: The Apollo moon landings and American culture* (2014) or Sage's *How outer space made America: Geography, organization and the cosmic sublime* (2014).

Also, cultural geographers have taken up outer space and space exploration as the subject of their research. For instance, Cosgrove (1994, 2008) or MacDonald (2007) explore the impact of space ventures on the popular imagination by investigating the relationship between human geography and celestial space in an attempt to establish a critical geography of outer space. Both Cosgrove (1994, 2008) and MacDonald (2007) address the object of their enquiry by acknowledging the need to encompass literary works as well as cultural and artistic artifacts in scholarly investigations within the field, such as the renowned space age images, including Apollo 17's Blue Marble, Hubble's Deep Field or those produced by space artists. Even more technically-oriented publications, such as *Down to earth: Satellite technologies, industries, and cultures* (2012) edited by

[2] To illustrate the point, Geppert's edited collection of essays include such titles as Eisfeld's "Projecting landscapes of the human mind onto another world: Changing faces of an imaginary Mars", Syon's "Balloons on the moon: Visions of space travel in francophone comic strips" or Lagrange's "A Ghost in the machine: How sociology tried to explain (away) American flying saucers and European ghost rockets, 1946-47".

Parks and Schwoch, contain numerous references to social and cultural implications of space technologies. For instance, in the introduction to the volume, Parks and Schwoch (2012: 3) assert that "since their emergence in the late 1950s, satellites have been embroiled in the formation of new global imaginaries, security paradigms, economies and cultures. Satellites have been fundamental to contemporary conceptualizations of the global and to processes of globalization". Other publications of this kind include, for example, Lane's *Geographies of Mars* (2011) in which the author discusses the historical evolution of scientific and popular culture representations of the planet as well as its imaginary inhabitants as depicted in cartography, scientific illustrations or astronomical photography published in the late 19th and early 20th century media. Also, space art works, whose chief aim is to portray human space endeavours and the universe, are sometimes studied from the perspective of landscape conventions or those concerning visualizing science, and often applied by art historians, cultural geographers, sociologists or cultural studies researchers (see e.g. Miller 1996; Lefebvre 1991; Gamwell 2002; Santina 2013, etc.).

It seems that a common trait of the aforementioned approaches is an acknowledgement of the need to embrace a number of interdisciplinary ideas and theories, particularly literary, cultural, social, artistic or filmic, in examining space exploration as an increasingly important research subject. A recent revival and rediscovery of the topic by the humanities has occurred partly due to the proliferation of cinematic and digital visualizations or computer simulations of space-related phenomena, including a 2012 documentary on White's Overview Effect (see 2.3.4.1. for details), YouTube, NASA TV and the International Space Station broadcasts, astronomical photography, educational films and programmes as well as various images permeating social media. As pointed out by the organizers of the Cosmo-graphies: Textual and Visual Cultures of Outer Space conference (2014),

> [T]he arrival of 'cyberspace' could arguably be said to have had a profound effect on the cultural understanding and importance of 'outer space' in the collective imaginary. Visual and textual scholarship has arguably under-engaged with the fields of cultural geography, cultural history and cultural studies that are re-imagining 'astroculture'/'celestial space' as part of what Cosgrove calls a 'cosmography for the twenty-first century'. ("Cosmo-graphies: Textual and Visual Cultures of Outer Space" 2014)

Interestingly, the engagement of such a wide spectrum of interdisciplinary approaches in the studies of outer space and space exploration has allowed to open up new perspectives in a space-oriented philosophy, yet another recently emergent fields of academic enquiry. In the following section, I shall elaborate on the major scholarly attempts to define the concept and develop it into a respected scientific sub-discipline.

2.2. Defining a space-oriented philosophy, astroculture and space ethos

Certain attempts at depicting and philosophizing over the subject of space and space exploration are by no means novel. One of the earliest and most renowned cases of this kind go back to the Renaissance times, including Kepler's *Conversations with the star messenger* (1610) where the scientist expressed a firm belief in mankind's moral imperative to "create vessels and sails adjusted to the heavenly ether" and "prepare, for the brave sky-travelers, maps of the celestial bodies – (...) the Moon, you, Galileo, for Jupiter" (as quoted in Koestler 1960: 195).

A true revolution in the public perception of extraterrestrial worlds and interplanetary travels came with Galileo's 17th century discoveries supporting the Copernican sun-centered solar system. While observing the night sky, the astronomer contributed to a radical change in our view of the universe by providing some accurate details about the physical and geographical attributes of the sun, moon as well as planets, including Mars, Venus or Jupiter and its four satellites. Following this revolutionary thinking, various scholars pursued fictional writing in order to spread some of these ideas to the educated public and thus present a different perspective of the Earth and its place in the solar system, such as Wilkins's *The discovery of a world in the moone* (1638), de Fontenelle's *Entretiens sur la pluralité des mondes* [Conversations on the plurality of worlds] (1686) or Huygens's *The celestial worlds discover'd* (1698).[3] Some other examples of literary, scientific and popular science works containing elements of a space- and space-exploration oriented philosophizing are discussed thoroughly in Chapter 3 of this dissertation (see 3.2.).

[3] John Wilkins's *The discovery of a world in the moone*, considered one of the first popular science rather than fictional books, presents scientific facts about the technicalities of lunar travel as well as the physical and geographical qualities of the Earth's satellite. It seems that one of the main objectives of this work was, as the title suggests, to convince its readers that there might be "another habitable World in that Planet" and that it does not "contradict any principle of reason or faith" (Wilkins 1638: 210-212). Another work of this kind, *Conversations on the plurality of worlds* by French author Bernard le Bovier de Fontenelle (1686), offered a comprehensible explanation of advanced astronomical theories. Written as series of conversations between a philosopher and a marquise wandering in the garden and observing the night sky, the book accounts for the heliocentric model of the solar system and speculates on the nature and habitability of other planets. A popular science narration was also employed in Christiaan Huygens's *The celestial worlds discover'd* (1698), where the author explains the Copernican heliocentric model of the universe and muses upon the infinity of the universe as well as the nature and habitability of extraterrestrial worlds (Ordway et al. 1992: 43-44).

Meanwhile, the major premises of modern philosophy of space exploration have been laid by Munevar who currently holds a position of a Professor of Philosophy at the Evergreen State College, Olympia. In his unpublished manuscript available online (2009), the scholar discusses various philosophical aspects of human space efforts, including a humanistic, technological and economic value of space science, long-term space exploration and SETI, social and ideological criticism of space exploration and possible counterarguments proposed by space enthusiasts or President Obama's plans to revive the moon landing programme. Munevar (2009) justifies the ongoing need for continuing space missions by enumerating diverse benefits of space travel, including developing communication and land satellites as well as space technology and its spin-off products, such as cell phones, voice-controlled wheelchairs or reflective insulation. He also criticizes NASA and space advocates for the lack of a compelling argument for as well as an underlying vision or ideology of the present-day space exploration ventures. As argued by the scholar,

> My own reflections lead me to conclude that we ought to explore space. One crucial reason (…) is that the exploration of space will transform our views of the Earth and the universe to the significant benefit of our species. As we explore space we challenge our science, and as we challenge our science we change it in ways so profound that we come to face a different panorama of problems and opportunities in our dealings with the world. Indeed, it is as if a new world opens up to us; and when we try to adapt to the new "lay of the land", ideas and inventions occur to us that would have been unimaginable under the old perspective. (Munevar 2009)

Perhaps this perspective can be developed further when the relationship between philosophy and a broader subject of outer space realms is considered. Although the definition of a space-oriented philosophy has not been officially formulated yet, there have been certain academic attempts to elaborate on the issue from the point of view of a number of humanistic and interdisciplinary approaches. One of the most prominent examples of this kind is the recently established *Journal of Space Philosophy* edited by Bob Krone and published regularly under the auspices of Kepler Space Institute, which continues a never-ending mission of cosmological pursuits among scientists and scholars. In a preface to the first volume of the journal (2012), Krone and Arthur (2012: 3) attempt to capture the main idea behind their endeavours by defining the concept of a space-oriented philosophy:

> Philosophy – the search for knowledge, truth, understanding, and meaning – has occupied thought since Plato's *Thirty-Six Dialogues* (424-348 BC). Every person who has gazed at the heavens has wondered what it means for themselves and for

> humankind. Philosophy is the oldest research subject. Every science has defined its philosophical foundations. Humans have only philosophized while personally experiencing Space since the middle of the 20th Century. Kepler Space Institute takes pride in creating its online periodical *Journal of Space Philosophy*. (...) Over time, this Journal will be an increasingly valuable research source for educators, students, NASA Centers, libraries, Space organizations, and Space enthusiasts. (Krone and Arthur 2012: 3)

In accordance with the journal's major purpose, most articles cover a wide array of topics, such as White's Overview Effect, astronautic humanism, the planet Moon philosophy, the Chinese space philosophy, the philosophy of Carl Sagan or space education.

Also, it seems that Putnam's formulation of the journal's main imperative included in introductory remarks to the first volume (2012) might well serve as the definition of space philosophy seen as a fully fledged research subject and field of academic enquiry. The scholar (2012: 5) states that *The Journal of Space Philosophy* "will explore the spirituality and ethics, the cultural imperatives and moral values of the human quest for the stars". Hence, it can be implied that the very term denotes the search for knowledge, truth, understanding, and meaning of space-related matters considering primarily the relationship between humans and the cosmos. Such a definition would embrace both humanistic and interdisciplinary character of the concept as well as emphasize the importance of the study of cultural, psychological, religious, mystical or spiritual implications as well as representations of outer space and space exploration. In this sense, its meaning can be seen as close to the central concern of Russian Cosmism which, by definition, entails a broad theory of science, philosophy, religion and ethics utilized to study the origins, evolution and future existence of mankind and the universe. For this reason, as argued by Harrison (2013), it might be more appropriate to use the term Cosmism rather than space philosophy or space ethos when discussing the ways human beings attempt to attach a deeper meaning to the infinite space (see 1.2. for details). Additionally, the latter notions are considered more equivocal as they might become subject to conceptual misunderstandings and confusion with similar concepts derived from the fields of urban studies, art theory, geography or cultural geography. Perhaps, "outer space philosophy" or "the philosophy of outer space" might serve as other more unambiguous terms adequately denoting the concept, however, it seems that neither of them has been officially applied in academic discourse.

2.2.1. Astroculture

In many aspects, a space-oriented philosophy may be reminiscent of astroculture, the term coined by Geppert (2012) and discussed in one of his recent books, *Imagining outer space: European astroculture in the twentieth century*. The scholar introduces the concept in the preface and defines it in reference to McDougall's *The heavens and the earth: A political history of the space age* (1985) where it is argued that alongside prosperity of economic resources and availability of technological means, culture, symbolism and the public imagination served as another essential driving force which allowed to launch the U.S. space programme:

> Far from intending to establish yet another academic subdiscipline, astroculture constitutes an umbrella concept to ease McDougall's terminological difficulties in referring to an underspecified and barely studies field of historical research. To remain within and augment his vocabulary: astroculture comprises a heterogeneous array of images and artifacts, media and practices that all aim to ascribe meaning to outer space while stirring both the individual and the collective imagination. (Geppert 2012: 8)

Geppert (2012: 8-9) elaborates on the definition of astroculture by stating its distinction from other related notions signifying scholarly investigations of humanistic facets of space research and exploration, including astropolitics, astrosociology or space and extraterrestrial (ET) culture :

> At the same time, the superordinate concept is designed as an explicitly culture-related counterpart to such better known and firmly established notions as 'astrophysics', 'astropolitics' – evidenced by the founding of an academic journal by this title in 2003 – or 'astrosociology'. When historicizing outer space, for reasons of practicality, inclusiveness and connectivity, astroculture is to be preferred over other umbrella notions. The obvious and conceivably encompassing, yet far too imprecise choice, 'space culture(s)', is unsuitable due to the equivocality of the term 'space' itself, thus inviting conceptual misunderstandings from other fields like urban studies or entire disciplines such as geography. Further alternative suggestions include, for instance, Margaret Mead's and Donald N. Michael's largely inconsequential mid-1950s 'Man-Into-Space' (MIS) program for the social sciences, launched well before the first artificial satellite, or the more recent, narrower 'extraterrestrial (ET) culture' as developed by American anthropologist Debbora Battaglia. Astroculture as a novel concept does share some of the defining features of ET culture, including an emphasis on lived experience, the objective of de-exoticizing the alien, and its self-understanding as an exploratory project. Yet, there are also distinct differences. Not all astroculture revolves around alien life or extraterrestrial technology, anthropocentric and terrestrial as those may be, but

> comprises a wider range of images, artifacts and activities conducted by a broader range of expert and amateur actants. Different as the so-called 'space', 'science fiction', 'ET', 'UFO' and other related communities are – the first, mutatis mutandis, focusing on applied science, the second on fantasy, the third on humans and the fourth on alien technology – their agendas, concerns and practitioners overlap and compete to such an extent that any separating, non-integrative approach seems unduly self-limiting from the outset and would require particular justification. Taking seriously the umbrella concept of astroculture leads to analyzing similarities and commonalities before possibly re-establishing differences and boundaries between the various subcultures. Hence, the entire range of supposedly obscure and frequently exoticized phenomena, including UFOs, the 'technological wing of the ET imaginary'; early contact claims, alien abduction experiences and 'starship memories'; or Erich von Däniken's so-called pre-Astronautics fall as well under the purview of astroculture, as do space mirrors, space elevators, space stations and space colonies. (Geppert 2012: 8-9)

In view of the above quote, the concept of astroculture seems to share certain common traits with that of space-oriented philosophy. Specifically, both fields appear to reject the idea of historicizing and politicizing space-related phenomena. Instead, they propose a more epistemic-ontological approach to debating space exploration, extraterrestrials or questions concerning the evolution of the universe itself as well as analyze various cultural practices and artifacts, including those of popular or science fiction culture, to determine their impact on the collective mind and imagination. On the other hand, there are also certain differences. For example, while the focus of astroculture is more on the way astrocultural artifacts and representations of extraterrestrial phenomena affect and shape the popular understanding of space exploration, space philosophy places the emphasis on accumulating the knowledge about and comprehending the meaning of the relationship between humanity and the cosmos. The research can be often accompanied by the examination of media images or other mass-produced objects of culture, yet the primary concern of space philosophers is addressing and musing over some general and fundamental questions of the human mind and existence in relation to space settings or values, ethical principles, beliefs and ways of thinking which result from this interplay.

2.2.2. Space ethos

In the U.S., one of the first modern and full-fledged concepts standing for a space-oriented philosophy was proposed by Harris (1992) under the name of space ethos, often perceived as a predecessor of Harrison's American Cosmism. The scholar (2009: 9) defines the notion as follows:

> Perhaps the underlying need for humankind is to articulate and support this vision [of outer space] with a new space ethos. *Ethos* is defined as the *fundamental character* or *spirit of a culture*. It is the underlying sentiment that informs the beliefs, customs, practices of a society. Moving beyond Earth causes a redefinition of the American, Russian, European, or Asian ethos. (...) nations are struggling to redevelop their purpose, policies, and priorities as to their roles in the development of outer space. Currently, the majority of global inhabitants do not perceive, its exploration and utilization, as central to their well-being. In general, humanity is still terrestrially oriented. People have yet to fully grasp the full significance of migrating aloft, and its importance to this planet and its people! (...) Humanity is beginning to appreciate that we explorers are required to undertake bold endeavours. (Harris 2009: 9)

Harris (2009: 6) argues that the emergence and articulation of space ethos is possible due to multiple space visions which have prevailed in the national cultures for centuries, particularly those put forward by space philosophers and prophets. It should be noted that the first instances of more elaborate and quasi-scientific depictions of space occur in literary fiction mostly in the form of fantasy tales, myths, legends and allegories, to a large extent influenced by both amateur and professional astronomical observations (Ordway et al. 1992: 35). Therefore, initially, the mission was carried out by science fiction and popular science writers who were continuously stirring the public imagination and incited their curiosity about extraterrestrial worlds and interplanetary travels. The world known examples might include 19th and 20th century French novelist Jules Verne or American and Russian writers like Robert Heinlein, Isaac Asimov, Arthur C. Clarke, Leonid Bogoiavlenskii or Nikolai Morozov. In Russia and America, the two world leaders in space exploration, more professional visions appeared at the turn of the past century, having originated in the writings and theories of Kontantin Tsiolkovskii, Robert Goddard, Hermann Oberth, Sergei Korolev, Wernher von Braun or Krafft Ehricke. These and some other less renowned space enthusiasts advanced numerous futuristic scenarios some of which have become today's realities, including satellite communications, Earth observations, orbital flights, the Moon landings, robotic missions or remote sensing (Harris 2009: 16). A suggested by Harris (2009: 16-17) an akin role was played by space artists and illustrators who, since the 19th century, have been continuously providing various artistic renderings and visualizations of humanity's future in space that can be found in a number of media, such as books, comics, newspapers and magazines, television programmes or films. The most prominent examples include activities of 20th century noted space artists, including Lucien Rudaux, Ludek Pesek, Nikolai Kolchitskii, Chesley Bonestell, David A. Hardy, Robert McCall or Aleksei Leonov and Andrei

Sokolov as well as individual members of the International Association of Astronomical Artists (IAAA), such as Michael Carroll, Lynette Cook, Don Dixon, William K. Hartmann, Ron Miller, Chee Ming Won or Igor Beziaev ("The IAAA membership" 2014).

As Harris points out (2008: 4), in modern America, space ethos manifests itself and is being promoted mostly in the realm of popular culture, particularly in numerous works of television and film producers like Stephen Spielberg, Stanley Kubrick, Tom Hanks, Gene Rodenberry or George Lucas. Additionally, the attempts to maintain space ethos in the U.S. culture are constantly undertaken by the government and endorsed by the average annual amount of about fifteen billion dollars invested by American taxpayers in space enterprises which is more than anywhere else in the world. A space vision and ethos are also articulated by politicians and in the official documents concerning the future developments of the U.S. space policy, such as the senator Spark Matsunaga's 1985 statement, the National Space Commission report, "Pioneering the space frontier" (both quoted in 2.3.2.3.) or the special 2010 White House strategy paper "Reduce the national deficit by utilizing space resources" and the National Space Policy of the United States of America published in 2010 which both imply implementing an active explorative spirit to human spacefaring which would lead to revitalizing the country's economy and eliminating the global poverty. The latter document contains President Barack Obama's statement which seems to reflect the chief imperative of the U.S. space endeavours (National space policy of the United States of America 2010: 1):

> Fifty years after the creation of NASA, our goal is no longer just a destination to reach. Our goal is the capacity for people to work and learn and operate and live safely beyond the Earth for extended periods of time, ultimately in ways that are more sustainable and even indefinite. And in fulfilling this task, we will not only extend humanity's reach in space – we will strengthen America's leadership here on Earth. (National Space Policy of the United States of America 2010: 1)

Meanwhile, when elaborating on the Russian space ethos, Harris (2008) notes that it has a substantially longer tradition than its American counterpart as its very foundations were laid by Cosmism in the late 19th century whose major theories served as the basis for an emerging space programme. The lively spirit of the movement was long present in Russia's public political, social and cultural life and helped articulate space ethos already in the communist era which then used to somewhat replace religion. This tendency became particularly apparent in the nationwide praise for the Soviet cosmonauts, mostly presented as revered heroes, and for the national space programme's outstanding achievements nurtured in

the media as well as celebrated and commemorated in a variety of public places, including cosmodromes, parks, museums or city squares (Harris 2008: 19). Since the dissolution of the Soviet Union, the national space programme has undergone a major crisis as is still largely underrated and underfunded as a socio-political and cultural enterprise, mostly due to the country's constant struggle with ongoing financial, economic and social problems. As suggested by Harris (2008: 20), the cost of the maintenance of the Mir station is hardly covered by a humble annual amount of about 270 million dollars which has, among many other factors, led to a gradual erosion of the old Soviet space ethos, well evident at the beginning of the 1990s (Harris 2008: 22):

> In the beginnings of the more market-oriented Russia, if the price was right, everything was up for sale, including space artifacts. Mementos of space heroes were posthumously pressed into duty to sell cars – the famous Cosmos Pavilion, a shrine of Soviet space feats, had been turned into a used-car lot in 1992, while the exhibit wasclosed for repairs. The Buran space shuttle became an amusement for children in Gorky Park. Cosmodromes deteriorated and fell into disrepair. (Harris 2008: 22)

On the other hand, certain individuals have undertaken numerous efforts to rediscover and revive the spirit of space ethos in the present-day Russia, including General German Titov who, in his 1992 lecture to the Planetary Society, asserted that humanity should gain a deeper understanding of space exploration activities which have the potential to serve its spiritual development. A similar concern was expressed by the flight testing director for the Mir space station, Vladimir Isvanov, who stated that "Russia is and will be a space power. Breathtaking ambitions are necessary to reach the spiritual heights, the heights of the Russian spirit. We began with the first Sputnik and we will go far beyond" (as quoted in Harris 2008: 22). As pointed out by Harris (2001: 305),

> [A]n enduring feature of the Soviet and Russian space programs is its sense of history. It is not one universally shared in a country which has endured much hardship and where people have more immediate and pressing concerns on their mind, but it is one held by enough people to matter... It was a space program in which its participants and admirers could immensely take pride – a program built on a potent mixture of courage, endurance, daring, engineering genius, quality and imagination. (Harris 2001: 305)

Other academics have also observed the resurgence of space ethos in the post-Soviet Russia. Such a tendency can be confirmed by an increasing number of scholarly meetings and publications dealing with Russian Cosmism, which still remains one of the most essential constituents of the

national space ethos, or studying its prevalence in public life. Instances of this kind may include Gacheva and Semenova's or V. I. Sevastianov's publications, the annual conference known as Fedorovian Readings, various Cosmist-related advocacy groups, organizations, public and private institutions as well as movements of esoteric and occult origins (see 1.5. for details). This trend becomes also evident when taking into account numerous manifestations of the New Age mentality which is currently vivifying in Russia and is often reflected in certain societal trends, such as an unprecedented interest in the supernatural or astrology as the means to explain the impact of extraterrestrial phenomena on human existence (see 1.1.2. for details). Harris (2008) argues that the present-day Russian space ethos cay be defined as a specific interplay between the country's space policy priorities and Cosmism, the latter being the product of and having incorporated certain elements of the nation's spirituality and mysticism both rooted in traditional folklore and Eastern Orthodoxy. Particularly the latter, as pointed out by Thomas (2011: 16), has revived since the fall of communism, and thus affects the main objectives of today's space programme which is manifested, for instance, in the presence of religious icons aboard the Russian section of the International Space Station (see 1.5. for details). According to some scholars, this might be viewed as the symptom of a gradual replacement of atheism by Orthodox religion as well as the continuation of the Cosmist movement in modern Russia (Thomas 2001: 17). These changes were also noted in 2007 by the Mayor of Moscow Iurii Luzhkov, who claimed: "Russian Cosmos is an image, a philosophical notion, a practice and we are glad to share it with our friends in the whole world – our common motherland Earth" (as quoted in Thomas 2011: 17).

It appears that the U.S. space ethos, despite being often regarded as close to Harrison's American Cosmism, remains a considerably distinct phenomenon. Although both concepts share certain characteristics like the concern with examining a set of values, beliefs and practices which emerge from the relationship between some intrinsic qualities of the U.S culture and national space efforts, there are also clear differences. For instance, while Harris (1992) argues that space ethos began developing with the culmination of the space age in 1957, Harrison (2013) asserts that the roots of Cosmism go back to the outset of the U.S. space programme as well as show influences of the old national traditions of frontierism, exceptionalism or transcendentalism. Moreover, as implied by Harrison (2013: 42), the latter term tends to embrace a wider and more national culture-oriented spectrum of philosophical, religious, psychological, ideological, or technological aspects of space exploration activities pursued in America throughout the past century. These features make it perhaps more akin to

the Russian Cosmist movement which, as pointed out by Scalan (1997: 28), has earned the status of "an original philosophical outgrowth of the Russian spirit" and still exerts an overreaching influence on the Russian mentality and its "cosmic consciousness".

2.3. American Cosmism

Harrison (2013) argues that although traditionally associated with the Russians, the spirit of Cosmism also prevails in the U.S. culture. Defined as "a product of science, religion, and national culture, reflected in academic and popular views about our place in the universe, space exploration, and human destiny", it seems to have its roots in the Christian thought and American frontier tradition as well as early space research and exploration (Harrison 2013: 25). The scholar (2013: 26) elaborates further on this overreaching phenomenon, describing it as:

> [A] constellation of attitudes and beliefs, anchored in religion and culture, that help nations define themselves and their place in the universe, motivate activities in space, and proclaim national values to the world. Historically and specifically, cosmism is associated with Russians, but parallel elements in American space philosophy hint that cosmism is an overwhelming phenomenon, anchored in the distant past, but with Russian and American versions moving along difference tracks. (Harrison 2013: 26)

What is more, Harrison (2013: 42) points out that the notion tends to capture a deeper and more complex interplay between ideology, religion, philosophy and technology when defining the national visions of the cosmos than space ethos (Harris 1992).

As there are merely few sources dealing with the theory of American Cosmism, I shall elaborate on the emergence and evolution of this distinct national tradition as parallel to its Russian counterpart. As proposed by Harrison (2013), the concept is by all means novel, thus my attempt to characterize the phenomenon will be mainly a substantial extension of certain historical and cultural trends which appear to have been crucial in the process of its formation. While these two variations of American and Russian space thought have much in common, having assimilated utopian, prophetic, religious or national influences, there are also evident differences which lie in the nations' diverse cultural heritage, primarily different social and philosophical systems. In particular, the scholar suggests that the main characteristics of American Cosmism as opposed to its Russian variation lie in the nations' distinct i) human spaceflight experiences regarded as a religious system; ii) visionaries of space-oriented philosophy and space programme;

iii) national mythologies underlying both countries' interest in space research and exploration; iv) the interplay between science, imagination and the occult accompanying the evolution of the cosmic thought (Harrison 2013: 25-44). He also maintains that the U.S. space visions and interpretations of the role humanity is supposed to play in the evolution of the universe remain a mixture of science, emotions and beliefs based on the ideology of Americanism. In this aspect, it seems to have been developing parallely to Russian Cosmism, deeply embedded in the concept of Russianness as well as skillfully combining scientifically- and technologically-grounded ideas with mystic, occult and spiritual elements (Harrison 2013: 27).

2.3.1. Spaceflight as a religious experience

Most sources imply that Americans can be generally considered a religious nation. In post-war America, particularly in the 1950s and 1960s, there has been a renaissance of organized religion, often attributed to a nationwide affluence and the rise of social mobility, Cold War anxieties, future-oriented optimism as well as patriotic feelings. A devoted religious participation set a good example for all citizens who strived to reaffirm the American way of life centered around patriotic and family values (Putnam and Campbell 2010: 87-88). Although church attendance has decreased considerably since the 1950s, the results obtained in one of the 2006 surveys suggest that only five out of over three thousand participants identified themselves as atheists or agnostics (Putnam and Campbell 2010: 16). At the same time, most people express some form of belief in life after death, God or other divine spirit, regarding religious feelings and practices as a highly personal experience, often not easily classified as belonging to any specific denomination and combining elements of Christianity, Hinduism, Buddhism or New Age mentality (Putnam and Campbell 2010: 126).

It seems that the history of human spaceflight experiences has been primarily analyzed through the lens of Cold War politics rather than religious or spiritual terms. An approach proposed by Launius (2013) implies the use of deeply religious connotations in the advocacy for investment in space exploration seen as a higher purpose and the way to gaining and developing a higher self-awareness and cosmic consciousness. According to Launius (2013: 45), the notion of religion utilized in such an argumentation denotes "the practice of faith and worship, the existence of a set of beliefs inspiring reverence and allegiance, trust in an alternative arrangement of human affairs that cannot be physically demonstrated, a frequent promise of immortality, an explanation of origins, and conviction in a message of salvation". These characteristics easily fit in the definition of a civil or secular religion coined by

Bellah (1967) who asserted that the American nation has evolved their own form of belief system which involves national self-worship as well as a common set of ethical principles, values, rituals, memories and sacred ideals guiding, among other matters, a philosophical stance toward humanity's place in the cosmos. The term allows to comprehend the role human spaceflight occupied in the U.S. space programme and in the popular mind, accounting for its romantic representation as a truly transcendent experience and the opportunity to enlighten oneself through reaching a higher plain.

In early 20th century Russia, popular science and science fiction publications dealing with the questions of rocketry, spaceflight and astronomy were, despite being not widely available, highly popular among the masses. Many Russians attended lectures, meetings and discussion groups as well as took part in excursions to explore nature and learn more about science. This tendency coincided with social moods triggered by the success of the Bolshevik Revolution which, among other issues, incited enthusiasm for boundless possibilities of science, technology and space travel (Siddiqi 2010). Harrison (2013: 27) elaborates further on the phenomenon:

> In Bolshevik Russia, carefully researched articles on spaceflight appeared in outlets such as *Pravda*. Scientific lectures sold out, and crowds stripped vendors; shelves clean. Police were summoned to control crowds that were denied admission to space symposia or were excited by false rumours of an impending American rocket launch to the Moon. Societies with impressive names, and sometimes with impressive credentials, promulgated visionary ideas about space, and sponsored special exhibits featuring sleek ships and eerie simulations of distant planetary surfaces. Space-related themes infiltrated literature, art, and the cinema, and people with different levels of education, skill, and imagination shared ideas. The "space craze" of the 1920s lost steam due to a growing realization that despite rumours to the contrary, a successful space launch was in the distant future. In its early days, the Soviet government did not provide material support for rocketry and spaceflight as practical matters, such as electrification, industrialization, and agricultural production had come to the fore. Still, popular interest in the heavens and spaceflight never disappeared and peaked once again following Sputnik and other early Soviet successes. (Harrison 2013: 27)

Similarly, as pointed out by McCurdy (2011: 33-35), in post-war America, various portrayals of human spaceflight were highly popular and available in widely accessible mass media. However, the notion was initially evolving in a close relationship with the main trends in science fiction literature and film. That is why numerous depictions of space travels and extraterrestrial life were often perceived as largely fictional and implausible scenarios or simply a pure fantasy based on highly advanced, yet at the same time pseudo-scientific and highly incomprehensible technologies. Only in the 1950s and 1960s, the

reality of spaceflight was largely reinforced by exposing the audience to more probable textual and visual representations of spaceflight created in a realistic, convincing and scientific-like manner (McCurdy 2011: 54-55). Also, a rapid advancement in aviation and rocket science as well as the outset of the space age era contributed to an observable change in public attitudes toward orbital and lunar space missions. The reality of the actual spaceflight did not only deepen a nationwide interest in space endeavours, but it also triggered the emergence of a secular religion closely associated with and to a large extent justifying this unusual achievement.

Drawing on the Internal Revenue System's legal definition of religion, Launius (2013: 48) proposes his own criteria which enable him to classify the enterprise as a religious ideology:

> (1) a distinctive worldview with doctrines or traditions based on faith, rather than knowledge, including a salvation ideology; (2) identification of revered leaders and condemned villains; (3) sacred texts; (4) commonality of rituals, rules, and shared experiences; (5) attention to the divine, holy, mysterious, sacred, and sublime, and (6) tight group identity and internalist social organizations. (Launius 2013: 48)

It appears that within these characteristics there are certain themes which clearly correspond to Russian Cosmism, particularly its spiritual, prophetic, transcendent and utopian motives, including the belief in universal salvation, the ongoing quest for attaining a higher level of cosmic consciousness and perfecting humanity and the appreciation of an overwhelming beauty and grandeur of the universe that brings about both personal and global enlightenment as well as harmony in all realms of human activity.

2.3.1.1. Textual and visual evidence

Since the beginning of the history of American space programme, human spaceflight has been often portrayed as a spiritual quest whose ultimate goal is to lead humanity to achieving absolution, purification and finally eternity (see e.g. McCurdy 2011; Launius 2013; Oliver 2013; Tribbe 2014). The phenomenon has been analyzed in detail in Oliver's *To touch the face of God: The sacred, the profane and the American space program 1957-1975* (2013) where it is argued that the formation of space programme had, among other factors, clearly religious motivations and, during the most intense period of the space age, it remained an ongoing source of divine inspiration or spiritual insight. As pointed out by the scholar (2013: 166-167), a transcendental spirit of the national space endeavours, although often contradictory and deemed inferior to the government's political and scientific objectives, played a significant role in shaping a popular perception of space exploration:

> [S]paceflight and spirituality had combined in a relation rich with both promise and potent. Most accounts of the US space program in the Mercury-Apollo era address little more than a desultory paragraph to the theme of religion. A few, in conscious contrast, thrill to the provocation of pronouncing the program religious in its aims and dominant values. In truth, spaceflight was a field of human endeavour in which conceptions of the sacred pressed up against apprehensions of their own negation. From the teasing assertions of Soviet cosmonauts that there was no evidence of God in space, through the reading of Genesis during the first manned American mission to the moon, to the final wave of petitions – as Apollo-Soyuz approached – insisting that NASA not prohibit acts of religious speech by the nation's astronauts, the space program was a source of acute spiritual satisfaction and disquiet. In its inspirations, in its import for notions of where man stood in relation to the divine, in the opportunities it presented for profound and novel experience, and in its role as an agent of transcendence within a secularizing state the program was implicated deeply in questions of ultimate concerns. Within the wider culture of the long Sixties, the program was significant because it was religiously significant. (Oliver 2013: 166-167)

Largely in opposition to NASA's institutional and highly secular culture, the public image of the U.S. space efforts gained a more transcendental and mystical dimension evident mostly in the following representations: i) spaceflight seen as a religious experience based on the belief that space exploration would provide an ecumenical appeal and revive or enlighten the astronauts' and the world's nations' spiritual lives; ii) space exploration viewed as a manifestation of the environmental sublime and nature's divinity observed both in Earth's and outer space scenery; iii) astronauts regarded as communicators of grand epiphanies, religious or spiritual feelings and other numinous states of the mind experienced during spaceflight; iv) the presence of religious iconography endowed with eschatological meanings, including launching rockets, the Apollo crews' Earth photography or Genesis reading, a man on the moon and in Earth's orbit, Irving's project of High Flight Foundation, etc., whose representations were widely circulated in the U.S. media (Oliver 2013). These and akin reflections on the evangelical or sacred nature of the national space programme might have occurred as a reaction against techno-scientific priorities advanced and promoted by NASA's leadership (Oliver 2013: 168-169):

> Early in the space age, there also had been expansive speculations about whether spaceflight would be an occasion for spiritual experience. The media was curious to know whether, aloft in the heavens, the astronaut would feel closer to God. (…) What fascinated many Americans about human spaceflight – the potentially transformative effects of a passage to the high places of sacred tradition or to an Archimedean position of vantage – was for NASA managers the stuff for nightmares. Some astronauts did return from their missions attesting to epiphany. (…) However,

> within the program itself they were regarded as misfits, precisely because in their encounters with the cosmos they had proven so susceptible to change. NASA placed a premium on stability in its astronauts, stigmatizing as eccentric and hazardous any behavior in space that went beyond a routine avowal of the beauty of the universe. (...) The same insistent, self-conscious focus on operational priorities cramped the agency's style through the season of its greatest triumph: Neil Armstrong's first steps on the moon may have lifted the nation's mood, but the thrill of the moment was hardly likely to be quickened into a broader spiritual transformation by its coda of contingency samples, seismic experiments, and awkward repartee with Richard Nixon. (Oliver 2013: 168-169)

Similarly, McCurdy (2011: 120-121) emphasizes, among political and economic factors, a clearly religious-oriented motivation behind the U.S. space efforts:

> To its most devoted advocates, however, space exploration promises far more: to continue the quest begun centuries earlier to supplant religious dogma with science as a means of understanding the universe. Space exploration addresses the great mysteries of life. How did the universe begin? Where did the solar system come from? Are humans alone, or is the universe teeming with life? How will it all end? Since Galileo Galilei employed a pair of converted spectacles to observe the moons of Jupiter, advocates of this new way of understanding have argued that natural observation will provide answers to questions such as these. For many in the exploration business, this quest has a spiritual quality, promising answers to cosmological questions that have intrigued humans throughout history and have inspired great myths and religions. By probing the mechanics of the universe, humans can find answers to questions that have encouraged spiritual introspection since thinking began. It will allow humans "to know the mind of God". (McCurdy 2011: 120-121)

Launius (2013: 48) suggests that certain traces of such an ideology manifest themselves particularly in the nationwide phenomenon of Apollo nostalgia[4] whose various representations can be found in literature, film, advertising, music or art. It deals with various reflections on the moon programme and longing for its glorious reincarnation, portraying Apollo as a transcendental, spiritual and revolutionary event as well as a great breakthrough in science, technology and human evolution. Facing a failure of the Apollo programme partly caused by a decline of the space race rivalry of the 1970s, NASA and

[4] According to Boym (2001: 8), modern nostalgia, whose present-day meaning originated in Johannes Hofer's medical dissertation (1688), can be defined as "a mourning for the impossibility of mythical return, for the loss of an enchanted world with clear borders and values; it could be a secular expression of a spiritual longing, a nostalgia for an absolute, a home that is both physical and spiritual, the edenic unity of time and space before entry into history".

space advocates attempted at redefining spaceflight ideals in the field of economy, foreign policy and popular culture. This is how Launius (2005: 135) discusses the cultural heritage of the project:

> Apollo brought forth a long existentialist fall from grace, along with hopes for a resurrection at some future indeterminate date when the cosmos would be opened as space advocates desired. (…) [T]he lament for Apollo that exists in many parts of the pro-space movement suggests (…) a loss of vision once had by the nation in the Apollo era. (Launius 2005: 135)

Such ideas were all captured in *Apollo 13* (1995), the "coming home" narrative and drama based on real events, namely the 1970 Apollo 13 mission which failed to land on the moon due to the explosion of an oxygen tank (Dean 1998: 62). A relatively recent study has found that the representation of space mission encoded in the film is highly nostalgic in its celebration of the past and visual style, evoking the sublime feeling as well as a strong sense of heroics and community among astronauts (Maslin 1995). An earlier picture also considered an epic depiction of the U.S. manned spaceflight, *The right stuff* (1983), recounts the formation of the original Mercury programme, portraying the national and personal mission of seven astronauts, including Alan Shepard, Gus Grissom, John Glenn or Scott Carpenter. Based on Tom Wolfe's book of the same title (1979), the film exposes a moral ambiguity of its heroes, presented, on the one hand, as new heroic pioneers and, on the other, as naïve executors of the government's propaganda. Still, the presence of highly evocative, compelling images accompanied by Caleb Deschanel's stirring photography and uplifting, Oscar-winning score composed by Bill Conti reinforce a strong sense of nostalgia crucial to the Reagan administration's main policies (see e.g. Scott 2010). The stories of both Project Mercury and Apollo 13 were included in a twelve-part docudrama miniseries titled *From the earth to the moon* (1998), which depicts the landmark Apollo missions of the 1960s and 1970s. The show is famous for its realism and outstanding special effects which celebrate and dramatize a unique U.S. tradition of the moon landings.

Launius (2013: 49) points out that human spaceflight, specifically Apollo missions, "represented a reincarnation of a new religious tradition", and could be read not only as the search for God, but also as an attempt to unite with the divine spirit as well as to attain a higher level of consciousness and deep spiritual values:

> Apollo evoked, in a metaphorical and absolutists sense, emotions of awe, devotion, omnipotence, and most importantly redemption for humanity. It embodied a new clerical caste (the engineers and especially the astronauts), arcane rituals (Mission Control and other operational activities) that were deeply mystical, as well as

> possessing a higher purpose, a language of devotion (the NASA jargon invoked by both practitioners and acolytes/enthusiasts), articles of faith, and a theology of salvation that allowed humanity to reach beyond Earth and settle the cosmos. The promise of a utopian Zion on a new world, occupied with immortality of the species, resonates through every fiber of the space exploration community. Wernher von Braun, as only one example among many, viewed space exploration as a millenarian new beginning of humankind. These deep-seated convictions energized space exploration and the subjugation of the universe from before the dawn of the space age. (Launius 2013: 49)

As implied above, a salvation doctrine, to a large extent in line with Fedorov's resurrection project, is present in American Cosmism as one of the principal rationales for carrying human spaceflight missions. In other words, it becomes clear that mankind needs to transform itself into a genuinely multi-planetary species in order to ensure its survival. The message was conveyed by von Braun in his 1976 speech to the National Space Institute in which he expressed the belief that space exploration would "offer new places to live – a chance to organize a new interplanetary society, and make fresh beginnings" (as quoted in Launius and McCurdy 2008: 38). Launius (2013: 51) argues that avoiding extinction and guaranteeing the eternity of the human soul can be seen as pure statements of faith based on no specific knowledge or reason.

Such religious statements were also common among astronauts themselves who quite openly expressed their abiding faith in God. Harrison (2013: 28) mentions the fact that Gordon Cooper, one of the seven astronauts of Project Mercury, called his spacecraft *Faith 7* and, while crossing over the South Pacific, he recorded a prayer which was broadcast from space and later recited before the Congress:

> I would like to take this time to say a little prayer for all the people, including myself, involved in this launch and this operation. Father, thank You for the success we have had flying this flight. Thank You for the privilege of being able to be in this position, to be up in this wondrous place, seeing all these many startling, wondrous things that You've created. Help guide and direct all of us, that we may shape our lives to be good, that we may be much better Christians, learn to help one another, to work with one another, rather than to fight. Help us to complete this mission successfully. Help us in our future space endeavors, that we may show the world that a democracy really can compete, and still are able to do things in a big way, are able to do research, development, and can conduct various scientific, very technical programs in a completely peaceful environment. Be with all our families. Give them guidance and encouragement, and let them know that everything will be okay. We ask in Thy name. Amen. (Cooper 1963)

Examples of religious acts performed during spaceflight might include the Apollo astronauts reading the Bible while circling the Moon in December

1968, Buzz Aldrin taking communion on his mission or Edgar Mitchell and Jim Irving leaving the Bible on the Moon (Harrison 2013: 29). Numerous references to God can be also found in the astronauts' public statements, interviews or space memoirs, published widely between the 1960s and 1990s. The fragment quoted below is White's telephone interview with Edwin Carr, the former Republican Senator who was aboard STS 51-D launched in April 1985, conducted on July 23, 1986 (White 1998: 247-250):

> You see it as one world, and you recognize how insignificant the planet Earth is when you look at 10 billion stars in the Milky Way and recognize that our sun is a rather minor one. You look out there millions of light-years, and it is impossible to comprehend the vastness of space. I have always believed that there were other human beings on other planets. Not in our solar system, obviously, but I personally believe that God created our Earth and the universe and that we are not the only children of God in the universe. (White 1998: 247-250)

In another interview taken by White (1998: 189), the Gemini and Apollo astronaut Michael Collins, the first men to set foot on the moon, stated that the most appropriate crew for an Apollo mission should, in his view, include "a philosopher, a priest, and a poet". A similar impression was given in a public statement made in 1985 by the Gemini crew member and Apollo 17 commander Gene Cernan, where he summarized his experience as a moon walker as follows (Norris 2014):

> When I was the last man to walk on the moon in December 1972, I stood in the blue darkness and looked in awe at the earth from the lunar surface. What I saw was almost too beautiful to have happened by accident. It doesn't matter how you choose to worship God… He has to exist to have created what I was privileged to see. (Norris 2014)

A virtually physical presence of God was experienced by Jim Irwin, the Apollo 15 astronaut, who, in his space memoir *To rule the night* (1973), described the lunar mission as a highly profound and spiritual experience (Irwin and Emerson 1973):

> I felt an overwhelming sense of the presence of God on the moon. I felt His Spirit more closely than I have ever felt it on the earth, right there beside me, it was amazing. When we were struggling with the difficult tasks on the EVA (extra-vehicular activity), when a key string broke and I couldn't get the science station up, I prayed. Immediately I had the answer. It was almost like a revelation. God was telling me what to do. I never asked Houston because I knew there would be a delay. I prayed, and immediately I knew the answer. I am not talking about some vague sense of direction. There was this supernatural sensation of His presence. (Irwin and Emerson 1973)

Interestingly, attributing space endeavours to God's assistance, the theme present on a large scale in American Cosmism and distinct from scientific-materialistic atheism widespread in the USSR, made a considerable distinction between American and Soviet ways of life (Harrison 2013: 29). The presence of an atheistic thought can be also found in the cosmonauts' space memoirs or public announcements, for example that of Titov: "Some say God is living there [in space]. I was looking around very attentively, but I did not see anyone there. I did not detect either angels or gods… I don't believe in God. I believe in man-his strength, his possibilities, his reason" (as quoted in Rowell 2008). Suppressing religion by instilling the masses with atheism, debunking magic and promoting technology was one of the chief constituents of a new era of communism initiated by Khrushchev. In the media, early cosmonauts were often presented as icons of scientific techno-culture, publicly stressing their lack of devotion to anything that could be considered spiritual and supernatural or even disregarding astronauts' religious beliefs, seen as backward and naive. Rockwell (2006: 27-28) elaborates further on the phenomenon:

> When asked whether he had brought "any mementos such as photos of [his] dear ones, or any talismans" on his voyage, Gagarin assured reporters that he did "not believe in any omens and talismans, and other such things". Upon his return to earth, German Titov, the second Soviet man in space, publicly shared his conclusion that having visited heaven and finding no God there, He must not exist. The following remark of a peasant from Kalinin oblast' recorded in the early 1960s seemed to support his claim: "[I] believe and [I] do not believe in God. For a long time I was religious, but now [I] do not know what to be [they] launched the sputnik– [they] did not find God". (…) Gagarin professed a materialistic philosophy of life, saying, "We are children of the Earth. To it we owe our lives, warmth and the joy of existing". (Rockwell 2006: 27-28)

Pop (2009) also points out that in the Soviet popular mind the place of religion was taken by Marxism where Marx himself serves as Moses and Lenin stands in for Christ. In the times of religious suppression, icons were replaced with portraits of Lenin, Stalin or other communist leaders and orthodox churches with the Red Square or other places of worship where pilgrims traveled to pay homage to Lenin's embalmed remains or objects of collective cult. Harrison notes (2013: 29) that "while Soviets were unable to resurrect Stalin as envisioned by the Cosmists, they were more than successful to provide their flock with 'heavenly signs' by means of space technology". On the other hand, the government's attempt to root out religion that has been deeply embedded in the national consciousness for thousands of years, could be considered a mission impossible (Smolin-Rothrock 2011). Preaching atheism by promoting spaceflight and educating the audience

about the wonders of the universe through the lens of science and technology eventually failed as the public opinion accepted the fact that science and religion did not contradict each other and, what is more, often coexisted in both physical and spiritual terms (Harrison 2013: 30). The Archpriest L.A. Taranovskii described this tendency as follows (as quoted in Smolkin-Rothrock 2011: 190):

> Flights to space are new proofs of God's power, and the idea that cosmonauts did not see God, well it is not as if he sits in one place. One cannot see God, he is a spirit. And if life on other planets is discovered, then their existence also involved the participation of God, he is all powerful. (as quoted in Smolkin-Rothrock 2011: 190)

In this way, the Soviet spaceflight, despite having strongly promoted a nationwide enthusiasm for atheism, did also offer a clearly mystical dimension of the whole enterprise. Long duration orbital missions of the 1970s and 1980s were often described by cosmonauts themselves as momentous, meaningful and spiritual experiences of a great significance for the whole mankind.

The idea of a religious experience of space travel is usually carried and conveyed by astronauts who, as implied by Launius (2013: 52), tend to function as revered leaders. The image of an astronaut, portrayed as a romantic and idealized hero exploring the final frontier and often sacrificing their own life, has always been an inseparable part of American Cosmism. This largely mythicized figure, working individually or within a unique group of exceptionally skilled and daring professionals, is deeply engrained in the popular mind, perpetuating various realms of popular culture. Launius (2013: 52) elaborates on the phenomenon:

> Astronauts are humanity's exemplars in the pursuit of the quest of spaceflight as a civilization. In the United States, they were imbued with this responsibility in 1959 and have carried it to the present. In the context of this ideology, all astronauts are viewed as virtues and heroic, cool under pressure, and technologically dexterous. They are brilliant and attractive; impressive in every setting; they are able, bold, learned and brave; they ooze Americanism and patriotism of the highest caliber from every pore; and they are sought after like only a few other celebrities. (Launius 2013: 52)

A similar view is held by Llinares (2009: 164) who notes that the construction of the astronaut was supposed to serve as a living example and embodiment of American national identity as well as hegemonic masculinity:

> The astronaut's revered position as an icon of the 20th century is inculcated culturally as much as historically. Innumerable media representations have contributed to an intertextual mythology which constructs the astronaut as an ideal embodiment of American identity. Elements such as competitiveness, individualism, patriotism, family values and even religious morality inform

> characterizations of the astronaut in both the photojournalism of magazine and literary accounts of the space race (…) Underpinning this cultural mythology is an intrinsic conceptualization of masculinity which, drawing from Barthes (1957), becomes 'naturalized', outside historical context, as an efficacious notification of some eternal truth. (Llinares 2009: 164)

Such an iconic representation has its roots in the beginnings of human spaceflight programme of NASA, particularly in the Mercury, Gemini and Apollo projects realized between 1959 and 1972. In the 1960s, largely due to astrofuturists' efforts and Kennedy's promise to send Americans to the moon before the end of the decade, space-related themes became much more popular among the public and widely spread in popular magazines and newspapers, such as *Life*, *Colliers's*, *Look* or *Saturday Evening Post*. Many publishers cooperated with NASA's public affairs officers in their promotion of the image of the astronaut shaped through nationalism (represents physical strength, national pride and international prestige), romanticism (represents heroism in accomplishing missions in the final frontier), and pragmatism (brings economic, scientific and educational benefits to humanity) (Kauffman 1994: 50-66). For instance, *Life*'s numerous articles and pictures of the decade were often devoted to the prospect of moon landing (see 3.2.4. for details).

Still images accompanied by considerably accessible, explanatory and educational texts remained a popular alternative to TV coverings of the topic, including NBC's *Huntley-Brinkley Report* or *CBS Evening News* hosted by Walter Cronkite. The latter is considered the first TV space journalist, accredited with being "the most trusted man in America" and an authoritative expert on the national space programme (Scott 1989: 171). As one of the leading and most influential voices in the U.S. homes, he gave an inspiring and highly convincing narration of the historic events in space exploration, ranging from Project Mercury to the Apollo and Space Shuttle missions. His in-depth coverings were often visualized by the use of the actual footage which took the viewers into space or inside the shuttles and rockets, making them feel like real astronauts whose virtues and skills were frequently extolled by Cronkite. As the decade witnessed a considerable public interest in television, space research was subject to educational films often produced by NASA to publicize their main activities. One of the most popular and commonly viewed titles included astronauts' biographies, such as *The John Glenn story* (1963) and short documentaries on extraterrestrial life and the most significant moments in the history of American space programme, such as *America in space: The first decade* (1968). Also, a near-sainthood of astronauts was well depicted in later cinema and television productions, like the aforementioned *The right stuff* (1983), *Apollo 13* (1995) or *From the earth to the moon* (1998).

The greatest historic achievements and the most tragic accidents in the history of manned space missions still play a significant role in the U.S. culture. Space exploration-related public places, including the National Air and Space Museum in Washington, D.C., the Johnson Space Center in Houston or the Kennedy Space Center in Florida, commemorate such events and the crews who successfully performed their tasks or died in the line of duty. Numerous exhibitions, such as Apollo to the Moon or Moving Beyond Earth, are open to visitors throughout the whole year and memorialize not only highly momentous and heroic occasions, like the Moon landings, but also the most dramatic incidents, including the Apollo 1, Challenger and Columbia lost missions. Their commemoration takes place each year and always embraces both mourning and reflection on the risk and danger space endeavours still pose to human life (Launius 2013: 52-53). On the other hand, the loss of seventeen astronauts in over fifty year history of the U.S. space programme only reinforces the need to probe deeper into the cosmos and search for more effective solutions that would lead humanity to achieve salvation and inhabit a hostile space environment. Launius (2013: 54) suggests that a collective observance of such tragic moments constitutes another important element of the religion of spaceflight:

> Much like the confession of sin in traditional religious traditions, a desire to partake in the guilt associated with the loss of astronauts is a very significant part of the religion of spaceflight. For the devoutly religious, the mantra is that humanity is sinful and every individual must accept this fundamental truth. The unworthiness everyone must inculcate into the very depths of their soul can only find release in the salvation achieved through oneness with God. In the Christian tradition, we are ultimately responsible, every one of us, for the death of Jesus Christ. We are worthy only of the "pit of hell", but God grants salvation not because we deserve it but because of mercy. Only through human acceptance of this reality, repentance for the evil that inhabits us, and mercy from the throne of God may salvation be attained. (Launius 2013: 54)

Meanwhile, the image of an astronaut has yet another dimension, namely that of the frontiersman, an adventurous, fearless hero whose mission is to discover and tame the wilderness of new, unexplored lands. Such an ideology is clearly related to Turner's Frontier Thesis which successfully advanced the myth that pioneering the American West has played a substantial role in shaping the national character. However, a detailed analysis of the phenomenon will be provided further in this chapter, in the section devoted to national mythologies underlying the U.S. interest in space research and exploration (see 2.3.3.)

2.3.1.2. Sacred texts, rituals and spaceflight adherents

Launius (2013: 55) argues that there is a distinct set of sacred texts published in mid-century popular media which is believed to have greatly inspired a group of adherents of human spaceflight missions. The first significant "holy writ" or set of writings the scholar identifies is a series of articles devoted to space-related themes which appeared in *Collier's* between 1952 and 1954. Editors of the magazine's special spaceflight series, Man Will Conquer Space Soon!, hoped to attract large audiences by presenting them with unforgettable depictions of manned space missions rather than Korean or Cold War news (Hardy 1989: 16). Imaginable pictures and illustrations portraying highly precise projects of the first space station and space suit or humans setting foot on the moon and Mars were created with scientific accuracy by some of the most notable space artists of that time, including Chesley Bonestell, Rolf Klep and Fred Freeman. More importantly, however, the issues exposed their readers to impressionistic articles by Wernher von Braun describing the key characteristics of the NASA space programme, ranging from a convincing vision of artificial satellites and the first orbital flights to permanently inhabited space stations and human exploration of the Moon, Mars and Solar System planets.

Heroic prose depicting the greatest achievements and visions of the U.S. space programme can be also found in narratives of the Apollo moon landings available in popular broadcast and print media of the 1960s and 1970s (Launius 2013: 56). The rhetoric was well captured by Ronald (1994) who suggested that such stories, often accompanied by iconic images, are likely to retell a specific mythology of highly ritualized texts invoking a sacred character of religion-stylized prayers, such as the Muslim or the Lord's Prayer:

> All the exhilarating stories are here: the brave, visionary young President who set American on a course to the Moon and immortality; the 400,000 workers across the nation who built the Apollo spacecraft; the swash-buckling astronauts who exuded the right stuff; the preliminary flights of Mercury and Gemini – from Allan Shepard's suborbital are into space, through John Glenn's first tentative orbits, through the rendezvous and spacewalks of Gemini that rehearsed the techniques necessary for Apollo. There is the 1967 fire that killed three astronauts and charred ineradicably the Apollo record and the Apollo memory; the circumlunar flight of Christmas 1968 that introduced the world to Earth-rise over the lunar landscape; the climax of Apollo 11 and Neil Armstrong's heroic piloting and modest words, "That's one small step for a man, one giant leap for mankind"; the even greater drama of Apollo 13, rocked by an explosion on the way to the Moon and converted to a lifeboat that returned its crew safely to Earth thanks to the true heroics of the engineers in Houston; and, finally, the anticlimax of the last Apollo missions. (Ronald 1994)

Launius (2013: 57) supports the above claim by emphasizing the ongoing popularity of space-related writings, particularly in the form of quotes, comments and mentions, often invoked in discourse and bearing the characteristics of scripture or other sacred texts:

> [O]ver time these stories have taken on the characteristics of scripture and are invoked, glossed, and re-glossed by adherents, and debated as to nuances of meaning. Their influence in unmistakable. Every history mentions them, quotes them, and favorably comments on them. They have been reprinted, used in speeches, and invoked in public policy debates. Finally, they were central to the development of NASA's plans, and have continued to affect strategic thinking about space exploration, especially as it relates to a systematic, step-wise methodology for exploring the solar system. (Launius 2013: 57)

Although still present to a lesser or greater extent, the initial enthusiasm for human spaceflight waned with NASA's final withdrawal from Project Apollo and the memory of great heroic missions was gradually replaced with a sense of disappointment and hopelessness. Today, Apollo nostalgia is often expressed as a general lack of interest in the future of space exploration, which is evident even among baby boomers, some of whom still seem to have an affection for NASA-sponsored activities (Launius 2005: 137). At the beginning of the new millennium, there has been a cultural shift toward maintenance of the status quo in the national vision of the final frontier and any attempts to recreate the past glory of the project is doomed to fail mostly due to extremely high expenditures and no grand motivation behind it.

Another important element of the religion of spaceflight proposed by Launius (2013: 57) is a set of complex rituals, often imbued with symbolic, religious or esoteric meanings, accompanying astronauts in their preparation for a mission. The scholar (2013: 57-58) suggests that the process is highly ritualized, consisting of a few stages which need to be completed in an extremely heedful and almost reverent manner; this includes the arrival at the Kennedy Space Center, a series of preparations, a ritualistic breakfast, travelling to the launch site or entering the spacecraft. The aforementioned feature film, *Apollo 13*, realistically depicts a ritual of preparing for launch and presents astronauts as reverent missionaries with a higher purpose bestowed upon them. Launius (2013: 58) highlights religious undertones of the crew's experience:

> This film, as well as the actual experience of launch, represents an epiphany for astronauts, launch controllers, and spectators. Some watched in awe, others sobbed with emotion; all were moved by the experience. It represented a scene of redemption for all non-believers. At the conclusion of the launch sequence, with Apollo 13 safely in orbit around Earth, Mission Control comments, like the priest

> at the conclusion of a Mass, "And that is how we do that". At a fundamental level, the launch sequence represented human communion with deity. To release such energy under total human control is to become like gods, to transcend the earthly plain and to reach for heaven. (Launius 2013: 58)

Interestingly, the Russian experience seems even more ritualized. Orbital flights embraced a series of ritualistic events, such as the crew being blessed and sprinkled with holy water by an Orthodox priest, having a high-protein low-residue meal at breakfast before the launch, the cosmonauts signing their names on a hotel room door, their departure being serenaded by the Soviet band Zemplyane's [The Earthlings'] rock song, "The green grass near my home", or a special talisman being hung inside the crew compartment (Murphy 2008).

Another constituent of the religion of spaceflight suggested by Launius (2013: 59) is a strong group identity among space programme advocates often accompanied by a lifetime commitment to promoting space-related issues. The phenomenon, mostly interpreted in informal terms, is well illustrated by millions of people visiting a number of locations devoted to exhibiting and celebrating milestones in the history of spaceflight each year. Some world-known examples might include the Smithsonian Institution's Air and Space Museum in Washington, D.C., the Kennedy Space Center in Florida or Space Center in Kitakyushu, a Japanese space-oriented theme park. Also, spaceflight adherents express a strong belief in chosenness of humanity predestined to accomplish a long-term mission of exploring and taming the cosmic environment. The idea, rooted in Old Testament traditions, both endorsed and reflected the original image of America as a Promised Land (McDougall 1997: 5).

One of the pro-space movements founded in the 1980s are proponents of the so-called Overview Effect, the term coined originally by White (1987) and often seen as the present-day form of outer space religion.

2.3.1.3. The Overview Effect

White (1998: 9) suggested that both astronauts and cosmonauts, having moved into nonterrestrial space, went through such a profound experience that their worldview must have been affected as they have viewed the Earth from a distance, gazed outward into an infinite outer space, experienced weightlessness and performed EVA (extra-vehicular activity). White argues (1998: 4) that extraterrestrial conditions have enabled space travelers to undergo the Overview Effect, the concept denoting "the predicted experience of astronauts and space settlers, who would have a different philosophical point of view as a result of having a physical perspective". Additionally, the phenomenon encompasses the

core and halo experience, the former of which consists of the following components: i) "Changed perceptions of space". Due to the lack of a direct experience of the Earth's motion, humans still tend to view their place in the cosmos similarly to their remote ancestors, i.e. with the Earth occupying a stationary and central position in the universe. Both astronauts and cosmonauts' mission is to bring changes to these misconceptions by sharing their spaceflight experiences; ii) "Changed perceptions of time". Contrary to humans' experience of time on the surface of the Earth, its perception changes significantly for an astronaut in orbit where time speeds up (e.g. both sunrise and sunset takes place every 90 minutes by a clock set to Earthbound time). On the other hand, time tends to slow down the farther one moves from the Earth; iii) "Silence". While on Earth humans are always exposed to a great variety of different sounds and noises, astronauts and cosmonauts in orbit are surrounded by a vacuum and are only able to hear sharply reduced sounds generated by a spacecraft. These conditions create the effect of a complete silence, strengthened by the feeling of weightlessness and a tranquil, majestic panorama; iv) "Weightlessness". The feeling of weightlessness, experienced when drifting freely in space or walking on the moon, the latter of which provides only one sixth as much gravity as Earth, can trigger an euphoric reaction in astronauts and cosmonauts (White 1998: 20-23).

According to White (1998: 14-19), the aforementioned constituents of the core experience tend to affect the public sphere, creating the so-called halo experience, which invests human spaceflight with broad social and cultural meanings: i) "The Experience and Its Communication". The language enrichment is listed among one of the most prominent social and cultural implications of space exploration. As human spaceflight experiences as well as space technology are more and more often dubbed by means of newly-emergent terms or described in a metaphorical and elaborate manner, some novel culture-related concepts come into use in the field; ii) "Public/Private Boundary". Space travel, despite being primarily classified as a largely private experience, becomes increasingly public through its spread in a number of media, where it takes diverse forms and undergoes a constant re-interpretation and re-presentation; iii) "Cultural Roles and Expectations". Exploring outer space, often seen as American final frontier, has transformed the image of an astronaut regarded as the national hero and a revered leader who has experienced something profound and futuristic available only to a highly insignificant and chosen fraction of the world's population. According to White (1998: 19), "the astronauts and cosmonauts fit into the mythical subconscious archetypes of the gods and heroes of old, flying beings who perform feats of daring no one else is able or willing to do". Despite certain attempts of NASA and some astronauts to discourage such a misconception, cultural and social pressure to prevail it for the sake of coming up to the public expectations is still high.

White's concept of the core and halo experience embraces multidimensional aspects of human spaceflight, presenting it not only as an intense and profound personal experience, but also a cultural event which greatly affects the public domain. Both core and halo effects extend an individual meaning of space travel to the public sphere and, what is more, the latter implies the occurrence of further socio-political and cultural implications, such as the emergence of global space ethos or development of deep ecological movement and bioethical thought. The Overview Effect captures the most essential characteristics of space travel, encompassing its physiological, physical, psychological and spiritual impact on human beings. Most importantly, it shows that spaceflight experience should primarily serve awareness-increasing functions and provide the opportunity for an individual's spiritual development, the emergence of cosmic consciousness as well as a major transformation in global belief systems (White 1998: 15-26).

The main idea behind White's Overview Effect was to provide a sense of grand purpose of humanity's future space efforts and to mark the new beginning after the Challenger explosion (Bjornvig 2013: 6). With the end of the Cold War and approach of the new millennium, such ideas were mostly in line with the U.S. space policy which has officially laid solid foundations for the concepts of space culture and global space ethos arising gradually within the frame of modern society (Harris 2008: 36). According to Jesco von Puttkamer, the former NASA strategic planner, the opening of extraterrestrial environment must be realized as a broad social and cultural process, requiring a conscious change in people's attitude towards space enterprises which should be seen from a truly holistic and cosmos- rather than self-centered perspective (Harris 2008: 1-2). Such concepts are strongly promoted by Harris (1992), a space psychologist who formulated 21st century novel challenges that humans need to face in their upcoming space endeavours. The chief principles of space research and human spaceflight were already mentioned in 1985 by the U.S. senator Spark Matsunaga (as quoted in Harris 2008: 1):

> At a certain point, anything less than international exploration of the cosmos from our tiny planet will cease to make any sense at all… we must develop policies that respond to the unfolding realities of the Space Age, that move us out to meet it on its own uniquely promising terms. Without such policies, earthbound civilization can only wind up recoiling upon itself. (as quoted in Harris 2008: 1)

Simultaneously, the National Space Commission longsighted report, Pioneering the Space Frontier, proposed a fifty-year scenario for the U.S. space programme based on the following principles: i) the extension of human knowledge about the universe; ii) space research and exploration which should lead to humans inhabiting the inner solar system; iii) a reasonable use of outer space resources to serve both mankind and the

cosmos (Harris 2008: 4-5). In addition to exposing a more humanistic approach to space endeavours, the report drew on the mythical concept of American frontier and advocated the vision of men, seen as space pioneers, being at the threshold of the new, unknown world. In an introduction to the Advancing Science section, the authors emphasize a philosophical and spiritual dimension of human attempts to unravel the mysteries of the universe ("Pioneering the space frontier" 1986):

> Through consecutive evolutionary steps tending over billions of years the Universe is now able to contemplate itself. We humans stand in awe at the majesty of creation surrounding us. Can there be a grander perspective than the long evolution of intelligent life from the violent flash of the Big Bang? Can there be a greater challenge than using our access to space to understand the Universe and humanity's place within it? With faith in our Nation's ability to meet this challenge, we propose that the United States, through a vigorous program of space science, undertake a unified and comprehensive effort to understand the origin and evolution of the cosmos by integrating the findings of many diverse disciplines. This can lead to great new discoveries while increasing our ability to forecast future phenomena, including most importantly those that affect or are affected by human activities. ("Pioneering the space frontier" 1986)

According to Brojnvig (2013: 6), White's Overview Effect offered not only a convincing pro-space policy, but also successfully formulated a genuine 21st century philosophy of space which should be interpreted in the spirit of astrofuturism, secular religion, deep ecology and universal monism. As Brojnvig (2013: 6) put it, "the book was to create a revolution with the twofold aims of saving the planet and getting a portion of humanity into space". Meanwhile, the Overview Effect itself, defined as a collective paradigm of spaceflight experience, can serve as a religious and philosophical belief system which embraces biological (Gaian), physical, psychological and technological aspects of human-Earth relationship.

Most of such ideas originated already in the 1960s. The Apollo crews' images of drifting in a seemingly empty void of space did not only become one of the most symbolic icons of the 1960s America, but they also contributed to the establishment of the so called counterculture, based on an emerging global consciousness and ecological awareness which advanced new ways of living and perceiving the surrounding reality. Cosgrove (2001: 261) notes that Apollo 17's Whole Earth implied a holistic understanding of the world with no boundaries and no superiority of the Western civilization: "Thus liberated, and with no signs of meaning, boundary making, or possession, Earth appears to float free as a *sui generis* organism". Also in his 1994 article published in *Annals of the Association of American Geographers*, Cosgrove asserts that Whole Earth carries deep cultural and imperial meanings which affected the U.S. self-

representation in its post-war geopolitical mission. Particularly, it signifies a universal expansion of a socio-economic order advanced by American *imperium* today understood as "an economic and technological order of which *22727*'s erasure of political boundaries allows representation in the networks of financial, media, or communications links etched across an unbounded globe" (Cosgrove 1994: 289-290). At the same time, the scholar (1994: 289-290) argues that the former interpretation of the image, defined as "an environmentalist conception that appeals to the organic and spiritual unity of terrestrial life (...) [and] implies the extension of organic bonds across all humanity and the entire globe", tends to prevail in the popular mind.

Stewart Brand in his *Whole earth catalog* (1968-1972), one of the first publications dealing with such an ideology, released numerous photos of the entire Earth as seen from space which aimed to inspire its viewers and evoke a sense of shared destiny. Functioning as an encyclopedia of information, innovative ideas, equipment and tools for environmentally friendly living in the field of land use, crafts, technology, politics, daily life and communications, it served as the Bible for countercultural and ecological movements teaching about ephemeralization, synergetics and whole systems. As Henry and Taylor (2009: 193) observe, "If *Earthrise* took the astronauts and the American public by surprise, Apollo 17's *Whole Earth* image of the fully illuminated Earth in space stunned the world". The scholars (2009: 194) further discuss the global impact of Earthrise and Whole Earth as well as how they have become one of the most recognizable icons of the U.S. environmental movement:

> As with *Earthrise*, the image of Apollo 17's *Whole Earth* became indelibly etched into the human imagination. Both photos revealed Earth as a fragile oasis, a biosphere of tremendous biodiversity. (...) That Apollo forever altered the way we see ourselves in relation to our planet is indisputable, though its specific intervention in the environmental movement is nearly impossible to map. The environmental movement in the US existed long before the Apollo programme, dating to the 1890s with the establishment of Sequoia and Yosemite National Park in 1890, the Forest Reserve Act of 1891 that preceded the formation of a national forest service, and the founding of the Sierra Club in 1892. By the 1960s, multiple events in the US, including the emergence of NASA in 1958, nuclear weapons testing, publications of Rachel Carson's *Silent Spring* (1962), the Civil Rights Movement converged in sparking widespread and various responses to environmental concerns. (Henry and Taylor 2009: 194)

Concerns about the planet and ultimate fate of its inhabitants were also expressed in one of the key terms of the space age discussions, which denotes a world view advancing a restricted use of natural resources as well as a harmonious existence in a cyclical ecological system. The notion, first coined in Henry George's *Progress and poverty* (1879), was elaborated in public

discourse of the 1960s and well characterized by Adlai Stevenson in his 1965 famous speech to the UN:

> We travel together, passengers on a little space ship, dependent on its vulnerable reserves of air and soil; all committed for our safety to its security and peace; preserved from annihilation only by the care, the work, and, I will say, the love we give our fragile craft. We cannot maintain it half fortunate, half miserable, half confident, half despairing, half slave—to the ancient enemies of man—half free in a liberation of resources undreamed of until this day. No craft, no crew can travel safely with such vast contradictions. On their resolution depends the survival of us all. (Stevenson 1965: 224)

In popular culture, Spaceship Earth is known as one of Disneyland theme parks' attractions opened in Epcot, FL, in 1982 and housed in the 18-story geodesic sphere that takes passengers on a dark ride back in time where they can witness the greatest breakthroughs in human communication since prehistoric times. The final stage of the journey, located at the top of the construction, is actually a planetarium filled with an infinite number of stars, a huge rotating Earth and a projection of what one's future would look like in terms of technology and communication. The structure, except for offering an entertaining time travel, reinforces a utopian notion of spaceflight characteristic for American 20th century space culture and based on the idea of international space programme and global cooperation in space endeavours.

It seems that many aspects of the Overview Effect conform to the main characteristics of outer space religion which combines New Age thinking, environmentalism and salvation ideology (Bjornvig 2013: 10-11). Bjornvig (2013: 11) comments on religious underpinnings of White's concept as follows:

> According to White, the astronauts' first steps into space were a transformational moment with history-changing potential. A new era will commence where current problems traumatizing earthly existence will dissipate. Thus, outer space is presented as a medium for salvation. *The Overview Effect* also contains directions for the performance of rituals in the form of visualization exercises. There is no indication of a belief in transcendent, divine beings in *The Overview Effect*, which is typical of outer space religion. However, the way in the universe itself is portrayed as somehow influencing, even directing, cosmic evolution makes it an obvious candidate to fulfill the role occupied by gods in conventional religion. The evolutionary steps predicted by White in the form of the various civilizations include the systems-theory-inspired idea that technological systems will merge with natural systems, thus blurring the nature/technology dichotomy – something often forming part of the salvation process in outer space religion. (Bjornvig 2013: 11)

What is more, White (1998) includes several references to Peter Russell's *The global brain* (1983) which propounds the theory that mankind is at the threshold of achieving a universal unity and transforming Earth into a living, intelligent, self-conscious and sentient organism. Another work White (1998) cites is *The phenomenon of man* (1955) in which de Chardin develops the concept of Noosphere implying that the universe is currently in the process of consciously self-directing its evolution toward the Omega point. At this stage, human beings will be able to unite into one single planetary system connected through a telepathic network that would ensure their immortality.

White's ideas propose a synthesis of science and religion by suggesting that human evolution on a cosmic scale has an ultimate purpose as well as all planetary civilizations will unite, gain a self-reflective global consciousness and eventually commence interstellar communication understood in both physical and psychical sense. Interestingly, the Overview Effect seems to demonstrate yet another dimension here, namely that offering a more mystic and esoteric experience to its adherents. This aspect, however, will be elaborated in the section devoted to my analysis of the interplay between science, imagination and the occult in the context of American Cosmist thought (see e.g. 2.3.4.)

2.3.2. The visionaries of space travel

Another chief premise of American Cosmism, the U.S. space-oriented philosophy formulated by Harrison (2013), are concepts put forward by the visionaries of the national space programme credited with instilling the masses with the idea of space travel and inspiring the space age. In the case of Russian Cosmists, whose origins go back to the late 19th century, it was Nikolai Fedorov who laid the foundations for its future development (see 1.2.). Other thinkers, whose theories largely contributed to the extension of the Cosmist school of thought, include Fedorov's student, Konstantin Tsiolkovskii (see 1.4.2.) or Sergei Korolev, the Soviet chief rocket designer, whose projects, such as the construction of spacecraft, became an emblem of the national prestige in space research and exploration (see 1.5.). Similarly, the U.S. has a few renowned visionaries and rocketeers whose remarkable achievements and personal enthusiasm for unlimited possibilities of human spaceflight are memorialized and celebrated nationwide. Among such individuals were Robert H. Goddard, the father of American rocketry, or Wernher von Braun, a rocket scientist, whose reputation and fame rose to mythic proportions (Harrison 2013: 30-31).

Next to Tsiolkovskii, Robert Goddard is claimed to be one of the leading figures in modern rocket science. Already in his youth, he speculated about the prospects of a man-made rocket reaching the moon or the habitability of alien planets (Harrison 2013: 32). In 1904, he defined a lifelong purpose of his

research, stating that "it is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow" (as quoted in Evans 2008: 5). One of Goddard's early achievements that made him famous nationwide was providing a cutting edge scenario of a rocket launch to the Moon which was greeted with substantial skepticism by fellow scientists and the public opinion. Despite heavy criticism, in 1926 Goddard managed to prove his uncontested authority in the emerging field of space technology as he succeeded in performing the first known rocket flights (Evans 2008: 5). His fame rose not only due to his unsurpassed achievements in rocketry, but also his constant attempts at self-promotion based on numerous contacts with reporters (Harrison 2013: 32). Harrison (2013: 32) notes that "perhaps Goddard's most important attribute was his persistence: he doggedly pursued funds, and failed launches only spurred him on. He got rockets to work, and without this experimental proof the claims of other theorists would have gone unnoticed". In 1941, after the U.S. had joined the Second World War, Goddard became engaged in the military plans to design rocket-powered planes and was working on the project until his death in 1945. Today, the scientist is particularly praised for his unflagging popularization of space-related projects; despite the fact that the U.S. government officials demonstrated little interest in rocket science except for utilizing its potential in warfare, he still managed to continuously stir the national interest in early space research and exploration (Evans 2008: 5).

After the Second World War, some famous German rocket engineers, including Willy Ley, Wernher von Braun and Krafft Arnold Ehricke, were seized by the U.S. Army and engaged in developing technologies for the American rocket and space programme (Jedicke 2007: 10). In contrast to their Soviet counterparts, who worked in strict secrecy, German scientists' activities were highly publicized by the U.S. media as a successful construction of modern rockets became one of the main priorities of both military strategy and foreign policy, especially at the outset of the Cold War (Harrison 2013: 32; Jedicke 2007: 11). Harrison (2013: 32) emphasizes their unsurpassed role in spreading the idea of space travel in the popular mind:

> The Germans in America are celebrated for their pre-war vision, research, and advocacy; for their development during World War II of the liquid-fueled V-2 ballistic missile; and for their contributions as scientists and engineers over 40 years to the United States' advancement from small experimental rockets to the giant Saturn rockets that got Americans to the Moon. They are remembered less kindly for their association with the Nazis and use of slave labor during the Nazi regime. But without question, through writing books and lavishly illustrated magazine articles, consulting on movies, giving speeches, and appearing in the media, they shaped the American imagination in space, and for many years set the agenda for NASA planning. (Harrison 2013: 32)

Before he migrated to the U.S, Willy Ley, one of the German top engineers, had been successfully pursuing his career as a talented scientist and popular science writer. At the age of twenty, he accepted the position of vice-president of the German Rocket Society where he helped build a substantial membership of the organization as well as raise funds to construct a rocket-providing ground on the outskirts of Berlin and provide a highly qualified staff of engineers and mechanics. In 1935, Ley settled down in New York City where he made a living by publishing popular science books, including *Rockets: The future of travel beyond the stratosphere* (1944), *The conquest of space* (1949, in collaboration with Chesley Bonestell), *The conquest of the moon* (1953, in collaboration with Wernher von Braun and Fred Whipple), *Rockets, missiles, and space travel* (1957) or *Beyond the solar system* (1964), most of which turned out to be an instant success (McCurdy 2011: 25). Known primarily as one of the greatest popularizers of rocketry and space flight themes in America, he made his name with a number of scientific articles which appeared in some of the major science fiction magazines, such as "The dawn of the conquest of space", published in the 1937 issue of *Astounding Stories* or For Your Information, a regular column published in *Galaxy Science Fiction* since 1950. Also, his remarkable knowledge and promotion skills were highly valued by popular film industry (see 3.2.4. for details).

Before Wernher von Braun began working for the U.S. Army at Huntville, Alabama, he had been involved in pursuing the projects of the German Rocket Society. Introduced to its members by Willy Ley, the scientist quickly showed his unusual talents and charisma and was engaged in realizing the programme of the German rocket center as a technical director for research and development (McCurdy 2011: 25). Once in the U.S., he did not only find himself in charge of the most superb and technologically advanced enterprises in rocket science, but he also managed to capture and captivate attention of the most powerful electronic communications and print media of the mid-20th century. Therefore, today von Braun is widely regarded as one of the most effective promoters of the U.S. space programme since the end of World War II; most of his projects, such as robotic spacecraft launches or the construction of multi-stage rockets and space stations, gave the impression of being both imminent and feasible (Launius 1998: 6; Harrison 2013: 33). Harrison (2013: 33) argues that "the 'von Braun paradigm' of an integrated stepping-stone approach to space exploration meshed with the politics and political culture of the 1950s through the 1970s, although last its prime politically, remains influential today".

At the same time, another German immigrant, a propulsion engineer and a strong advocate of space colonization, Krafft Arnold Ehricke, proposed his own philosophical concept of the Extraterrestrial Imperative based on the idea that humanity should pursue space exploration and exploitation of the

Solar System resources in an attempt to sustain the evolution and ensure survival of the species. The scientist (1978) assumed that, as there are no limits to human creativity, the spaceship Earth and mankind, seen as a closed system, should open themselves to the universe and turn to extraterrestrial sources of energy by means of technoscientific advances:

> Far from being isolated in space, Earth is a spaceship with external supplies. The most fundamental commodity, energy, comes from an external source. Terrestrial environment and the biosphere run on the 1.5 billion kilowatt-hours of solar energy intercepted annually. Earth and space are indivisible. Only a few centuries ago did man begin to understand this indivisibility in terms of natural laws. Now we experience it by going into space and returning at will and by conversing with our automated scouts all over the solar system. In a few years this indivisibility will express itself in the productive industrial use of extraterrestrial environments. The Extraterrestrial Imperative is a manifestation of larger evolutionary cycles-an integral part of life's commitment expansion and growth. The reality of the biosphere testifies to this fact. This splendid system assures our planet's unique position as a colony of life for the duration of our star unless the climatic or genetic foundations are destroyed. When the planet's accessible (organic but abiotic) energy sources became exhausted some three billion years ago, life's response was a vigorous struggle for survival through growth. (Ehricke 1978)

While Ehricke was working in the U.S. Army along with his fellow rocket scientists, he published a story entitled *Expedition Ares* ([1948] 2003) which depicted human spaceflight to Mars, as well as a science book, *The Mars project* (1953), written in collaboration with von Braun, which described a manned mission to Mars by means of a ferry system. Except for popularizing space-related themes in post-war America, the scientist is remembered for designing an early space station and studying lunar industrialization, a technologically advanced process of terraforming the Moon by the use of fusion energy and nuclear-powered freight transporters (Freeman 2009).

Apart from individual visionaries of the U.S. space programme, various advocacy groups have been formed, including the Space Frontier Foundation, the National Space Society, The Space Tourism Society or the Mars Society or the Planetary Society, which have been continuously endorsing innovative entrepreneurship in space since the 1980s (Harrison 2013: 33-34). In modern popular culture, the perception of space "as a bastion of concentrated power" became increasingly popular in contrast to early science fiction literature and film representations which emphasized heroism of small groups accomplishing interplanetary or intergalactic missions (Launius 2005: 133). Space research and exploration has transformed into an immense government-sponsored activity with the focus on science, technology and Cold War politics which brought disillusionment

among the nation who felt their vision of the future was shaped by few people holding the federal power. Such social moods were one of the main ideas behind the establishment of the Space Frontier Foundation in 1988, a space advocacy nonprofit organization dedicated to opening space environment to human settlement as well as increasing involvement of the private sector and free enterprise in space research and exploration. The founders, including Jim Muncy, Rick Tumlinson and Bob Werb, based their revolutionary concept "on research performed since Apollo" and the conviction "that the vision of massive industrialization and settlement of the inner solar system was possible within one or two generations" ("Our history" 2014). Their space agenda aimed to encourage the current space programme among individuals and space enthusiasts as well as spread the idea of space tourism, particularly through promoting popular culture ventures, such as *Babylon 5*, a space opera television series. Thus, as it seems, this and many other similar organizations promote both scientific and commercial missions and pursue not only political goals, but also promulgate social enthusiasm in an attempt to inspire people and gain public support for their actions.

Harrison (in Andersen 2012) additionally argues that a number of space advocacy groups founded in America in the second half the 20th century have recently taken up the mantle of American Cosmism. He also notes that there have been certain changes in the way space exploration has been pursued and promoted, particularly due to the shift to the private enterprise:

> There have been some changes, especially with the shift to the private sector; it used to be that people thought that only the government could bring these things about. But overall, the ideas of the 1950's still propel a lot of this activity. Roger Launius, a curator at the National Air and Space Museum, has written a lot about this, and he's argued that the von Braun paradigm doesn't really work anymore, because we're not getting results with it. We have to come up with a new vision for space exploration and it has to be one that doesn't depend upon humans going out there and doing all of the work. An ideal vision would involve a mix of optical and radio astronomy along with robotic missions, probes and flyby's and that sort of thing, a more modest role for humans in space, and then, finally, a new kind of probe-probes with human-level intelligence. A mix like that would have a much better chance of reanimating the space program. (Andersen 2012)

Thus, it seems that while various space advocacy groups, such as the NASA Space Society or the Frontier Foundation, have evolved the new ways of popularizing and encouraging the idea of spaceflight among the public, their effort still remains emblematic of the original concepts proposed by the national space visionaries of the 1950s, including the von Braun's paradigm

(see 2.4. for a definition). They mostly embrace numerous popular culture representations of space endeavours, often nurtured in television programmes or film and entertainment industry which provide realistic portrayals and simulations of extraterrestrial environment. The principal ideals permeating such enterprises frequently reflect those spread by Wernher von Braun, Robert Goddard, Willy Ley or Krafft Arnold Ehricke in their convincing textual and visual depictions of the nationwide vision of long-term space exploration centered around highly influential and inspiring premises of American Exceptionalism, frontierism or Manifest Destiny.

2.3.3. The role of national mythologies in envisioning space endeavours

As Harrison (2013: 34) argues, both Russian and American Cosmism are based on the national myths closely associated with a sense of common identity, which endorses the countries' interest in space endeavours carried out throughout the 20th century. For instance, for Russian Cosmism, expansion into space was reserved only for those who considered themselves unique and chosen which mirrors the chief premises of messianism of the Russian people predestined to create harmony in the whole universe and unite all humanity in both physical and spiritual sense. Similarly, the ideology of American Cosmism largely draws on deep-rooted national themes, particularly on a highly popular mythology of the American frontier which conjures compelling images of wagons, families and two-wheeled carts moving across the prairies, Pony Express riders, cowboys, sheriffs and miners or some historically significant events, such as the Lewis and Clark expedition.

In the popular mind, the Winning of the Wild West usually evokes associations with perilous and burdensome journeys of adventurous and brave colonizers who sought freedom, self-fulfillment, wealth and abundant possibilities for individual development (Turner 1893). Originally formulated by Turner in 1893, the Frontier Thesis postulated that a distinctive character of American national identity and democracy was shaped by the frontier experience. The process of westward expansion had a considerable impact on the pioneers and settles themselves whose personal features, including individualism, egalitarianism, determination, strength, independence, innovation, pragmatism, resourcefulness or inclination to use violence, evolved in the course of discovering and taming largely unknown and unexplored lands. In his 1893 paper, "The significance of the frontier in American history" delivered to the American Historical Association in Chicago, Turner elaborated on the U.S. frontier tradition as one of the most important factors which helped establish a new form of liberty distinct from the European old, eroding and

often dysfunctional socio-political system. He traced the birth of American democracy and institutions to social and economic conditions provided by frontier life of early pioneers (Turner 1893: 293):

> American democracy was born of no theorist's dream; it was not carried in the *Susan Constant* to Virginia, nor in the *Mayflower* to Plymouth. It came out of the American forest, and it gained new strength each time it touched a new frontier. Not the constitution, but free land and an abundance of natural resources open to a fit people, made the democratic type of society in America for three centuries while it occupied its empire. (Turner 1893: 293)

Predominantly however, Turner's thesis is seen as an evolutionary model accounting for the impact of geographical space of the U.S. uncultivated and vast land on some unique characteristics of the American national identity formed precisely at the juncture between the uncivilized, savage wilderness and the civilized human settlements: "[T]he frontier is the outer edge of the wave—the meeting point between savagery and civilization" (Turner 1893: 3). Successive generations moved further to the west, developing genuinely American features, such as intolerance of social hierarchy, distrust of authority, violent behaviours, individualism, adherence to family values or dependence on nature and self-rule. In other words, migration to the frontier, defined by Turner (1893: 4) as "the line of most rapid and effective Americanization", enabled the American spirit to prevail. Also, the scholar emphasized a prominent role of ever-moving line of settlement in shaping the American way of life (Turner 1893: 2-3):

> All peoples show development; the germ theory of politics has been sufficiently emphasized. In the case of most nations, however, the development has occurred in a limited area; and if the nation has expanded, it has met other growing peoples whom it has conquered. But in the case of the United States we have a different phenomenon. Limiting our attention to the Atlantic coast, we have the familiar phenomenon of the evolution of institutions in a limited area, such as the rise of representative government; the differentiation of simple colonial governments into complex organs; the progress from primitive industrial society, without division of labor, up to manufacturing civilization. But we have in addition to this a recurrence of the process of evolution in each western area reached in the process of expansion. Thus American development has exhibited not merely advance along a single line, but a return to primitive conditions on a continually advancing frontier line, and a new development for that area. American social development has been continually beginning over again on the frontier. This perennial rebirth, this fluidity of American life, this expansion westward with its new opportunities, its continuous touch with the simplicity of primitive society, furnish the forces dominating American character. The true point of view in the

> history of this nation is not the Atlantic coast, it is the Great West. Even the slavery struggle, which is made so exclusive an object of attention by writers like Professor von Holst, occupies its important place in American history because of its relation to westward expansion. (Turner 1893: 2-3)

The frontier thesis, although its validity is often questioned by contemporary historians, has been widely adopted as one of the leading theories, in particular in the studies of American west (see e.g. Fabian 1998). What is more, the doctrine served as a driving force behind the ongoing promotion of a sense of national identity, especially in the government's endeavours to gain support for realizing their main policy objectives. One of the most vivid examples of such attempts is promulgation of the myth of the frontier in the context of space exploration activities. An evocative image of the extraterrestrial frontier was offered in order to convince the public that the prospect of spaceflight was in fact real as well as spread the need of continuous progress and innovation. According to McCurdy (2011: 6), the nationwide space programme easily fit the image of the U.S. settlers pioneering the Wild West:

> Space exploration offers an opportunity to extend the exploration process into new realms, and that line of extension supports the notion that human discoveries in the cosmos will resemble those on the Earth. (...) Through metaphors and associations, space activities interlock with the most important characteristics of the American experience. The relationship gives the space exploration vision a level of desirability far beyond that it would receive of it had to stand on its own. The exploration of space promises to maintain the spirit of innovation and discovery that has made American strong. It connects to the corporate experience in a nation that has grown rich through business firms. It expands the experience with aviation in a nation that invented heavier-than-air flight. It affirms the idea that progress occurs through science. It has helped to define the conservation movement and is associated, in an odd sort of way, with the American agonies over slavery and servitude. The associations are so strong that Americans would want to believe in space travel even if it was not true. The associations give space travel a faith-like quality, encouraging belief even in the face of doubt and adversity. (McCurdy 2011: 6)

Turner's thesis was particularly telling when referred to the moon landings. According to Launius (2005: 130), the US popular culture of the 1960s and 1970s was to a large extent dominated by the Apollo myth based on American frontier tradition which advances "an almost transcendental faith in American growth, American institutions and American exceptionalism". Therefore, many space advocates have referred to Turner's frontier thesis which proposed that the western expansion conditioned the nation's development both in terms of spiritual and material benefits, providing for

democracy, freedom, individualism, heroism, optimism and numerous virtues, such as self-reliance, hard work or a sense of community and justice. The symbolism of the final frontier was soon transported into space which gained a new ideological dimension associated with the themes of discovering, exploring, taming and finally settling the unknown, literally intangible wilderness; in other words, the act of moving westwards was replaced with that of upwards. The term itself was often used in public discourse, ranging from Kennedy's Moon Speech (1962: 373) about "the new frontier of science and space" to the prologue of every *Star trek* episode which always begins with the words "Space, the final frontier". This romantic and evocative image was mythicised by conjuring visions of a golden age for mankind which offered limitless possibilities of human spaceflight and a highly utopian idea of civilizing new worlds (Launius 2005: 132):

> While there may be many myths about Apollo and spaceflight, the principal one is the story of a resolute nation moving outward into the unknown beyond Earth. These were ordinary Americans doing extra-ordinary things, a heroic perspective that would ultimately lead to a peaceful, productive future for all humankind. In this great place, in this limitless future, human nature was supposed to rise out of its old turpitude and depravity to a new dignity. There sturdy Americans would have the chance to live rationally and quietly, free of all contaminating influences that had gone before on Earth. By the millions, had the promise of Apollo been kept, these Americans would find homes in the undeveloped vastness of the Moon, Mars and other parts of the Solar System, bringing life to the wasteland of space and turning it into a garden. Never mind that it was a utopia with neither form nor substance. (Launius 2005: 132)

In popular culture, the national myth of the frontier was often reinforced by an idealized image of the Apollo astronaut portrayed as an innovative, gallant and non-conformist frontiersman. What follows is Kauffman's (1994: 31, 36) description of the concept:

> The American frontiersman shares many characteristics with the archetypal hero of earlier myths. Like the traditional hero, the frontiersman had evil forces to contend with, both a hostile, unknown environment and the sinister inhabitants lurking within it. The American frontier myth features a rugged, independent pioneer who attempted to conquer the land and its inhabitants, thereby expanding the country's domain and improving its way of life. (...) The frontiersman in space had to embody what American liked to believe were traditional American values, combining traits from both Puritans and the pioneers. From the Puritans, one would expect qualities like humility, discipline, and religious devotion. (...) From the Pioneers who settled the Western frontier, the new frontiersman would learn courage, patriotism, and fierce self-reliance. (Kauffman 1994: 31, 36)

One of the most recent powerful images of the frontiersman which draws on the myth of American Wild West is Clint Eastwood's *Space cowboys* (2000), portraying adventures of four retired test pilots sent into space to fix a Soviet satellite. The film contrasts young NASA staff with elder individuals who symbolize experienced, knowledgeable, judicious, virtuous and independent frontiersmen, skilled enough to accomplish the mission despite the fact that their age and technological craftsmanship can be questioned. Initially seen as outdated and insignificant, the team demonstrates their ability to overcome even the most insurmountable obstacles and thus deconstructs a modern and romanticized image of a young heroic astronaut prevailing in the U.S. culture. Sublime spectacles make the cosmos truly the final frontier as the manned mission serves to domesticate space as well as make it cozy and homely. A sense of nostalgia is present here, yet it is partly replaced with a new, optimistic and hopeful vision of space travel which, despite appearing remote and beyond reach, is still within the bounds of possibility. It seems that Eastwood's and similar productions tend to reinforce the Apollo astronaut myth which, since the beginning of the space age era, has become a cultural icon personifying a utopian future and American ideals, including a masculine heroism, leadership, experience, individualism or wisdom. The space travelers' image in popular culture has been unified and individual identities have been replaced with the dominant cultural stereotype prevailing in a variety of media. One of the most recent examples include a documentary titled *The wonder of it all* (2007) which contains first-person interviews with six Apollo astronauts who landed on the moon. Their comments have been edited in such a way so that the audience could get the impression there is a single, seamless and composite meta-story behind the lunar missions with no interference of alternative memories. Realistic representations of the final frontier and manned space missions could be also found in some of the major American magazines and periodicals of the mid-20th century, including *Life*, *National Geographic* or *Collier's* (see 3.2.4.1. for details).

In entertainment industry, Walt Disney offered its own version of the frontier experience called *Tomorrowland*, one of the theme lands available at Disneyland, CA since 1955 and featuring various attractions that represented the view of the future and outer space in the year 1986, such as Moonliner, Autopia, the super highway to the future, or Rocket To The Moon (Trahan, McKim and Hawkins 2004: 161). Particularly the last construction, a tall futuristic space ship, enabled the audience to take the actual trip to the moon or Mars with the possibility to admire the magnificent views of outer space as they were leaving Earth and heading toward the unknown worlds. The grand opening was broadcast live and all the exhibits were betokened with a huge optimism which is often seen in the 1950s predictions of the future, here expressed by Walt Disney himself: "Tomorrow offers new frontiers in science, adventure and ideals. The Atomic Age, the challenge of Outer Space and the

hope for a peaceful, unified world" ("Tomorrowland at Disneyland park fact sheet" 1955). By this statement, he made a clear reference to Disneyland's *Frontierland* seen as the nation's legendary tradition of the past deliberately associated with a popular 1950s and 1960s rhetoric of the new and final frontier of space as well as the endless frontier of science (Rosenberg 2008: 180).

Space-related themes were also brought to television in a more entertaining form aimed both at adult and young viewers, namely as an animated sitcom called *The Jetsons*, aired from 1962-1963 and originally produced by Hanna-Barbera as a counterpart to *The Flintstones*. The cartoon series presented everyday life of the Jetsons family set in 2062 in a futuristic utopia known as Orbit City, replete with Googie-like buildings raised above the ground, flying saucers serving as cars, robot maids or home's push-button and labour-saving gadgets. This 1960s picture of America of the future projected the contemporary culture dilemmas often caused by the space age technological devices and reflected what the nation feared about the U.S. space programme and its possible implications on life on Earth in the next decades of the 20th century.

The motif of technology and technocracy was illustrated in Stanley Kubrick's *2001: A space odyssey* (1968), partly based on Arthur Clarke's short story *The sentinel* (1959), which exposed the potential hazards of alien technology and extraterrestrial life. Kubrick's epic picture continues such themes, presenting a series of encounters with the unknown black monoliths which seem to have an effect on human evolution. Consisting of four episodes, depicting a tribe of early hominids as well as a trip to the moon, Jupiter and beyond, the film touches upon philosophical and allegorical matters, including man's futile attempts to unravel the unknown, precarious implications of using advanced technology or weakness and fragility of humanity in the face of the vastness of the cosmos and uncertain future. These and other meanings were visually encoded in the form of unforgettable cosmic imaginary, some depicted by Chesley Bonestell, which inspires a sense of the sublime awe as well as a "numinous sense of wonder" (Palmer 2006: 103) (see 4.1.1. for details). Interestingly, such visual impressions were almost absent in the famous original science-fiction series of *Star trek* (1966-69), set in the 23rd century in the Milky Way galaxy, and portraying the adventures of the starship *Enterprise* during its five-year mission to peacefully explore the extraterrestrial worlds and new civilizations. Except for being praised for its promotion for racial, gender and class equality in the crew's intergalactic cooperation, the show was not likely to present outer space in a highly evocative manner. Nevertheless, *Star trek*'s scenario, which spun off another five television series and several films, is believed to have highly contributed to a peaceful representation of the final frontier and astronauts in American popular culture. This is how Rosenberg (2008: 177) comments on the phenomenon:

> In 1969, U.S. astronauts posed for a much-debated iconic image in which they planted an American flag on the Moon. They also left behind a gold olive leaf and a plaque that stated "We came in peace for all mankind". Throughout the Space age, a multitude of such representations persistently and unproblematically mixed rhetoric of a national "conquest" of space with invocations of peace and cooperation; they embedded calls for national greatness within universalistic justifications. The tensions between serving the nation and humanity as a whole may have seemed insignificant, indeed even invisible, to most Americans because such juxtapositions sounded so familiar. A long rhetorical tradition avowing America's unique national mission to and for the world, after all, stretched from the puritans through America's long experience of frontier expansionism to Woodrow Wilson and Franklin Roosevelt and into Kennedy's New Frontier. In classic American tradition, space age representations both raised and quieted or masked the tensions between serving the nation and representing all of humanity. (Rosenberg 2008: 177)

Also, the themes of technology, modernism, nationalism and planetary consciousness in the 1960s space age culture dominated the field of architecture, decorative arts and design, elaborating on a new aesthetic style based on eclecticism, modernism, retro futurism and primitivism (Rosenberg 2008: 179). Space motifs were present in everyday objects, such as automobiles, toys, wallpapers as well as household appliances, including dinnerware, ashtrays, vases or chandeliers, characterized by an unusual shape resembling satellite orbits, space platforms or rockets. Futuristic forms could be also found in furniture and interior design with prevailing boomerang sofas, spherical equipment, oval or amoeba shaped tables as well as contrasting colours, like red, black and white. Meanwhile, Googie architecture, one of the most popular trends in the mid-1960s America which originated in Southern California in the late 1940s, was particularly widespread in suburban coffee houses, drive-in restaurants, car parks and washes, motels or gas stations. Such buildings exploited dream-like and optimistic visions of spaceflight and the development of nuclear power in their design, captivating the viewers' imagination with circular pavilions, golden arches, bright colours, neon lights, sharp and bold angles, rounded edges, rocket- or flying saucer-shaped forms, starbursts, upswept roofs or large windows. These abstract features aimed to symbolize, according to Hess (2004: 29, 194), "invisible forces of speed" and "a high-energy explosion", expressing the national fascination with the space age technological novelties, American aerospace superiority and the upcoming prospect of space travel. Interestingly, Googie's futuristic design often embraced the past anachronistic and simplistic motifs, such as tiki-hut roofs or frontier themes which trivialized this novel architectural fashion and exposed a naïve

optimism of the U.S. space culture[5] of the 1950s and 1960s. Although the style was abandoned in the 1970s, some conventions and geometrical shapes were conserved and still persist in selected urban constructions, such as commercial signage, coffee shops in Los Angeles, hotels and casinos in Las Vegas or terminals at Washington Dulles International Airport and Los Angeles International Airport. Today, Googie's remnants are appreciated as "the roadside look of a Space Age nation-on-the-go", remaining an interesting cultural artifact and symbol of early car culture (Rosenberg 2008: 181). Rosenberg describes this unusual architectural style in the following way:

> Googie was a style of optimism, an exemplar of free and unregimented spirits who broke the rules, an effervescence of populist self-confidence. If the Space Age coincided with an increasingly powerful American imperium, then Googie represented the imperial signature of what one historian has termed America's "empire of fun". Its bold and shiny surfaces revealed few dark sides. (Rosenberg 2008: 181)

It seems that throughout the 20th century, the myth of American frontier was largely exploited by space advocates in a variety of forms. A prominent history of the U.S. space exploration clearly draws on the concept of the final frontier which implies conquest and, what follows, offers new abundant cultural and economic opportunities for those who dare to reach for it. It also has its own distinct ideological dimension; for John F. Kennedy, commencing the moon race was not only the question of maintaining international prestige, but also the way to perpetuate the American way of life. Embracing a frontier philosophy served the function of ensuring the national survival, enlivening the spirit of innovation and creativity as well as providing a continuous source of inspiration for space enthusiasts (McCurdy 2011: 163-164).

2.3.4. Science, esotericism and the occult in American Cosmism

Harrison (2013) asserts that American Cosmism, akin to its Russian counterpart, tends to demonstrate certain esoteric and occult influences. This includes the idea of humanity expanding throughout the cosmos, achieving physical, spiritual and psychic immortality or intergalactic communications

[5] The term space culture should be clearly distinguished from NASA's organizational or institutional culture which consists of a set of norms, values, beliefs as well as customs and practices of the government agency related to the performance of the U.S. space programme (Ott 1989; McCurdy 1992, 1994). NASA, founded in 1958, "adopted an organizational philosophy suited to the scientific and technological missions" which it performed and thus "acquired a reputation as a high-performance government organization" (McCurdy 1994: 1).

skills by means of computer emulations and quantum physics. Furthermore, the concepts of terraforming other planets or the human mind exceeding the speed of light, investigated mainly within the realm of speculative science rather than religion, can be also subject to esoteric studies.

2.3.4.1. The Overview Effect as a salvational worldview: Textual and visual evidence

In American Cosmism, esoteric and occult themes often take form of various representations of peak spiritual and transcendent experiences often connected with spaceflight. The previously discussed Overview Effect, which triggers the feeling of sublime in many astronauts and cosmonauts viewing the Earth from space, can serve as a perfect example (White 1998; see 2.3.1.3. for details). White (1998: 33-34) suggested that particularly later orbital and lunar missions provided the conditions that evoked a sense of grandeur, beauty, unity with nature as well as concern for natural environment: i) EVA allowed space explorers to experience certain extraterrestrial locations in a direct physical and conscious way; ii) longer missions gave more time to reflect on extraterrestrial phenomena, involving the so-called Earthgazing; iii) lunar missions enabled astronauts to view the whole Earth and selected parts of the actual outer space. One of the Apollo 9 astronauts, Russell L. (Rusty) Schweickart, defined his impressions as the Cosmic Birth Phenomenon, a transcendent and spiritually transformational experience which encompasses a shift of self-identity from anthropo- to cosmos-centered. Schweickart's 1974 profound and highly inspirational description of his orbital flight, delivered to a gathering on Planetary Culture, is quoted below (Brand 1977):

> And you realize that that perspective… that you've changed, that there's something new there. That relationship is no longer what it was. And then you look back on the time when you were outside on that EVA and those few moments that you had the time because the camera malfunctioned, that you had the time to think about what was happening. And you recall staring out there at the spectacle that went before your eyes. Because now you're no longer inside something with a window looking out at a picture, but now you're out there and what you've got around your head is a goldfish bowl and there are no limits here. There are no frames, there are no boundaries. You're really out there, over it, floating, going 25,000 mph, ripping through space, a vacuum, and there's not a sound. There's a silence the depth of which you've never experienced before, and that silence contrasts so markedly with the scenery, with what you're seeing, and the speed with which you know you're going. That contrast, the mix of those two things, really comes through. (Brand 1977)

A similar, yet more holistic impression, was reported by Edgar Mitchell, the sixth man on the moon and the pilot of Apollo 14. While working nine hours on the lunar surface, the astronaut devoted some time to his personal reflections on the view of Earth as seen from space as well as the nature of the universe itself (Mitchell and Williams 2009: 463):

> On the return trip home, gazing through 240,000 miles of space toward the stars and the planet from which I had come, I suddenly experienced the universe as intelligent, loving, harmonious. It occurred when looking at Earth and seeing this blue-and-white planet floating there… seeing that there was a purposefulness of flow, of energy, of time, of space in the cosmos – that it was beyond man's rational ability to understand, that suddenly there was a nonrational way of understanding that had been beyond my previous experience. (…) My view of our planet was a glimpse of divinity. We went to the moon as technicians; we returned as humanitarians. (Mitchell and Williams 2009: 463)

In some deliberations, astronauts mention a sense of overwhelming, universal unity experienced in outer space. Such a thought was expressed by Charles Walker, a payload specialist and the member of 1985 space shuttle flight, in a telephone interview conducted by Frank White on July 2, 1985 (White 1998: 224-226):

> I found the experience of seeing the world as one distinct entity an enlightening one, and realizing with my own senses the interrelatedness of the environment on the globe and the magnitude of the universe in which the globe sits. It extended my desire to have a firsthand feel for the world around us, and it sensitized me to learn as much as I could about the interconnectedness of the environment. (White 1998: 224-226)

The concept of the Overview Effect and its impact on humanity's worldview has been one of the most common manifestations of esoteric and occult dimensions in American Cosmism. Many astronauts who flew in space reported that they had undergone a profound psychological and spiritual transformation or achieved a grand epiphany; the cosmos appeared to them as a synergistic whole as well as a conscious, intelligent and harmonious being whose creation was deliberate rather than accidental. Since the publication of White's *The overview effect* in 1987, the idea that space travelers tend to experience a mental state characterized by an inexplicable euphoria as well as a sudden revelation and realization of their intrinsic cosmic connection to the whole universe, has largely affected the U.S. popular mind and imagination. This exhilarating response to the vastness of space and time has been not only reported by astronauts, but also utilized in public discourse and investigated by behavioural and neuropsychologists. For instance, Harrison and Summit (1991) assert that human spaceflight offers

numerous possibilities for personal development and spiritual growth. Similarly, Harrison and Fiedler note (2013: 10) that "training for and working in space allows people to develop their abilities, gain a strong sense of accomplishment, and feel worthwhile. There is unparalleled challenge, the opportunity to redefine one's place in the cosmos". Currently, Andy Newberg, an American neuropsychologist famous for his studies on neurotheology, plans to examine how the human brain functions in zero-G conditions and thus confirm that outer space provides innumerable benefits for both physical and mental health of space tourists (O'Neill 2008). Additionally, his research might reveal whether a psychological change, which occurs as a result of being in outer space, can be compared to a religious and transcendent feeling common among people practicing meditation who often experience visions of the whole universe seen as an interconnected quantum web.

In 2008, discussions on the Overview Effect carried during the National Space Society's Annual International Space Development Conference became an inspiration to found The Overview Institute, also known as The Overview Group. Its mission is to "research and educate both the space community and the general public on the nature and psychosocial impact of the space experience" ("About us" 2012). It also strives to redefine "a global vision of planetary unity and purpose for humanity as a whole" ("Declaration of visions and principles" 2012). As stated in the Institute's official declaration, the most challenging task is to communicate the Overview Effect, which has been so far experienced only by a handful of approximately five hundred individuals, to a vast number of people so that they could feel as if they were actually "there". Defined as "the experience of seeing firsthand the reality of the Earth in space, which is immediately understood to be a tiny, fragile ball of life, hanging in the void, shielded and nourished by a paper-thin atmosphere" ("Declaration of visions and principles" 2012), the phenomenon has been already widely promulgated through the advent and popularization of a commercial space industry as well as the rapid evolution of high-definition digital media. Innumerable virtual and three-dimensional simulations of outer space environment can potentially spread the concept to multi-million audiences around the world and unable them to enjoy this immense experience first-hand. On the other hand, the promotion of the Overview Effect is still largely marginalized due to the following factors: i) the access to commercial space industry is restricted to extremely wealthy entrepreneurs and space enthusiasts; ii) the Overview Effect is often regarded as a philosophical or aesthetic epiphany rather than "the fundamental perspective-altering experience" reported by both astronauts and scientists; iii) space simulation art and other forms of digital media serve mainly marketing and entertainment rather than awareness-increasing functions through public education about space; iv) the emerging space movement is frequently marginalized and understated by political leaders

when compared to some significant global matters, including those of international relations, energy or environment; instead it should be potentially treated as one of the most effective tools for gathering world support and solving those problems ("Declaration of visions and principles" 2012). Therefore, the Overview Group was established in an attempt to prevent the aforementioned and make people realize numerous psychological and spiritual benefits of incorporating the Overview Effect into their lives ("Declaration of visions and principles" 2012):

> For these reasons, the undersigned individuals, formally known as The Overview Group, have come together to create The Overview Institute with the purpose of both researching and informing the world of the reality, nature, and potential of the Overview Effect. We will also promote and support widespread experience of it, through direct space travel, and newer, more powerful and more publicly available space art, multi-media and education. We will encourage artists, educators, entertainment creators, and simulation media designers and technologists to consider the rich potential of integrating the Overview Effect into their work as well as the opportunity to play a role in bringing space experiences to the world. And, just as important, we will network with world social leaders in all those areas most likely to benefit from the Overview Effect, both directly experienced and through space media. ("Declaration of visions and principles" 2012)

A recently produced and broadcast worldwide Planetary Collective documentary, titled *Overview*, reflects the above quoted initiative of the Institute. The premiere, financed by the Harvard Extension School's Freethink@Harvard series, was followed by a discussion hosted by Frank White at Harvard's Graduate School of Education on December 7, 2012 ("The overview effect: Astronauts' unique view of the earth and what we can all learn from it" 2012). The film was created on the 40th anniversary of the famous Blue Marble photograph of Earth taken by the Apollo 17 crew in 1972 and documented astronauts' personal impressions of the Overview Effect. The whole material was accompanied by relevant comments from space theorists and philosophers.

Earlier examples of the implementation of the term, understood as a pro-space movement, even before it was actually coined and introduced to the public discourse by White, might include Spaceship Earth or Brand's *Whole earth catalog* which gained a considerable popularity in the U.S. culture of the 1960s and 1970s (see 2.3.1.3. for details). These concepts can be also associated with globalism, an ideology, ethical position as well as a cultural icon of the new era, initially applied to studying cross-cultural values at workplace. Bjornvig (2013: 9) gives a concise description of the phenomenon:

> During the 1980s and 1990s, values-based management and spiritual techniques entered the workplace in order to create cultural values that supposedly would generate a renewed sense of purpose, keep employees loyal, and ensure a strong corporate identification in times of growing transnational competition. Partly provoked by global concerns of environmental problems and human rights, a new ethics was to be created, through, for instance, the reading of wisdom literature and providing spiritual retreats for managers. (…) Part of this trend was a view of globalization as a positive value to be internalized, thereby transforming one's personal outlook and gearing one for the emerging global world system. For example, the founder of Consulting Network Individual, Cynthia F. Barnum, talked of globalization as a paradigm shift, partly prompted by the "one world" realization of space exploration, concluding that "the world is borderless when seen from a high enough perspective". (…) And thus, through a discourse of concern for the well-being of the globe, the ideology of globalism and capitalism is in fact able to not only legitimate, but also naturalize itself, thereby disabling resistance. (Bjornvig 2013: 9)

Except for issues related to globalism, Brand's intellectual legacy seems to carry certain traces of mysticism and spirituality which emerged in the wake of American countercultural movements of the 1960. In discussing its impact on the U.S. culture of the period, Bjornvig (2013: 10) explains how Brand combined astrofuturist with Eastern mystic and ecological ways of thinking in his creation of a salvational worldview, advanced in one of his works, *From counterculture to cyberculture* (2006):

> The systems theory notion of the technological and natural world as commensurable through an understanding of both as consisting of patterns of information was combined by Brand with drug-induced mysticism and Eastern religious ideas. Thus, he created a salvational world view in which the image of the whole Earth played a crucial role. Brand lobbied NASA for a picture of the whole Earth and he subsequently used the image for the cover of the *Whole Earth Catalog*. To Brand, the image of the whole Earth signified the wholeness of the global system and the possibility, through the elevated viewpoint that had made the image possible in the first place, to become "comprehensive designers" with the creative powers of gods, able to influence and change the system. In this scheme, technology was seen as an indispensible vehicle for social transformation, consciousness expansion, and even mystical evolution. (Bjornvig 2013: 10)

In *The overview effect* (1987), White also presents his own theory of salvation feasible due the rapid development of computers, artificial intelligence or the world-wide web. Specifically, he proposes nine evolutionary stages the realization of which would lead to the eventual unity of the universe seen as a self-conscious, interconnected and intelligent being: i) pre-planetary which

stands for the present-day evolutionary stage of human civilization still struggling with numerous global problems, yet able to experience the Overview Effect that will finally become a collective paradigm based on the emergence of global technology and telecommunication systems, such as satellite monitoring of the Earth and its orbit; ii) Terra which denotes a stage of human civilization functioning similarly to James Lovelock's Gaian system in the course of which a part of the world's population would leave their home planet; iii) the Copernican Perspective which implies that the human race would become a part of the solar system during long-term stays in Earth's orbit; iv) the Solarius civilization during which the whole solar system would become colonized by a new species working alongside robots equipped with artificial intelligence able to contact another extraterrestrial civilization; v) Universal Impact, the emergence of which, possible during long-term missions to the moon, would lead to the eventual recognition of the unity of the cosmos as well as humanity's true place in the universe and their destiny to become cosmic citizens; vi) Galaxia which denotes an alien Overview Effect, the stage in which a permanent contact with extraterrestrial intelligence would become plausible; vii) Cosma Hypothesis which stands for the stage in which all the galaxies and civilizations would be finally and genuinely united, thus constituting a single, self-conscious system (White 1998). Some of these ideas are already being promoted by the so-called Tarranauts, people who have experienced the Overview Effect and gained astronaut awareness without having actually been in Earth's orbit. They form various pro-space movements, consisting of environmentalists, Solarians, Glaxians or SETI (Search for Extraterrestrial Intelligence) scientists (White 1998). Also, White (1998) suggests that the salvation project may be accomplished with the realization of Tipler's theory of the Omega Point which, often seen as pseudoscience, proposes a mechanism for the resurrection of the dead. In his 1994 book *The physics of immortality: Modern cosmology, God and the resurrection of the dead*, the physicist hypothesized that our future descendants would create a massive computational system in the form of cyber space in the collapsing spacetime which would eventually lead to the emulation and reconstruction of the dead.

This theory, however, has received much criticism by scientists and academics who claimed that through his inconsiderate violation of the Copernican principle and the laws of probability, Tipler advanced a theological and metaphysical cosmological worldview based on largely unverifiable reasoning of esoteric origins (see e.g. Edwards 2001). For example, Ellis (1994: 115) calls it "a masterpiece of pseudoscience" as well as "one of the most misleading books ever produced" and although seemingly erudite, the major claims sound like a pure fantasy and lack intellectual rigour. Similarly, Krauss (2007: 53) describes Tipler's proposal as "more

dangerous than mere nonsense" due to the fact that the physicist's arguments are clearly not grounded in valid and respectable research of modern physics, especially in its assumption that the universe will recollapse which is highly unlikely to occur. Despite the prevalence of pseudoscientific and often untruthful claims speculating on salvation, the fascination with the subject in America has also found its more practical expression. One of the most prominent examples, reminiscent of the Russian Cosmists' immortalist and transhumanist views, is the practice of cryonics, the low-temperature preservation of the deceased with a view to resuscitating them back to life by means of future technologies. Long present in literature and popular culture,[6] cryonics was first proposed in the 1960s by Evan Cooper (writing under the pen name Nathan Duhring) in *Immortality: Physically, scientifically, now* (1962) and Robert Ettinger in *The prospect of immortality* (1964), who both suggested that the early stages of clinical death as well as death itself, followed by freezing one's body, may be reversible thanks to future medical technology. The idea, supported by a considerable number of scientific literature (see e.g. Best 2008, Merkle 1992), led to the formation of Life Extension Society (LES), the world's first cryonics organization founded to promulgate cryonic suspension of people, and similar societies throughout the United States. Today, the leading American and Russian non-profit organizations of this kind, including the American Cryonics Society (ACS), Alcor Life Extension Foundation, Cryonics Institute, the Immortalist Society or KrioRus, maintain hundreds of cryopreserved human patients and animals as well as conduct and promote research and education in the field of life extension and suspended animation, the latter of which might aid intergalactic journeys (see e.g. Bostrom 2005: 10-13; Quigley 1998: 140-146).

Meanwhile, an inimitable opportunity to experience the Overview Effect first hand and thus realize the potential of White's salvational doctrine might be given in the process of the development and commercialization of space tourism. The industry, despite being mostly considered an activity not yet common for all the inhabitants of our planet, is still gaining more and

[6] One of the first and most notable American science fiction works which featured the theme of cryonics include Lydia Maria Child's *Hilda Silfverling, A fantasy* (1846), Jack London's *A thousand deaths* (1899), H.P. Lovecraft's *Cool air* (1928), Neil R. Jones's *The Jameson satellite* (1931), Edgar Rice Burroughs's *The resurrection of Jimber-Jaw* (1937), John W. Campbell's *Who goes there* (1938) or Robert A. Heinlein's *The door into summer* (1957) (see e.g. Milburn 2014: 531-533). Since the 1960s, it appeared lavishly in broadcast media, especially in films and television series, such as *The thing from another world* (1951), the opening episode of the space adventure series *Lost in space* (1965), the original *Star trek* series episode titled *Space seed* (1967), *2001: A space odyssey* (1968), *Sleeper* (1973), *The thing* (1982), *Iceman* (1984), etc. (see e.g. Van Riper 2002: 36-37).

more attention of not only the wealthiest space enthusiasts, but also those unable to afford such an adventure. Out of seven space tourists who, between the years 2001 and 2009 visited the International Space Station, six were American and were all transferred there via Soyuz ships. The roots of this kind of unusual leisure activity can be found in the U.S. space shuttle programme which offered payload specialists to join the mission and serve aboard the ISS as a non-astronaut expert and a full participant of the flight performing non-technical duties. With a further extension of the project, Charlie Walker became the first non-government space traveler whose stay in orbit was paid for by his employer. The action was constrained after the Challenger disaster in 1986 where Christa McAuliffe tragically died along with other six astronauts as the first participant of the Citizen in Space programme realized by NASA in the 1980s (Van Pelt 2005: 21).

The first genuine space tourism enterprise was initiated toward the end of the 1990s by the Russian MirCorp, a private venture administering the space station, which offered affluent non-astronauts the opportunity to visit the ISS in an attempt to reduce its maintenance costs. As NASA was initially against sending wealthy, yet inexperienced adventurers into space, the American-based tourism company Space Adventures, Ltd. began cooperation with MirCorp in organizing space trips, the first of which took place in 2001 when the American businessman Dennis Tito made a successful visit to the ISS (Bridges 2001). In the next few years, Space Adventures in collaboration with the Federal Space Agency of the Russian Federation and OAO S.P. Korolev Rocket and Space Corporation Energia organized six flights for private space tourists which were shortly halted after the Columbia disaster in 2003 and then resumed and carried out until 2009 (Andrieu and Schieb 2003). The news announced by Space Adventures and the Russian Federal Space Agency in January 2011 seemed promising for all enthusiastic space explorers – the orbital space tourism was about to restart in 2013 with Russia's assurance that it will double the amount of launches of three-Soyuz space ships from four to five a year (Shiryaevskaya 2011). Also, the booklet available on the Overview Institute's website titled *The overview effect will change the world* (2012), extols the virtues of commercial space travel by pinpointing the recent developments in the industry, including Richard Branson's Virgin Galactic Spaceline and a few other companies, such as Elon Musk's Space-X, Bigelow Aerospace or Orbital Sciences, which are currently designing and constructing their own commercial rockets, spaceships, space station or even space hotels. Although the recent fatal crash of Virgin Galactic's SpaceShipTwo might erode the public trust in such ventures, the NewSpace industry has estimated that 100,000 people may travel in space in the next decades of the 21st century and the cost of the whole enterprise will be reduced to that of a mid-priced car (Beaver 2012).

This grand project, despite appearing somewhat unrealistic and inaccessible in the present day, is likely to transfer the psychological effects and aesthetic impressions of spaceflight to the general public in various forms of the print, broadcast and digital media. Currently, space images, such as the view of the Earth seen from orbit or other breathtaking extraterrestrial locations are promulgated through educational programmes, virtual visualizations of outer space, computer games or live broadcasts of NASA TV available for free on the Internet, particularly those of astronauts' and cosmonauts' stay at the International Space Station. David Beaver (2012), the Director of the World Space Center, argues:

> With the arrival of public space travel, greater understanding of The Overview Effect becomes vitally important. If such experiences have been under-communicated by the limitations of conventional media, it may also be that they are difficult to express to (or by) those of us who have never been to space. Astronaut vetted, cognitively based media, particularly advanced simulation media, can add back in much of the missing sense of reality, bringing a real taste of the space experience to the earth-bound. And the internet now provides a channel for the Overview meme that wasn't even dreamed of during the Apollo era. Cognitive and media sciences explain that it is the very overcoming of the perceptual limitations of most conventional space media that makes The Overview Effect possible. Direct multi-sensory experience of space, so foreign to us on Earth, overrides previous media-based images, and shifts our internal models, on which our perceptions are based. Related technologies provide the sensory and media tools and techniques that can help us overcome these 'cognitive barriers'. But before we can consider strategies to accelerate, intensify and direct The Overview Effect, we have to gain a greater sense of its reality, its nature and the factors that currently limit our perceiving it. (Beaver 2012)

In the space age era, although space imaginary was diffused merely by print and broadcast media, it was prevalent in various forms and thus played an equally, if not much more significant role in increasing public awareness about outer space. A revolutionary book by Robert Poole, *Earthrise: How man first saw the earth* (2008), discusses the social impact of space visualizations by arguing that the first photographs of Earth as seen from orbit have profoundly changed the world, particularly by altering humanity's earth-centered perspective. The pictures of the whole Earth captured by technological devices and astronauts themselves are regarded by McCurdy (2011: 300-301) as iconic and highly significant for the future of mankind:

> The first high-quality, full color photograph to show the whole Earth as it appears in full sunlight from distant space was taken by a machine. In 1967, the ATS-III satellite took a portrait of the Earth from geosynchronous orbit, far

> enough away to capture the whole sphere. (...) One year later the astronauts on *Apollo 8* became the first humans to witness the scene of the Earth rising above the lunar surface. Astronaut Bill Anders quickly snapped a photograph. The three astronauts read from the Bible on the famous Christmas Eve flight, immutably linking the image of the Earth with a sense of the divine. The final trio of explorers, who returned home in the last month of 1972, captured a frame-filling photograph that became, in the words of astronomer Carl Sagan, an "icon of our age". (McCurdy 2011: 300-301)

An immense cultural impact of the Apollo photographs is also confirmed by other scholars who note that a number of these powerful space images, particularly those taken by Apollo crews and a global system of satellite communications might have given rise to the environmental movement and holistic ways of thinking as well as possibly implicated politically and socially significant events, such as the end of the Vietnam War or the Cold War. Beaver (2012) comments on the way space visualizations and reports widely available in the media affected the space age popular culture and public imagination:

> Those who lived through that unique era were surrounded with space images and concepts from the countless space reports, products that were sold (truthfully or not) as 'space age technology' and the increasing infusion of space into popular media, culminating perhaps in *Star Trek* and *2001: A Space Odyssey*. These two are icons among many space enthusiasts, and are cited by many astronauts as their career inspirations. And they were the inspiration for many of the space science fiction staples of today. (...) The First Space Age inundated us with space imagery and ideas, both real and imagined, along with the added reality of a massive government program. Cars had tail fins, emulating rockets! The astronauts were highly visible national heroes, whose exploits were avidly followed on national television. Many children dreamed of following them into space. We were living in The Space Age. And from the far future exploits of Captain Kirk and company to the starkly real visions of the near future *2001'*, we just knew we were destined to soon go there ourselves. The spaceliner that carried citizens to the gleaming giant space station in *2001' was Pan Am*. The hotel in the station was a Hilton. It was our present world projected just a few decades out, to the early 21st Century, toward which we were rapidly rushing. And then Apollo ended, the space program cut back, the Shuttle program and the International Space Station became long and drawn out affairs with radically reduced expectations. The Shuttle accidents further delayed and reduced the dream. Science fiction turned from outer space to cyber-space, and young people dreamed not of being astronauts but of creating new computer 'apps' that sold to Microsoft and Google, and later of mega-hit websites and content. (Beaver 2012)

As implied above, the space fad seems to be particularly characteristic for the space age era when a myriad of space-related experiences conveyed in popular media were considered both novel and extraordinary. Various manifestations of the Overview Effect, ranging from the groundbreaking *Collier's* magazine or Disney's Man in Space series to more recent astronauts' accounts or activities of pro-space movements, have exposed a global significance of the Cosmic Consciousness or, as put by Russell, Cosmic Birth Phenomenon (White 1998: 191). What is more, when investigated from the perspective of psychology and neurology as well as occult science, the epiphany resulting from seeing the planet from orbit gains a new esoteric dimension as it evokes an overwhelming feeling, including that of the sublime and agape. Mitchell (2009: 225-226) summarizes a highly profound emotional, aesthetic and cultural impact of the experience on his own life:

> In February 1971 during the return flight of Apollo 14, following exploration of the lunar surface, my often-described life-changing epiphany occurred. It has taken many years of deep study on my part to find a coherent scientific framework to explain the profundity of this event, while enjoying its emotional, aesthetic and professional satisfactions. What was it about seeing our home planet from a great distance that caused my mind to make a major shift in perceived values and led me to redirect the course of my life into more esoteric pursuits? What is it in nature that stimulated this sense of wonder, awe, excitement, and ecstasy at the most profound levels? The noted British astronomer, Fred Hoyle, predicted at the beginning of the space age that pictures of Earth from space would create major changes in human perception about ourselves. To a certain extent this has happened, as the pictures of our planet from deep space have been continuously in demand, published in both print and electronic media since the first photographs were taken from the vicinity of the moon on Apollo 8 in 1968. The word *agape* comes to mind, both in meaning a sense of astonishment and within the Greek concept of an asexual love of all things in nature. (...) The ancient Sanskrit phrase *savikalpa samadhi* nicely describes my experience of seeing the separateness and individuality of physical objects, like stars, planets, and galaxies, with my eyes, but experiencing at a visceral level the feeling of connectedness, or unity, of all matter born in the furnaces of star systems, including our biomolecules. The experience was accompanied by a sense of ecstasy and bliss. (Mitchell 2009: 225-226)

Mitchell (2009: 226-227) believes that the Overview Effect is an experience shared by virtually all space farers at the quantum and metaphysical level. The phenomenon might be explained by means of the Hindu notion of Akasha, connoting the basic element and essence of all the world's matter or, in more scientific terms, the quantum hologram which stems from Max Planck's research of the black body radiation emitted by material objects.

Subsequent studies, including that of Walter Schempp, have revealed that such emissions carry coherent nonlocal information about each substance and remain fundamental and perceptible to both human physical senses and intuition or the so-called sixth sense (Mitchell 2009: 227).

2.3.4.2. The New Age and its impact on American Cosmism

Various scientific and non-scientific investigations of the Overview Effect have revolved around the concept of transcendence, spiritual transformation, cosmic unity and universal monism. These and akin findings are often subject to esoteric literature, particularly in the context of its possible impact on one's psychological well-being and spiritual development. Also, the interplay between science, esotericism and occultism in American Cosmism is clearly manifested in the New Age movement of the 1960s and 1970s which coincided with the beginning of the Age of Aquarius, connoting either the present-day or upcoming astrological era, a period of enlightenment and brotherhood. The early traces of New Age science can be traced back to the teachings of Spiritualism and astrology practitioners as well as Theosophical Society, particularly Helena Blavatsky's prediction that the coming of New Age was imminent and that the destiny of Earth in connection to the cosmos was guided by the world's members of a mystical brotherhood ("New Age movement" 2014). In the U.S., its intellectual roots go back to the New Thought tradition of the late 19th century when, in 1886, Emma Baker Hopkins founded the Christian Science Theological Seminary in Chicago which trained its practitioners on spiritual healing (Melton 1992: 16). Initially a feminist movement and a schism from mainstream Christian Science, it spread to other parts of the U.S., having finally emerged as a new religious tradition. At the beginning of the 20th century, the school of thought was structured around several Christian denominations, mostly including independent churches, such as Divine Science, Unity or Homes of Truth. However, in 1957 an ecumenical organization, the New Thought Alliance (currently the International New Thought Alliance), revised its creed-like Declaration of Principles where it eliminated all references to Christianity and included a novel statement which affirmed "the inseparable oneness of God and humankind, the realization of which comes through spiritual intuition, the implications of which are that we can reproduce the Divine perfection in our bodies, emotions, and all our external affairs" ("About INTA" 2014). Also, the New Thought practitioners believe that "the universe is the body of God, spiritual in essence, governed by God through laws which are spiritual in reality, even when material in appearance", the principle akin to those proposed by mystical, esoteric and Eastern religious

traditions ("About INTA" 2014). The firm bases and ongoing popularity of New Thought in North America gave rise to the emergence of the New Age movement whose prophets, instead of building a new organization, gained members from the preexisting and older groups of metaphysical and esoteric origins and adopted most of their peculiar ideas (Melton 1992: 18).

In the U.S., the New Age movement placed the emphasis on one's enlightenment, personal development, spiritual growth as well as acquisition of new, higher forms of self-awareness and cosmic consciousness. The ideology became particularly widespread in the wake of a turbulent and uncertain period of the 1960s marked by the lost of highly unpopular Vietnam war, political assassinations, a nationwide disrespect for authority, student protests and urban riots. Similarly, in Russia, the public interest in occult themes and practices was on the rise, specifically during the Bolshevik Revolution and the fall of the Soviet Union. Being a relatively novel phenomenon, the movement sought inspiration from Thesophy, Spiritualism as well as Eastern religions in an attempt to revive an interest in mystical experiences. It gained much support from the U.S. Theosophical Society and absorbed their concept of channeling based on the belief that mediums are able to communicate with spirits and can utilize a supernatural source of information as the basis of enlightenment. Other theosophic principles of spiritual growth and enlightenment are often synonymous with the process of learning. In one of her works, titled *New religions and the theological imagination in America*, Bednarowski (1989: 93) highlights the New Age preoccupation with learning, particularly the phenomenon of near-death experience: "If Theosophy concentrates on the learning that must take place during the intervals between incarnations, New Age thinkers seem more interested in what the individual and all of humankind must learn about death itself". She continues discussing an intrinsic relationship between learning and enlightenment by emphasizing the New Age belief in the non-existence of death (Bednarowski 1989: 86):

> Learning [that there is no death] is an ongoing process. It is not enough simply to die in order to learn the lesson that there is no death. Enlightenment in not automatically granted on the other side of the grave as a kind of reward for dying (...). The knowledge that there is no death can be only achieved by "conscious union with God", and the learning must continue until the individual consciousness understands that "life, God, being everywhere, it must follow that death can be nowhere, because there is no place left for it". (Bednarowski 1989: 86)

Another central premise of the New Age movement is its stress on anticipating a New Age which will bring about a global spiritual transformation and international peace, accomplished through the acquisition of esoteric, mystical and occult knowledge. Such ideological

assumptions were particularly popular among the adherents of Gnosticism, Freemasonry, Rosicrucianism as well as practitioners of ritual magic ("New Age movement" 2014). In the 1970s, David Spangler, the American leading theosophist, formulated the fundamental idea of the New Age science based on the belief that various manifestations of the long awaited era might be initiated by people's releasing new waves of spiritual energy. In one of his major works, *Revelation: The birth of a new age* (1976), Spangler defined the main principles of the movement and attracted its new devotees from less popular metaphysical or occult groups, such as, for instance, the collapsing psychedelic movement. The hope for one's continuous growth and transformation as well as the massive spiritual awakening became of the most appealing promises of the New Age prophets. Melton (1992: 19) characterizes the chief premises of the movement as follows:

> The message of the New Age movement is its hope in transformation. Exponents of the New Age have undergone a personal transformation which changed their lives. They have witnessed a similar change in others and believe it possible that every person can also be transformed. Very real spiritual energies are available to create change, and numerous techniques function to harness that energy to produce change. Most of the various New Age activities aim at facilitating that personal transformation through such diverse activities as body work, spiritual disciplines, natural diets, and renewed human relationships. (...) But if personal transformation on a large scale is possible, argues the New Age, then social and cultural transformation is also possible. The world can be changed from the crisis-ridden, polluted, warlike, and resource-limited world in which we live into a New Age of love, joy, peace, abundance, and harmony. This generation is also especially lucky as special spiritual energies are now available to transform humankind into the Golden Age heretofore only dreamed about. It is, of course, this hope of the complete transformation of society that gives the movement its name. (Melton 1992: 19)

The accomplishment of the aforementioned transformation varies among New Age groups. Some claim that a global catastrophe is needed in order to achieve the goal; others believe that a critical number of people must accept the New Age perspective or that the movement's values, including those of environmentalism, feminism, alternative technology or peace, should be spread by individual adherents into every sphere of life (Melton 1992: 19). Another way to transform the world is to draw on traditional occult practices, such as the use of astrology and tarot cards, yet treated more as a symbol and means of self-understanding or comprehending the impact of cosmic influence on human existence rather than fortune-telling tools. Other practices that should assist personal transformation include developing meditation techniques, mediumship and other psychic skills or applying

alternative medicine as the form of spiritual healing, such as chiropractic, bioenergotherapy, acupuncture or the use crystals seen as healing-transformative devices as proposed by Alper (1982), the founder of the Arizona Metaphysical Society and a Spiritualist channel.

New Age is often considered an expression of American culture. In an article "Religion and the American experience: A century after", Albanese (1988) argues that it tends to share certain common traits with the fundamentalist movement, being both reflections of an emerging American ethnicity. Specifically, she lists five areas where both ideologies seem to converge: i) the idea of spiritual transformation of an individual and the whole society; ii) a mystic and visionary rhetoric of newness expressed as a continuous revelation; iii) the powers of healing which will treat both the body and the spirit as well as bring about material prosperity; iv) the prevalence of ontological positivism and religious materialism; v) the promotion of "new voluntarism" characterized by the non-elite and nationwide "do-it-yourself" quality (Albanese 1988: 339-343). Close links between American national character and the New Age philosophy were also suggested by Brown (1992) who noted that most of its adherents belonged to the generation of baby boomers and thus drew the parallel between the drug subculture's pursuit of alternate state of consciousness and the New Age culture's cultivation of awareness-raising and meditative techniques. Another factor that contributed to the rise of New Age in the 1960s was the development of humanistic and transpersonal psychology as well as the self-realization of yoga as a result of which "the psychological and the spiritual become linked through powerful inner experience" (Brown 1992: 95). Around that time, the movement emerged as a new American religious tradition serving important therapeutic functions. Lewis (1992: 10) emphasizes the increasing popularity of "New Science" in American culture which, to a large extent grounded in Fritjof Capra's writings, advanced the view reconciling science and mysticism, often expressed in the practice of shamanism and Native American Indian spirituality in the New Age subculture.

Such forms of quasi-religious and quantum healing rituals are indicative of holism, another alternative worldview proposed by the movement and directed against mainstream Christianity, dualism, reductionism, scientific rationalism and other Western values (Hanegraaff 1996: 515-516). Hanegraaff (2007: 39) contrasts the reductionist and holistic approaches to life as follows:

> Reductionism may take at least two forms; and in both cases the New Age alternative is, again, holism. Reductionism, in the sense of materialism, means that spirit is reduced to matter and thus denied an autonomous existence. Spirit is no more than an ultimately illusory phenomenon of purely material processes. The New Age alternative is the precise opposite: ultimate reality is wholly spiritual

> instead of material, and matter is a manifestation of mind instead of the reverse. According to a second aspect, reductionism manifests as a tendency toward fragmentation: integral wholes are reduced to separate fragments or 'basic building blocks'. The New Age movement, in contrast, emphasizes that wholes are not mechanistic but organic. The whole of reality is more than the sum of its separate parts; and the same goes for smaller parts of this whole, such as human beings. (Hanegraaff 2007: 39)

A holistic understanding of the surrounding reality makes New Age ideologically close to traditional esotericism. As the movement stresses the significance of an inner individual experience of the self as the most effective means to comprehend humanity's genuine relationship with God and the whole universe, it seems to be clearly grounded in gnosis which implies man's essential oneness with divine reality. The New Age interest in esoteric themes manifests itself in intellectual discussions over channeling, spiritual healing and personal growth, holistic science, unity in nature, evolutionism and reincarnation, psychologisation of religion as well as occultism (Hanegraaff 2007: 25-26).[7]

In the context of American space-oriented culture, the beginnings of the New Age esoteric and occult practices can be already observed in the 1950s UFO-cults. Although the fascination with the phenomenon of flying saucers was particularly widespread among groups that pursued mainly scientific research, many of them evolved into quasi-religious sects which built an occultist belief system. The most prominent example of such beliefs includes apocalyptic visions of the end of the world which will mark the coming of a new age of universal brotherhood, peace and prosperity where the human species will live in accordance with spiritual laws governing the

[7] Hanegraaff (2007: 25-26) comments on the relationship between the two concepts as follows: "In common parlance, the terms 'New Age' and 'Esotericism' indeed tend to be used interchangeably, as near or complete synonyms (...) 'Western esoteric' currents existed long before the New Age movement, so that the two domains cannot be synonymous; but to account for the precise nature of the relationship between both is far more difficult. If the New Age movement is a contemporary phenomenon historically connected to much older esoteric traditions, many people drew the conclusion that one may gain an adequate idea of what Western Esotericism is all about, by imagining modern New Age beliefs and practices transposed back into an earlier period. Such an idea, while very common, is wholly unhistorical: Western esoteric currents and beliefs have in fact been thoroughly transformed under the impact of new developments in the wider society, particularly those in the wake of the Scientific Revolution and the Enlightenment. As a result, there yarns a huge cultural and epistemological gulf between contemporary 'New Age' types of Western Esotericism and their pre-eighteenth century predecessors. While there can be no doubt about the historical continuities between Western Esotericism and the New Age movement, this continuity consists by virtue of an ongoing process of reinterpretation. Ideas are changed (...) according to the cultural context in which they are perceived; and over the course of time the context itself is transformed by these changed ideas".

universe (Hanegraaff 2007: 27). Apart from apocalyptic UFO-cults, there were also other countercultural communities which flourished in the U.S. since the 1960s. Such movements, mostly rooted in England, consisted of idealist and enthusiastic world-reformers whose focus was on creating rather than solely anticipating the New Age. Some of the world-known individuals of the kind are David Spangler or Matthew Fox, an American Episcopal priest, who founded the Creation Spirituality theology based on deep ecumenism as well as mystic and spiritual practices aimed to reinforce a holy connection between man, nature, God and the cosmos (Hanegraaff 2007: 28).

At the turn of the 1970s and 1980s, the New Age gained even more popularity, having integrated a vast number of ideas and activities concerned with the coming of a new era into its mainstream ideology. Ferguson's 1982 revolutionary book, *Aquarian conspiracy: Personal and social transformation in the 1980's*, widely considered the manifesto of the movement, redefined the concept of New Age as an attempt to give rise to new ways of living and suggested that the phenomenon has a distinct American colouring (Hanegraaff 2007: 28-29). As pointed out by Hanegraaff (2007: 29), "In contrast with the original movement, Theosophical and Athroposophical ideas are no longer particularly prominent; instead, one finds a very strong influence of the characteristically American Metaphysical Movements with their Transcendentalist backgrounds, including the New Thought movement and a certain type of religiously-oriented psychology and alternative therapies".

Similar opinions were expressed by other scholars who often argue that New Age is primarily a manifestation of the Western occult tradition, in particular the American metaphysical tradition which encompasses various ideologies and movements, such as Theosophy, Spiritualism, New Thought represented by the International New Thought Alliance, Christian Science, the Spiritual Frontiers Fellowship, the Divine Science Church or the Association for Research and Enlightenment, whose origins lie in transcendentalism. The writings of Thoreau, Emerson or Alcott advanced the view that salvation can be obtained through self-discovery, the revelation of the inner self which would lead to the discovery of the divine order of the universe (York 1995: 33). Therefore, the metaphysical tradition has incorporated not only theosophical and oriental beliefs, such as reincarnation, karma, astral protection, auras or communication with Spiritual Masters, but also the ideas proposed by transcendentalism, mesmerism or Swedenborg's mystical spiritualism, including one's self-reliance, inner development, utopian idealism, holism or the use of hypnosis, animal magnetism and generally healing powers of nature. The way the metaphysical-occult dimension of the movement has fit the American culture and national character is well summarized by York (1995: 34):

> New Age is a blend of pagan religions, Eastern philosophies, and occult-psychic phenomena. The Euro-American metaphysical tradition and the counterculture of the 1960s together constitute the occult underground or what Campbell refers to as the "cultic milieu". At the same time, New Age itself is an outgrowth of the Haight-Ashbury flower power expression and the broader occult-metaphysical tradition (of the United States in particular). (...) The 1960s' musical *Hair* did much to popularize the ideas of a coming "Age of Aquarius" – not only brought about by dedication to psychic phenomena, the occult or spiritual techniques but also concerned with ecological restoration, new understandings of education, citizen diplomacy missions, decentralist empowerment politics, and holistic thought. In short, this concern is what may be thought of as pragmatic efforts towards social change. (York 1995: 34)

As implied in the above quotation, York (1995) specifically emphasizes the importance of occult, esoteric and supernatural dimensions of the New Age thought. The movement's goal, among many others, was to seek a quantum leap in global consciousness as well as a personal achievement of wellness by means of embracing alternative therapies and philosophies, such as holistic healing, hypnotism, mysticism, astrology, paganism or magical practices and rituals.

As suggested by the statistics, the New Age ideology gained many adherents in the 1970s and 1980s America, among whom were academics from the University of California, Berkeley, who in 1970 decided to award their bachelor of arts degree in the field of magic ("Berkeley student will graduate with bachelor of arts in magic" 1970: 24). According to a 1976 Gallup poll, 4 percent of the surveyed engaged in TM, 3 percent practiced yoga and 1 percent declared involvement in Eastern religions which together constituted about 10 million Americans adhering to certain alternative religious groups (Harris 1989: 64). Other reports also confirmed that various forms of mysticism were increasingly popular, as suggested by Harris (1989) in the *Psychology Today* article, "Mysticism goes mainstream". The data collected by the University of Chicago Research Council indicated that around 20 million American people have reported having mystical experiences, like spiritual healing or paranormal activity, including communicating with the dead (Greeley 1987: 47-48). The survey conducted in 1989 by the *Body, Mind and Spirit* magazine revealed that 79 percent of its readers claimed there is a clear distinction between religion and spirituality; what is more, 94 percent considered themselves spiritual compared to only 40 percent who declared being religious (Levine 1989: 111-112). York (1995: 41-42) suggests that such research exposed a wide range of New Age practices aimed to reinforce the capacities of an individual inner self, the most common of which included spirit channeling, attending spiritual workshops and seminars, having psychic, intuitive or out-of-body experiences,

organizing séances and using spiritual healing. Generally, these figures are usually higher than those of the UK and European membership estimated for the New Age beliefs and activities.

Some of these trends were also reflected in the nationwide perception of the U.S. space programme at the turn of the 1970s, whose technocratic, secular and rationalist character was often linked to the so-called commercial mysticism, the term proposed by Barry Malzberg in his science fiction novel *Beyond Apollo* (1972), where he defines it as follows:

> Commercial mysticism was invented in the mid-1960s as a reaction against the devices of technology and particularly of the space program which gave more and more people the feeling that their lives were totally out of control and that there was no way in which they could stop machines from crushing them to death. The occult, the bizarre, Satanism, astrology, and the factors of chance reached high popularity during this difficult period. (Malzberg 1972: 133; as quoted in Tribbe 2014: 198)

Examples of some common manifestations of Malzberg's commercial mysticism in American culture can include the perception of spaceflight, in particular Apollo, as a civil religion (see e.g. 2.3.1.; Tribbe 2014: 166), astronauts' reports on metaphysical, transcendental or mystical experiences during space missions (see 2.3.1.1. and 2.3.4.1. for details), labeled the "Greening of the Astronauts" by the 1972 issue of *Life* where it denoted the postflight personal spiritual transformations, White's Overview Effect (see 2.3.1.3. and 2.3.4.1. for details) or the widespread UFO and SETI fad.

2.3.4.3. SETI as a parapsychical and occultist phenomenon

Undoubtedly, the rise of the New Age movement largely contributed to broadening the scope of intellectual discussions teetering between science and religion. One of the space-related manifestations of such a trend is the emergence and development of astrobiology, SETI and aspects of parapsychology investigating the relationship between humans, extraterrestrials and the cosmos. Harrison (2013: 39) elaborates on a change of public attitude toward such and akin topics, once considered trivial and mostly fantastical:

> Scientific questions about the origin, distribution, and future of life in the universe touch on basic issues of human existence. Topics once addressed in science fiction or fantasy magazines now appear in refereed journals and books issued by major publishers. Ben Finney and Erik M. Jones and their contributors proposed past voyages of discovery as prototypes for interstellar migration, offered serious looks at such topics as the size of founding communities, and

> forever linked spaceflight and the search for extraterrestrial intelligence. They stressed culture and the human experience, Stephen J. Dick and Mark Lupisella and their contributors explore the role of space exploration on long-term changes in the human condition. Dick foresees cosmic evolution, the search for extraterrestrial intelligence (SETI) and interstellar travel, leading to the emergence of a new breed of cosmic or interstellar humanity over the next thousands of years or so. (Harrison 2013: 39)

The rise of astrobiology and SETI in 20th century America is often attributed to a 1959 paper titled "Searching for interstellar communications", whose authors, Giuseppe Cocconi and Philip Morrison, argued that radio astrology could serve as the prefect means to trigger interstellar communication. A number of private searches was carried out in the following decade, including Frank Drake's Project Ozma or the construction of the Ohio State University radio telescope, called Big Ear, which laid foundations for the university's future SETI programme. Undoubtedly, such enterprises were conflated with techno-scientific aspects of the emerging field of ufology[8] in post-war America thriving due to an increasing number of UFO contactees as well as UFO sightings and abductions.[9] As noted by Tribbe (2014: 210), the spread of UFO-buff communities in the 1960s and 1970s largely coincided with the widespread feeling of powerlessness triggered by the looming defeat in the

[8] Since the emergence of SETI, scientists have clearly distanced their research from that pursued by ufologists, the latter of which is deemed pseudo-scientific. According to Lamb (2001: 40), for example, SETI researchers obey distinct methodological rules, realize academic projects supported by adequate empirical research and "work within the limits of existing theory and levels of technology", thus making SETI a recognized field of scientific and academic inquiry.

[9] One of the pioneering and most renowned 1950s and 1960s contactees who contributed to the development of American ufology and astroculture were George Van Tassel, George Adamski, Truman Bethurum, George King or Orfeo Angelucci who all claimed to have been in regular contact with extraterrestrials. As the accounts of their activities and abductions, often published as bestsellers, have evoked much interest of the general public, many of them have become media celebrities (Geppert 2012), sparking the wave of UFO sightings in the post-war America and Europe (Gulyas 2013: 127-128). For instance, Adamski's books, *Flying saucers have landed* (1953), co-written with Desmond Leslie, and *Inside the space ships* (1955), although later dismissed as a poorly written hoax, provided one of the first elaborate accounts of his encounters with Nordic aliens from the Solar System and fantastic travels aboard their spacecraft. Since Adamski's encounter with a Venusian visitor named Orthon in the Mojave desert, alien contact narratives served to promulgate a number of socio-political and religious views as well as voiced numerous countercultural and New Age concerns, including antiwar, environmental or ecological sentiments. The rising popularity of ufology was also due to other mid-20th century as well as later contactees' writings and activities which not only sought inspiration from Theosophical beliefs, but also commented on contemporary science, human culture or world history in attempt to change American and western societies.

Vietnam war, social turmoil, economic problems as well as "the larger neo-romantic reaction against American rationalism". Such tendencies, often manifested in the common belief in unfathomable forces of nature and supernatural phenomena uncontrollable by the human mind and modern technology, led to the emergence of a new pastoralism or romanticism of the 1970s. Tribbe (2014: 203) describes the core assumptions of this countercultural phenomenon as follows: "At the core of the new romanticism was an effort to recapture nature, God, magic, and mystery from a rationalist mindset that, if allowed to continue guiding American progress, would lead to the ultimate destruction of these crucial elements of existence".

The movement found its numerous expressions in the neo-romantic way of a harmonious living with nature, largely inspired by the cult of the Native American Indian, as well as in mainstream American culture, particularly in films (*Night of the living dead*, 1968; *The Andromeda strain*, 1971; *The exorcist*, 1973), music (a rustic, simplistic, laid back and country-inspired rock sound), fashion (the rising popularity of casual, drab, denim, earthy and sensual clothes), architectural trends (the neo-romantic decor and rustic interior design), automobiles (the rise of smaller and wood-paneled imported cars), or everyday objects and devices, such as a biofeedback training (BFT) machine. These and related phenomena somewhat mirror the nation's disenchantment with futurism and technocratic rationalism of the Space Age as well as its "quest for enhanced spirituality and a more transcendent existence" (Tribbe 2014: 214). The public fascination with extraterrestrials easily fit this cultural trend through its combination of science, particularly astrological research, with the study of the paranormal. Hess (1993: 22) implies that "the rise of UFO cults has transformed the otherwordly discourse of spirits and apparitions into the somewhat more rationalized form of extraterrestrials and contactees" which is characteristic for both New Age and new romantic movements.

In 1971, the UFO fad gained a nationwide significance as NASA officially established a multi-million-dollar SETI programme, thus making it distinct from the ETI discourse widespread in the U.S. popular culture. What is more, the project gained a new status oscillating between that of a rigorously scientific and a popular science investigation and therefore enjoyed an enormous support from both academic and scientific community as well as enthusiastic individuals and amateur researchers (Sheridan 2009). Sagan's best-selling book *Intelligent life in the universe* (1966), an American version of the Soviet *Universe, life, intelligence* (1962) written by Iosif Shklovskii, largely contributed to vivifying the public interest in detecting signals of extraterrestrial life. Although state and privately funded SETI investigations continued well in the 1980s, partly due to the efforts of the U.S. Planetary Society as well as the research conducted within the Sentinel, META (Megachannel Extra-Terrestrial Assay) and BETA (Billion-channel

Extraterrestrial Assay) projects, the NASA SETI programme was heavily criticized and ridiculed by the Congress. As a result, the funding for research was ceased in 1981 only to be restored one year later after Carl Sagan convinced Senator William Proxmire of the project's long-term value and then cancelled again in 1993 after an operational and government-sponsored NASA Microwave Observing Programme (MOP) had started. It was resurrected in 1995 under the name of Project Phoenix by the nonprofit SETI Institute of Mountain View, CA, and supported by private funds. It continued the mission of its predecessor and until 2004 it conducted the targeted search of approximately 1,000 Sun-like stars located at a rough distance of 200 light years. Since the official cancellation of the NASA SETI programme, the research has been pursued by the SETI Institute, a not-for-profit organization founded in 1984, the SETI League, Inc., another nonprofit association of professional and amateur radio astronomers, SETI@home, an Internet-based and state-run volunteer computing project launched by the University of California, Berkeley in 1999 or SETI Net, a private search system created in 1999 by an amateur individual.

Sheridan (2009) argues that SETI has inspired at least two significant changes in the U.S. popular culture. First, it has largely contributed to a profound change in the ETI discourse and the way extraterrestrial intelligence is depicted in film and television industry. Second, it is credited with the revival of a non-fiction and popular science genre, mostly concerning popular representations of ETI. The public fascination with ETI was triggered by Percival Lowell, an enthusiastic amateur astronomer, who, in a self-established observatory in Flagstaff, Arizona, made continuous, fifteen-year long observations of the surface of Mars in an attempt to detect the signs of life there. As a consequence of his long-term studies, the scientist made intricate drawings of Martian canals and published his research results in three books, *Mars* (1895), *Mars and its canals* (1906), and *Mars as the abode of life* (1908) which spread the long-held belief that Mars was able to sustain intelligent life forms (Kidger 2005: 110). The topic was further popularized in numerous issues of *Scientific American* which discussed Martian life in a highly serious tone and convinced turn-of-the-century American audience that it was only a matter of time before humans made a contact with their neighbour planet's inhabitants. In post-war America, the idea was promulgated by Robert Goddard's invention of rockets which, although initially met with public derision, quickly caught on in the media, particularly in major general interest magazines as well as science fiction and popular science film industry.

As argued by Sheridan (2009), the Red Scare, which culminated in the era of McCarthyism, became the main incentive behind the nationwide portrayal of ETI as "thinly disguised metaphors for the Communists that some suspected of lurking everywhere" in both textual and visual media, including press, radio broadcasts, films or comic books. In his *Mythologies*, Barthes

(1957: 42, as quoted in Lagrange 2012: 224) also points out that "the mystery of flying saucers was at first entirely terrestrial: we suspected that the saucers came from the Soviet netherworld, from this world as devoid of clear intentions as another planet". Alien films, which boomed after the Kenneth Arnold and Roswell incidents of 1947 and fostered the public interest in UFO-related affairs, were particularly popular in the 1950s. Robert Wise's *The day the earth stood still* (1951), Fred M. Wilcox's *Forbidden planet* (1956), Edward L. Cahn's *It! The terror from beyond space* (1958) or Ib Melchior's *The angry red planet* (1959) offered diverse, yet highly improbable perspectives on the fist human contact with aliens, either peaceful or hostile. The audience was exposed to strikingly unconvincing varieties of alien life in the form of carnivorous plants, immense bat-rat-spider or amoeba-like creatures, exotic rocky or mountainous structures and desert landscapes. In a plethora of science fiction films, including *The thing from another world* (1951), *The man from planet X* (1951), *Invaders from Mars* (1953), *Invasion of the body snatchers* (1956) or *The brain from planet Arous* (1957), extraterrestrials were depicted as extremely treacherous and evil creatures feeding on human blood, stealing their souls or implanting mind-control devices in people's brains in an attempt to enslave the world. Such portrayals of aliens often served as metaphors for the government's anti-communist Cold War messages revolving around the fear of the Soviet Union and a seemingly imminent nuclear war. The popularization of SETI in the early 1960s has reversed these trends and shifted the public attention to more scientific and credible scenarios advancing a possible existence of technologically superior alien life willing to communicate with the human species. Sheridan (2009) argues:

> SETI quickly became a marvelously apt symbol of the hope that the United States and the Soviet Union could negotiate an end to their differences. (...) The SETI *process* fired the imagination of Cold War Americans, and so did the *objects* of its searches. SETI's promoters offered the public a particularly appealing vision of what it meant to be an intelligent being. "SETI-ETIs" were a far cry from the dark aliens-as-Commies ETI portraiture dominating the popular culture at the time, and the public immediately warmed to them. As we saw, SETI's pioneers were so convinced that ETIs would be humanoid that the issue of ETIs' "nature" did not even rise to the level of conscious consideration. Their published writings, however, made it clear that they believed ETIs were not simply humans like themselves; rather, SETI-ETIs represented "advanced" or "superior" or even idealized visions of what SETI's founders hoped humans would become. (Sheridan 2009)

Similar ideas were proposed by Sagan and Shklovskii in their classic *Intelligent life in the universe* (1966) where the scientists speculated that the Milky Way galaxy, let alone the whole cosmos, is teeming with civilizations that are likely to be more advanced than our own. As suggested by Sheridan

(2009), the hypothesis was developed by newly-established SETI research groups and widely discussed in a number SETI conferences which eventually led to a vivid embracement of this novel trend in the U.S. popular culture:

> In a spectacular reversal of iconography from the Red Scare ETIs of 1950s movies, SETI-ETI – the "advanced" and "superior" humanoid intelligence that SETI's architects assumed they would find – dominated ETI portraiture in the popular culture, almost from the moment SETI began. It maintained its grip for the next three decades. SETI-ETI made its debut, however, not in movie theaters but even closer to home, in the still-new medium of television. (Sheridan 2009)

The portrayal of extraterrestrial life in line with the new standards set by SETI-ETI was soon adopted in the 1960s television programmes, popular science texts and science fiction series *The outer limits* (1963), *Star trek* (1966-1969) or *My favorite Martian* (1963-1966). Such a trend continued well into the next decades of the 20th century with the production of highly popular television series, including *Mork and Mindy* (1978-1982), *ALF* (1986-1990) or *3rd rock from the sun* (1996-2001) as well as iconic science fiction films, such as *Close encounters of the third kind* (1977), *Star wars* (1977), *E.T.* (1982) or *Contact* (1997).

Although most scientists and academics involved in the study of SETI have emphasized the distinctiveness of their activities from esoteric and paranormal science, many SETI sympathizers admit there are certain similarities between the fields. Harrison et al. (2000: 71) stress an interdisciplinary character of the endeavour whose investigation has engaged the whole array of different scholars, including physicists, biologists, anthropologists, futurists, philosophers, theologians, artists, economists, historians, psychologists, sociologists or political scientists. Similarly, in his article "Looking for God and space aliens", Tarter (2000: 38) asserts that "SETI may be the one area of natural science that lies most closely to the traditional religious concerns and practices of the major earthly belief systems". One of the vivid manifestations of the phenomenon is the rise of UFO religions in 20th century America, such as Scientology, Unarius Academy of Science, the Universal Industrial Church of the New World Comforter or the currently non-existent Heaven's Gate, whose adherents believe in the technological and spiritual superiority of alien civilizations which will help humans overcome the world's ongoing ecological, economic and socio-political problems, such war, hatred, poverty, hunger, bigotry or natural disasters (Martin 2008: 336-374). What is more, except for constituting an important part of certain belief systems, there exists a profound sense of mystery which accompanies the SETI research. Such a deep metaphysical quality is exposed in a number of activities, like a constant pursuit of a superior and divine source of knowledge or an attempt to escape and transcend earthly concerns by contemplating supernatural and heavenly objects (Tarter 2000: 38-39).

Since the late 1970s, when 51 percent of Americans were convinced that extraterrestrials truly existed, there has been a minor decline in a number of UFO enthusiasts; still, in 1990, as much as 46 percent of the nation expressed a strong belief in ETI (Worthing 2002: 61). Moreover, Worthing (2002: 61) suggests that there has been "the recent legitimation of the search for extraterrestrial life within the scientific community" which "has been paralleled by a rediscovery of the significance of this question within the theological community". This trend is often manifested in the rise of the so-called ETI myth whose chief assumptions have been formulated by astrotheology, the field of science which speculates on social, cultural and ethical implications of space research and exploration, concerning mostly the question of origins and extension of life on and beyond Earth. In his paper, "Myth in the heart of science: Evolutionary progress as myth in astrobiology and UFOs", Peters (2012: 9) attempts to define the extraterrestrial intelligence myth from the perspective of astrobiology:

> The ETI myth in both its astrobiological and UFO variants functions within an evolutionary worldview replete with the doctrine of progress and reverence for intelligence, science, and technology. The suppressed religious thirst for ultimate meaning in a comprehensive view of the universe gets quenched with the nectar of the gods become extraterrestrial aliens. (Peters 2012: 9)

Also, some scholars note that the UFO myth can be described as a postmodern phenomenon in its attempt to subvert the scientific and secular paradigm by introducing speculative magical and occult elements to its nationwide image in popular culture (Tumminia 2003: 103, as quoted in Peters 2012: 22):

> Postmodern myths, such as flying saucers, extraterrestrial deities, and alien abductions, express pluralistic collagelike symbolism of relatively recent origin. With the dawning of the rational technological age, social scientists expected secularization and science to wipe out superstition and magical religions. This has not happened. Instead, a magical enchanted worldview subverted the scientific paradigm into an animistic account of space being that was readily available for our mass consumption. That condition now pervades in our popular culture. (Tumminia 2003: 103, as quoted in Peters 2012: 22)

The statement quoted above is confirmed in other sources as well. Martin (2008) argues that the phenomenon of UFO in 20th century America is clearly a manifestation of both esoteric and occult spheres of public life. Similarly, Koch (1986: 341) argues that UFO and occult practices have akin origins and often occur parallel, particularly in the realm of intergalactic communication and religious ideology:

> The whole manner of communication between UFO's and contact persons proceeds in thousands of cases, according to occult rules. Frequently, telepathy is the means of transferring messages. The UFO people can communicate by automatic writing, by use of the ouija board while in trance. All the spiritualist rules of the game are practiced; levitation, teleportation, apports, telekinesis, psychokinesis, materializations, astral travelling and many more. UFO manifestations all arise from the same demonic morass. Likewise, the religion and philosophy of the UFO people shed light on their anti-biblical position and activities. They tell their contact persons that the Bible is full of errors. Christ is not the Son of God but rather a Venusian. Three contemporary Venusians are the real saviors of mankind. Mediums like Uri Geller are allies of these Venusians. The same can be said for other mediums like Adamski or Puharich, who are said to have the assignment on earth to give reality to the ideas of the UFO beings. The obvious purpose of these beings is to destroy faith in Christ and the Bible and to replace it with a fuzzy web of whimsies. (Koch 1986: 341)

Many researchers tend to express similar views and present evidence that SETI, particularly its UFO dimension, can be classified as partly occultist or parapsychical phenomenon, including Lynn Catoe, who, in the preface to a 1969 U.S. Government Printing Office publication *UFOs and related objects: An annotated bibliography*, stated:

> A large part of the available UFO literature is closely linked with mysticism and the metaphysical. It deals with subjects like mental telepathy, automatic writing and invisible entities as well as phenomena like poltergeist [ghost] manifestations and "possession". Many of the UFO reports now being published in the popular press recount alleged incidents that are strikingly similar to demonic possession and psychic phenomena. (Catoe 1969)

Also, some famous publications of the world's leading American UFO investigators, including John Keel's *UFOs: Operation Trojan Horse* (1970) and *The Mothman prophecies* (1975), Trevor James Constable's *They live in the sky* (1958) and *The cosmic pulse of life: The revolutionary biological power behind UFOs* (1976) or Kenneth Ring's *The Omega project: Near-death experiences, Ufo encounters, and mind at large* (1992) frequently link the SETI research and UFO cults' practices to esoteric and occult science, in particular Spiritualism and demonology. A demonic nature of the phenomenon, specifically advanced by non-Christian researchers, can be best illustrated by the bestselling American novelist Whitley Strieber's accounts of his personal UFO encounters (Ankerberg and Weldon 1992). In two of his books, *Communion: A true story* (1987) and its sequel *Transformation* (1988), the writer expresses the belief that non-human extraterrestrial entities he contacted were evil, yet intelligent enough to manipulate him into thinking that they are benevolent, benign and trustworthy. Strieber's

recollection of his experiences can be reminiscent of demonic visits, including the smell of sulfur palpable at the aliens' presence or their appearance and behaviour that "seemed almost to be a demon with a narrow face and dark, slanted eyes [which] spoke to me in a high, squeaky voice". According to Ankerberg and Weldon (1992), these and other equally popular reports of close encounters with UFO tend to follow a strikingly similar pattern:

> Characteristically, these UFO experiences include the following: The occult background of the subject; the dramatic manipulation of mental experiences; poltergeist events; the ever-present experience of supposedly "missing" time; mental terrorism; profound and drastic personality changes; social notoriety and/or stigma; dramatic continuing aftereffetcs and contacts with the entities; an initial intuitive sense of tremendous fear and frequently evil; and numerous correlations to ancient paganism which "haunt" the relationship. (Ankerberg and Weldon 1992)

It seems that the study of SETI has been continuously shaped by both scientific and esoteric influences. As put by Harrison (2013: 40), "below the radar for most physical and biological scientists, but of enormous importance to cultural historians and social scientists, are the widely held beliefs about astrology, parapsychology, psychic activity, unidentified flying objects (UFOs), and alien abductions". A vast range of esoteric, occult and supernatural beliefs and practices related to SETI research, although highly popular in the U.S., is often sharply differentiated from mainstream science. This trend makes it distinct from the Russian Cosmist experience where the boundary between psychic experiences and empirical science is often blurred and thus renders the former more acceptable for academic and scientific community (Harrison 2013: 40). Meanwhile, in the context of American Cosmism, UFO and NDE encounters tend to display numerous traces of the New Age thinking, in particular the evolutionary transformation of the human body, mind and spirit. In fact, SETI and UFO adherents advance the view close to the movement's core message, namely that humanity, inseparable with God and created out of the same divine essence, is at the threshold of a new age of spiritual development, cosmic consciousness and occult enlightenment.

2.4. Concluding remarks. Comparing Russian and American Cosmism

Space exploration, one of the most significant human endeavours in the history of human civilization, has always occupied a special place in the U.S. culture. Various activities performed within the final frontier have been subject to both empirical and materialistic science as well as space philosophy which exposed the public to mystical, spiritual, esoteric and transcendent

experiences beyond Earth. The latter, also known as space ethos (Harris 1992) or American Cosmism (Harrison 2013), which stands for its more elaborate variation, has been continuously shaped by the forces of culture, such as national myths, religious and philosophical systems or historical figures and events of an utmost importance, embracing both nationwide achievements and failures. Harrison (2013: 41) argues that "non-scientific, populist, religious, and quasi-religious attitudes affect people's interpretations of scientific achievements and motivate their interests in space exploration". In the U.S., this includes the phenomenon of the Overview Effect which encompasses religious, mystic and spiritually profound experiences reported by the majority of astronauts, the newly-emergent concept of a global higher consciousness or the widespread interest in esoteric, occult and paranormal aspects of space exploration, such as SETI and UFO. These and other related constellations of emotions and beliefs accompanying the public attitudes toward space efforts constitute American Cosmism which has helped form space visions, set agendas for space as well as determine humanity's tasks performed in the final frontier throughout the 20th century. Furthermore, Harrison (2013: 41) asserts that ideas parallel to those proposed by the Russian Cosmists can be also found in the U.S. culture:

> Russian space philosophy and activities are not really in a class by themselves. We find similar or analogous ideas in America. Even Fedorov's idea of reassembling the dust of all the people who ever lived has a Western counterpart: Frank Tipler's proposal to achieve resurrection and eternal life through computer emulations. (Harrison 2013: 41)

However, there are also distinct differences. In contrast to Russian Cosmism, which originated at the turn of the 20th century, peaked in Bolshevik Russia of the 1920s, and then continued its evolution into the space age, its U.S. counterpart began to emerge about four decades later, in post-war America. Moreover, one may even hypothesize that contrary to space ethos which, as proposed by Harris (1992), commenced developing in response to the Soviet launching of Sputnik in 1957, the spirit of Cosmism may be traced back to the emergence of observational cosmology in the early 20th century as well as the beginnings of the U.S. space programme. The ideals of the latter were spread by newly established and influential space advocacy groups, such the American Interplanetary Society, founded in 1930 (later known as the American Rocket Society), or individual "rocketry romanticists" (Winter 1980). Also, although both Russians and Americans put an almost unquestioned faith in highly advanced technology which would enable humans to achieve perfection and unity in outer space, they proposed various means to accomplish it. While the Russian Cosmists advanced social solidarity as well as combining science with characteristically Russian forms of Orthodox spirituality, mysticism and occult

practices, American space advocates put the emphasis on liberal democracy and individual initiative, one of the chief ideals connected with westward expansion across the U.S. (Andersen 2012).

Except for such crucial discrepancies, both Russian and American Cosmist thought seem to have developed a set of common characteristics. In the U.S., many ideas and theories formulated by the Russian Cosmists were modified and embellished by Robert Goddard, Wernher von Braun or other German rocket scientists and later adapted to the major American political, social and religious values which shape the public attitudes toward space endeavours. Therefore, it appears that one of the major roles in the evolution of both forms of Cosmism was played by visionary rocket scientists who inspired and spread the idea of space travel and extraterrestrial life in popular culture. In post-war America, such themes evolved under a strong influence of German rockets scientists, including Wernher von Braun, Robert Goddard, Willy Ley and Krafft Arnold Ehricke, whose ideas of space travel and extraterrestrial life were widely spread in popular science books and film industry, thus defining the nationwide vision of long-term space research and exploration. Harrison calls it the "von Braun paradigm" which was initiated the 1950s and founded on the premise that the U.S. space programme would follow subsequent stages, ranging from suborbital and orbital flights to the Moon and Mars landings (Andersen 2012). Meanwhile, Russians had their own space-oriented thinkers and rocket engineers, such as Nikolai Fedorov, Konstantin Tsiolkovskii or Sergei Korolev, whose pioneering research greatly inspired the public imagination and, most importantly, triggered the nationwide space fad which began in the 1920s, about three decades earlier than in America. As noted by Siddiqi (2008: 272), in the years 1921-1932, nearly 250 space-related articles appeared in the Soviet media and over 30 nonfiction books on the subject were published; in contrast, merely two such works occurred on the U.S market during the same period. Perhaps, one of the most striking differences between American and Russian leading visionaries of space exploration lies in the fact that while the former concentrated more on realistic and technologically credible achievements in the field, the latter inclined to muse upon utopian, mystical and spiritual aspects of spaceflight as well as incorporated them into their mainstream scientific theories (Mann 2012):

> Russians have long had a spiritual fascination with space. For centuries, the people told parables, folk tales, and myths about space travel. A mystical early-20th century Russian philosophy known as Cosmism wanted humans to travel into the universe, recover the ashes of the deceased, resurrect the dead, and settle throughout the cosmos. Following the 1917 Russian Revolution and the end of World War I, the 1920s were a hopeful period for many Soviet citizens. People wanted to come together and help build a utopian socialist society. (Mann 2012)

Furthermore, Siddiqi (2007) suggests it was both the popularity of and threat posed by American rocket scientists which led Russians to rediscover their own space visionaries and found one of the world's first pro-space groups engaged in organizing various public events promoting early space research and exploration (see 1.5. for details).

What is more, both Russian and American space philosophies appear to have certain nationalistic overtones. The former drew much on the ideology of the Russian imperialism and Eastern Orthodox Church which helped reinforce early Cosmists' imperative to solve the ongoing global problems, inhabit distant planets, unite the human race in all time and space dimensions or ensure both spiritual and technological development of mankind. Since the late 19th century until the Stalinist era, there was an immense enthusiasm for space among the masses; in the Khrushchev's times, cosmonautics played a particularly iconic role symbolizing the greatest achievements of the Soviet socio-political system and the dawn of the space age promised the "storming of heaven" (*shturm neba*) which could ensure material prosperity and thus increase social solidarity (Richers and Maurer 2011: 23-26). In this respect, the philosophy provided a convincing justification for an expansionist socialist ideology which intended to spread the Bolshevik Revolution around the world and further into space. Meanwhile, American Cosmism largely stems from Manifest Destiny and Turner's frontier thesis which have successfully served as a potent myth in constructing the nationwide space-oriented philosophy and culture. Exploring the universe offers abundant prospects of finding new economic resources, wealth and freedom as well as unlimited possibilities for individual initiative and self-development in both physical and spiritual sense. Also, the idea of American exceptionalism clearly manifests itself here and has been often incorporated in popular space imagery encouraged by NASA in the form of awe-inspiring visions portraying the U.S. nations as the world's pioneers and leaders of space exploration.

What is more, in the context of spaceflight, both schools of thought are frequently perceived as a form of secular religion. In an interview, titled "The holy cosmos: The new religion of space exploration", given for a 2012 issue of *The Atlantic*, Harrison elaborates on the way Cosmism resembles a religious belief system:

> Well, the roots of this extend back to antiquity in early notions of sky gods and that sort of thing; it's telling, for instance, that the polytheistic gods of yesteryear lent their names to planets. In the modern era, Cosmism is generally thought to have originated with early twentieth century Russians. There are a couple different ways that you see the religious aspects of Cosmism. One place you see it is in the tremendous faith that both Russians and Americans have in technology; specifically, the idea that technology can solve the problems of humanity, and that we need to

> leave Earth to create a better society, to find, in some sense, perfection in space. You see this idea over and over when space exploration is discussed, the idea that we can leave behind the problems that plague society here on Earth and we create these wonderful new societies in space. There's a general resemblance in this thinking to religious views of heaven, and in particular notions of salvation. Russian Cosmism actually preceded the Bolshevik Revolution, which meant that the first instances of it were culturally intermingled with the Russian Orthodox Church, which may have lent it some of these religious overtones. You see this kind of messianic approach to space flight, with people touting this deliverance that awaits man in the cosmos. In the twenties, Russian Cosmists talked a great deal about redeeming deceased individuals in space by reassembling the atoms of their bodies, bringing them back to life and letting them enjoy the "ideal society" of the Bolsheviks. Now if you skip forward to SETI, which I conceive of as a part of space exploration, though it's certainly exploration at a distance, you find that it's premised on this view that any alien civilization capable of persisting long enough to make themselves evident to other civilizations will have passed through a bottleneck of technological adolescence, and as a result they're going to be very old and wise and almost godlike. (...) Ted Peters, who has done some great work on religious symbolism in SETI (...), argues that it's pure mythology, this idea that these beings exist, that they're out there and they're smarter than us, and that they're good-natured and they're going to help us. From his point of view, it has all the markings of a religious myth. This religious, godlike aspect of extraterrestrials is particularly evident in the culture surrounding UFOs, especially in the 1950's and 60's. (Andersen 2012)

Perhaps, religious aspects of space exploration seem to be more prevalent in American Cosmism; Launius (2013) argues that the philosophy has developed at least five crucial components that allow to classify it as the belief system, namely the ideology of salvation pursued by means of advanced technology, the representation of astronauts seen as revered heroes, sacred scripture-like texts conveying spaceflight experiences, a set of rules and rituals as well as group identity among space advocates. These trends can be mostly found in popular culture manifestations of the Apollo myth and post-Apollo nostalgia, astronauts' reports and public statements indicating that they experienced a kind of religious epiphany in space or pro-space movements' activities which popularize the idea of space travel and its immense impact on increasing the individual, global and cosmic consciousness. Representations of Spaceship Earth, Brand's *Whole earth catalog* or the Overview Effect remain other important symbols of outer space religion, particularly widespread in the U.S. culture since the 1960s.

In contrast, Russian Cosmism has not evolved such an elaborate and prevailing set of religious assumptions, most probably due to restrictive attempts of the Soviet government to instill the masses with scientific-

materialistic atheism, the policy officially implemented by Khrushchev (see e.g. Rockwell 2006). Instead, Cosmists chose to incline more toward esoteric and occult dimensions of their theories centered around the concepts of Fedorov's Common Task and resurrection project, Vernadskii's noosphere or Tsiolkovskii's universal monism. Similarly, mystic, esoteric and occult ideas also seem to have played a vital role in the development of American Cosmism. The SETI and UFO culture mentioned by Harrison in the above quotation (Andersen 2012) have evidently displayed such tendencies; so has White's Overview Effect which offers a novel perspective on human spaceflight experience which should be seen as a genuinely transformative, profound and transcendent personal event crucial for one's spiritual and psychological growth. What is more, the concept, present in the U.S. popular culture of the 1980s, has developed its own distinct theory of salvation which, read partly in line with that of Fedorov, could be realized by use of computer emulations, artificial intelligence or quantum physics. Such discussions underwent a major revival also due to the New Age movement whose core ideological principles centered around seeking personal enlightenment, self-awareness, spiritual growth as well as evolving higher forms of cosmic consciousness. The New Age adherents promoted mystic and metaphysical experiences as well as occult practices, including spiritual, holistic and quantum healing, hypnotism, astrology, magnetism, channeling or magical and neopagan rituals.

It seems that Harrison's proposal of American Cosmism, despite having a considerably shorter tradition than its Russian counterpart, has evolved its own distinctive set of characteristics that may be analyzed parallel to the chief assumptions of the Russian Cosmist thought, such as the religion of spaceflight, including a salvation narrative, the national mythologies and visionaries of space exploration as well as the interplay between the occult, esotericism and science. Undoubtedly, the origins of Cosmism as the world's first space-oriented cultural and philosophical movement go back to the late 19th century Russia, yet, as argued by Harrison (2012, 2013), its variation can be also found in the U.S. culture and, what is more, it may serve as a more elaborate and adequate extension of Harris's national space ethos (1992). More specifically, Harrison (2013: 42) asserts:

> The United States has its counterpart to Russian cosmism, and while there are some differences, no term seems more appropriate than American cosmism. Phillip R. Harris once offered the term "space ethos" to capture the interactions of national culture and space exploration. But space ethos fails to convey the breadth and depth of thinking, the early origins, and the occasional blurring of ideology, religion, and technology that permeate thinking about humans and space. (Harrison 2013: 42)

Andersen (2012) even suggests that the U.S. has recently taken turns with Russia with respect to developing their national space-oriented culture and philosophy and claims that "today Americans are the most fervent Cosmists on the planet, even if manned space exploration seems to have stalled for the time being". The statement might seem true if one takes into account an increasing number of academic and popular publications dealing with the subject of outer space and astroculture from the perspective of humanities rather than science and technology (see 2.1. for details). Additionally, popular culture representations of space endeavours tend to reinforce and promulgate the recently re-emergent and re-discovered spirit of Cosmism and space ethos, particularly due to the efforts of certain space advocacy groups, such as the National Space Society or the Planetary Society, which successfully deliver various pro-space messages to the American public. Therefore, it appears that Harrison's American Cosmism, although seen as a relatively modern phenomenon, has the potential to become one of the mainstream space-oriented cultural and philosophical movements of the new millennium.

Chapter 3

American and Soviet space art in the context of 20th century culture and literature

In the present chapter, I will outline the history as well as the chief generic and scientific assumptions of 20th century space art in the American and Russian/Soviet cultural and literary context. Envisioning the unknown and extra-sensory realms of experience in both verbal and visual form has always been one of the most fascinating human endeavours. Particularly, portrayals of largely fantastic or futuristic places and concepts related to outer space have gone well beyond the ordinary, presenting images that can be neither perceived by our senses nor supported by the previously accumulated knowledge about the world. In 20th century America as well as Russia and Soviet Union, outer space, defined by *Oxford English Dictionary* (2014) as "the region of space beyond the earth's atmosphere or beyond the solar system (…) beyond the usual limits of awareness or accessibility", has been often depicted in both textual and visual discourse prevalent in diverse domains of national culture, including science fiction and popular science books, articles, illustrations, films or related art works. The latter term is often regarded as a modern genre of artistic expression and one of the primary means of portraying outer space locations, space technology as well as space exploration activities pursued by human beings since the dawn of the space age.

3.1. American and Russian definitions of space art

In the most general terms, space art can be defined as "the depiction of the universe beyond the limits of the earth" which "represents an age-old fusion of science and art" (Miller 1996: 139; Hartmann 1990: 132). The depiction itself, however, may take various forms, ranging from the most popular representational portrayals of outer space which alone covers a few genres and styles in the form of drawings, paintings, illustrations and abstract or digital imaginary, to zero-g space art, photography, sculptures, installations

or other contemporary artworks. All these artifacts of visual arts attempt to present and communicate diverse concepts related to the cosmos and human-made achievements of the space age. On the other hand, although by a more formal definition, the term space age art or space art embraces the whole array of different forms and styles, representational and pictorial portrayals of outer space environment still remain the main and most widespread expression of the genre, particularly in the context of 20th century popular culture. A similar definition of space art is given by Dixon (2009), one of contemporary American space artists and the member of International Association of Astronomical Artists (IAAA):

> Space Art is a general term for art emerging from knowledge and ideas associated with outer space, both as a source of inspiration and as a means for visualizing and promoting space travel. Whatever the stylistic path, the artist is generally attempting to communicate ideas somehow related to space, often including appreciation of the infinite variety and vastness which surrounds us. (Dixon 2009)

Hartmann (1990: 12) provides a more elaborate definition as well as mentions the origins of genre which can be traced back to the first astronomy inspired depictions of the universe and a wide range of themes covered by painters and illustrators who consider themselves space artists:

Long before the first Sputnik circled the Earth in 1957, a certain breed of artists, inspired by astronomical discoveries, adopted the whole cosmos as their muse. Like artists re-creating the world of the dinosaurs, these painters reveled in the challenge of combining the latest findings with their own creativity. For want of a better term, current artists of this school have evolved the term “space art” for their work. Space art is art inspired by a human adventure that transcends national differences: space exploration. The artists paint vistas of other planets, moons, asteroids, comments, and star systems; events of the past, present and future of the cosmos; and their own abstract responses to our cosmic environment. (Hartmann 1990: 12)Meanwhile, the Russian sources tend to provide a wider spectrum of the genre’s major terminology and definitions. The closest equivalent to what American literature on the subject defines as space or astronomical art is the so called *kosmicheskaia zhivopis* (space art) and *kosmorealizm* (astrorealism). The Art Seven Oil Painting Gallery describes the former term as follows (2014):

> Сам термин «космическая живопись» относительно новый, как и само направление изобразительного искусства. Несомненно, развитие космонавтики и космические полеты сыграли очень важную роль в популяризации космической живописи, однако интерес к космической теме возник несколько раньше, чем были совершены первые полеты за пределы

> Земли. Первые картины, которые можно отнести к направлению космической живописи, принадлежат кисти художника Юрия Швеца и удивительны именно тем, что в те годы еще не существовало космонавтов, полетов в космос и космической техники. Его полотна и наброски к фильму «Космический рейс» опередили свое время на десятилетия: первому настоящему «космическому художнику» удалось вообразить то, что в реальности еще не существовало. В окончательном же утверждении космической живописи как отдельного жанра изобразительного искусства прямая заслуга космонавта А. Леонова, сделавшего первые наброски космических пейзажей «с натуры». Сегодня космическая тема в живописи весьма популярна: в этом направлении пробуют себя многие молодые художники; создаются иллюстрации к научно-фантастическим произведениям, организовываются выставки с картинами подобной тематики в России и за рубежом (“Kosmicheskaia zhivopis” 2014).
>
> [The term “space art” and the object of its representation is relatively new. Undoubtedly, the development of astronautics and spaceflight missions played a very important role in popularizing space art works, however, the nationwide interest in the subject of space originated some time before the first manned space missions actually took place. The first pictures, which can be attributed to space art, were painted by the artist Iurii Shvets in the times when astronautics, spaceflight and space technology were still in infancy. His paintings and sketches for the film *The space voyage* (*Kosmicheskii reis*) were ahead of their time for decades: the first genuine “space artist” managed to imagine what had not yet existed in reality. Aleksei Leonov can be deemed another notable contributor to the latter stage of development of the genre of space art, credited with drawing the first sketches of extraterrestrial landscapes as viewed from the actual space. Today, space related themes in visual arts are very popular: many young and inspiring artists, working in the domain of the genre, create illustrations for science fiction works and organize various space art exhibitions both in Russia and abroad.] [translation mine, KB]

Since the early 1970s, certain American artists and scholars have proposed various definitions and classifications of space art. According to Malina (1970: 323), for instance, the main expressions of the genre include: i) art works created on Earth with materials provided by astronautical technology; ii) art works created on Earth which portray psychological and philosophical concepts related to man and the universe; iii) art works created and utilized in outer space. In his later article, Malina (1991: 147) defines space art as “contemporary art which relies for its implementation on participation in space activity” and suggests that “in some sense, space art is an extension of the environmental and land art movements, where artists (…) have used large sections of the earth as the raw material for their art objects”. The scholar (1991: 147) further proposes five broad categories of the genre:

1. Art which makes use of new techniques, materials or sensory experiences generated as by-products of space exploration.
2. Art which expresses the new psychological experiences or new philosophical conceptions developed through space exploration.
3. Art in space made to be viewed from earth.
4. Art on the earth to be viewed from space.
5. Art in space to be used in space or viewed from space. (Malina 1991: 147)

The first two and classic categories proposed by the scholar embrace mostly the visual fine arts of the space age era, including kinetic and abstract paintings as well photographs, such as Frank J. Malina's *Away from the Earth, II* (1966), Aleksei Leonov's *Dawn in Space* (1967) or Edward H. White II's *Photograph of American Astronaut* (Malina 1970: 323-325). Meanwhile, the last three categories denote a more modern form of artistic expression and encompass a number of human-made art objects, like the Sputnik itself, the Echo balloon satellites, Joseph McShane's artwork known as the Get Away Special Canister, launched in 1984 by NASA on the U.S. Space Shuttle, or Tom Van Sant's 1981 *Reflections in Space*, a reflecting eye laid on the California Shadow Mountains' desert floor (Malina 1991: 147-149). Since the 1960s, numerous artists, scientists, engineers and architects have been involved in the process of designing and building environmentally friendly public artworks exhibited either on Earth and seen from space or in space and seen from Earth. However, most artifacts which fall under these categories have never been actually created and do merely exist in the form of largely unrealized proposals and projects put forward by individuals or larger groups of artists promoting innovative ideas at the intersection of arts, space and science. Nevertheless, due to the emergence of such novel concepts and technological advances, other subgenres of space art emerged in the 1980s, particularly astronautical and zero-g space art in the form of sculptures and artworks created in or brought into space.[1] Astronautical, zero-g space art and related sculptured works, however, have never gained as much appraisal in 20th century American, Soviet or global popular culture as

[1] One of the most prominent examples include: NASA's 1986 Vertical Horizons experiment which transported visual art materials into space and resulted in a considerable collection of the first oil paintings created by astronauts while orbiting the Earth; Andrei Sokolov's radiant study of the golden sunlight on the Soviet space station, the first painting to be carried to Earth orbit in 1986; Arthur Woods's *Cosmic Dancer*, the first sculpture to be brought into space in 1993; *Ars ad Astra - the 1st Art Exhibition in Earth Orbit*, the first exhibition of twenty artworks which took place aboard the Mir station in 1995; microgravity or zero gravity performances staged within various projects, including Dragan Živadinov's Noordung Cosmokinetic Cabinet; parabolic zero gravity flights organized for artists by the UK arts group called the Arts Catalyst; the Fallen Astronaut figurine left on the moon by the Apollo 15 crew; the Hubble Space Telescope photographs (see e.g. Woods 2014).

have pictorial and representational works of space art mostly in the form of traditional paintings and digital media, which successfully spread to the mass audience.

In the past century, numerous visualizations of the universe and space exploration endeavours featuring extraterrestrial landscapes or space technology appeared in science fiction, popular science and picture essay magazines, films as well as on television. Malina (1970: 323) notes that early space art published until the late 1970s, "has been in the nature of illustrations of landscapes on celestial bodies that were based either on available astronomical information or on science fiction imagination and of subjects taken from space technology". A similar view is expressed by Dixon (2009):

> Practitioners of the visual arts have for many decades explored space in their imaginations and on their easels. The vast majority of space art output has been pictorial representations of space subjects, realistically and otherwise, using painting and more recently digital media. Science Fiction magazines and picture essay magazines were a major outlet for space art, often featuring planets, space ships and dramatic alien landscapes. (Dixon 2009)

One of the first sizeable and elaborate publications dealing with pictorial representations of the cosmos was Miller's 1978 photo guidebook titled *Space art*, which offered a comprehensive outline of the history as well as theoretical assumptions of the genre. In the introductory chapter, "The archeology of space art", Miller (1978: 10) provides a concise definition of the scientific artist whose profession may be equated with that of the painter or illustrator of outer space locations and space exploration artifacts:

> Yet, there is one category of art in which departures from reality oppose the purpose of art. The purpose is to visualize a part of reality which is "unseeable", and the person who does this is the scientific artist. The two sciences which the scientific artist pursues are paleontology (…) and astronomy (…). Both sciences need to have their subject matter visualized in realistic, concrete terms – not just laboratory symbols and other mumbo-jumbo. When the scientific artist creates an accurate vision of the unseen objects, he not only provides inspiration to those working in the field, but he forms a method of communication to the rest of the world: the non-scientific public. (Miller 1978: 10)

The above quotation raises an important question related to academic and popular science attempts to define space art. More specifically, it states the two principal objectives of the genre which is to accurately visualize the unseen part of the universe in a highly realistic and scientifically credible manner as well as to inspire and communicate certain aesthetic and astronomically-grounded ideas to a broader, unspecialized audience. Malina

(1970: 323) has contributed to such discussions by emphasizing the fact that space art should also serve purely aesthetic purposes which makes it generically close to visual fine art:

> Whether or not the special physical conditions and experiences encountered during manned flight in space and during man's sojourn on the Moon and other celestial bodies will significantly affect the visual fine arts is an intriguing question. In this note, I use the term *visual fine art* to mean: 'the discipline that has the purpose, by means of artifacts, of stimulating human emotions and of deepening emotional perception of selected portion's of man's environment'. (Malina 1970: 323)

A similar stance, promoting the view that space art needs to perform, among many other, an inspirational function, is presented in the IAAA Manifesto (2014) which states:

> Space art serves the most basic function of fine art, that of inspiration. It directs our focus toward the space frontier, where human destiny inevitably lies. We are in the midst of a human adventure that will be remembered when the international squabbles of our century are long forgotten. We are stepping off ancestral earth and learning what wonders and resources are scattered throughout the starlit blackness of space. It is an adventure for artists, scientists and all mankind. ("The IAAA manifesto" 2014)

Malina (1989: 286) also points out that some of the most culturally and historically significant space art works, including those of Chesley Bonestell, Ludek Pesek or David Hardy, played a substantial role in promoting the early space programme by envisioning and anticipating the actual space exploration endeavours. In this way, they rendered the space age possible in the collective imagination by propelling public interest in and gaining support for space advocates' plans to send humans into space. In a Treatise on Space Art posted on the IAAA website which outlines a historical perspective on the genre, Woods (2014) even suggests that "the idea of space exploration began in the mind of the artist (...). Yet long before the first rocket penetrated the atmosphere, artists were making the concept of humanity traveling beyond Earth's atmosphere a reality". At the same time, Miller (1978) emphasizes the need of the artist's objectivity and describes their role as "to look at reality, to form a personal impression of it, and to develop the skills necessary to render the impression in objective terms" and "to weigh the photographic rendering of reality against the recreation he can construct through his own imagination". This stance coincides with Cook's (2009: 16) view who contends that space art can be perceived as "the youngest member under the broad umbrella called scientific illustration" and thus suggests that the artist's aim is to depict a scene in the most feasible terms.

Hartmann (1990: 132-139) elaborates on a science- and technology-centered role of space art in a more comprehensive way by enumerating four objectives of the genre which are i) to encourage science and exploration; ii) to record space history and scientific knowledge of the cosmos; iii) to direct humanity toward "a new future" and unite the nations in pursuing common space ventures; iv) to synthesize the realms of art and science in both theoretical and practical sense in order to stimulate the public interest in and new concepts about the universe. The artist elaborates on the aforementioned cultural and aesthetic role of space art as follows (Hartmann 1990: 134-139):

> Here, then, is one role of space art in relation to science and exploration: to encourage it. Space art makes us want to interact with, understand, and converse the beauty of the universe around us. (...) The inspirational role is just part of a larger role of art in general: to affect feelings, and through feelings to become absorbed into our philosophies and thus to affect attitudes (...) toward space exploration. It has conveyed a sense of excitement, drama, mystery. A second role of space art is to record history. This occurs in two ways: by recording actual events, and by recording scientific knowledge. NASA runs a visionary art program (...) [which] is a remarkable facet of NASA: it recognized that space exploration is not just an obsession of wild-eyed engineers but a human endeavor shared by all our society. (...) The painters' eyes record events of space exploration with a wider range of emotional mood, a more intimate human response, and more unexpected perspectives than the abundant photos in the NASA collections. (...) Another part of the historical function of space art is that it provides a unique record of how scientists envisioned other worlds, decade by decade and year by year. (...) A third role of space art (...) is its ability, in its own small way, to direct society toward a new future. It can bridge international gaps more easily than political, scientific, and technical initiatives. (...) To paraphrase Jules Verne, what artists can imagine, engineers and politicians can accomplish. The fourth role of space art is to connect the worlds of art and science (...) Some years ago, C.P. Snow spoke of the gap between the "two cultures", art and science. Space artists bridge this gap. Or rather, they see no gap. Space artists and space scientists are both naturalists, although they ask different kinds of questions. By philosophical tradition, scientists are dividers: they subdivide phenomena until they isolate areas where quantitative measurements can be made. In contrast, space artists are synthesizers; they combine all this knowledge to consider the *experience* of an alien planet. (Hartmann 1990: 134-139)

Meanwhile, astronomical art, which is the purest form of the genre particularly widespread among the U.S. painters, translates highly complex extraterrestrial phenomena and space technology into a more comprehensible form. Such depictions literally transport the audience to the represented scene so that they are able to witness the invisible and largely unknown realms of experience. Therefore, as proposed by Carroll (1982: 211), most images tend to serve three basic functions: i) they illustrate a

given scientific concept; ii) they provide the framework in which laymen can refer to the cosmos; iii) they are considered an object of aesthetic contemplation. What is more, in order to present the right viewer's location and realistic settings, illustrators need to consider a number of scientific facts. For instance, when portraying Jupiter from Europa's surface, the moon should be depicted as a cold, icy and flat terrain, bearing a strong resemblance to the Earth's polar regions. Similarly, the planet, being the central and most complex visual element of the painting, should be not only carefully structured, but also placed just in front of the viewer's eyes, i.e. slightly above the horizon (Carroll 1982: 211). Interestingly, depicting spacecraft would additionally create a sense of familiarity and intimacy between the work and its audience by providing a manmade element which humans can relate to in commonly known terms. Such compositions would allow the audience to virtually travel in space and time and thus experience the Overview Effect (see 2.3.1.3. for a definition) extended to the farthest and uninhabitable parts of the universe.

In this sense, space art has been often considered close or, in some popular sources, even synonymous to astronomical art which, as mentioned before, became particularly widespread in post-war America. Another stance on the issue is mentioned in the introductory chapter to *Visions of space: Artists' journey through the cosmos* (1989). Here, Hardy (1989: 8) states that "space art, or astronomical art to use its original title, has been with is for well over the century", suggesting that the latter should be seen as the original genre from which the former, encompassing a much wider range of artistic expressions, has developed. Meanwhile, Miller (1978: 10) clearly equates the two genres in their purpose by noting that similarly to space art, the latter should serve primarily inspirational and educational rather than propagandistic or political purposes:

> In the case of astronomical art, there is little question that the taxpayers of the world were rallied behind the space program largely due to popular illustrated magazine, articles and books – like the *Collier's* and the *Life* series of the '50s and the now classic books by Chesley Bonestell, with text by Wernher von Braun, Willy Ley, and others. The astronomical artists of the last few decades has as much to do with the success of the space effort as any technical advances. Just as early American artists showed the public views of the unconquered West and helped propel interest in exploration and expansion (as artists of vision and realistic imagination always point the way), so, too, astronomical artists have shown the public what the unseen planets, moons, comets, and distant reaches of the galaxy might look like when we are able to be there in person. And, as a result, just as the field of astronomy has produced eminent scientists, it has also produced several great artists. (Miller 1978: 10)

Concurrently, Dixon (2009) makes a more clear distinction between the two genres, regarding astronomical art as an aspect of space art whose main objectives and premises, however, remain strikingly alike:

> Astronomical art, largely an outgrowth of the artistic standards of Bonestell, is an aspect of space art whose primary emphasis is in giving the viewer visual impressions of alien and exotic places in the Cosmos. As an Astronomical artist, one should have a sense of why the lighting, sky color, even your chosen landscape surroundings appear as they do, and how a drastic change in a specific condition as on other worlds could alter the scene dramatically. One should have a reasonable 'grounding' in science, the nature of the sky and weather, and Geology for knowing the Earth as well as Astronomy for knowing the heavens. Such artists share with every other conceivable creative expression the vast arena containing what can be called Space Art. (Dixon 2009)

The equivalent of astronomical art in the Russian popular and scholarly discourse is *kosmorealizm*, often attributed to the works of Nikolai Kolchitskii, Robert McCall, Aleksei Leonov or Andrei Sokolov. The term functions as a subgenre of space art grounded in scientific and realistic representations of space subjects and ought to be clearly differentiated from the widespread *nauchno-kosmicheskaia zhivopis* (science-fiction art). Unfortunately, numerous contemporary Russian sources, particularly *Tekhnika molodezhi* [Technology for the Youth], tend to draw much confusion in their attempts to define and describe the main generic characteristics of the Soviet space art. Namely, some of them use the concept of *nauchno-kosmicheskaia zhivopis* interchangeably with that of *kosmicheskaia zhivopis* (space art) or *retrofuturizm* (retrofuturism) when discussing the life and works of the major representatives of the genre, suggesting that the terms are to a large extent synonymous. What is more, many Soviet space artists are popularly regarded as *khudozhniki-fantasty* (fantasy artists) which evokes quite evident associations with the genre of fantastic art whose aim is to portray largely mystical, non-realistic, folkloric or mythical subjects in a representational and naturalistic style (Aldiss 1975: 3-6). This terminological tendency, however, might be deemed true when some characteristically Russian modes of space art representation are taken into account. For example, many Soviet space art works draw on varied non-realistic styles and tend to incorporate romantic, symbolic, magical and often surrealist influences in their depictions of the cosmos and space exploration.

Meanwhile, a number of American sources indicate that space art or, as some scholars and artists suggest astronomical art, needs to be clearly distinguished from science fiction and fantasy art, which focuses on imaginative, innovative and futuristic representations of space settings as well as other space-related themes, including space technology, spaceflight,

extraterrestrial life, time travel or the idea of parallel universes. Hardy (1989: 8) defines the dichotomy between the two genres as follows:

> I am surprised to find, in conversation, that many people do not know what space art is. Either is it assumed to be science fiction art, or the more realistic examples are taken to be 'photographs' which magically appear on the printed page – even when we have not yet visited the world in question. Some artists have always felt the need to depict scenes beyond the familiarity of their own locality, and have been inspired by the dramatic, the fantastic, the 'other-worldly' – even on our own planet. They have endeavoured to show the public what lay beyond the frontiers of their day. In the 1870s and 1880s artists like Frederick Church, Paulus Leeser and Thomas Moran travelled to the poles, to the Grand Canyon or to Yosemite or Yellowstone, to paint icebergs, aurorae, volcanoes, chasms and mountains. Space artists carry on this tradition, but they have a handicap: much as they may like to, they cannot visit the laces they paint. So they visit them vicariously, in imagination. The difference between their work and that of science-fiction artists is that while SF and (especially) fantasy art is created by the mind of the artist (or the author whose work is being illustrated), the space artist must base his or her work solidly upon fact. A sound knowledge of astronomy and astrophysics, of geology, technology and mathematics, is a prerequisite for the 'realistic' school of space artists, and even the more abstract or surrealist painters still need to have this background, or they cross the borderline into fantasy. (Hardy 1989: 8)

Interestingly, Hardy (1989: 8) emphasizes another disparity between space art and what he calls hard space art which stands for highly realistic, scientifically-grounded and fact-based representations of outer space:

> [By] 'hard' space art (...) I mean the type that represents planetary landscapes, space hardware (vehicles, space stations and so forth), or the people who will one day walk on those alien terrains or operate those ships. The important factor in this type of art is that the scenes created must be just as believable as any territorial subject. This does not mean that they have to be purely photographic; style and technique are as important as in any other branch of art. (Hardy 1989: 8)

Additionally, Hartmann (1990: 144) stresses the existence of diverse forms of artistic expression within the domain of the genre by contending that "space art covers a spectrum, from the 'hard' scientific realism of the Bonestell tradition to the 'softer', more subjective and symbolic images that reflect inner responses of the cosmos". These seemingly minor discrepancies might become more distinguishable in the way that certain space art works can be seen as clearly embracing a variety of different styles. For example, Sokolov (1990: 160-161) proposed two different styles practiced by contemporary space artists, namely the symbolic-fantastic and realistic approach observed in depictions of space pioneers, technology and landscapes:

> Two approaches to space art are already well developed. First, the symbolic-fantastic genre, where realism is secondary to symbolism, has already won an honorable place in the history of art. Second, (…) the realist approach to space art [which] is still evolving. (…) [However], detailed illustrations of equipment, spacesuits, interiors of spaceships, and so on are of minor importance. (…) Major attention must be paid to closer rapport with the space explorers themselves. Artists need spiritual understanding of their impressions, memories, and notes. The opposite is true, however, when it comes to the painting of space landscapes. A number of specific, cosmic peculiarities of these landscapes must be taken into account – the lack of conventional "up" and "down", the absence of atmospheric perspective, and so on. Space landscapes must be mastered not only by artists, but also by painters of human activity, because this activity takes place, even today, against a background of space. (Sokolov 1990: 160-161)

Sokolov, however, seems to have neglected some of the major developments of space art since it is usually argued that in the case of pictorial and representational depictions, one may differentiate between at least four distinct styles: i) descriptive realism, an aspect of astronomical art, which follows the artistic tradition of Chesley Bonestell and focuses on portraying highly detailed as well as scientifically and technically accurate and credible representations of extraterrestrial scenes; ii) impressionism, which takes more freedom in utilizing form and color to provide a viewer with the artist's impression of the subject matter and does pay so much heed to being scientifically and technically reliable or adhering to scientifically established facts and principles; iii) hardware art, which presents the style akin to that of descriptive realism, yet focuses mainly on portraying the hardware of space technology, including spacecraft, probes or other advanced equipment used in space exploration; iv) speculative depictions of alien life forms in extraterrestrial settings. This classification has been often proposed and applied by space artists themselves as well as academics who have studied a variety space art of representations since the 1970s (see e.g. Carroll 1982; Dixon 2009; Hardy 1989; Hartmann 1990; Malina 1970, 1991; Miller 1978, 1992, 1996; "IAAA" 2014, etc.).

In the present chapter, I shall analyze merely pictorial, that is "expressed in pictures", and representational, meaning "relating to or denoting art which aims to depict the physical appearance of things", images of outer space and space exploration created by well established American and Soviet space artists ("factual, adj."; "representational, adj." 2014). First, however, I will attempt to outline the history of space art with a specific focus on the U.S. and Soviet cultural as well as literary context. Hopefully, it will allow me to pinpoint the main differences in the evolution of the two nations' space art traditions which might have affected their clearly distinctive way of visualizing the cosmos and space exploration endeavours.

3.2. The history of American and Soviet space art

3.2.1. Literary beginnings

Most academics and artists themselves suggest that the foundations of space art were laid by Jules Verne in his classic novels depicting the manned space travel, titled *De la terre à la lune* [From the earth to the moon] (1865) and *Autour de la lune* [Around the moon] (1870) (see e.g. Miller 1978, 1992, 1996, 2014; Hartmann 1990; Hardy 1989; Ordway et al. 1992, etc.). Before these publications, spaceflight was mainly visualized in the form of fantasy tales, satires and allegories largely shaped by both amateur astronomical observations as well as the authors' religious, occult and socio-political views. The journey to the moon or distant planets was usually portrayed as accomplished by the use of supernatural means, including magic, demons or flying geese rather than scientific or technological devices. Similarly, the extraterrestrial environment was depicted in a highly fantastical or allegorical form presenting an alien world replete with mountains of ruby, pumpkin-houses or supernatural creatures (Miller 1978, 1996, 1992; Ordway et al. 1992).

One of the earliest examples of this kind is a series of six articles published in the *New York Sun* in 1835, commonly known as the Great Moon Hoax, which revealed the supposedly latest discovery of life and civilization on the moon made by benefit of an immense telescope. The stories, later attributed to the newspaper's journalist Richard Adams Locke, described a truly fantastic world covered by forests, mountains of ruby, rivers and volcanoes as well as inhabited by goats, bison, beavers, unicorns, beavers and human-like, bat winged creatures. Interestingly, the series was lavishly illustrated with depictions of lunarians and their alien habitat, which are sometimes regarded as the first attempts at space art. Similarly, in the mid-19th century Russia, portrayals of outer space landscapes were often trivialized and included in popular chapbooks, such as Demokrit Terpinovich's *Puteshestvie po solntsu* [Voyage in the sun] (1845), Dmitrii Sigov's *Puteshestvie v solntse i na planetu Merkurii i vo vse vidimye i nevidimye miry* [Voyage to the sun and planet Mercury and all the visible and invisible worlds] (1832) or Semion Diachkov's *Puteshestve na lunu v chudnoi mashine* [Voyage to the moon in a wonderful machine] (1844). When it comes to fiction, the motif of space travel to extraterrestrial worlds became quite popular toward the end of the century, particularly in Konstantin Tsiolkovskii's prose, such as his famous short story titled *Pervye na lune* [First on the moon] (1893), which contained two illustrations depicting the lunar landscape in a considerably realistic manner.

For the past few centuries, numerous stories narrating the experience of space travel served mainly as vehicles for satire on contemporary social issues (Miller 1978: 11). For instance, *L'Autre monde ou les états et empires de la lune* [Comical history of the states and empires of the moon] (1657) by Cyrano de Bergerac has a particularly satirical literary form and can be considered a parody on the theme of a rocket-powered space travel, retaining some elements of technical and scientific credibility (Ordway 1992: 41). The hero, narrating the story in the first person, after many futile attempts to reach the moon, finally succeeds in his plan by attaching fireworks to a self-made spaceship. The extraterrestrial world he visits is presented as inhabited by four-leg creatures with magical weapons and musical voices. Another example of this kind of prose is Edgar Allan Poe's supposed hoax entitled *The unparalleled adventure of one Hans Pfaall* (1835) which provides interesting details of the hero's journey to and from the moon reached by benefit of a revolutionary new balloon. There are virtually no descriptions of the body's surface and inhabitants, yet the author can be praised for surprisingly accurate portrayals of Earth as seen from orbit grounded in scientific facts rather than fantasy fiction (Poe 1975: 29):

> Beheld the singular phenomenon of the sun rising while nearly the whole visible surface of the earth continued to be involved in darkness. In time, however, the light spread itself over all, and I again saw the line of ice to the northward. It was now very distinct, and appeared of a much darker hue than the waters of the ocean. I was evidently approaching it, and with great rapidity. Fancied I could again distinguish a strip of land to the eastward, and one also to the westward, but could not be certain. Weather moderate. Nothing of any consequence happened during the day. (Poe 1975: 29)

Other works of fiction of a similar kind include Francis Godwin's *The man in the moone or the discovrse of a voyage thither* (1638), Gabriel Daniel's *A voyage to the world of Cartesius* (1694), David Russen's *Iter lunare: or voyage to the moon* (1703), Ralph Morris's *A narrative of the life and astonishing adventures of John Daniel* (1751) or Voltaire's *Micromégas* (1752) (Miller 1990: 29). *The Man in the moone or the discovrse of a voyage thither* (1638), a novel written by a historian and later the Church of England bishop Francis Godwin, is one of the first utopian fantasies published in Europe and another 17th century narrative describing the imaginary journey to the moon as well as the mechanics of space travel (Ordway 1992: 40). The main hero, Domingo Gonsales, while travelling on exile, discovers a powerful species of wild swan inhabiting the island of St Helena which enable him to fly back home. However, as a result of an unfortunate incident, the birds take Gonsales in his self-made flying machine on a twelve-day voyage to the moon, where the traveler encounters a utopian state and the natives Lunars.

A more fictional representation of the moon was included in Gabriel Daniel's *A voyage to the world of Cartesius* (1694) which introduced the idea of soul travel to the extraterrestrial worlds (Ordway 1992: 43-44). Interestingly, a traveler continued his voyage through the infinity of the cosmos to "the Space beyond the Universe" or "the Indefinite Spaces" which are sometimes considered the first use of modern term outer space. Also, evidence is provided that extraterrestrial life exists and most planets known to humans are inhabited, the assumption common in 17th century imaginary literature.

Literary representations of outer space sometimes took form of fantastic utopian novels, particularly in 18th century Russia. The first description of the manned travel to the moon was provided by Vasilii Levshin in his story entitled *Noveishee puteshestvie* [The newest voyage] (1784) where the main hero constructs a magical machine which enables him to get to the moon. Interestingly, he discovers that in fact its native inhabitants to a large extent resemble humans. What follows is a description of what the visitor witnessed while approaching this alien world (Levshin 1989):

> Между тем он приближался к Луне. Какая чудесная перемена! Сей малый светленький кружочек учинился преогромным шаром, и Нарсим не примечал, чтоб оный испускал от себя свет. Сей шар был точная наша Земля, или темная глыба, наполненная горами, водами и равнинами. Чем ближе он опускается, тем многочисленнее рождаются в очах его предметы удивления. Уже различает он сначала леса, потом видит блестящие кровли зданий. О небо! не сплю ли я? – вопиет Нарсим, обращая стремительно на все стороны взоры. – Луна населена!.. Вот города... деревни!.. Ах! Я вижу и самых тварей... Боже мой! здесь такие же человеки!.. Они имеют свои нужды: вот пахарь, чредящий свою землю... Се пастухи с стадами!.. Кажется, что златый век здесь господствует – по сих пор еще не вижу я монахов и ратников... Тут-то истинный престол весны, тут-то истинный род жизни... Завидное состояние! Кажется, одни радостные звуки свирелей провождаются к ушам моим... Сей город преогромный, удивительное художество сооружало здания. Но что ж такое! Я не вижу нигде молитвенных храмов: конечно, нет здесь правоверных? (Levshin 1989)

> [Meanwhile, he was approaching the moon. What a wonderful change! This small, shining circle has transformed itself into a huge globe, and Narsim did not notice that it emitted its own light. This globe was similar to our Earth, or a dark mass, replete with mountains, waters and plains. The closer he was getting, the more numerous objects he witnessed. First, he spotted forests, then he saw the shining roofs of various buildings. Good heavens, am I dreaming or is it real? – wondered Narsim, viewing the surroundings – The moon is inhabited! ... There are towns...and villages! ... Ah, and I see some inhabitants themselves ... Oh my God! They are the same as men! ... They have their own professions: a plowman

> working on his land … The shepherds with their herds! … It seems that the golden age still prevails here – I cannot see any monks and warriors (…) It seems that I can hear some joyful sounds of the flute… this city is enormous, an amazing art constructed buildings. But what's that! I cannot see any places of worship: of course, there are no religious people here?] [translation mine, KB]

Meanwhile, in the early 19th century Russia, imaginary literature was mostly dominated by fantastic, gothic and supernatural stories with little reference to scientific fact. Bulgarin's *Neveroiatnye nebylitsy ili puteshestvie k sredotchiiu zemli* [Untrue un-events or a journey to the centre of the earth] ([1835] 1990), Gogol's *Nos* [Nose] (1949 [1836]), Pushkin's *Pikovaia dama* [The queen of spades] (1834) or Dostoevskii's *Dvoinik* [Double] (1846) were more likely to utilize paranormal, magical and utopian elements or satirical phantasmagoria in constructing the fictional world. The first true science fiction novels, *Predki Kalimerosa: Aleksandr Filippovich Makedonskii* [The forebears of Kalimeros: Alexander, son of Philip of Macedon] (1843) and *MMCDXLVIII god* [Year 3448] (1833) by Alexandr Veltman rarely involved detailed depictions of the cosmos; instead, the author used the utopian idea of time travel set either in the past or in the far future. The exception was Vladimir F. Odoevskii's epistolary *4338-i god: Peterburskie pisma* [The year 4338: Petersburg letters] ([1835] 1929), one of the first futuristic Russian literary works which, although largely utopian in nature, was clearly grounded in science rather than imagination, fantasy and the supernatural. The author envisions Petersburg as the world of innumerable technological advances, including the telephone, photocopying, air and space travel, artificially controlled climates as well as hallucinogenic drugs or truth drugs in the form of magnetic baths which aim to eliminate hypocrisy from social life. Siddiqi (2010: 18-19) comments on the character and rising popularity of most space-themes fictional texts of the period as follows:

> Fictional anticipations that centered on the cosmos emerged in Russia in parallel with three broader social and cultural processes in the late nineteenth century: the rise and expansion of the publishing concerns, the growth in literacy, and the beginnings of industrialization. Where works such as Odoevskii's novel had been furtively exchanged among readers, in the late imperial era, mass publishing and the intermittent relaxation of censorship brought the medium of technological anticipations directly to a newly hungry urban populace. Following in Odoevskii's footsteps, many on these works – especially homegrown novels – often combined the mystical and folk traditions with a distinctively scientific and technological sheen and an appeal to utopian dreaming. New discoveries in chemistry, biology, physics, and, particularly abetted a marked popular interest in a new medium, later known as (…) science fiction. (Siddiqi 2010: 18-19)

18th century Western literature, sometimes seen as precursory to modern science fiction, tends to provide more scientific and technical details, particularly considering the representation of space exploration. For example, while Russen's *Iter lunare: or voyage to the moon* (1703) introduces the audience to the idea of moon-spring device, Defoe's *The consolidator or, memoirs of sundry transactions from the world in the moon* (1705) presents several types of spaceships, including a Chariot-shaped engine known as Consolidator, conceived, constructed and successfully utilized in lunar travel by ancient peoples (Ordway 1992: 44). Meanwhile, Morris's *The life and astonishing adventures of John Daniel* (1751) presents adventures of the main hero and his son Jacob who, while incidentally reaching the moon on their voyage, witness the following extraterrestrial scene (Morris 1751: 197):

> [T]here were prodigious mountains, extensive plains, and immense lakes, interspersed with the vastest plantations of trees that can be imaged, to lie within the compass of the eye at once; at then the air was serene, thin and transparent, that we could fee distinctly, to a distance beyond comparison, to what we could ever before. (Morris 1751: 197)

Interestingly, a short story by the French philosopher and satirist Voltaire, *Micromégas* (1752), introduces its audience to a novel idea in early modern science fiction, namely an alien visiting the earth. The space traveler from the planet orbiting Sirius sets off on a voyage around the universe, befriending a Saturian and taking him further to Earth, which they thought remained uninhabited. Having soon learnt Latin, the aliens begin conversing with humans, whose clear anthropocentrism remains the source of scorn and ridicule of the visitors.

Only few of the aforementioned publications were illustrated, yet most scholars agree that none of these visuals can be seen as reminiscent of space art works; Miller (1990: 29) suggests that "the artists demonstrated as much disregard for astronomy as did the authors. Nevertheless, there were representative of the rapidly increasing interest in outer space voyaging and the possibilities of other worlds". The most famous and realistic story depicting the journey to the moon which might have served as an inspiration for Verne was Kepler's translation of Galileo's scientific theories into a fantastic tale, *Somnium* (1634). The story was based on Galileo's scientific theories and regarded by certain writers, including Carl Sagan or Isaac Asimov, as the first work of science fiction. It depicted a space adventure of Tycho Brahe's student who, with the help of his mother, an Icelandic witch named Fiolxhilda, gets transported to the moon by demonic forces. The work is considered to be the prototypical detailed description of the Earth as seen from orbit and the moon, the effects of gravity forces as well as lunar

astronomy (Ordway 1992: 38-39). Miller (1978: 11) explains why the novel can be seen as the first treatise on lunar astronomy written in a serious, scientific tone:

> His Moon is similar to our world except that mountains are much higher and more rugged, with deep valleys and fissures. Kepler was also aware of the Moon's extreme climate, the weightlessness and the airlessness of space, and was the first writer to propose lunar inhabitants with a biology to suit their environment. Had *Somnium* been illustrated, it might have provided is with the first true astronomical art. (Miller 1978: 11)

Verne's *From the earth to the moon* and *Around the moon* (1865) as well as its sequel *A trip around the moon* (1870) contained illustrations by A. de Neuville and E. Bayard which are considered the first true space art works as, contrary to earlier depictions of space travel, they portrayed views grounded in scientific facts rather than satirical imagination or mysticism (Miller 1978: 11). While the first novel narrates the story of post-American Civil War Baltimore Gun Club's attempts to construct a massive Columbiad space gun with the goal to send the heroes in a projectile to the moon, the latter describe the actual trip to the lunar surface. The images accompanying the plot can be characterized by a remarkable realism in depicting both spaceflight and outer space environment as well as strictly conformed to scientific and astronomical facts known in the mid-19th century. What is more, the submitted illustrations were meticulously scrutinized by Verne himself for authenticity and adherence to technical details on the basis of a lunar map. Miller (1990: 31) comments on the visuals as follows: "Emile Bayard and A. de Neuville provided some of the most memorable images created during the last century. The launch of the Projectile, the three astronauts enjoying freefall, the splashdown in the Pacific, are still being reprinted in books on space travel today". In a different source, Miller (1992: 52) contends that "the illustrations (…) accompanying the second novel were the first to show a rocket operating in interplanetary space, and the first to make any attempt at a realistic representation of the Earth and Moon as seen from space".

Another science fiction novel of Verne, titled *Hector Servadac* [Off on the comet] (1877), included even more spectacular illustrations by P. Phillipoteaux which depicted Jupiter and its moons as viewed from a passing asteroid as well as Saturn's rings as seen from the planet's surface (Miller 1978: 11, 1990: 31). Today considered one of the first examples of astronomical art, the visuals perfectly fit the plot which centered around the space adventures of forty people of different nationalities and ages who embark a two year journey on the comet and travel through the Solar System witnessing otherworldly and often romantic extraterrestrial views. What follows is a passage from the novel which gives a highly realistic impression of one of the planet's visited by the heroes (Verne 2008: 412-413):

> To any observer stationed on the planet, between the extremes of lat. 45 degrees on either side of the equator, these wonderful rings would present various strange phenomena. Sometimes they would appear as an illuminated arch, with the shadow of Saturn passing over it like the hour-hand over a dial; at other times they would be like a semi-aureole of light. Very often, too, for periods of several years, daily eclipses of the sun must occur through the interposition of this triple ring. Truly, with the constant rising and setting of the satellites, some with bright discs at their full, others like silver crescents, in quadrature, as well as by the encircling rings, the aspect of the heavens from the surface of Saturn must be as impressive as it is gorgeous. (Verne 2008: 412-413)

Numerous space art-like images also appeared in other late 19th century works of fiction. One of the most prominent examples might include André Laurie's *Les exilés de la terre* [The conquest of the moon] (1889) which contains one of Verne's illustrators Georges Roux's depictions of the moon explorers equipped with respirators and admiring an eclipse of the sun by Earth as seen from the lunar surface. Another novel, *A journey in other worlds: A romance of the future* (1894) written by John Jacob Astor and illustrated by Dan Beard, offered highly futuristic descriptions of solar power, a worldwide telephone network, terraforming other planets as well as air and space travel to Saturn, Jupiter or Cassandra, the tenth, trans-Neptunian planet of the Solar System which, over thirty years before the discovery of Pluto, turned out to be incredibly prophetic. The portrayals of the planets, most depicted by Beard, can be considered largely fantastical. Jupiter, for example, is presented as a dense jungle world rich in natural resources and inhabited by monstrous creatures, such as flesh-eating plants, giant snakes and mastodons, vampire bats and flying lizards. Saturn, in contrast, is reminiscent of an ancient world of silent spirits with the capacity of foreseeing the space travelers' deaths (Miller 1978: 13-14). Meanwhile, one of the first instances of pre-space art depictions of extraterrestrial life were illustrations included in Wells's *The war of the worlds* (1898) which exposed the audience to largely fantastical views of the Martians presented as hostile ameba-like creatures inhabiting a barren extraterrestrial landscape. When it comes to depictions of modern space technology, one of the most famous science fiction novels containing such illustrations includes the astronomer Everett Hale's novelette *The brick moon* ([1869] 1970) which provided portrayals the first artificial satellite and space station or Le Faure and de Graffigny's *Aventures extraordinaires d'un savant russe* [The extraordinary adventures of a Russian scientist] (1888-1896), a Vernian-like cosmic saga lavishly illustrated with the view of the sun and the small planets, stellar worlds as well as spaceships.

Also the late 19th century Russia experienced the rise of science fiction novels, the so called *nauchnaia fantastika* (scientific fantasy), particularly due to

Verne's translations which, among many other foreign writers, such as H. G. Wells or Allan Burroughs, flooded the Russian market at the end of the imperial era (Siddiqi 2010: 20). Especially Verne's principal novels, *From the earth to the moon* (1865), *Around the moon* (1865) and *A trip around the moon* (1870), were highly praised by the Russian leading writers of the period, including Tolstoi, Chekhov and Turgenev, which contributed to Verne being, as put by Stites (1989: 53), "the most widely read foreign author of the age among Russians". In Russia, Vernian visions were often presented in the form of utopia, such as Bogdanov's *Krasnaia zvezda* [Red star] (1908), whose main hero, a scientist and revolutionist Leonid, is invited to visit a socialist Mars to learn the basics of the planet's socio-political system. However, it was largely Flammarion, the French astronomer famous for his popular science works, including *La pluralité des mondes habités* [The plurality of inhabited worlds] (1862) and *Astronomie populaire* [Popular astronomy] (1880), that laid foundations for what was later to become the first Russian non-fiction works. Russian publishers adopted the term *astronomicheskii roman* (astronomical novel) to denote Flammarion's class of fiction, which centered mostly around descriptions of outer space and space travel (Siddiqi 2010: 19). Siddiqi (2010: 19) notes that one of Flammarion's most important legacies in Russia considered literary representations of Mars, largely inspired by the Italian astronomer Giovanni Schiaparrelli's discovery of channels (*canali*) on the red planet in the 1870s, which led to the worldwide speculations on the existence of canals on its surface. The theory was also developed by a number of European and American scientists, including, for instance, Percival Lowell (see 2.3.4.3. for details).

According to Siddiqi (2010: 20), the first wave of homegrown science fiction in Russia was inspired by both Verne's fiction and Flammarion's popular science works and at least half of these novels represented the new genre of *astronomicheskii roman*. Examples might include the prose popularizing the recent astronomical discoveries like Krasnogorskii's *Po volnam efira* [On the waves of ether] (1913) or *Ostrova efirnogo okeana* [Islands in the ether ocean] (1914, co-authored with D. Sviatskii) as well as stories depicting the views of alien landscapes and extraterrestrial life, Infantiev's *Na drugoi planete* [On another planet] (1901) and Afanasiev's *Puteshestvie na Mars* [Journey to Mars] (1901). As suggested by Stites (1989: 61), the latter, often considered a dystopia, "warned against the modernization by describing Mars where the rise of cities, roads and factories has turned the simple, primitive, trusting, rural Martians into greedy, competitive, cannibalistic brutes and egoists – into a 'neurotic society'". Also, Tsiolkovskii's novellas tend to be classified as astronomical novels, for instance *Na lune* [First on the moon] (1893), originally published as a monograph supplement to *Vokrug sveta* [Around the World], *Grezy o zemlie i nebe* [Dreams of the earth and the heavens] (1895) or *Vne zemli* [Beyond the earth] (1920) which contained a number of scientific and technical concepts,

such as space stations, space suits, multistage rockets, space rockets or spacecraft takeoff and landing mechanisms. As put by Siddiqi (2010: 22), "the old tension between his vision of the future – fantastic, unbelievable, and utopian – and the language he used to communicate this vision – torpid, turgid, and inelegant – gave his fiction a strange tenor, one that firmly linked his fiction to popular science writing rather than creative literature". However, virtually none of the aforementioned novels exposed their readers to visualizations of space-themed elements of the plot. Only Tsiolkovskii's *First on the moon*, whose main heroes happen to wake up one morning at home which has been mysteriously transported to the moon's surface, is accompanied by two images. Interestingly, the author provides the audience with considerably realistic descriptions of the extraterrestrial body, including physical and geographical conditions affecting the roommates. A short novel was first published in the oldest Russian popular magazine *Vokrug sveta* [Around the World] and included the illustrations by Gofman presenting the heroes leaping on the surface of the moon and observing a total eclipse of the sun by Earth. What is more, most scenes were depicted with a dose of realism, portraying the body as a barren, rocky and unexplored area (Tsiolkovskii 1893):

> Ah, and there's the Moon – in its last quarter! Well, it couldn't fail to surprise us, since its width seemed three or four times greater than the diameter of the Moon we had seen before. And it shone brighter than by day on Earth, when it shows up like a white puff of cloud. Silence... clear weather... a cloudless sky... There were no plants and no animals.. A desert with a black sky and a blue dead Sun. No lake, no stream, and not a drop of water! Even the horizon wasn't any paler – that would have indicated the presence of vapors, but it was just as dark as the zenith! (...) Just mountains and mountains, horrible, high mountains, whose peaks didn't gleam with snow. No snowflake anywhere! There were the valleys, plains, plateaus... How many rocks were scattered there... (...) A gloomy picture! Even the mountains are bare, shamelessly unclothed, since we don't see the light veil – the transparent bluish smoke that the air casts over earthly mountains and distant objects... Severe, strikingly precise landscapes! And the shadows! Oh, what dark shadows! And what sharp transitions from shade to light! There are none of the soft tones that we're so used to and that can be produced only by an atmosphere. Even the Sahara – even that would seem a paradise in comparison with what we see here. We missed its scorpions, the locusts, the hot sand lifted by the dry wind, not to mention the occasional sparse vegetation and groves of fig trees... We had to think about returning. The ground was cold and exuded cold, so that our feet were chilling, while the Sun baked us. Overall, we felt an unpleasant sensation of cold. It was like when a person comes in from the cold to warm up in front of a blazing fireplace and can't get warm, because it's too cold in the room: his skin feels pleasant waves of warmth that can't overcome the chill. (Tsiolkovskii 1893)

What is more, Tsiolkovskii often illustrated non-fictional works with highly detailed and mechanical scientific drafts of space vehicles and equipment. The first known work of this kind is the scientist's unpublished manuscript *Astronomicheskie risunki* [Astronomical drawings] (1879), which depicts the solar system planets as well as the distances between them. Other examples include *Svobodnye prostranstvo* [Free space] (1883, published in 1954) which contained a sketch regarded as Tsiolkovskii's earliest attempt to portray a spacecraft; this simple drawing presents weightless explorers wearing spacesuits, a machine reminiscent of a canon which propels the spacecraft through the vacuum as well as primitive gyroscopes that steer the spaceship while travelling through space. These images, however, should be classified more scientific and technical drawings rather than Vernian- or space art-like visual representations of space exploration.

3.2.2. Space art in non-fiction works

As most scholars argue, the first instances of what is now considered space art appeared in non-fictional works of the second half of the 19th century. In particular, a 1874 publication of James Nasmyth and James Carpenter titled *The moon*, is widely believed to have initiated the astronomical art tradition (Miller 1978: 12, 1990: 32, 2014: 10). The book, being a classic study of the lunar surface and its origins, contained highly realistic illustrations which were the actual photographs of the precise plaster models of Earth's satellite juxtaposed against the black void of starry space (Miller 1978: 12). Miller (1990: 32) asserts that the images "were immensely influential, possessing both the inherent realism of the photograph and the catcher of two eminent astronomers". In 1887, *Cassel's Family Magazine* began publishing a lavishly illustrated series of stories, "Letters from the planets", written by W. S. Lach-Szyrma, which literally transported their readers to the sun and Solar System planets, including Mercury, Mars and the moons of Jupiter. The narratives were accompanied by evocative visuals produced by Paul Hardy which, among largely fictional and fantastical scenes depicting the Martian civilization, offered more realistic portrayals of extraterrestrial locations, such as the meteorites falling into the sun, believed to have generated its heat, the lunar mountains or the surface of Mars illuminated by its two satellites. A series of similar images called Guesses at Futurity and created by Fred T. Jane, appeared in *Pall Mall* magazine; some of these pictures, including *Interplanetary Communication: Gold Mining in the Mountains of the Moon* (1895) were strikingly realistic and reminiscent of the moon colonies visualized in the mid-20th century by R. A. Smith, one of the British Interplanetary Society space artists. Another instance of this kind includes *Stories of other worlds*, later published as a book titled *Honeymoon in space* (1901), written by George Griffith

and serialized by *Pearson's Magazine*. Illustrated by Stanley L. Wood, the stories exposed the audience to visions of planetary and lunar surfaces designed according to the principles set by contemporary science. One of the images, *A Glimpse of the Sinless Star*, shows the heroes wearing highly realistic space suits while walking on the moon (Miller 1978: 12). In 1908, *Cosmopolitan* published Well's article "Is there life on Mars?", which contained remarkably precise and atmospheric paintings of William R. Leigh depicting the Martian landscape through the lens of the Victorian science. Miller (1990: 35) describes his impressions as follows: "Solar-powered waterwheels the size of the Woolworth Building keep the great Martian canals flowing, spindly-legged birds and beasts congregate in Martian marshes, and cities bustle with gyroscope-equipped unicycles racing along precarious aerial tracks while sweet-faced winged Martians watch from their soaring towers".

Following the turn of the 20th century, popular science gained its momentum; as many popular science books appeared on the Western reading market, space art began evolving as the primary means to illustrate some of the points raised by the authors of such publications. One of the most notable professionals of this kind was Lucien Rudaux, regarded as one of the earliest genuine astronomical artists and credited with illustrating a number of popular science texts of the 1920s and 1930s, including *Astronomie les astres l'univers* [Larousse encyclopedia of astronomy] (1948), *Splendour of the heavens* (1923), *Manuel pratique d'astronomie* [Practical manual of astronomy] (1935) *Sur les autres mondes* [On other worlds] (1937) or magazines and periodicals, such as *La Nature*, *Popular Science* (which published reprints of his works) or *The Illustrated London News* which served as the main medium to spread space art works to the mass audience. Rudaux utilized a highly realistic and at the same time loose and impressionist style, mostly due to the use of watercolours, which gave the paintings both authentic and romantic quality. Miller (1978: 44) describes the artist's legacy as follows:

> His paintings are not burdened with extreme detail and are simple and geometric in design. They have a matter-of-factness about them. (...) To Rudaux, he was not painting fantastic, imaginary worlds, but places as real and substantial as our own earth. (...) Without trying to be photographic, his paintings have the appearance of being painted from life. Rudaux's careful attention to scientific accuracy is especially evident in his paintings of the lunar surface. Unlike his predecessors and contemporaries (...) Rudaux did not paint craggy, precipitous moonscapes. In fact, his depiction of the Moon's surface often bears an uncanny resemblance to Apollo photographs. It was due to the special knowledge afforded the professional astronomer. In *Astronomy* Rudaux pointed out that no one can actually *see* the lunar mountains in profile by simply looking through the telescope at the edge of the Moon, silhouetted against the night sky. (Miller 1978: 44)

Another notable space artist working for *The Illustrated London News* was Scriven Bolton whose technique was strikingly similar to that of Rudaux. His depictions of space subjects seemed equally dramatic and accurate due to the method he followed after James Nasmyth and James Carpenter based on adding details to previously constructed and photographed detailed plaster models of extraterrestrial bodies (see 3.2.2. for details). Often dubbed the forgotten space art pioneer, Bolton created many prominent works, including *Saturn Seen from Titan*, which later turned out to be enormously influential and served as the prototype for the future space and astronomical artists' unique style. Interestingly, both Rudaux and Bolten's works are believed to have inspired one of the greatest American space artists, Chesley Bonestell, who was also "providing architectural renderings for *The Illustrated London News* to indulge in space painting" (Miller 1992: 58).

The only well known American space artist of this era was Russell Butler, famous for painting the total solar eclipse (1918), the Earth as seen from the moon (1925) and Mars as seen from its inner moon Phobos (1930). For many years the three artworks were frequently copied by various artists and reprinted in a number of media, including *Natural History*, as well as remained on display in the Hayden Planetarium of the American Museum of Natural History (Lawrence and Milner 2000). Meanwhile, when it comes to pre-revolutionary Russia, it seems that there are no accounts of any particular space artists active at that time. However, there existed certain avant-garde individuals and movements clearly inspired by the Cosmists' ideas, particularly of Nikolai Fedorov, such as Kandinskii, Filonov or the Suprematists led by Kazimir Malevich, the latter of whom successfully "encapsulated the contradictions of the Soviet space fad" (Siddiqi 2010: 103). Although abstract in nature and presenting mostly geometric forms, some of Malevich's paintings, such as *Suprematism* (1917) or *Drawing* (1918) portray objects which are reminiscent of space stations or futuristic space cities and similar to those published in the Soviet pulp fiction and popular science magazines of the 1920s. Even a more striking instance of avant-garde artists inspired by Cosmism was an informal group known as Amaravella, the term derived from a Sanskrit word denoting "creative energy", "immortality sprouts" or "bearing light", founded in the 1920s and by Petr Fateev. Many works of the movement, including those of Sergei Shigolev, Boris Smirnov-Rusetskii, Viktor Chernovolenko or Aleksandr Sandar, the latter famous for his multi-media compositions which combined painting, sound and architecture like *Sound in Space* (1920), *Lunar Sonata* (1925) or *From the Moon to Space Way* (1930), were based on the concept of cosmic harmony and universal consciousness. What is more, they reflected both modern and national influences in visual arts and science, such as archaic and medieval

Russian art. However, most paintings exhibited by Amaravella, similarly to those of Suprematists, were still generically far away from space art works, mostly due to the artists' highly abstract, fantastical and often vague or hardly definable forms of artistic expression.

3.2.3. The rise of space art in American and Soviet magazines and popular science texts

Since the 1920s, American space art, initially merely occasionally, began appearing in early pulp and science fiction magazines which published both fantastical and popular science texts accompanied by illustrations, often mixing the two genres. One of the most prominent artists who worked for such publishers was Frank R. Paul (1884-1964) known for portraying dramatic and imaginative scenes replete with hardware in the form of enormous spaceships, robots, machines and aliens characterized by bright and sometimes even garish colours. Both Miller (1978: 15) and Nowakowski (2014: 14-16) note that the artist's illustrations are representative of the art noveau and pulp style; according to Miller (1978: 15), Paul's compositions were "drawn convincingly and authoritatively, although always with an odd flavor of art noveau". His legacy comprises thirty eight covers for *Amazing Stories* (1926-1929), seven covers and several dozen backcovers for *Amazing Stories Annual* and *Quarterly* (1939-1946; 1961-1968), one hundred and three covers for *Wonder Stories* (1929-1936) as well as numerous covers for *Science Fiction* or *Planet Stories*. Although most of his famous illustrations, such as the *Amazing Stories* cover depicting Well's *The war of the worlds* (1927), can be clearly classified as science fiction art, there are also works which are more astronomical in nature, such as the images produced for *Science and Invention* portraying Saturn rings' bizarre visual effects or the first U.S. colour painting presenting a space station, published in *Science Wonder Stories* (1929) (Miller 1978: 16, 136). What follows is Miller's comment (1990: 39) on the status of American early science fiction magazines and periodicals in the context of astronomical illustrations published within the domain of their tests:

> Science fiction magazines, interestingly enough, were far ahead of "respectable" journals in the accurate description of astronomical subjects. One of the first and probably the finest was Charles Schneeman's cover for *Astounding*, a view of Saturn as seen from Iapetus that remains one of the most outstanding astronomical paintings published in the first half this [20th] century. Other *Astounding* covers during the period were contributed by Gilmore, Hubert Rogers ("An Einstein Eclipse") and "A. von Munchausen". (Miller 1990: 39)

In the 1930s, Rockwell Kent, an American writer and one of the nation's highly valued painters and illustrators, created four lithographs for the 1937 issue of *Life* depicting, in the manner of astronomical art, four possible deaths of Earth, which largely anticipated Bonestell's set of the 1953 End of the World images. Also, as mentioned in the above quotation, another example of early astronomical illustrations was Charles Schneeman's cover for the 1939 issue of *Astounding* considered to be one of the finest instances of pre-Bonestell works. The same year, Charles Bittinger (1879-1970), one of the most highly regarded American artists of the first half of the 20th century, created a set of paintings for the 1939 issue of *National Geographic*, including *Eclipse of the Sun by the Earth* or *The Earth as Seen from the Moon*, alternatively known as *A Blue Globe Hanging in Space-The Earth as Seen from the Moon*. Miller (1978: 17) notes that:

> Bittinger's paintings were among the very first astronomical art to appear in a nationally distributed magazine and were described as "combining a fine sense of color values and artistic composition with a painstaking effort to achieve scientific accuracy". But with one of two exceptions, they are rather crudely done and the science is only slightly better. (Miller 1978: 17)

Similarly, Russia of approximately the same period, although most fictional and non-fictional works were largely science fiction oriented, experienced the rise of popular science publications. Their tradition goes back to the times of Peter the Great and at the turn of the century they were mostly dependent on private publishers and astronomical societies, such the Russian Society for Enthusiasts for the Study of the World, founded in 1909 in Saint Petersburg and led by Nikolai Morozov (Siddiqi 2010: 31). Both Morozov's and Tsiolkovskii's ideas related to space travel were published as fictional works in the first popular science journals, some of which emerged as early as in the late 19th century and flourished in the first two decades of the 20th century, including *Mirovedenie* [The Study of the Universe] established by the aforementioned society. Most titles, however, were short lived and only very few of them focused on astronomy; the great majority was preoccupied with discussing biology, geography, aviation or technology.

One notable exception to this rule were popular science and science fiction journals published by the Soikin Company, one of the most successful private enterprises in late imperial Russia which issued about thirty two magazines and periodicals, including *Priroda i liudi* [Nature and People] (1889-1918), *Vestnik znanii* [Journal of Knowledge], *Vokrug sveta* [Around the World], *V masterskoi prirody* [In Nature's Workshop], *Nauka i zhizn* [Science and Life] or *Mir prikliuchenii* [World of Adventure] as well as monographs on astronomy, rocketry, astronautics and space exploration. According to Siddiqi (2010: 34), a lavishly illustrated weekly *Nature and People* as well as other titles,

"communicated a sensibility that blurred the distinction between science and its popularization" in the way it combined science fiction with popular science discourse. Vladimir Riumin's "Na rakete v kosmicheskoe prostranstvo" [The rocket into cosmic space] from the 1912 issue of *Nature and People* is considered to be the first popular science article ever published in Russia which represented the style characterized by mixing fantasy with reality of space travel (Riumin 1912: 556-558, as quoted in Siddiqi 2010: 35):

> Who among us have not enthused over Jules Verne's fantastic novel "From the Earth to the Moon", and who knows that (…) Tsiolkovskii has already provided the basis for the actual possibility of interplanetary [travel], not in the form of belle-lettrist work but rather in a solid work, grounded in mathematics? (…) With the gracious permission of the same K. E. Tsiolkovskii, I would like to popularize his original idea – outstanding in its boldness [and] to make it accessible to a wide circle of readers. (Riumin 1912: 556-558, as quoted in Siddiqi 2010: 35)

Another prolific writer of popular science texts often published by the Soikin Company was Iakov Pereleman, the chief editor of *V masterskoi prirody* [In Nature's Workshop] and author of *Mezhplanetarnye puteshestviia* [Interplanetary travels] (1915), seen as the first and most significant monograph in the imperial Russia devoted entirely to science of space exploration. The book outlined how various authors and scientists envisioned space travel throughout the centuries and "drew a progressive but direct line from the cosmic dirigibles of H. G. Wells to the lunar spaceship of Jules Verne to Tsiolkovskii's theory of rocket flight through space" (Siddiqi 2010: 40). Pereleman also produced a number of articles which largely contributed to the rise of popular science discourse in pre-revolutionary Russia; this is how Siddiqi (2010: 39) evaluates the writer's legacy:

> Pereleman's principal contribution in the imperial era was to shift to public discourse of space travel from one of fantasy to plausibility. In the many articles on space exploration he wrote in the 1910s he bought a distinctively "rational" sensibility that relied on measured and modest language – the language of "true" science – giving the idea of cosmic travel a sheen of respectability on par with any other established and professionalized science such as mathematics or astronomy. (Siddiqi 2010: 39)

More importantly, however, it should be noted that some of the aforementioned popular science media and texts, which emerged in the late 19th century Russia, contain illustrations created by little known artists. Pereleman's aforementioned monograph, for instance, includes eighty images depicting interplanetary travels and various space vehicles, most of which represent the style of a technical drawing. More space art-like illustrations were used for the cover of the 1924 issue of *In Nature's Workshop* (vol. 4),

regarded as the first cover story which portrays the theme of space exploration in the form of a rocket juxtaposed against a starry cosmos. The image could be also considered a visual introduction to Perelman's article published in the volume, "Est' li zhizn na Venere?" [Is there life on Venus?]. Another example may be the cover story of the February 1931 issue of *Journal of Knowledge* (vol. 3) that presents the view of the mountainous landscape of an alien planet with an enormous sun looming on the horizon. This evocative and romantic picture announces a series of articles which speculate on various aspects of space science, including Romm's "Ot chego svetit solntse?" [Why does the sun shine?], Arrenius's "Zhizn na nebesnykh telakh" [Life on celestial bodies] or Gorshkov's "Shto novogo po voprosu o forme i razmerakh Zemli" [What's new about Earth's form and size?].

A particularly interesting image is the 1928 black and white cover of *Around the World* (vol. 24) which represents a mountainous lunar landscape with the view of Earth seen from the moon. The scene is accompanied by a caption which states: "The world of the moon is the world of contrasts: the light and shadows, the high mountains and deep cracks, the sweltering days and cold nights…"[2] that aims to illustrate Nabokov's two page article from the issue titled "Mir luny" [The world of the moon]. Meanwhile, the 1937 cover of *Science and Life* (vol. 4) depicts the view of the red planet which serves as a prologue to the article by A. Mikhailov titled "Obitaemy planety?" [Are the planets inhabited?]. The text is illustrated by a few technical drawings, including the map of Mars, the schema of Mars's and Earth's orbits as well as the picture used for the aforementioned cover story. These and similar images, although not officially regarded as the first instances of the Soviet space art, can be informally classified as such due to their remarkable resemblance to the U.S. expressions of the genre in the same period. The most striking difference, however, would be that while American illustrations are mostly astronomical art works, their Soviet counterparts can be deemed more fantastical and imaginative.

3.2.4. Space art in print and broadcast media since the 1940s

3.2.4.1. The American cultural and literary context

Astronomical and space art began flourishing in the 1940s and 1950s popular culture, particularly in the years following the launch of Sputnik in 1957. Both in the U.S. and the Soviet Union, various representations of outer space and space exploration produced by the most renowned artists working within the

[2] Translation mine, KB.

genre, appeared in science fiction, general interest and popular science magazines and periodicals, including *Life*, *Collier's*, *National Geographic*, *Coronet*, *Omni*, *Popular Mechanics*, *Sky & Telescope*, *Tekhnika molodezhi* [Technology for the Youth], *Iunyi tekhnik* [Young Technician], *Ogoniok* [Little Flame], *Molodezh mira* [Youth of the World], *Vokrug sveta* [Around the World] or *Nauka i zhizn* [Science and Life]. Some works of the leading representatives of the genre in this period, namely Chelsey Bonestell or Nikolai Kolchitskii, were also published in popular science books, such as *The conquest of space* (1949) and *Exploration of Mars* (1956) (Bonestell's paintings) or science fictions novels like Mikhail Vasil'ev's *Puteshestviia v kosmos* [Travels into space] (Kolchitskii's paintings).

A higher demand of the publishers for such images seem to have served a clear purpose, namely to convince the nation that the government's space programme, which put forward the concept of exploring the final frontier, was in fact feasible and worth pursuing. In the 1940s, representing space travel and alien worlds in the U.S. popular culture was predominantly confined to the realm of science fiction genre; in contrast, the promotion of space travel in Europe at that time was mostly the domain of scientists and engineers (McCurdy 2011: 34). The previous two decades have marked an enormous interest of Americans in completely fictional extraterrestrial scenarios whose plot derived more from a fantasy genre than science as such. Early 20th century America witnessed an influx of pulp fiction magazines and periodicals, such as *Amazing Stories*, *Galaxy Science Fiction* or *Astounding Science Fiction*, which commenced the golden age of science fiction of the 1930s and 1940s. Soon, the Hollywood film industry followed suit, producing fanciful television series, including *Captain Video* (1949-1955), *Buck Rogers* (1950-1951) or *Tom Corbett*, (1950-1955) which contributed to the otherworldly image of space exploration (McCurdy 2011: 35). Extraterrestrial travels were intended to seem unreal and astounding both to attract science fiction fans and provide entertainment for other audiences.

On the other hand, a group of first-generation astrofuturist writers with an impressive intellectual background in technoscience, including Arthur C. Clarke, Robert Heinlein, Willy Ley or Isaac Asimov, provided an outlet for new, highly probable science fiction scenarios (Kilgore 2003: 64-65). By definition, astrofuturism can be described as:

> the tradition of speculative fiction and science writing inaugurated by scientists and science popularizers during the space age of the 1950s. Although it draws upon a rich history of science fiction, astrofuturism as a narrative genre is distinguished by its close connections to engineering projects funded by the government and the military. (Kilgore 2003: 2)

Von Braun's *The Mars project* (1953) seems to serve as a good example of science fiction prose written in the tradition of American astrofuturism; a manmade expedition to the red planet in the late 1940s can be seen as a continuation of the U.S. territorial expansion aimed to conquer and terraform new lands. The ideology, persistent especially in mid-20th century space-oriented popular culture, to a large extent dominated the print and broadcast media, utilizing imperialist, capitalist as well as utopian motives in its promotion of exploration and colonization of the universe. A similar trend might be observed in space art created in the manner of descriptive realism and often commissioned by editors of some of the major mid-century general interest and pulp magazines.

Hence, to provide a sensible balance to science fiction and fantasy visuals, specialists came up with the idea of exposing the audience to more realistic depictions which could be found in a number of American popular media. Various artists, scientists and engineers began to evolve an interest in portraying alien worlds that were far from the imaginary realms promoted by science fiction or fantasy writers and illustrators. Highly convincing representations of extraterrestrial landscapes and manned space missions provided a chief outlet for visuals communicating the idea of space exploration to the American and Soviet public and greatly contributed to its popularization. In the U.S., space and astronomical art works were even commissioned by editors of science fiction and pulp magazines, such as *Amazing Stories*, *Astounding Science Fiction* or *The Magazine of Fantasy & Science Fiction* which replaced some of the usual fantastic and melodramatic visions of space adventures with realistic views of the Solar System planets and beyond (McCurdy 2011: 51). According to Miller (1978: 19),

> [space art] helped convince the public that space exploration was far from a fantasy and that it was well within the reach of contemporary science and engineering. Beyond the question of hardware, realistic and accurate paintings of their worlds showed that the moons and planets were not as insubstantial as fuzzy astronomical photographs made them seem, but were genuine worlds in their own rights. (Miller 1978: 19)

As mentioned before, astronomical and space art began appearing in a number of science fiction, general interest and popular science magazines which flourished since the 1940s. Examples might include the publication of Chesley Bonestell's series of paintings depicting Saturn in a 1944 edition of *Life* or the 1950s *Collier's* Man Will Conquer Space Soon!, whose team of engineers, writers and artists, such as Wernher von Braun, Willy Ley, Chesley Bonestell, Rolf Klep and Fred Freeman, were supposed to provide the U.S. public with unforgettable narratives and portrayals of early manned space missions (Hardy 1989: 16). As put by Hardy (1989: 16), the enterprise was highly successful:

> From 'a baby satellite' to a full-scale, 150-foot wheel-shaped space station and a fleet of three moonships built in orbit, the team convinced the USA, then the rest of the world, that space travel could become a reality, and created a climate in which the National Aeronautics and Space Administration (NASA) could begin its work. (Hardy 1989: 16)

Two years later, the same set of articles and images was collected and published in the 1950s popular science books, *Across the space frontier* (1952), *Conquest of the moon* (1953) and *The exploration of Mars* (1956). Also, as pulp magazines constituted the mainstream market in the decade, there were numerous artists who combined space fiction and space art when creating marvelous visions of outer space and space exploration, most of whom maintained their own individual style. These include Mel Hunter, famous for producing illustrations for *Galaxy* and *Amazing Stories* as well as painting a highly dramatic and sublime interior of the lunar crater for *Time-Life*; Jack Coggins, a British-American artist who illustrated several popular science books on space travel, such as *By space ship to the moon* (1952) or *Rockets, jets, guided missiles and spaceships* (1951) as well as worked for science fiction magazines, notably *Galaxy* and *Astounding/Analog*; Alex Schomburg, a Puerto Rican artist best known for creating the first cover of *The Magazine of Fantasy and Science Fiction* (Jan. 1953); Frank Tinsley, a science and aviation reporter who published and illustrated popular science books on spaceflight, such as *The answers to the space flight challenge* (1958); Edward Valigursky, famous for creating cover art for science fiction magazines, such as *IF: Worlds of Science Fiction* in the form of both planetary landscape and space hardware; Ralph Andrew Smith, the British artist known for his cooperation with the British Interplanetary Society and Arthur C. Clarke, for whom he illustrated several books on space exploration, including *Interplanetary flight* (1950), *The exploration of space* (1951) or *Exploration of the moon* (1954) (Hardy 1989: 17-19; Miller 1990: 41-42).

It should be also noted that certain astronomical and space traditions in depicting space exploration can be related to the development of popular science discourse in the post war America which remains, along with science fiction, one of the two chief expressions of astrofuturism. As put by Kilgore (2003: 82): "As popular science, its pedagogical mission is explicit: through science journalism, polemical articles, and books, astrofuturists present their program as a pragmatic goal for real-goal science and technology. They call upon the authority of science with charts, mathematical quotations, and blueprints based on contemporary technology". However, due to technical and scientific complexities of popular science discourse, astrofuturists often turned to science fiction in order to attract a wider audience. For this reason, they

utilized entertaining and familiar conventions of the genre when narrating the details of spaceflight, particularly a "sense of wonder", often fostered by science fiction writers, such as Arthur C. Clarke, Isaak Asimov or Robert A. Heinlein, and standing for an emotional and intellectual enlightenment of the reader who suddenly confronts and comprehends a given idea anew. *Brave New Words: The Oxford Dictionary of Science Fiction* (2007: 179) translates the term as "a feeling of awakening or awe triggered by an expansion of one's awareness of what is possible or by confrontation with the vastness of space and time, as brought on by reading science fiction". Csicsery-Ronay, Jr. (2002: 71) argues that since the pulp era, the concept was conveyed predominantly by science fiction magazines, such as *Astounding*, *Wonder Stories* or *Amazing Stories*, which evoked two closely related categories of response, the expansive sublime and the intensive grotesque, the latter defined as "a quality usually attributed to objects, the strange conflation of disparate elements not found in nature". Drawing on this view, one may conclude that science fiction literature, film industry and selected space art works are likely to trigger the sublime sense of wonder by suspending one's knowledge about the world and distorting commonly known scientific facts and natural phenomena. The use of a sense of wonder was also present in popular science discourse where it reinforced a fictive and futuristic element of technoscientific speculations as well as helped define "humanity as *homo faber* grappling with an immense universe, comprehending that larger nature through science and subduing it with technology" (Kilgore 2003: 83).

On the other hand, Kilgore (2003: 72) characterizes the early popular science discourse in the 1950s America as credible and focused on communicating the idea of space travel to the public via realism rather than pulp and science fiction scenarios:

> By the mid-1950s, the conquest of the space frontier seemed to be an idea whose time had come. The derision and embarrassed dismissal the subject had encountered in earlier years evaporated as a growing number of writers and artists with solid science and engineering credentials came forward to promote it. In contrast to an earlier generation of writers who used space as a background for formulaic pulp adventures, many of these new writers, including von Braun, held positions of authority within the scientific and technical communities of their day. Although their faith in the importance of space and its relevance to a scientific agenda made them a definite minority within those communities, they could not easily be dismissed as crackpots. They were tied into a postwar military-industrial complex that was actively experimenting with the new rocket technology, doing research and development that had government sanction. The aerospace industry that emerged from this constellation of interests in the 1950s also realized the importance of selling the new technology to the public. The

> American people had to be convinced that the investment being made in rocket technology was the only sure way of guaranteeing a tranquil and prosperous future. The astrofuturist agenda, as a result, dovetailed nicely with the interests of the aerospace industry. As astrofuturists wooed the public with their wonderful space futures, they also dymistified rocket technology and advertised the benign intent of the industries behind it. Their message was that crossing the space frontier was no fantasy for the far future; rather, it was a goal that could be accomplished in the near future. Their books and articles presented a conquest of space that would not threaten social and political constants. On the contrary, it would allow for an endless renewal of the democratic values and prosperity central to the American way of life. (Kilgore 2003: 72)

Hence, popular science discourse produced by the postwar generation of astrofuturists, including Wernher von Braun, Krafft Ehricke, Willy Ley, Robert A. Heinlein or Arthur C. Clarke, seems to have represented a science-fictional genre which, despite its marginal status, successfully introduced various space-related ideas to the American public. The narrative models of how to convey space travel to a wide audience tended to combine the Western patterns of technosocial thinking with 19th century romantic imagination which presented the subject as "an American destiny emerging inevitably out of the national experience" (Kilgore 2003: 81). As argued by Kilgore (2003: 80):

> Through their popular science and science fiction, von Braun and Ley re-created the conversion and enlightenment experience that characterized their own youthful reading of Verne, Wells, Lasswitz, and Oberth. They created a unique blend of technoscientific extrapolation and fantastic adventure for "rocket-minded" youths conscious of the possibilities the conquest of space could offer. They helped create a social and political consensus that mirrored the official culture of mid-twentieth-century America and that found cultural legitimacy in the "man in space" movement of the 1950s. (Kilgore 2003: 80)

Also, both science fiction and popular science film industry of the 1950s and 1960s began utilizing space artists' works to illustrate either scientific particulars of space technology or space adventurous and informative scenarios. In the U.S., Bonestell's realistic images often served as the framework for presenting melodramatic fantasy plots. Examples may include Pichel's *Destination moon* (1950), regarded as the first major American science fiction film which won the 1950 Academy Award for special effects and portrayed a highly probable scenario of the moon landing. Meanwhile, Haskin's 1955 *Conquest of space*, based on Bonestell and Ley's speculative science book of the same title (1949), pictures a manned mission to Mars, offering awe-inspiring images of Martian landscape, high-tech equipment and the vastness of the universe. Maté's *When worlds collide* (1951), also

considered an exceptionally realistic space adventure film of the post-war era, depicts a struggle of a small group of engineers to construct the rocket which will enable them to leave Earth in the face of impending danger from outer space (Hardy 1989: 14). However, as most of these productions failed to be popular among varied audiences, science fiction film producers decided to abandon realism and replace it with well known fantasy formulas for the next several years (McCurdy 2011: 54).

Kubrick's *2001: A space odyssey* (1968) can be seen as one of the exceptions to this rule as his epic utilizes diverse forms of realistic and unforgettable cosmic imagery, some depicted by Chesley Bonestell. For instance, in one of the last scenes, when Dr. David Bowman leaves his spaceship to examine a monolith discovered in Jupiter's orbit and is suddenly pulled into a tunnel of light, the viewers witness the vast distances of space, outrageous astronomical phenomena and bizarre alien landscapes of extraordinary colours. Also, the whole *Star trek* series (1966-1967, 1968-1969) used a number of space artworks produced mostly by Rick Sternbach, Dave Archer and Mike Okuda which depicted awe-inspiring views of outer space and space exploration. Some of these images, including Sternbach's *Neptune Seen from Triton* or a few other untitled paintings, were also published by *Astronomy* and *Fantasy & Science Fiction* in the 1970s.

Meanwhile, in the domain of popular science, one of the first attempts at educating the public about abundant prospects of human interplanetary exploration was made by Walt Disney who, in collaboration with Wernher von Braun and Willy Ley, produced a television series, including *Man in space*, *Man and the moon* and *Mars and beyond* (1955-1957). The shows summarize a history of rocket science as well as introduce the audience to the basics of the first manmade spaceflight and extraterrestrial conditions in outer space. Although in popular form, the programmes adopt a serious tone, explaining the technical details of solar system trips as well as scientific facts about astronomical phenomena and celestial bodies encountered by space travelers.

Some academics argue that many productions of the 1950s astrofuturist culture of space were intended to present the American public with "elaborate visions of promise and fear" and thus prepare them for the conquest of space (McCurdy 2011: 61). The launch of Sputnik 1 and Sputnik 2 contributed to the rise of Cold War national security concerns, justifying the main space programme policy objectives. However, contrary to a common misconception, at the outset of the space age not everyone shared the enthusiasm of Wernher von Braun or other space pioneers and visionaries. In fact, the Eisenhower administration were more likely to include the modernization of the national school and highway system or anti-nuclear range of ballistic missiles rather than space exploration projects in the list of

their priorities. In response to that, James Killian, the chairman of the president's science advisory committee, gave an outlet to his strong advocacy of space efforts in the form of a short pamphlet, *Introduction to outer space* (1958), which was later published and sold to the American public for only fifteen cents (McCurdy 2011: 64-65). It introduced the U.S. citizens to the question of artificial satellites and automated spacecraft as well as their practical implementation in science and technology with little emphasis on the actual manned spaceflight mission. As the embodiment of the government's space policy, the pamphlet remained an alternative to the dominant point of view and stood mostly in opposition to science fiction popular culture promoting a romantic and adventurous vision of human expeditions to the moon and nearby planets. As suggested by McCurdy (2011: 66), an ambiguous character of the U.S. space-oriented popular culture had its effect on public opinion; by 1955 a number of Americans who believed that manned space missions which would occur in the next 50 years increased to 38 percent. Still, in 1960 when asked if the government should spend over 40 billion dollars to send a man to the moon, 58 percent of the surveyed gave a negative answer, yet at the same time claiming that such a mission would be accomplished within the next decade.

In the 1960s and 1970s, astrofuturists' activities attracted much more attention of the U.S. public and space-related themes became more prevalent in popular culture, also due to Kennedy's policy objective to send Americans to the moon. *Life*'s numerous articles and pictures of the decade were often devoted to spreading the Apollo myth, especially the construction of the image of an astronaut and the prospect of moon landing. For example, "Man's journey to the moon" (27 Apr. 1962), "America's giant jump into space" (25 Sep. 1964), "16 pages of fantastic color: The space walk" (18 Jun. 1965), "Most remarkable views of earth ever recorded" (24 Sep. 1965), "Astronaut Conrad at start of flight" (3 Sep. 1965), "The true color of the moon" (1 Jul. 1966), "Highest photos of earth taken by man" (5 Aug. 1966), "Barnstorming the moon" (6 Jun. 1969), "On the moon" (8 Aug. 1969), "To the moon and back" (11 Aug. 1969) or "Apollo 12 on the moon" (12 Dec. 1969) remain one the most telling cover stories offered by the magazine. The readers were presented with a brief explanation of both Mercury and Apollo programmes, astronauts' personal stories as well as magnificent pictures taken in space, never witnessed before in colour. In the years 1969-1970, the magazine published another series of articles, Of a Fire on the Moon, non-fiction works by Norman Mailer narrating the Apollo 11 moon landing. Consisting of three installments, *A fire on the moon*, *The psychology of astronauts* and *A dream of the future's face* and outfitted with a number of photographs drawn from NASA archives, the text contemplates the technologies and metaphysics of the lunar mission as well as its impact on the American psyche. What is more, in

the 1960s, popular science discourse in the U.S. continued the traditions established in the previous decades. As argued my McCurdy (2011: 105), most articles offered highly detailed and fact based descriptions of extraterrestrial objects, spaceflight and other space exploration endeavours with no or little attempt at philosophizing:

> During the early 1960s, the public possessed a seemingly insatiable appetite for information about space science and technology. Sensing this interest, television networks and print journalists devoted extensive resources to the process of informing the public about the details of space flight, hiring science reporters and displaying their work. Newspapers provided elaborate accounts of rocket technology, orbital dynamics, life support, guidance and control, and reentry mechanics. They explained communication blackouts, space medicine, rendezvous and docking, and a host of other details regarding space exploration. Words in print followed the tradition established by writers of popular science two decades earlier, whose books led readers step by step through the details of space flight without much interpretation or philosophizing. (McCurdy 2011: 105)

Illustrations and images accompanying popular science discourse in both broadcast and print media tended to reflect a similar pattern. Particularly, the late 1970s and 1980s witnessed a revival of public interest in popular science which experienced a clear decline since the mid-1960s. The trend, dubbed by *Newsweek* "the science boom", led to the appearance of Carl Sagan's famous television series *Cosmos* run by the PBS since 1980 or the publication of several new popular science magazines, including *Astronomy* (the first issue appeared in 1973), *Omni* or *Star & Sky*, which all featured astronomical phenomena and the current advancements in space science (Westwick 2007: 37). Michaud (1986) mentions the names of one of the most renowned space artists, including Robert McCall or Gerard K. O'Neill, whose works occurred in both mainstream and peripheral media in the middle of the space age era:

> During the height of the space age, Robert McCall became a significant contributor of space paintings, doing artwork for *2001* and a dramatic mural for the National Air and Space Museum in Washington, D.C. McCall's 1971 painting of a city floating over the Arizona desert might be seen as an evolution of architect Paolo Soleri's arcologies on the one hand and an indirect precursor of Gerard K. O'Neill's space colonies on the other. During the later 1970s, younger space artists found good outlets for their work in new astronomy and science fact magazines, reaching a larger audience. One of them, Don Davis, did depictions of Gerard O'Neill's space colonies, which were still being sold as posters by the L-5 Society in 1984. (Michaud 1986)

The aforementioned sources made a creative use of space art by various representatives of the genre. These include Robert McCall, who produced artwork for *Life* magazine in the 1960s, NASA for which he documented the history of the U.S. space programme, Kubrick's *2001: A space odyssey* (1968) or *Star trek: The motion picture* (1979); William K. Hartmann who illustrated numerous covers of *Natural History*, *Smithsonian and Astronomy* or *American Scientist*; Don Dixon who created cover art for *Scientific American* and *Sky and Telescope*; Michael Carroll, an illustrator for *Time* and *National Geographic*. Also, since the 1950s, *Fantasy & Science Fiction*, *Astounding/Analog* and other magazines utilized numerous space art works. In particular, their cover art was often created by some of the best known British and American space artists of the 20th century, including David A. Hardy,[3] Chesley Bonestell, Pamela Lee,[4] Robert McCall, Ron Miller,[5] William K. Hartmann,[6] Michael Carroll,[7] Don Dixon,[8] Pat Rawlings[9] or Bob Eggleton.[10]

[3] David A. Hardy (1936-) is the British space artist and the longest-established living professional in the field. He is mostly famous for painting for the British Interplanetary Society as well as illustrating a number of covers for books and magazines, including *Analog Science Fiction and Science Fact*, *The Magazine of Fantasy and Science Fiction*, *Sky & Telescope*, *Astronomy*, *Popular Astronomy* or *Astronomy Now*. His style is often reminiscent of that of Chesley Bonestell and classified as both highly credible and inspiring descriptive realism (Gustafson and Nichols 1995: 542).

[4] Pamela Lee (1949-) is the American space artist. After having been introduced to space art by William K. Hartmann, the genre soon became her specialty. She is particularly well known for her engagement in the NASA Art Programme and related projects as well as illustrating covers for science fiction novels, including Bova's *Mars* (1993), Sullivan's *Dreaming in smoke* (1998) and others ("Lee, Pamela" 2014).

[5] Ron Miller (1947-) is the American space artist as well as author of fantasy novels and numerous books devoted to space art (see the references). After having worked as the art director for the Smithsonian Air and Space Museum's Albert Einstein Planetarium, he was engaged in various NASA projects, including NASA art workshops or a 1991 series of U.S. Postal Service stamps commemorating the national space programme. He is also active as an illustrator of science fiction books (e.g. Small Press books), magazines (e.g. *Analog*, *Asimov's Science Fiction*) and films, such as *Cosmos: A personal voyage* (1980) or *Dune* (1984) ("Miller, Ron" 2014).

[6] William K. Hartmann (1939-) is the American astronomer, painter and author of non-fiction books on astronomy, planetary science and space art, including *Out of the cradle: Exploring the frontiers beyond earth* (1984, co-written with Pamela Lee and Ron Miller), *In the stream of stars: The Soviet/American space art book* (1990, co-written with Ron Miller, Vitaly Myagkov and Andrei Solokov) and science fiction novels, such as *Mars underground* (1997). He also made a name for himself by illustrating astronomical concepts and phenomena for popular science magazines like *Sky & Telescope*, *Natural History* or *Smithsonian and Astronomy* ("Hartmann William K." 2014).

[7] Michael W. Carroll is the American award-winning astronomical, science fiction and paleo artist as well as science journalist. His art has appeared in magazines, such as *Time*, *Sky & Telescope*, *National Geographic*, *Astronomy Now* or *Astronomy* and books covers

Meanwhile, when it comes to space artists of origins other than Anglo-American, the name of Ludek Pesek should be mentioned in the context of the 1960s and 1970s. The magnificent works of this Czechoslovakian-Swiss painter had been already known in Europe by the time they were first published in the U.S. One of his major books, such as *The moon and the planets* (1963) and *Planet earth* (1972), remained largely unexplored by the American public until 1970 when his dramatic vision depicting a close view of Saturn's rings came out in the August 1970 issue of *National Geographic*. As noted by Miller (1990: 42), Pesek's composition had an everlasting impact on the current trends of the U.S. space art: "Pesek's work was a breath of fresh air; it combined realism with a painterly style that never attempted to be photographic. Yet, ironically, it was just this relatively loose, matter-of-fact technique that enhanced his art's believability: they looked like painting that had been created on location".

As the 1970s witnessed numerous advancements in space research and exploration provided by the Pioneer, Mercury, Viking, Voyager, Apollo, Space Shuttle and Skylab programmes, the commercial demand for space art considerably increased. The decade marked the end of few and isolated specialists in the field and saw the emergence of a number of individual space painters and illustrators (Miller 1990: 42). Each of the aforementioned artists represented their own style, however, most of them followed the science- and fact-based tradition characteristic for astronomical art, often seen as the predecessor and closest parallel to space art, as well as focused on depicting the cosmic environment as a new frontier of mankind.

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illustrating Carl Sagan's or Arthur C. Clarke's stories. He is also known as a founding member of the International Association of Astronomical Artists ("Vitae" 2014).

[8] Don Dixon (1951-) is the American astronomical artist famous for his lifelong involvement in various speculative documentary and film projects, including *Overlords of the U.F.O.* (1976), *Battle beyond the stars* (1980) or *Wolf creek* (2005), as well as his science fiction covers, created for *The Magazine of Fantasy and Science Fiction*, *Colonies in space* (1977), *Nemesis* (1989) or *The Martians* (1999) ("Dixon, Don" 2014).

[9] Pat Rawlings considers himself a space illustrator and designer best known for documenting the future of space exploration in a highly realistic and visionary manner. His paintings and digital images appeared in numerous books (e.g. Ballantine Books, Tor Books, Time-Life Books), magazines (e.g. *Aviation Week & Space Technology*, *Analog*, *Scientific American*, *Air and Space/Smithsonian*) television programs and films (Walt Disney Television Productions, IMAX Space Films, the 1996 3D IMAX film, *L5: First city in space*) or Encyclopaedia Britannica ("Artist Bio" 2014).

[10] Bob Eggleton (1960-) is the American astronomical, science fiction, fantasy, horror and landscape artist. His art appeared in many magazines and books, the latter of which include *The first man in the moon* (1989), *Dragonhenge* (2002) or *The stardragons* (2005). He is also the winner of 12 Chesley Awards, 9 Hugo Awards, 2 Locus Awards and the 1999 Skylark Award ("Who's Bob" 2014).

3.2.4.2. The Soviet cultural and literary context

Similarly to its U.S. counterpart, one of the leading forces constituting the Soviet public discourse about space were, as mentioned before, popular science magazines, including *Tekhnika molodezhi* [Technology for the Youth], *Vokrug sveta* [Around the World], *Znanie – sila* [Knowledge – Power] or *Nauka i zhizn* [Science and Life], which helped determine the ideology and imagery of the cosmic enthusiasm, thriving particularly in the 1950s and 1960s. Following Tsiolkovskii's ideas, popular magazines of the period described in detail the technical and scientific aspects of spaceflight, promoted the ongoing successes of the Soviet space programme as well as explained the greatest mysteries of the universe (Schwartz 2011: 233-234). For instance, while *Knowledge is Power* released a special 1954 issue devoted to the first manned mission to the moon to take place in 1974, *Technology for the Youth* published a nationally acclaimed science fiction story about interplanetary contacts (Schwartz 2011: 235). According to the history of NASA (2014), such journals could have played an important role in igniting the space race:

> Perhaps the most widely publicized Moon-rocket project in the Soviet Union is that proposed by Yu. S. Khlebtsevich, which made its first appearance in an article entitled "On the Way to the Stars", in Tekhnika-Molodezhi in July 1954; later it was published in an expanded form as The Road Into the Cosmos, in the November 1955 issue of Nauka i Zhizn'. Khlebtsevich suggests landing a mobile "tankette-laboratory" on the Moon. The tankette, which would weigh not more than a few hundred pounds and would be radio controlled from the earth, would explore the surface of the moon and report its findings back to earth. Information so obtained would make possible the next stage-the mastery of the Moon by man in the next 5 to 10 years. ("Astronautics and other countries: Astronautics in the USSR" 2014)

However, despite a great number of articles and visuals whose content lavishly promoted space exploration in literary, scientific and propagandistic terms, the public generally remained indifferent toward such themes. As the 1950s space propaganda was mostly associated with Stalinist politics, it was rarely mentioned in the national newspapers and often met with disinterest or even open criticism reflected in popular culture of the period, such as Eldar Riazanov's 1956 comedy drama entitled *Karnavalnaya noch* [Carnival night] or Grigorii Danelia's *Tritsat tri* [Thirty three] (1965) which clearly ridiculed the topic of extraterrestrial life.

The nationwide popularity of the Soviet science fiction film industry has boosted since the 1920s with the appearance of the first picture of this kind produced in Russia, *Aelita* (1924) (Siddiqi 2010: 99). Based on Aleksei Tolstoi's novel of the same title, the film is famous for its Cosmist overtones as well as contribution to the popularization of spaceflight in the 1920s Soviet culture.

It also features the Martian landscape, particularly toward the end of its action, presented in a highly futuristic, constructivist and mechanistic manner with human-like inhabitants wearing metal and acrylic costumes. In other early Soviet science fiction films, such as Vasili Zhuravlov's *Kosmicheskii reis* [Cosmic voyage] (1935) with screenplay consulted by Konstantin Tsiolkovkii and concept art prepared by Iurii Shvets, Mikhail Kariukov and Aleksandr Kozyr's *Nebo zovet* [Battle beyond the sun] (1959), later re-edited for the U.S. version of the film directed by Francis Ford Coppola (*Battle beyond the sun*, 1962), Pavel Klushantsev's *Planeta bur* [Planet of the storms] (1962) or Evgenii Sherstobitov's *Tumannost Andromedy* [The Andromeda nebula] (1967), explorations of alien planets and species are often portrayed as optimistic, either humorous or dramatic, adventure stories accompanied by depictions of an uncanny and infinite void of the cosmos as well as outlandish extraterrestrial landscapes replete with volcanic eruptions, monstrous creatures and hostile plants. Such depictions, however, seem to have employed the style of fantasy and science fiction rather than space art.

In the realm of popular science, Pavel Klushantsev's documentaries, considered to be one of the first of this kind, were particularly widespread among the audience, mostly due to their visionary and awe-inspiring scenery as well as the use of numerous visual effects and techniques then considered revolutionary and much ahead of the director's time. Examples of his most renowned science-grounded short films include *Doroga k zvezdam* [Road to the stars] (1957), *Luna* [Moon] (1965), *Mars* [Mars] (1968), *Vizhu zemliu* [I see the earth] (1970) some of which served as the basis for popular science books authored by Klushantsev himself, such as *K drugim planetam!* [To other planets] (1962) or *Stantsiia 'Luna'* [Station 'Moon'] (1974). Klushantsev's 1960s films *Moon* and *Mars* "combined science education with realistic portrayals of science fiction, even though the (…) two were hybrids of documentary and theatrical film, switching from scientific lectures and interviews to dramatic demonstrations of scientific principle" (Lewis 2008: 264). What is more, most pictures followed a similar pattern and utilized both highly evocative depictions of spaceflight and extraterrestrial landscape with a science-grounded discourse. Scott and Jurek (2014: 12) praise Klushantsev's *Road to the stars* for its realistic portrayal of the manned spaceflight mission and space station which are visually reminiscent in a number of aspects to Kubrick's epic scenes from *2001: A space odyssey* (1968):

> Two years after the broadcast of Walt Disney's "Man in Space" caused a sensation in America, the Soviet Union realized their own speculative science documentary depicting man's future in the cosmos. *Road to the Stars* (…) was a stunning, hour-long, color cinematic preview of man's first foray into space, including the construction of a huge revolving space station and a first landing on the Moon.

> (…) Americans got their first exclusive extended preview of scenes from Klushantsev's film on May, 11, 1958, when Walter Cronkite introduced grainy black-and-white footage from *Road to the Stars* in an episode of the CBS News weekly documentary series *The Twentieth Century*. The episode, "Ceiling Unlimited", speculated on the Soviet Union's long-range plans in space in the wake of *Sputnik 1*, and included interviews with rocket scientists Wernher von Braun and Krafft Ehricke. (Meerman and Jurek 2014: 12)

Following the outset of cosmic enthusiasm in the mid-1960s, popular science magazines, particularly *Technology for the Youth*, *Knowledge is Power, Around the World* and *Science and Life*, largely increased their circulations and published a considerable number of space art works, including those of Nikolai Kolchitskii, Aleksandr Pobedinskii, Georgii Pokrovskii, Stefan Lefterov, Sergei Gavrish, Iurii Shvets, Oleg Kirienko as well as Andrei Sokolov and Aleksei Leonov, who collaborated on a number of compositions (see 1.5. for details about cosmic enthusiasm in the USSR). As argued by most scholars, these journals "became the leading voices for the public discourses about outer space during the Thaw and, hence, defined the imagery and ideological boundaries of cosmic enthusiasm" (Schwartz 2011: 233). They predominantly served an informative function, namely they educated their readers about the technicalities and scientific particulars of space research and exploration as well as revealed the greatest mysteries concerning the evolution of the universe. After Stalin's death, a range of space-related themes was widely discussed in popular science magazines and, what is more, became one of the most prominent and politically neutral topics, often lavishly illustrated. For instance, the 1954 issue of *Knowledge is Power* launched a special series of articles depicting a detailed fictitious scenario of the first manned mission to the moon dated 1974.

Interestingly, while portraying outer space and space exploration most of these journals focused on glorifying the ongoing achievements of the Soviet space programme as well as gallant efforts of the cosmonauts presented as revered heroes. Schwartz (2011: 236-237) elaborates on the phenomenon:

> The popular scientific journals constructed the cosmonauts in this 'figurative sense' as actualized Stalinist heroes, who personified the promised glorified future of a better world, the earthly paradise to come, and propagated the Russian words of Druzhba (friendship) and Mir (peace) worldwide. At the same time, Iurii Gagarin and German Titov were addressed as 'brothers in heaven', who desecrated the old religious Heaven and dethroned its Christian gods. In a more straightforward 'literary sense', the journals circumstantially embellished the beginning of the cosmic era of mankind in the tradition of Tsiolkovskii's dreams and highlighted its first technical and scientific forerunners. (…) Until the middle of the 1960s, all these figurative and literary symbolic representations of the ongoing successes of the

> Soviet space flight programme followed established schemes of science popularization. However, they seemed increasingly to attract ordinary people. Hence, during the Thaw popular scientific journals enlarged their circulations considerably. *Science and Life*, for instance, increased its volume from 150,000 copies in 1957 to 1,750,000 in 1965; while Technology for the Youth increased circulation from 250,000 in 1955 to 1.2 million in 1964. Obviously, the attitude of Soviet people shifted quite rapidly from a dominant disinterest in the topic to increasing curiosity when, as personalized Sputnik figures, Gagarin and Tereshkova became the new 'stars' of the Soviet firmament of the Thaw. We can find a possible explanation for this change in attitude by looking not so much at the symbolic level, but by more closely exploring the narratives published in popular scientific journals about the space race. The picture that emerged at that point in time shows that the discourse about outer space was much more ambivalent than the transformed political 'cult of personality', the established schemes of science popularization, and the international 'peaceful competition' of the space race suggest. (Schwartz 2011: 236-237)

Schwartz (2011: 237) notes that the increasing public interest in space endeavours pursued by the Soviet Union and largely triggered by popular science journals tended to connote certain subtexts. For instance, the first significant achievement of the national space programme, the launch of Sputnik, which in Russian means fellowship and companion, was on the one hand metaphorically associated with the Soviet political and technological superiority in the space race rivalry and, on the other, with popular religious beliefs as the first satellites or cosmonauts were often addressed as "'stars' in the sky and 'brothers in heaven'" (Schwartz 2011: 237). The latter carry deeper metaphysical and mystical meanings which served as fateful omens and suggested that new space technology, particularly the prospect of spaceflight, could ensure a better future and provide the opportunity to escape confines of the Earth and get away from one's own society. Other ideas widely spread by a number of popular science and science fiction magazines were the way mankind would discover, conquer and colonize the universe, their close encounters with extraterrestrial intelligence or how would the human interaction with the cosmos and alien civilizations affect life on Earth. Such topics, as argued by Schwartz (2011: 238), were usually characterized by a pseudo-scientific style which clearly bordered on science and pseudo science, particularly until the mid-1960s:

> Writings were positioned between the craving for sensations and the belief in wonders, but were at the same time seriously discussed by known academics and engineers, practitioners and laymen, writers and readers. (…) Due to the enormous response to these publications by readers, the journal Knowledge is Power even founded an internal committee for 'alien contacts' to collect and

> systemize all the reports on this matter. In 1965, a prominent psychiatrist stated that one of the most common illness narratives of his patients consisted of close encounters with aliens. (Schwartz 2011: 238)

According to Schwartz (2011: 238), such "illness narratives" largely contributed to a gradual shift in a number of writings on scientific and space-related themes which moved from a highly idealized and speculative bourgeois-Stalinist to a more experimental and fact-based post-Stalinist science paradigm. Due to the fact that scientific discourse in the late Stalin period was extremely politicized and therefore remained in a clear opposition to the Western materialistic concept of science, other speculative theories of esoteric or occult origins gained popularity after Stalin's death. Examples might include alien visits or intergalactic communication via telepathy which were discussed in a highly serious tone, such as the case of the Himalayan Yeti which was believed to have been a crash-landed Martian, or the Tunguska event, the 1908 large explosion in East Siberia which was allegedly caused by an extraterrestrial object hypothesized as the Martian spaceship. Although stories of this kind were later moved to a special section of popular science journals called "terra phantasia", the Stalinist science paradigm was still quite dominant and the very concept of space exploration was often portrayed "in the sense of Tsiolkovskii as an experimental ground for unlimited speculation" (Schwartz 2011: 239). Schwartz (2011: 239-249) distinguishes two opposing intellectual traditions in the Soviet popular science discourse related to outer space:

> [I]n the popular scientific discussion around outer space, we find two differing intellectual operations. On the one hand, the de- Stalinization of hitherto political forbidden fields of science enables the emergence of rather esoteric topics as objects for serious discussion. On the other hand, the worldview paradigms of late Stalin times live on in the theoretical notion that no natural boundaries for scientific enterprises exist. Thus, the post- Stalinist hubris of colonizing space and its opposite imaginary direction of aliens contacting Earth imply the same political and theoretical hypotheses. However, when the first option was firmly connected with the concrete achievements of Soviet cosmonautics until the end of the Thaw, the second field of scientific speculation gradually caused a fundamental shift in the notion of the role of humans as part of the universe. This shift can be characterized as a turning away from a materialistic, dialectic worldview to a more positivistic understanding of science. Popular culture and folk tales of ordinary people, which had previously been seen as cultural heritage and as showing the creativity of the oppressed classes, were now restudied as authentic documents for a previously known and subsequently overlooked higher truth. For instance, popular scientific journals published increasingly ethnographic reports about religious legends from Soviet minority cultures, which

> could be interpreted as close encounters with alien forces from outer space. Similarly, medieval icons were studied as illustrations of extraterrestrials, and biblical wonders were read as descriptions of technical inventions from outer space. These so- called 'cosmonauts of ancient times' caused a whole wave of reader responses in the beginning of the 1960s. (Schwartz 2011: 239-249)

Hence, as suggested by Schwartz (2011: 240), one may observe a gradual shift from the Stalinist idealist tradition of discussing space exploration to the post-Stalinist trend to present such issues in a more positivistic, materialist and scientific light. Also, these two traditions often overlapped and thus resulted in certain speculative as well as esotericism- and occult-grounded undertones. Aleksandr Kitaigorodskii (1965: 7), one of the most renowned physicians of the period, characterized this novel tradition in scientific discourse as follows: "Quite often people honestly believe in the possibility of a 'divine will' interfering with our world. More educated people believe in wonders grounded in scientific explanations". Of course, while in the Stalinist era scientific achievements of the national space programme were mostly attributed to the Soviet people and served strictly propagandistic purposes, later the same activities also became subject to unknown forces of cosmic and supernatural origins, including extraterrestrial intelligence. Particularly, in Khrushchev's times, the image of space exploration and cosmonautics was no longer strictly associated with the concept of state control, social order, political repression as well as enforced collectivization and industrialization, but it became one of the primary means for the Soviet society to achieve a humanistic and spiritual transformation. What is more, as argued by Schwartz (2011: 244-245), the two aforementioned patterns dominant in popular science discourse often existed parallely:

> In the context of the antireligious campaigns of Khrushchev's time, cosmonauts were constructed as secular heavenly sons who worked wonders even more fascinating than religious fairy tales could tell. On the other hand, these discourses about outer space in the popular scientific journals were transformed from the official utilitarian concept to more ambivalent narratives about space flight as a gateway into other worlds, of imaginary possible close encounters with alien beings and unknown secrets of human society. Parallel to the optimistic notion of overcoming all natural restrictions and of colonizing the moon – and even Mars – within a few decades, we find a persisting belief in wonders grounded in scientific explanations that re-established a worldview in which humans form part of a bigger universe of natural, cosmic, or occult forces. In this vein, humans are no longer conceptualized as active almighty subjectivities transforming the world around them as they like, but as limited intellectual and physical beings who have to accept that there exist other, more powerful supernatural or extraterrestrial forces, ones on which they are probably dependent. (Schwartz 2011: 244-245)

Therefore, one may argue that some the accompanying illustrations tend to portray these two intellectual traditions. While on the one hand, particularly in the 1950s, the presence of certain propagandistic elements associated with the Soviet political and social system was quite evident, on the other, certain depictions of space exploration contained quasi-religious and occult connotations. During the Thaw, for instance, many science fiction stories and images, often published regularly in popular science magazines, presented spaceflight as an attempt to escape the Soviet everyday reality into inverted utopias where the authors' fears, desires and views concerning their own society were extrapolated to extraterrestrial places and civilizations (Schwartz 2011: 245). Similarly, space art representations seem to have performed a twofold function; alien worlds and space efforts were presented both in an optimistic manner of social realism with the focus on the Soviet ideology and in the style reminiscent of medieval icons which, through various artistic means, emphasized spirituality, mysticism and esotericism of the depicted scene.

3.3. The American tradition of space art

3.3.1. The Hudson River School influences: The sublime and the picturesque

Most sources suggest that a distinctive tradition of the U.S. space art, having evolved from and thus retaining many features of astronomical art, goes back to 19th century American landscape movement, also known as the Hudson River School painters, and their vivid portrayals of the American wilderness. According to Miller (1992: 56-57),

> Space art could not have existed before the romantic nineteenth century and its revolutionary discovery of the visionary landscape. Perhaps inspired most by the writings of Jean-Jacques Rousseau, the romantic artists did not merely observe nature, they rediscovered it in moments of intensely heightened vision. Landscape painting evolved from the merely decorative and pastoral to the highly charged emotional. Almost diametrically opposed to the romantic landscape were those of the pre-Raphaelites, yet these, too, were ancestors of space art. the pre-Raphaelites insisted upon a strictly accurate recreation of nature in the most minutely observed detail, with as little interpretation from the artist as possible. (...) The American vision of the romantic landscape came from the Hudson River School, whose practitioners were enamored with the American wilderness. Like the European romantics, they looked for the grandiose and awe-inspiring, but like the pre-Raphaelites they were also fascinated by detail. Probably because they

> were Americans and inheritors of a tradition of Yankee practicality, they were akin to the geologists, botanists, and other scientists who were the exploring, the unknown west of the Mississippi. (Miller 1992: 56-57)

Also, what makes the Hudson River School and space art pursuits to a large extent akin to each other is their common purpose of exposing the viewers to the unknown and unexplored realms of experience. For instance, 19th century official landscape painters, including Thomas Moran, Frederick Church or Alfred Bierstadt, are all credited with creating vast canvas depicting yet undiscovered territories of the Niagara Falls, Yellowstone or Yosemite and thus familiarizing the American public with the magnificent views they were unable to eyewitness. Many of their paintings were widely exhibited and circulated in the East, attracting crowds in the way today's popular motion pictures do (Carmer 1972: 19-24; Driscoll 1997: 8-20). Some of them were also published in a series of scenery albums often seen as a manifestation of the nationalism of nature in the form of American wilderness, including *Picturesque views of the American scene* (1820, unpublished), *American scenery* (Willis 1840) or *The home book of the picturesque* (1852) (Nash 1982: 71). Nash (1982: 67-68) argues that American romanticism gave rise to the nationwide appreciation of deistic wilderness recognized as one of the principal constituents of national self-esteem. The trend becomes apparent in 18th and 19th century literary and poetic texts defending an inspirational value of the country's natural scenery against a partly artificial glamour and sophistication of European culture which include Jefferson's *Notes on the state of Virginia* ([1785] 1853), Paulding's *The backwoodsman* (1818), Cooper's *The pioneers* (1823) or Irving's *Sketch-book of Geoffrey Crayon* (1819-20) and *Tour of the prairies* (1832).

As mentioned above, along with the textual, American public was also exposed to the visual depictions of "the wild and great features of nature: mountainous forests that know no man" as expressed and put into practice by Cole (Noble 1964: 62, as quoted in Nash 1982: 78). Similarly, since the 1920s, space artists have been acquainting the audiences with largely inexperienced and unseen wonders of the universe as well as space-related concepts, propelling the public interest in and affecting their attitudes toward space exploration: "Space art as it existed by the 1920s was heir to this realist romantic-naturalist tradition. Just as the painters of the Hudson River School changed our perception of the American wilderness, space art was destined to change our perception of the universe" (Miller 1992: 58). Similarly in a different source, Miller (1978: 10-11) clearly equates both movements' success in visualizing their subject matter and promulgating its underlying concept:

> The astronomical artists of the last few decades has as much to do with the success of the space effort as any technical advances. Just as early American artists showed the public views of the unconquered West and helped propel interest in

> exploration and expansion (as artists of vision and realistic imagination always point the way), so, too, astronomical artists have shown the public what the unseen planets, moons, comets, and distant reaches of the galaxy might look like when we are able to be there in person. (Miller 1978: 10-11)

For instance, one of Bonestell's most iconic paintings, *Saturn as Seen from Titan* (2004), has been praised by a number of scholars for its visual qualities reminiscent of those employed in the Hudson River School paintings. What follows is Holly and Taylor's (2009: 197) appreciation of the work viewed as having a profound impact on the future generations of space explorers and advocates:

> This painting invited viewers into the possible planetary landscapes that exist on moons of the outer solar system. In Bonestell's depiction, Titan's landscape resembles that of the American southwest or perhaps the craggy cliffs of the Rocky Mountains in winter. The deep blue of the sky recalls that of Earth; the view of Saturn is reminiscent of the view of the Moon we would expect in an earth landscape. (...) Even if Bonestell's was not completely accurate, viewers can imagine themselves on Titan viewing Saturn, an important quality considering that this particular Bonestell piece pre-dates spaceflight. The painting had an undeniable impact on many engineers, astronauts, and civilians in what become the US space program. (Holly and Taylor 2009: 197)

Among the most prominent characteristics of the landscape movement's tradition is its preoccupation with the notion of romantic landscape, which stands in opposition to scientific empiricism and secularism of the Western Europe and attempts to rediscover the presence of God and spirituality in nature. The two principal strands which evolved in the course of the school's development are pastoral elegaic and scientific exoticism, also inseparably connected with visualizing the sublime and picturesque (Allen 1992: 27). While both concepts were first proposed in 18th century European aesthetics and further discussed by Burke ([1757] 1990), Kant ([1764] 2003), Schopenhauer (1909) or Gilpin (1794), they seem to emphasize different qualities in landscape representation. As suggested by Hussey (1927: 14), "while the outstanding qualities of the sublime were vastness and obscurity, and those of the beautiful smoothness and gentleness, the characteristics of the picturesque were 'roughness and sudden variation joined to irregularity of form, colour, lighting, and even sound'". In other words, whereas the sublime is capable of evoking the viewer's intense emotional response to the vast, infinite and fearsome qualities of nature (Burke 1757; Kant 1764), the picturesque, which originated in the late 18th century Britain, can be found halfway between the serenely or orderly beautiful and awe-inspiring or often

terrorizing sublime. The latter term was further developed by Gilpin (1792: 6) who claimed that "roughness forms the most essential point of difference between the beautiful, and the picturesque; as it seems to be that particular quality, which makes objects chiefly pleasing in painting". Such picturesque compositions, characterized by the presence of regular and linear pictorial elements, including distance, perspective, light or shadow, may be found in Thomas Cole's five-part series of paintings, *The Course of Empire* (1833-1836), which depicts the rise and fall of an imaginary city and poses pastoralism as the ideal developmental stage of human civilization.

The sublime mode, on the contrary, is visually expressed in a number of Hudson River School paintings portraying an overwhelming magnitude of the unique and dramatic American Wild West scenery, such as those of Thomas Cole (*The Oxbow*, 1836), Frederick Edwin Church (*Niagara Falls*, 1857; *Twilight in the Wilderness*, 1860), Albert Bierstadt (*Looking at the Yosemite Valley*, ca. 1865-67) or Asher B. Durand (*The Beech's*, 1845). Some of the artists' works like George Inness's *Peace and Plenty* (1865), Bierstadt's *Yosemite Valley* (1868) or Church's *Mount Ktaadin* (1853) appear to combine both picturesque, idyllic and pastoral settings with untamed, wild and fearsome views suggestive of the sublime. Additionally, the depiction of the latter aesthetic concept would often involve elements later identified with Romanticism, whose aim was to evoke the feelings of uncertainty, fear, horror and terror brought about by visualizing conditions, such as vastness and infinity, darkness and danger or solitude and pain. These and similarly boundless, horrifying or violent qualities of nature tend to agreeably terrorize the beholder and render them fearful, helpless, yet at the same time astonished and highly inspired by the power of nature (Arensberg 1986: 3-4). A similar impression is frequently created by space art works whose common portrayal of the infinite and immense magnitude of the universe might lead the viewer to being reduced to a metaphysical dissolution or a "vanishing nothingness" as well as bring a sudden realization of an inevitable transience of one's own existence (Schopenhauer 1909: 266).

Interestingly, as pointed out by Kessler (2012), the expression of the sublime is also present in the U.S. Hubble's deep space images. In one of her recent works, *Picturing the cosmos: Hubble space telescope images and the astronomical sublime* (2012), the scholar finds numerous cultural, scientific, and aesthetic parallels between the telescope's compelling photographs of the cosmos and 19th century awe-inspiring paintings of the Wild West which both visually invoke the sublime. Kessler (2013) elaborates on her main argument as follows:

> As with the Eagle Nebula, many of the Hubble images bear a striking resemblance to earthly geological and meteorological formations, especially as depicted in Romantic landscapes of the American West. In the late 19th century, the painters Thomas Moran and Albert Bierstadt as well as the photographers William Henry Jackson, Timothy O'Sullivan, and others portrayed the awe-inspiring and unfamiliar western scenery in the visual language of the sublime. The formal similarities between these two sets of pictures situate the Hubble images within a visual tradition, and the reference to the sublime also has philosophical relevance. As defined by Edmund Burke and Immanuel Kant, the sublime describes an extreme aesthetic experience, one that threatens to overwhelm even as it affirms humanity's potential. For Kant, the sublime arises out of a tension between the senses and reason, and each faculty must be engaged to experience such an intense response. The Hubble images invoke the sublime, encouraging the viewer to experience the cosmos visually and rationally, to see the universe as simultaneously beyond humanity's grasp and within reach of our systems of knowledge. This tension extends to the relationship between the images and the celestial objects they represent; their reliance on digital data and imaging, which brings together numeric and pictorial representations; and the symbolic significance of the landscape reference with its evocation of the frontier. By repeatedly making use of this tension, a fundamental attribute of the sublime experience, the Hubble images make claims not only about what we know of the cosmos but about how we gain knowledge and insights. (Kessler 2013)

Kessler (2013) also comments more broadly on 20th century space art practices of representing space subjects in the U.S. culture where scientists and artists often utilize the mode of the sublime when translating complex data into a number of popular images depicting galaxies, nebulae or star fields. More specifically, she argues that rather than coming up with an entirely novel system of visualizing space, they have extended an existing one, inseparable with the idea of exploration and settlement, to subsequent stages of space exploration. This mode, used extensively in the last few decades, is that of the mythisized American frontier which has "functioned as the framework through which a new frontier was seen" (Kessler 2013). A similar view is expressed by Sage (2014) who, in the introduction to his recently published book, *How outer space made America: Geography, organization and the cosmic sublime*, investigates the way and reasons why the U.S. space programme reproduced the nation's geographical, cultural and political imagination by appealing to the image of America as the transcendental and sublime state. The scholar claims that audiences exposed to the visions of outer space and space exploration, whether generated by space telescoped or popular media, are always confronted with a strong sense of sublime vastness and infinity (Sage 2014: 1):

> Those passionate about outer space have long been in awe of its apparent 'spacelessness', outer space appears unbounded, infinite, sublime. When we see or think through Space, whether by looking at images produced by a powerful space telescope or enjoying a science-fiction film, we can journey in an instant to the most distant reaches of the universe, and simultaneously billions of years back in time, or into a barely imaginable future, far beyond the possibility of human life. (Sage 2014: 1)

Meanwhile, in the wake of earlier scholarly discussions on the cosmic sublime, Lyotard (1994) suggests that the sublime of transcendence is sometimes replaced by the sublime of immanence. More specifically, the philosopher argues that humans' capability of feeling and imagining the cosmos constitutes the cause for sorrow as they realize the constraints of their own physical condition. In this way, the scholar challenges a largely positive vision of the sublime, stemming mostly from the vastness of space and limitless possibilities created by new space technologies, by noting that modern astrophysics also draws on evoking a negative sublime feeling by providing their audiences with painful and finite outer space experiences. This view, however, does rarely apply to the analyzed space art works which tend to rely on visualizing space exploration by appealing to the idea of romantic landscape and classic concepts of the sublime and the picturesque that served 19th century American landscape painters in their depictions of the Wild West frontier.

3.3.2. Realist influences: Manifest Destiny, the NASA Art Programme and the IAAA

It should be noted that in contrast to the Hudson River School, which drew on the concept of romantic landscape seen as a reaction against the Western European secularism, empiricism and Enlightened religiousness, the U.S. space art tends to emphasize realism, scientific accuracy and believability of outer space settings. According to Miller (1990: 41), except for serving a clearly aesthetic and inspirational function which is to evoke a sense of awe and wonder about the cosmos, space art plays an equally important role in educating its audiences about various space-related concepts:

> What space art ought to teach is not so much what the other planets are like, but that they are there at all, that they are *real*. Believability is at least as important as accuracy, for if no one believes that the scene represents some place in reality, all the scientific accuracy in the world is for naught. Bonestell is a perfect example. Much is his work was astronomically unsound at the time he created it – he was indicating canals on Mars as late as the 1950s – to say nothing of natural bridges on Phobos and volcanoes on Jupiter. Nevertheless, so persuasive is his art that when the Apollo

> astronauts returned photos from the moon's surface showing that lunar mountains were not the craggy alpine peaks Bonestell had painted, it truly seemed as though it were the moon's fault, not Bonestell's. Although Rudaux a generation earlier had been correct in his less dramatic renderings of the lunar surface, and for all the right reasons, would we have been so anxious to visit the moon of we had known – or admitted – that he was right and Bonestell wrong? (Miller 1990: 41)

Naturally, the adherence to a realistic mode of representation can be particularly observed in many American space art works which depict planetary and outer space landscapes. Following Lefebvre and Mitchell's theories on the production of social space, the concept of landscape can be defined as a sight to be consumed which embodies both places, seen as specific physical locations, and spaces, understood as practiced places inscribed with social and cultural meanings (see e.g. Lefebvre 1991). Therefore, each single act of visualizing the universe or space exploration involves the process of implicating spatial practices within a given image which might be indicative of either implicit or more explicit subtexts related to certain patterns characteristic for the nation's cultural heritage. Examples might include frequently emphasized close links between space art and the Hudson River School's tradition of portraying the national frontier experience, as stated in the International Association of Astronomical Artists' Manifesto ("The IAAA manifesto" 2014):

> In the 1800s, artists accompanied explorers into the frontiers of the Americas and sent back colorful images of the new lands. Paintings from Thomas Moran and Albert Bierstadt spurred further exploration of the West, and helped to preserve Yellowstone, Yosemite, and other areas as national parks. In 1872, Frederick Church, the highest paid painter of his day, financed his own expeditions to paint polar aurorae, icebergs in the Arctic Sea, and volcanoes in South America. But soon, the Earth's frontierlands disappeared and the link between art and exploration broke down. Today, we receive images from a new frontier that is rapidly expanding, planet to planet, into space. A new link is being forged by a new generation of exploration artists-Space Artists. Armed with science, creativity and imagination, they construct realistic images of visions throughout the Universe, from our Earth to the Stars. Not only realist; surrealist and impressionist styles are equally valuable in this adventurous and innovative field. ("The IAAA manifesto" 2014)

What is more, Santina (2014) argues that through a depiction of outer space environment often visually reminiscent of 19th century American landscape paintings, space art works can be deemed reinforcing similar meanings centered around the ideals of Manifest Destiny which stress the U.S. primacy in exploring and colonizing space as the final frontier. Such a suggestion is made by Sage (2008: 27) in his paper, "Framing space: A popular geopolitics

of American manifest destiny in outer space", which investigates "how visual motifs of an American manifest destiny (…) have been mobilised through American astronomical art to explain and popularise conceptions of outer space that invite American human space exploration". Additionally, Sage (2008: 27) argues that "the inscription of outer space under the rubric of an American manifest destiny continues to frame the way in which the American space programme, and by extension American geopolitical and geographical imaginations can be understood today". However, such an understanding of cultural representations of outer space landscapes and space exploration produced by astronomical artists can be perceived as denying the complexities of space art which are likely to posit and problematise a greater variety of possible interpretations of some of these works.

Today, the International Association of Astronomical Artists, the world's largest organization of this kind founded in 1982 and composed mostly of American members, continue a realist tradition of the U.S. space art, largely inspired by its astronomical predecessor. While some of its fellows, particularly international artists, including Michael Böhme, Marie Green, Robert Parkinson or Frank Lewecke, represent surrealist, symbolic and impressionist styles, their American counterparts like Mark Maxwell, Pamela Lee, Kim Poor, Pat Rawlings, Rick Sternback, Mark Garlick, Michael Carroll, Don Davis, Don Dixon, Lynette Cook or William K. Hartmann, tend to adhere to the standards set by descriptive realism and astronomical art. Many of these artists are often called modern Hudson River School Painters and use either traditional painting or digital means to transport their audiences, as if they were virtual space tourists, to the frontiers of human knowledge challenged by 20th century space exploration.

A similar function was served by the NASA Art Programme, founded in 1962 "in an effort to present NASA's discoveries and cutting-edge research to the public in a way that would be more accessible than complex scientific reports", which brought a number of American distinguished artists of the period whose mission was to chronicle and thus as well as promote NASA's missions among the U.S. public ("The NASA art program" 2014). To complete their task, they were given an unprecedented opportunity to fully participate in the national space programme, which involved interacting with NASA staff and astronauts, exploring the space center's facilities and installations or observing various behind-the-scenes activities connected with space missions like the 1963 launch of the spacecraft Faith or the last manned spaceflight of the Mercury programme (Schulman 1990: 81-82). According to James Webb, the first director of the project, diverse depictions of space endeavours, created by George Weymouth, Peter Hurd, Robert Shore, Paul Calle and others, were supposed to convey a sense of awe, wonder and drama and thus incite the public interest in as well as endorsement of the national space

programme. Therefore, it can be also argued that many of these works served a partly propagandistic function as they clearly demonstrated the magnitude, glory and a sense of mission of some of the greatest accomplishments of NASA's major projects ("The NASA art program" 2014):

> According to James Webb, the second NASA administrator, who directed the start-up of the NASA Art Program, "Important events can be interpreted by artists to provide unique insight into significant aspects of our history-making advances into space. An artistic record of this nation's program of space exploration will have great value for future generations and may make a significant contribution to the history of American art". Webb wanted to convey to future generations the hope and sense of wonder that characterized the early days of space exploration. To carry out his vision, Webb asked James Dean, a NASA staffer and artist, to set up an artists' program that would document NASA missions. Working with National Gallery of Art curator Hereward Lester Cooke, Dean established a program that would give selected artists the chance to speak with famous astronauts and scientists, and allow them to have behind-the-scenes access to NASA missions. Artists flocked to the program, attracted by the chance to be a part of the early space exploration of the 1960s and the freedom to chronicle events through their unique forms of artistic representation. ("The NASA art program" 2014)

The NASA Art Programme is credited with producing a vast collection of more than two thousand and five hundred art works which, over the period of fifty years, have documented as well as captured the spirit of NASA's space missions in the form of sketches, drawings, paintings as well as photography and music. About one hundred artists, who contributed to the development of the programme, have mostly represented a realist and optimistic style when portraying the key moments of space exploration history. There are of course exceptions to this rule; some painters, including Mitchell Jamieson, Paul Calle, James Wyeth, Paul Arlt or William Thon, have created works which clearly incorporate more imaginative, abstract and spiritual elements ("Artists give NASA a different light" 2009).

The majority of scholars working in the field characterize a distinctive tradition of American space art as an aesthetic and ideological continuation of the Hudson River School's practices of depicting the U.S. frontier experience. Therefore, many noted academics and artists themselves, including Frank J. Malina, Roger R. Malina, Ron Miller, William K. Hartmann or David A. Hardy, emphasize the ongoing pursuit of the genre to portray extraterrestrial environment in both accessible and familiar visual language of realism combined with a sense of awe and wonder. As put by one of the U.S. contemporary space artists, Daniel D. Durda (2013: 2), various renditions of alien worlds "allow us to see the unseeable and to go places we can't yet reach, or to places (or times) we can never get to" and, in this sense, they indeed did as well as continue to revive and preserve the myth of American frontier.

3.4. The Soviet tradition of space art

3.4.1. Space art in the U.S.S.R. Union of Artists

According to Myagkov (1990: 54), the Soviet space art has been to a large extent institutionalized under the auspices of the U.S.S.R. Union of Artists (Soiuz Khudozhnikov SSSR), originally founded in 1932. Consisting of voluntary members, the union remained a unique organization of professional artists independent of the government in terms of its structure, finances and ideological stance. Its aim has been to encourage the creation of as well as promote various forms of artistic activities and enterprises which produce figurative art works, including decorative and applied arts, monumental sculptures, mosaics, murals, easel painting or graphics and design. The Union retained a democratic structure through the administrative board elected regularly at congresses as well as formed diverse committees, such as the Committee on Science and the Cosmos responsible for conducting organizational activities that propelled interest in space exploration.

Myagkov (1990: 54) suggested that space as the theme of figurative art was heavily subsidized by the U.S.S.R. Union of Artists and commissioned, similarly to the NASA Art Programme, a number of artists to create works which featured the national and global space efforts, later exhibited in various museums or public places, including urban ensembles or libraries. Since Andrei Sokolov, who served as the chairman of the Committee on Science and the Cosmos, visited the Baikonur space center in the 1970s, some notable artists, such as Iurii Pokhdaev or Aleksei Stepanov followed suit and paid more regular visits to the Cosmodrome in order to establish close contacts with both scientists and cosmonauts working there. Some of them were given a remarkable opportunity to observe the administration and implementation of space missions, particularly with the coming of *glasnost'*, during which the Baikonur space center became much more accessible for the members of the general public. One of the most prominent examples is the 1986 expedition of a group of ten artists, including Aleksandr Petrov, Gregorii Poplavskii, Georgii Orlov, Galina Pisarevskaia, Petr Kovalev and Olga Kovaleva and others, who, in preparation of the first Space Art exhibition in Moscow in commemoration of the 25th anniversary of Iurii Gagarin's orbital flight, were allowed to stay in the Cosmodrome's scientific and technical sites. The artists also cooperated and held regular consultations with the U.S.S.R. Federation of Space Exploration, the Glavkosmos as well as individual cosmonauts, such as Popovich or Klimuk, from whom they received numerous information on the most recent advancements in space research and exploration as well as personal impressions of spaceflight missions. As put by Myagkov (1990: 56),

"this allows the artists to make the contents of their works more interesting and realistic (...) [and] stimulate [their] creative fantasies, helping them to peer more boldly into the future of space exploration". The trend can be observed in the styles incorporated in many paintings produced under the auspices of the U.S.S.R. Union of Artists, which often lean toward abstract, impressionist and symbolic depiction of outer space endeavours. Examples might include Vitalii Miagkov's *Launch*, Galina Pisalevskaia's *Intercosmos II*, Gregorii Poplavskii's *Flowers to the Planet* or Petr Kovalev and Olga Kovaleva's *Unknown Planet* (Hartmann et al. 1990).

3.4.2. The influence of propaganda

It should be noted that many Soviet space art works, particularly those produced in the 1950s and 1960s, tend to display a clear influence of communist propaganda, understood as "the expression of opinions or actions carried out deliberately by individuals or groups with a view to influencing the opinions or actions of other individuals or groups for predetermined ends and through psychological manipulations" (Ellul 1973: 11-12). The primary function of the propaganda machine was to spread the Soviet ideology as well as educate and manipulate the masses in order to achieve a common goal which was the establishment of the communist state and "the development of a 'new Socialist man'" (White 2001: 6). Its success was to a large extent achieved through the government's control over mass media and communication, including art, posters, films, literature, radio, theatre, music and other visual and textual forms, which could easily reach a wide audience ("Public Opinion in the U.S.S.R." 2009). Naturally, many of them also served as the means to spread the content of space propaganda, particularly intense throughout the space age when it played a critical role in an ideological battle between the U.S. and the Soviet Union. One of its expressions in public life were national and universal exhibitions, such as EXPO-67, one of the most successful World's Fair of the past century held in Montreal in 1967, where the highly popular Soviet pavilion, celebrating the 50th anniversary of the Russian Revolution, attracted over 13 million visitors. The exposition, discussed thoroughly in the November issue of *Iskusstvo* [Art][11] was divided into three parts, the last of which was devoted to the theme of space as well as the progress and greatest accomplishments of the Soviet space research and exploration. Khalturin (1967: 14) discusses its content and visual appeal as follows: "В последнем разделе особое внимание привлекали многочисленное «семейство» спутников, кинозал, в котором

[11] The quoted issue of *Iskusstvo* comes from the private collection of Professor Wojciech Lipoński.

имитировалось путешествие на Луну, и панорамы поверхности Луны и Венеры, выполненные художником Е. Дешалытом." [The last section drew the audience's attention with its exposition of a group of satellites, special screenings, in which the journey to the moon was simulated, as well as the panoramas of the lunar and Venus's surface, painted by the artist E. Deshalyt.].

Although noted, often inexplicitly, in solely few academic and popular sources, the influence of communist propaganda has also left its mark on the content of the examined works of space art. Some early illustrations, for instance, contain certain imagery suggestive of the Soviet socio-political system, particularly the hammer and sickle as well as the red star (see e.g. Kolchitskii's *Nad Zemlei dvigalsia novyi uskusstvennyi sputnik* [The New Artificial Satellite Has Moved Above Earth], 1952; *Zapravka mezhplanetnovo korablia na sputnike* [Setting Up an Interplanetary Spacecraft in Orbit], published in Gilzin's *Puteshestvie k dalekim miram* [Travel to distant worlds], 1960), the red inscription *S.S.S.R.* (Leonov's *Miagkaia posadka* [Soft Landing] or *Pered priluneniem* [Before the Moon Landing] published in *Zhdite nas zvendy* [Stars are awaiting us], 1967) or other red coloured elements depicted on various space technologies like satellites, spacecrafts, rockets as well as cosmonauts' space suits and equipment (Kolchitskii's untitled paintings published in Vasiliev's *Putechestvia w kosmos* [Travels into space], 1958; Leonov's *Chelovek na lune* [Man on the Moon], published in *Zhdite nas zvezdy* [Stars are awaiting us], 1967). Later examples include Iurii Shvets's *Tekushchii remont. Zvezdnaia sluzhba* [Maintenance Works. Space Mission] (published in the 1975 issue of *Tekhnika molodezhi* [Technology for the Youth], vol. 4), or Oleg Kirienko's *Na Marse* [On Mars] (published in the 1979 issue of *Tekhnika molodezhi* [Technology for the Youth], vol. 1), which embrace a predominant number of red motifs, yet the artists' intention to portray them in this particular way remains unknown and the viewer might only suspect that they might intend to indicate certain propagandistic overtones.

As pointed out by Kohonen (2009), the propagandistic role of visual representations of space in the early 1960s was highly significant. First, this was the period of an intense space age with the Soviet Union triumphing over its U.S. rival as a result of which social utopianism and cosmic enthusiasm, based on the official Krushchev's policy, reached its zenith. Outer space became a powerful metaphor for the worship of science, technological modernization and the bright future of the Soviet nation. Kohonen (2009: 115) emphasizes an unusual character of varied visual images of the cosmos in which "fantasy crept into the scientific discourse through these utopian visions". In her study of photographs published in the 1961 issues of *Ogonek* [Little Flame], the scholar concludes that the portrayal of interplanetary travels were intended to express social utopianism and that the future in

space was presented as ordinary as well as employed the style of Socialist Realism, evident, for instance, in the image of a cosmonaut. Kohonen (2009: 127) comments further on popular visualizations of outer space as follows:

> The Soviet propaganda machine eloquently mixed cosmic utopianism with patriotic sentiments. Space was an influential emblem of modernization, the Promethean victory of Man over nature, freedom from gravity and from past horrors, and the promise of a bright, shimmering future. Indeed, space was a symbol of utopia on Earth. But in the midst of the Cold War policies and the technological utopianism so closely attached to the space race, (...) [visually] it was the man who had broken the barriers of Earth's gravity and survived, the cosmonaut, utopian hero and modern man. (Kohonen 2009: 127)

In one of merely few academic sources that comment on the presence of communist propaganda in the actual Soviet space art works, *Into the cosmos: Space exploration and Soviet culture*, Siddiqi (2012: 71) elaborates on the impact of the regime of Soviet secrecy, which constituted a significant aspect of the national space programme, on the content of popular imaginary related to space exploration: "[The] three features of the secrecy regime in the Soviet space program – eliminating contingency, creating a limited space of visibility and maintaining a master narrative – deeply affected (...) the content of Soviet space culture [and] its aesthetic qualities, (...) manifested in the imaginary associated with Soviet space exploits". Such practices were particularly widespread among the Soviet publishers "who had to be creative in communicating the new and modern symbiosis of man, technology, and adventure that the Soviet space program represented" (Siddiqi 2012: 71). For instance, photographs depicting early cosmonauts seem to perfectly fit this mode as they were edited and stylized in the way that would emphasize their characteristics of modest, bold, hardworking, diligent and flawless national heroes or simply whitewash some aesthetically displeasing qualities of a given image (Siddiqi 2012: 72). As pointed out by Siddiqi (2012: 72-73), similar adjustments were sometimes applied by the Soviet space artists, specifically considering their depiction of spacecrafts:

> Soviet artists and model builders were notorious for producing versions of Soviet spacecraft that often had little or no connection with reality. This practice, ubiquitous in the early 1960s, opened the way for some outlandish depictions of Soviet spacecraft, including a supposed *Vostok* spacecraft shown at air shows or documentary films that bore little resemblance to any real spaceship but that had quite striking and even beautiful fins attached to one end. The tension between aesthetics and secrecy was most starkly evident in the work of Soviet "cosmic" painter Andrei Sokolov, probably the most well-known "space" artist of the period. Sokolov later remembered that because he had no security clearance, he

> had to paint from his imagination about the Soviet space experience. Once, when he painted a rocket in flight, the painting was censored without explanation. Many years later he discovered that because his image approximated a real space rocket, it was not allowed for public consumption. Sokolov's experience provides a telling counterpoint to that of Aleksei Leonov, the cosmonaut turned painter, who was intimately familiar with secret technology. According to Sokolov, Leonov deliberately distorted reality [in his paintings] because of the requirements of censors, sketching deformed trusses on the launch pad and improbable satellites. The contrast between Sokolov and Leonov encapsulates how secrecy mediated the relationship between artist and the art in the world of secret space: because of secrecy, those who were not privy to secrets had to be careful about unleashing their imaginations, while those in the know had to let their imaginations run free so as to not to give away those secrets. (Siddiqi 2012: 72-73)

In view to the above quotation, it can be argued that the principal element which might have been deliberately distorted in some of the early space art works is that of space technology whose depiction, deemed an instrument of political power, often served to build and extol the Soviet scientific as well as technological superiority in the space age rivalry. This trend becomes particularly evident in the 1950s Kolchitskii's and the 1960s Leonov's paintings which were likely to encompass an excessive number of spacecraft representations, often of vast dimensions.

Meanwhile, in his most recent publication, *The art of space*, Miller (2014: 128) describes the Soviet propaganda and film poster design as a socially and culturally important form of space art expression: "Posters were a powerful art form in the Soviet Union. They first appeared during the Great October Revolution, where their powerful graphics and inflammatory slogans carried the communist message to the masses. (…) Vladimir Lenin, was a firm believer in the power of art to transform as well as communicate". Specifically, he argues that, along with the emerging science fiction film industry, poster art was heavily influenced by the Russian visual arts traditions, the trend which largely stemmed from an insular character of the Soviet regime. The greatest masters of the genre, including Viktor Govorkov, Georgii and Vladimir Stenberg, Leonid Voronkov or Grigorii Borysov, combined modern, eye-catching and futuristic elements, such as bold and abstract shapes, distorted angles, unusual lightening or intersecting planes, with certain retro motifs oriented clearly toward the past (Miller 2014: 128). In this respect, some space art works might be reminiscent of propaganda and advertising posters' visual design whose content depicted outer space or space exploration themes. In particular, both artists focused on envisioning drama of the Soviet interplanetary voyages, their scientific and technological triumphs as well as idealism, heroism and courage of the cosmonauts or the nation's leaders, merging "adventure with post-revolution propaganda" (Miller 2014: 128). On the

other hand, however, despite sharing a certain number of characteristics, the Soviet poster design and space art still remain the distinct genres of artistic expression. While the former remained a strictly political tool aimed to glorify and manipulate the representation of the national space efforts, the latter was mostly concerned with illustrating a given space-related concept in a cultural or literary context in which it occurred. Therefore, it seems that the incorporation of propagandistic elements by the Soviet space artists, if detected, served a secondary rather than primary function of their works.

3.4.3. Realist, romantic and symbolic influences

When it comes to certain generic characteristics, the Soviet space art is known to incorporate a greater variety of styles, often combining realism with symbolic and romantic imagery (see e.g. Hartmann 1990; Boczkowska 2013). Some Soviet and American space artists have made interesting comments considering a distinctive style represented by many Soviet works of the genre in contrast to that implemented by their U.S. counterparts. What follows is Myagkov's (1990: 54) view on the subject:

> Soviet space artists create some realistic works, but they also make use of romantic images and symbolism. Much attention is devoted to composition. The use of space as a theme is a natural insofar as the artists perceive themselves and all of humanity as parts of the cosmos. Most often the relationship to the cosmos is expressed through love for our native planet Earth. The subjects of Soviet space painting are extremely diverse, covering the entire history of Soviet space technology from the launching of the first artificial satellite to present-day spaceflights. Portraits are painted of cosmonauts and scientists. In paintings based on technical documents and observation, Earth and outer space are portrayed exactly as they appear to cosmonauts in orbit. Scientific data are also use in the depiction of spaceships and space stations on flights to the Moon, Venus, and other planets. In their paintings, artists refer to plans, photos, and other documents from past spaceflights and expeditions. They also fantasize, depicting man's scientific and technical works as they are displayed in orbit around the Earth, on the Moon, on Mars, and other planets. The paintings reflect various scientific hypotheses about outer space, about possible life in other worlds, about the structure of the universe, its evolution, and its diverse objects. Space painting makes visible that which exists in nature but is inaccessible to direct visible observation and photography; artists rely upon both scientific information and their own imaginations. Paintings of a philosophical nature are also created, expressing conceptions of human development in connection with the cosmos and with the broadening mastery of the expanses of space in the interest of science and economic development both on Earth and is space. (Myagkov 1990: 54)

A similar opinion regarding the existence of diverse styles in the U.S. and Soviet space art was expressed by one of the contemporary American space artists, William K. Hartmann. In the years 1988-1990, he was one of the participants of an international series of workshops initiated by the Planetary Society and organized by the IAAA, today regarded as the first joint venture of the U.S. and Soviet astronomical and space artists ever realized in the history of the genre ("The History of the IAAA" 2014). The meetings, held in Senezh-Moscow (1989), Utah (1989) and Gurzuf-Crimea (1990), resulted in a set of works, most of which were exhibited and later included in the Soviet-American space art book, *In the stream of stars*, edited by William K. Hartmann, Ron Miller, Andrei Sokolov and Vitali Myagkov (1990). As stated in The History of the IAAA (2014), the official purpose of the project was to "demonstrate the common ideal of international cooperation, dialogue for the better understanding of ourselves which ultimately would soothe the differences between the nations of the world as mankind prepares to step from ancestral Earth with a cooperative spirit". Also, the workshops provided an unprecedented opportunity to observe and compare the styles of American and Soviet space artists, which until that day, had mostly developed independently from each other. What follows is Hartmann's (1990: 15) comment on some of the most distinct differences:

> It was fascinating to see the diverse styles that had evolved in our isolated artistic "environmental niches". The Soviet artists tended to find the Americans more "materialistic" because many of us tried to show the actual appearance of other worlds, based on scientific data. The Soviets, for their part, said that they were trying to show the more "spiritual" side of space exploration, the response of the "soul" (Interestingly, the religious ideology came mainly from their side.). The discussion was fascinating. Some of the Western artists (and at least one Soviet) good-humoredly countered that the Soviet space painters had not yet absorbed enough scientific and technological information from the newly-opening Soviet space program to render planets and spacecraft with high realism. Was a soulful painting with a cosmic title really astronomically inspired, or just an abstract painting with an astronomical name? How could anyone know? The debates made us all think more deeply about the sources of our creative impulses. (Hartmann 1990: 15)

Although the aforementioned discrepancies are easily detectable when comparing American and Soviet space art works produced in the course of the 20th century, it might be difficult to explain their specific sources. Not only is both popular and academic literature dealing with the genre considerably scarce, but also it does not discuss any particular roots or inspirations which the Soviet space artists could draw upon. However, one may speculate that some of these tendencies can be reflective of certain trends in the socialist realism, particularly in the representation of propagandistic elements, the

early popular science discourse, often combined with a more optimistic and fantastical science fiction imagery, or one of the two strains in how artists engage science over the past centuries. The last hypothesis was proposed by Gamwell (2002) who postulates, paraphrasing greatly, the existence of two diverse approaches to visualizing science and spirituality; while the French, British and American approach tends toward realism and scientific accuracy, the opposing trend – the German, Austrian, and Russian – stems from the German Idealist philosophical tradition and leans toward expression and abstraction. However, although both perspectives seem parallel to the development of American and Russian space art traditions, there is no mention of any specific link between the two phenomena in either Gamwell's or any other sources. Another reason why space artists depicted space environment in a less realistic way is politically oriented and lies in the fact and until the 1970s most of them did not have a direct access to information available to scientists and engineers working in the Soviet space programme. What is more, due to a nationwide practice of the regime of secrecy, many images were filtered though the censorship apparatus and thus their authors often had to rely on their own imaginations rather than the actual data obtained from the recent advancements in space research and exploration.

The Soviet space art, despite remaining a largely unexplored area of artistic and scholarly enquiry, appears to have evolved a distinctive set of characteristics, particularly when compared to its American counterpart. The most significant of them include an unusual merge of realism with a more abstract and symbolic imagery which often evoke romantic, mystic, religious or spiritual connotations as well as a less evident adherence to scientific facts observed in many depictions. The roots of such a portrayal of alien worlds range from the Soviet strict secrecy regime's practices, which largely suppressed the freedom of expression in public discourse surrounding space exploration endeavours, to certain artistic, philosophical and discursive trends in 20th attempts to define human space efforts. Today, contemporary space art works in Russia are often confused with those representing the genre of science fiction art (*nauchno-fantasticheskaia zhivopis*), which in the U.S. sources is clearly distinguished from the mainstream space art activities. There also exist, however, numerous traditional and digital paintings classified as space art (*kosmicheskaia zhivopis*) and largely influenced by the Anglo-American realistic tradition, including those of Sergei Perov, Aleksandr Klimov, Iurii Koleiko or Igor Beziaev, the current member of the IAAA. At the same time, some of them, such as Perov's *Vzgliad so storony* [View from the Outside] (2005) or Klimov's *Sozdanie vremeni* [Creation of Time] (2002), seem to simultaneously follow a distinctively Russian pattern of portraying outer space realms by incorporating partly fantastical, spiritual, mystical and symbolic modes of representation into their images. In this way, the Soviet

space art traditions do not only persist in certain contemporary works of the genre, but, due to the genre's recent revival in Russia, they have also largely contributed to its nation- and worldwide popularization and appreciation in intellectual and artistic circles.

3.5. The impact of 20th century advances in space research and exploration on space art

The relation between space art and science seems unquestionable. According to Carroll (1982: 210), the space-age technology has profoundly affected 20th century depictions of the cosmos, leading to the emergence of the so-called Space-Art School, whose resources draw on precisionist, photo-realist and, realist and fine arts' traditions, thus interestingly exposing the balance between scientific accuracy and artistic imagination. As the 20th century witnessed the major breakthroughs in space research and exploration, including the 1903 first manned flight, the 1926 invention of the first liquid-fueled rocket, the 1961 first orbital flight by Iurii Gagarin or the 1969 first Apollo 11 moon landing, many space artists had access to unlimited sources of knowledge and inspiration in constructing their works (see e.g. Launius 1998). By the present-day, human beings have been to the Moon and unmanned spacecrafts have examined each planet of the Solar System except Pluto, which is estimated to be reached by the New Horizons probe in 2015. All these advances have largely affected the mode of visual representation in the genre which has produced innumerable depictions of space environment as well as space exploration over the past and present century.

The areas which have been particularly influenced by the constantly changing state of human knowledge about the universe are the Solar System planets and their moons. Remaining elements, including space technology like spaceships and space stations as well as other astronomical phenomena, such as asteroids and comets, galaxies, distant stars, nebulae, pulsars or black holes have not undergone so evident alterations. The following section is the summary of the most crucial developments in the U.S. and Soviet space research and exploration which seem to have evidently impacted the content of space art works discussed in the present dissertation.

(1) The Moon. In some early depictions of its surface, for example Bonestell's *Trip to the Moon* (*Life*, 4 Mar. 1946) or *Rocket to the Moon* (*Mechanix Illustrated*, Sept. 1945) as well as Kolchitskii's *Mezhplanetnyi korabl pribyl na lunnuiu bazu* [Interplanetary Spacecraft Has Arrived in the Lunar Base] (Gilzin 1960) or *Vid zemli c luny* [The View from the Moon] (Blagoi 1959), the Moon was often portrayed as a mountainous rather than a lowland terrain dominated

by impact craters (Hardy 1989: 79; Hardy and Moore 2006: 12; Miller 1978: 62-69). The first successful mission of the Russian Luna (1959-1976) and others that followed, including the U.S. Ranger (1961-1965), Surveyor (1966-1968), Lunar Orbiter (1966-1967) as well the U.S.S.R. Zond (1964-1970) or Lunokhod programmes (1970-1973), revealed the lunar surface to be plain and sterile, thus affecting its visual representations in space art, which since the 1960s, began imitating the actual reality, as portrayed in Leonov's *Miagkaia posadka* [Soft Landing] or *Pered priluneniem* [Before the Moon Landing], Leonov and Sokolov's *Lunnyi vezdekhod* [Lunar Rover] (Leonov and Sokolov 1967), Iurii Shvets's *Tekushchii remont. Zvezdnaia sluzhba* [Maintenance Works. Space Mission] (*Tekhnika molodezhi*, Apr. 1975), McCall's *2001* theatrical poster depicting the lunar exploration or William K. Hartmann's *Discovery on the Moon* (1978).[12]

(2) Mars. In the 1950s, it was commonly believed that the planet had two clearly distinguishable polar caps composed of water and dry ice, vast areas of reddish deserts, dust storms as well as old sea beds or canals possibly containing some forms of low vegetation nurtured by the polar caps' melting waters (Hardy 1989: 80; Miller 1978: 70-79). As suggested by Hardy and Moore (2006: 19),

> the landscape of Mars was generally believed to be flat. with no mountains and at best rolling hills, because no long shadows could be seen telescopically at the terminator – unlike the case with the Moon, whose mountains cast such shadows, Hardy did, however, depict craggy buttes left by erosion, and this prediction has proved quite accurate. (Hardy and Moore 2006: 19)

Such portrayals of Mars could be seen, for instance, in David A. Hardy's *Mars From Deimos* (1956), Kolchitskii's *Mars na nebe ego sputnika Deimosa* [Mars as Seen from its Moon, Deimos] (Gilzin 1960), Leonov and Sokolov's *Marsianskoe utro* [The Morning on Mars] (Leonov and Sokolov 1967) or Bonestell's vision of Mars as seen from Deimos (Ley, Von Braun and Bonestell 1956: 68). However, as a result of the first successful Mars missions carried out in the 1970s, particularly the U.S. Viking programme (1975-1978) which revolutionized our ideas about the existence of water on Mars as well as geological forms that had been formed in its distant past, the views of the red planet were largely revised. Since the late 1970s, space artists began envisioning this alien world as a barren land with a thin atmosphere as well as replete with Earth-like poles, impact craters, volcanoes, canyons, valleys and

[12] Works of William K. Hartmann mentioned in this section can be accessed at http://www.psi.edu/about/staff/hartmann/opc.html (William K. Hartmann's Online Painting Catalog available at William K. Hartmann's Home Page).

deserts (Hardy 1989: 80; Hardy and Moore 2006: 18-21). Such accurate depictions appeared in Hartmann's *Exploring a Martian Channel* (1979), Leonov and Sokolov's *V kratere Marsa* [In the Crater of Mars] (Shashkova 1973), Oleg Kirienko's *Na Marse* [On Mars] (*Tekhnika molodezhi*, Jan. 1979) or McCall's *Mars Colony* (1975). Also, Mars's two known satellites, Phobos and Deimos, examined more closely by the Soviet Phobos 1 and Phobos 2 probes (1988), proved to be small and irregularly shaped which largely coincided with Bonestell's aforementioned portrayal of Mars as seen from Deimos or Sokolov's *Na sputnike Marsa* [On the Moon of Mars] (Leonov and Sokolov 1967).

(3) Venus. Before the space age commenced, Venus was commonly perceived as a highly mysterious planet since little was known about the actual surface conditions (Hardy 1989: 76; Miller 1978: 56-57). Hardy and Moore (2006: 31) characterize the two ways the planet was imagined in the 1950s:

> Spectroscopic work showed that the upper atmosphere at least was rich in carbon dioxide; since this gas acts in the manner of a greenhouse, it was safe to assume Venus must be a hot world. Svante Arrhenius, a Swedish chemist whose work was good enough to earn him a Nobel Prize, believed Venus to be similar in condition to the Earth during the Carboniferous Period, around 350 million years ago, with luxuriant vegetation, extensive swamps, and no doubt life forms such as amphibians and insects. Other astronomers considered that there could be broad oceans, with relatively little dry land. In this case the atmospheric carbon dioxide would have fouled the water to produce seas of soda water. It is probable that life on Earth began in our seas, and the same would presumably be true of Venus, so life could evolve in the same way as it did here. Later, Fred Hoyle suggested there might be seas of oil. However, spectroscopic analysis showed no trace of either oxygen or water vapour; so, according to a different theory, Venus was a bone-dry, fiercely hot desert. In this theory, what we were seeing were clouds of dust, dense enough to mask the surface completely. High winds would erode the rocks into strange shapes, like alien sculptures. To attempt a landing there would be very hazardous. (Hardy and Moore 2006: 31)

The two diverse versions of what the world on Venus may look like were often depicted in early space art works. That of a lavish, watery jungle-like scenery with primeval vegetation was envisioned, for example, in Bonestell's set of illustrations for the articles "Mr. Smith goes to Venus" (*Coronet*, Mar. 1950) Meanwhile, a barren, desert-like and dusted landscape, was portrayed, for instance, in Sokolov's *Venera raskalennaia* [Venus is Red-Hot] (Leonov and Sokolov 1967) or *Venera. Posadka gruzovoi rakety* [Venus. Landing of the Massive Roket] (Leonov and Sokolov 1969). These hypotheses were abandoned with the first successful unmanned spacecraft missions to Venus,

especially thanks to the 1962 U.S. Mariner 2 probe, which debunked the myth of the existence of vast oceans on its surface. However, it was the Soviets who took the lead in the 1970s robotic exploration of the planet. In particular, Venera 9 (1975) is credited with obtaining the first reliable image of its surface presenting a gloomy, sharp-edged landscape with almost no signs of erosion. More detailed maps were constructed much later due to remarkable research results provided by Magellan Orbiter (1990-1994), which revealed a greater number of Venus's geographical and geological features, including volcanoes, lava flows, high mountains, deep valleys and impact craters (Hardy 1989: 79). These and similar characteristics were often incorporated in many 1970s space art paintings, such as Sokolov's *Avtomaticheskaia stantsia 'Venera 9' na Venere* [The Automatic Station 'Venus' on Venus] (Leonov and Sokolov 1978).

(4) Mercury. A relatively rarely depicted in space art works, Mercury remains one of merely few extraterrestrial bodies whose visual representation has not much changed throughout the 20th century. In the early space age era, it was believed that the planet had synchronous rotation which resulted in the existence of its two opposing hemispheres: one in permanent sunlight and the other in deepest dark (Hardy and Moore 2006: 36; Miller 1978: 50-55). After the U.S. Mariner 10 encounter with Mercury (1974-1975), it was revealed that its rotational period differs from the previous estimations and its "dark side" is not completely devoid of sunlight; similarly, there is no "twilight zone" characterized by tolerable temperatures. These discoveries, however, did not much affect the image of the planet which continued to be presented as a sterile, rocky and lunar-like surface replete with small craters, high cliffs, ridges or thrust faults, as depicted in Bonestell's *Surface of Mercury* (Ley and Bonestell 1949) or Leonov's *Na Merkurii* [On Mercury] (Shashkova 1973) (Hardy 1989: 75).

(5) Jupiter and its moons. The research results brought about by the Pioneer (1973-1974) and Voyager (1979) probes as well as the Galileo orbiter (1995-2003) have revolutionized the way Jupiter and four of its major satellites of planetary size, including Io, Europa, Ganymede and Callisto, are depicted in space art (Hardy 1989: 106-113; Miller 1978: 80-87). The most significant changes in their visual representation involve: i) the exclusion of icy mountains on Europa, as presented in Kolchitskii's *Mezhplanetnye puteshestvenniki na sputnike Iupitera Evrope* [Interplanetary Travelers on Jupiter's Moon, Europa] (Gilzin 1960) or Hardy's *Jupiter Seen from Europa, One of the Four Galilean Moons* (Moore and Hardy 2006: 46), which proved to have an icy and cracked, yet relatively smooth surface with shallow cracks, light ridges and no larger impact craters, as depicted in Sokolov's *Na Evrope – iarchaishem sputnike*

Iupitera [On Europe – the Hottest Moon of Jupiter] (Leonov and Sokolov 1981); ii) the inclusion of a number of active volcanoes as well as other geographical and geological features on Io, including variegated yellow, red and white patterns characteristic for the allotropes of sulphur, as portrayed in Hartmann's *Io Volcanics*, (1979), Hardy's *Eruption on Io*, (Hardy and Moore 2006: 50-51) or Sokolov's *Izverzhenenie vulkana na Io, sputnike Iupitera* [The Volcano Eruption on Io, Jupiter's Moon] (Tkachev 1982); iii) the inclusion of numerous impact craters, eroded peaks and pinnacles composed of compressed rock and ice on Callisto, as presented in Hardy's view from Callisto (Hardy and Moore 2006: 53) (Hardy 1989: 106-113; Hardy 2006: 46-55).

(6) Saturn and its moons. According to Miller (1978: 95), space artists have always devoted a special attention to Saturn as "with the possible exception of the Earth's Moon, [it] has been the subject if more space art than any other celestial object", most presumably due to the planet's mysterious rings and mystical connotations. The planet and its satellites, including Mimas, Titan and Iapetus, have been surveyed by Pioneer 11 (1979) as well as the two Voyager probes (1980-1981), the latter of which brought the most impressive results. The most important of them included: i) the depiction of Saturn's rings which, once believed to be solid or liquid, as portrayed in Bonestell's *Saturn* (Ley and Bonestell 1949), turned out to be composed of icy particles, as presented in Sokolov's *V koltse Saturna* [In Saturn's Rings] (Sokolov 1963) or Hartmann's *Saturn's Rings* (1978); ii) the representation of Titan, the largest known satellite in the Solar System, once thought to have a blue or greenish sky and the rocks covered with ice, as depicted in Bonestell's *Saturn as Seen from Titan* (1948), Hardy's *Saturn Viewed from Titan* (Hardy and Moore 2006: 57) or Sokolov's *Avtomaticheskiii vezdekhod na Titane, sputnike Saturna* [Automatic Rover on Titan, Saturn's Moon] (Tkachev 1982), proved to be have an atmosphere of orange-red smog replenished by "ice volcanoes" due to which Saturn can be only dimly visible from its icy, volcanic and upland surface, as seen in Hartmann's *Sunset Above the Clouds of Titan* (1979); iii) the portrayal of Mimas has changed from a rocky, hilly, yet relatively Earth-like landscape, as depicted in Bonestell's *Saturn From Mimas* (*Life*, 19 May 1944) or Kolchitskii's *Vid Saturna s ego sputnika Mimasa* [View of Saturn from its Moon, Mimas] (Gilzin 1960), to a craterous globe of an extremely low density and weak gravity composed of ice combined with rock. Also, as the satellite is moving in the plane of the ring system, Saturn's rings would be always viewed edgewise-on, as in Hartmann's *Mimas, Dawn* (1995) (Hardy 1989: 114-119; Hardy and Moore 2006: 57).

(7) Uranus. The commonly known image of Uranus represented in space art has not undergone any major transformations as there were practically no early depictions of the planet available in the popular media. Voyager 2

(1977), credited with sending some excellent and detailed photos of its encounter with the giant, has revealed its gaseous structure composed of "ices" of water, methane and ammonia as well as other characteristics, including a retrograde rotation and a system of thin, dark rings, as portrayed in Hartmann's *Uranus Seen from Umbriel* (1981) or Sokolov's *V atmosfere Urana* [In Uran's Atmosphere] (Leonov and Sokolov 1972) (Hardy 1989: 120; Hardy and Moore 2006: 64-65; Miller 1978: 88).

(8) Neptune. In the early 1970s, little was known about the planet except for the fact that it was a blue gas-giant, the near twin of Uranus, with two satellites, Triton and Nereid (Miller 1978: 90). The Voyager 2 mission provided more specific details about the world of Uranus which turned out to have an obscure ring system, several smaller inner satellites as well as high-altitude clouds and belts. Interestingly, some novel facts about Titan also proved to be startling; it was found that it had been the coldest place ever surveyed by a spacecraft, coated with ice and active geysers, as presented in Sokolov's *Issledovanie Neptuna* [The Examination of Neptune] (Senkevich 1984) or Hartmann's *The Liquid Nitrogen Ocean on Triton* (1989) (Hardy 1989: 123; Hardy and Moore 2006: 68-69).

(9) Pluto. As no spacecraft has reached the planet so far, numerous scientific facts about its structure and surface still remain unrevealed (Miller 1978: 92). Until 1978, it was unknown that Pluto has a major satellite called Charon, discovered in that very year by one of the U.S. Naval Observatory Flagstaff Station's astronomers, J. W. Christy. Pluto was then simply envisioned as a small, rocky body containing seas of liquid methane from which the sun could be viewed as an intensely bright and inconsiderable point of light, as depicted in Hardy's view of Pluto as seen a cave or a lava-tube (Hardy and Moore 2006: 72) Sokolov's *Posadka na Pluton* [Landing on Pluto] (Leonov and Sokolov 1972) (Hardy 1989: 126; Hardy and Moore 2006: 72). As late as in the 1990s, the Hubble Space telescope has provided some additional facts about the planet, including its reddish surface, extremely cold, yet extensive tenuous atmosphere; Charon was proved to be a considerably smaller and icy body containing less rock than Pluto, as seen in Hartmann's *Pluto and the Sun Seen from Charon* (1999).

(10) Space stations. The first serious and credible projects of space stations later envisioned by the major American and Soviet artists were put forward in the mid-20th century. The most widely depicted representations included a rotating wheel-shaped space station designed by Wernher von Braun, as portrayed in Hardy's 1954 painting (Hardy and Moore 2006: 8) or Kolchitskii's *Nad Zemlei dvigalsia novyi uskusstvennyi sputnik* [The New

Artificial Satellite Has Moved Above Earth] (Zakharienko 1952). Later visions became more diverse and elaborate, presenting space stations in various forms accompanied by shuttles and deep-space vehicles, as in McCall's *Space Station of the Future* (*Life*, 21 Apr. 1961) or his theatrical posters for Kubrick's *2001* (1968) as well as Leonov and Sokolov's *Orbitalnaia pilotiruemaia stantsia* '*Saliut-Soyuz*' [Orbital Operated Station 'Saliut-Soyuz'] (Leonov and Sokolov 1972) (Hardy and Moore 2006: 9).

Undoubtedly, planetary landscapes have undergone some major transformations in 20th century space art works, particularly those depicting the surface of the Moon as well as the Solar System planets and their selected satellites. Especially the U.S. probes, such as Pioneer (1958-73), Mariner (1962-1973), Ranger (1961-1965), Surveyor (1966-1968), Lunar Orbiter (1966-1967), Viking (1975-1978) or Voyager (1980-1981), have largely contributed to the success of planetary exploration and a substantial broadening of human knowledge about the Solar System. The U.S.S.R. activities in the field, including the Luna (1959-1976), Zond (1964-1970), Lunokhod (1970-1973) or Venera (1961-1984) programmes, are also credited with some unprecedented achievements, specifically in Venus's exploration which provided some information about the planet's surface and a coverage of its northern reaches (Launius 1998: 10, 35). However, it seems that since the 1960s the exploration of the solar system and the study of the universe by the use of artificial intelligence was more active and effective on the American side. Although the Soviet Union engaged more dynamically in the 1970s and 1980s planetary science programme, most of their attempts failed except launching several successful robotic missions to the moon, Venus and Mars, orbiting scientific and applications spacecraft around the Earth as well as exploring asteroids and Halley's Comet (Launius 1998: 11). Undeniably, as the United States had overwhelmed its Cold War rival in terms of a significant number of successes achieved solely in the field of robotic space exploration, American space artists produced more fact-based works grounded in science rather than imagination. With a wide and unconstrained access to the latest advancements in planetary exploration, they were able to paint various space subjects in line with the actual state of human knowledge about the universe. In contrast, their Soviet counterparts, especially in the 1960s, had a restricted access to some of the pioneering accomplishments of the national space programme and could have additionally struggled with the constraints of the regime of Soviet secrecy. Although there are virtually no accounts of any particular cases, it is highly likely that the widespread propaganda machine must have, to a lesser or greater extent, affected the content of popular space art works.

When it comes to the depictions of spacecraft and remote astronomical bodies, such as galaxies, asteroids and comets, stars, black holes, pulsars or

nebulae, any specific changes within their content are difficult to detect. More specifically, while the portrayal of the former was often subject to an individual artist's creative invention or sometimes the publisher's or the public demands, the vision of the latter could not evolve on a large scale due to scarce information obtained from deep space exploration, pursued mainly by NASA. At present, the only space probe, which has reached the edge of the Solar System in December, 2011 and entered the previously unknown sphere of interstellar space in August, 2013, is the U.S. Voyager 1 (Bryn 2013). Unfortunately, further deep space exploration is not yet feasible due to the current unavailability of adequate space engine technology. Although NASA has already announced its plans to develop three technologies crucial to pursue this mission, namely a large solar sail, a deep space atomic clock and a highly advanced laser communications system, the prospect of interstellar travel still remains within the realm of a distant future.

3.6. Concluding remarks. The current trends in contemporary space art

Since time immemorial various forms of space art representations have accompanied human endeavours to envision largely unexplored and unknown realms of cosmic experience. Being it Stone Age cave art or contemporary oil painting and sculpture, space art has engaged in a number of efforts to popularize space-related concepts and activities by visualizing them in both convincing and stirring way. Particularly 20th century representational and pictorial depictions have become the most widespread mode of artistic expression striving to portray the wonders of the universe and human space efforts. Numerous definitions and descriptions of the genre, however diverse they might seem, tend to emphasize its major aesthetic and educational purpose which is to communicate different ideas about the cosmos and the greatest accomplishments of the space age to both to scientists and members of the general public as well as to inspire the future generations of space enthusiasts and explorers. Both American and Russian sources, although the latter occasionally confuse space and astronomical art (*kosmicheskaia zhivopis*, *kosmorealizm*) with science fiction and fantastic art (*nauchno-kosmicheskaia zhivopis*, *khudozhniki-fantasty*), stress the fact that contemporary space art works would not have been conceptualized had it not been for a number of astronomy as well as space research and exploration inspired conceptions which have evolved since the dawn of the space age era.

The earliest depictions of outer space and space exploration appeared in literary works, the press as well as popular science publications, however, only the 1920s witnessed the rise of space art in popular science and science

fiction magazines and periodicals. It seems that throughout the analyzed period more space art-like illustrations appeared on the American rather than the Russian and Soviet side. What is more, since the very beginning of their use in popular science discourse, while the U.S. space art demonstrated clearly astronomical and astrofuturist influences, its Soviet counterpart tended to combine science fiction and fantastical elements with reality of space travel. Also, whereas the former was intended to present the American public with mostly realistic, promising and sometimes fearsome visions of alien worlds and space exploration embedded in the frontier myth, the latter visualized space subjects in the style combining both optimism of social realism and spirituality, mysticism as well as esotericism of medieval icons. With the rise of popular media in the late 1940s, space art works were often utilized in science fiction and popular science film industry which combined science education with realistic portrayals of space adventures and extraterrestrial landscapes.

One of the most recognizable 20th century representatives of the genre, Chesley Bonestell, Nikolai Kolchitskii, Robert McCall and Andrei Sokolov, have made a sizeable contribution to its development. Both Chesley Bonestell's and Nikolai Kolchitskii's paintings and illustrations are widely considered to embody a realistic mode of outer space representation and were published mostly in general interest, popular science and occasionally science fiction books as well as magazines. Their depictions of space subjects were highly praised by the editors and publishers for their spectacular and awe-inspiring qualities which helped portray space settings in a convincing manner. Meanwhile, Robert McCall and Andrei Sokolov, educated to become aircraft illustrators and often seen as American and Soviet counterparts of each other, produced works, generally classified by Russian sources as space realism (*kosmicheskii realism*). Both artists' visions of the universe and space exploration were commonly regarded as both highly imaginative and at the same time realistic, accurate and conveying a sense of authenticity. They were published as both individual space art works and in a number of popular media of that time, including science fiction and popular science magazines and film industry. Also, many of McCall's and Sokolov's works played a significant role in popularizing the national space efforts; while the former largely contributed to the NASA Art Programme, the latter acted as the head for the Committee on Science and the Cosmos of the U.S.S.R. Union of Artists. Therefore, both had a wide access to the behind-the-scene activities and outcomes of space exploration ventures carried out by the government.

When it comes to the main generic characteristics of American and Soviet space art, the two seem to differ mainly in the areas of artistic and cultural production. For instance, with respect to a specific mode of outer space representation, the U.S. space art draws on visual patterns utilized by

19th century American landscape movement, particularly the idea of romantic landscape which makes use of the sublime and the picturesque. On the other hand, its Soviet counterpart is likely to embrace a wider variety of styles, ranging from realism to symbolic and romantic imaginary. Also, whereas American works tend to seek inspiration from realistic and science-grounded depictions of space environment, the Soviet appear to be under a stronger influence of propaganda and incorporate a greater number of elements which lean toward expression and abstraction. Today's American and Soviet space art seem to follow their original and distinctive patterns of representation; while the former is largely affected by the Anglo-American realistic tradition of astronomical art, the latter often inclines toward encompassing partly fantastical, spiritual and mystical themes in their paintings. What is more, some evident differences lie in the extent to which space artists adhere to scientific facts revealed by subsequent advances in 20th century space research and exploration. Due to numerous successes of the U.S. planetary exploration as well as a wider and mostly unconstrained access to the research results brought about by space probes, there were more fact- and science-based works on the American rather than Soviet side. This situation makes a striking contrast to the Soviet conditions for space art expression often restrained and censored by the regime of Soviet secrecy applied both to the works' visual style and their content with respect to portraying the national space programme's scientific and technological achievements.

Today's space art has undergone a major revolution, particularly in terms of a visual mode of representation it tends to embrace which has shifted from a traditional painting or illustration to a digital depiction of space settings. In her article, "Is space art dead?", Lynette Cook, one of the contemporary American space artists, asks whether the genre, viewed in its classic, pictorial form, is currently experiencing a demise due to its wide adoption of technological advances. As argued by Cook (2009: 2), "the wondrous success of the Hubble Space Telescope and other technological marvels created ripples of uncertainty among space artists" and many space artists themselves turned to the use of computer generated imagery in their artistic endeavours. Her survey conducted among the International Association of Astronomical Artists members has revealed the following results considering the choice of style and media in individual works:

> The 62% of members who responded to my questions come from Australia, Belgium, Canada, China, France, Germany, Spain, the United Kingdom, and the United States. Career longevity varies from two to 56 years, with 23 years the average. A realistic art style is prevalent within this group (76%), with the remaining work identified by the practitioners as abstract, expressionistic, informal/conceptual, diagrammatic, impressionistic, pop, representational, semi-realistic, science fiction,

> storytelling, symbolic, surrealistic, art-in-space sculpture, and "other". Media choice varies too, with digital (computer generated imagery or CGI) taking the lead at 54%, acrylics second (28%), and oils in third place (8%). The remainder is a smattering of alkyds, charcoal, graphite, glass, gouache, ink (line and wash), installation/environmental, marker, pastel, constructive, photography, printmaking, watercolor, sculpture, and mixed media. (Cook 2009: 3)

Their paintings appear regularly in newspapers, popular science journals, popular books and textbooks, film and broadcasting as well as on the Internet, contributing to the wide spread of cosmic imagery in a number of international media. Cook (2009) also points out that a gradual process of digitalization of space art, which began approximately in the 1990s, allows the artists to incorporate an incredible amount of realism in the works as well as render them to a large extent similar to each other due to the widespread use of identical software programmes. In this way, although some digital artists have managed to develop their own personal style, most computer-generated images still seem to miss the uniqueness and subtlety stimulated by a hand-painted scene.

Another recent trend in the genre is popularization of artworks other than classic paintings and illustrations. For example, the Leonardo Space Art Working Group, carried out by the French branch of Leonardo/ISAST (the International Society for the Arts, Science and Technology), promotes and releases publications on various space-related projects which also deal with non-pictorial and non-representational portrayals of space environments and space efforts through an original combination of artistic and scientific endeavours ("Space art" 2006). As stated on their official website, the working group "aims to make visible the work of artists, writers, composers and others interested in the exploration of outer space. We also aim to help establish contact between artists, scientists and engineers interested in working together on space art projects" ("Leonardo space art working group" 2004). Their main activities involve organizing space art workshops and exhibitions, international conferences, meetings as well as online forums and discussions or documenting the most recent ventures of contemporary space artists. The current database has collected the work of over twenty different artists representing highly diverse styles and expressions of the genre, including abstract paintings, such as Ian Clothier's *What Order is This Chaos?* (1999) and Ivan Khokhlov's *Birth of the Star* (2004) or sculptures, installations, videos and performances like Pierre Comte's *Biospace 1* (1991), Jem Finer's *Zero Genie* (2002), Arthur Woods's *Cosmic Dancer Sculpture* (1993), Ansuman Biswas's *Homage to the Four Tops* (1999), Frank P. Pietronigro's *Research Project Number 33* (1998), Jane and Louise Wilson's *Star City* (2000), Iurii Leiderman's *Kefir Grains Are Setting Off For Flight* (2003) and many others ("Spacearts: The space art database" 2014).

Undeniably, the standards of the present day space art have been altered to fit the demands of contemporary artists who realize a variety of novel projects aimed to explore the limits of outer space and space exploration by means of visual arts and modern technology. Nevertheless, the principal idea behind space art endeavours, carried out in the past century and at the beginning of the new millennium, remains unchanged. Not only have space artists been always at the forefront of space exploration since the outset of the space age era, but also they have constructed their stirring visions long before the very first space exploration ventures originated. In fact, certain works of art and literature envisioned and anticipated some technological concepts related to human efforts in space as well as stimulated the evolution of the national space programmes. What is more, their mission continues today; while visually exploring distant destinations and seemingly unfeasible space exploration projects, space artists do not only inspire space scientists and engineers, but also help them develop advanced scientific and technological concepts. In this way, their artworks constantly incite the public interest in space and likewise largely contribute to maintaining the nation- and worldwide endorsement for further space development. It seems that if some of mankind's futuristic plans for space exploration ever come true, space art will be deemed unequivocally responsible for their success.

Chapter 4

The impact of Russian and American Cosmism on the representation of space exploration in selected works of American and Soviet space art

The aim of the present chapter is to outline the life and work of the leading American and Soviet space artists as well as to present the chief assumptions of the research methodology utilized in this work and the main research results of the study of selected space art works. Particularly, the following sections will summarize both qualitative data and the chief criteria of visual content analysis of selected images which will allow me to determine the impact of Cosmism on the representation of space exploration in their content. Some parts of the chapter will be devoted to a quantitative description of the collected materials, including a number of analyzed works, their authorship, origins and the date of publication, as well as a qualitative examination of specific coding categories used in the study and the major reasons for their selection. Meanwhile, the latter parts will be concerned with employing the qualitative data to the visual content analysis of American and Russian space art which will enable me to test the thesis of the whole dissertation and draw relevant conclusions.

In the following section, I will outline the life and work of Chesley Bonestell, Nikolai Kolchitskii, Robert McCall and Andrei Sokolov, the chief representatives of space art of the early (1940s-1960s) and late (1960s-1980s) space age in the cultural and literary context of the period. I choose to analyze selected works of these particular artists as i) their works (1944-1991) appear in quantities sufficient for conducting a visual content analysis and ii) the artists can be to a large extent considered American and Soviet counterparts of each other. Additionally, I will emphasize certain common traits between the artistic and cultural output of Chesley Bonestell and Nikolai Kolchitskii as well as Robert McCall and Andrei Sokolov and thus attempt to explain the choice of their works in my analysis. The artists' depictions of space exploration often served as the visual material accompanying the narratives and science fiction

stories published in general interest and popular science magazines. Some of them were also utilized in science fiction and popular science film industry where they stirred the viewers' imagination with their unforgettable and awe-inspiring visions of the universe and space endeavours.

4.1. The life and works of Chesley Bonestell, Nikolai Kolchitskii, Robert McCall and Andrei Sokolov

4.1.1. Chesley Bonestell

Chesley Bonestell, widely perceived as the father and master of American space art, was born in 1888 in San Francisco, California and, as reported in biographical sources, his lifelong interest in astronomy began already in early childhood. As pointed out by Miller (1978: 20), his lifetime encompassed the major events in the history of aviation and space programme, including both the first manned airplane and moon flights. Originally educated to be an architect, Bonestell began working as a architectural designer for *The Illustrated London News* in the 1920s where he produced numerous renderings of some prominent San Francisco buildings and was first introduced to Scriven Bolton's and Lucien Rudaux's space art. Having left England and returned to the U.S., the artist continued his architectural career and largely contributed to the design of such leading projects of his time as San Francisco's Golden Gate Bridge, the Chrysler Building, the Plymouth Rock Memorial, the U.S. Supreme Court Building, the New York Central Building or Manhattan office and apartment buildings (Schuetz 1999: 17). Since the 1930s, he began working as a special effects painter for the Hollywood motion picture industry where he created artwork for several films, including *Mr. Smith goes to Washington* (1939), *Citizen Kane* (1941) or *The adventures of Mark Twain* (1944) as well as space themed pictures, such as *Destination moon* (1950), *When worlds collide* (1951), *War of the worlds* (1953) and *Conquest of space* (1955) (Schuetz 1999: 31).

Bonestell's professional training as an architect and his broad knowledge of astronomy helped him develop his own style bordering on astronomical and space art. On May 29, 1944, *Life* magazine commissioned a special series of paintings depicting Saturn as seen from five of its moons, the first ever produced by the artist in print. This is how Bonestell himself commented on the artistic and technical aspects of illustrating the planet and its satellites (as quoted in Schuetz 1999: 17):

> As my knowledge of the technical side of the motion picture industry broadened I realized that I could apply camera angles as used in the motion picture studio to illustrate 'travel' from satellite to satellite, showing Saturn exactly as it would

> look, and at the same time I could add interest by showing the inner satellites or the outer ones on the far side of Saturn, as well as the planet itself in different phases. (as quoted in Schuetz 1999: 17)

His depictions of Saturn, the moon and Earth seen from orbit as well as other parts of the universe literally allowed the viewer to travel in outer space and witness some of the most stirring scenes which might have resembled the actual reality. These images are believed to have greatly impressed the world of astronomy and science fiction. As pointed out by Schuetz (1999: 18), "No one had ever before seen such paintings – they looked exactly like snapshots taken by a space-travelling *National Geographic* photographer. For the first time, renderings of the planets made them look like real places and not mere artist's impressions". *Life*'s series did not only bring the artist both fame and credit for his incredible works, but also enabled him to pursue a full-time career in the field of space art. After having been introduced to Willy Ley, he followed his advice and began including spacecraft and astronauts in his paintings; also, the two collaborated on an array of magazine articles, including the March 1946 issue of *Life* which described the first moon landing and later became an inspiration for *Destination moon* (1950) (Miller and Durant III 2001: 51; Miller 1978: 20).

Bonestell's space art soon began appearing in one of the major general interest and popular science magazines of his time, such as *Life*, *Collier's*, *Coronet*, *Pic*, *Scientific American* or *Mechanix Illustrated*.[1] One of the most memorable depictions is the cover for the first issue of the *Collier's* spaceflight series, Man Will Conquer Space Soon! (1952-1954), which presented a winged space shuttle jettisoning its lower stage while heading for the Earth's orbit. Interestingly, this highly futuristic painting anticipated the actual reality as a similar spacecraft was launched by the U.S. twenty nine years after Bonestell created his vision. Also, *Life*'s classic series of articles, The World We Live In (1952-1954), is widely regarded as one of the first most

[1] Examples might include eleven pictures of the moon in the March 4, 1946 *Life*'s article "Trip to the moon", nine pictures of the Earth in the Dec. 8, 1952 *Life*'s article "The world we live in: The earth is born", six pictures of the universe in the Dec. 20, 1954 *Life*'s article "The world we live in: The star-studded reaches of measureless space", four pictures of the moon in the Dec. 15, 1958 *Life*'s article "The moon: Myths, marvels and man's reach for it," the cover art for the March 22, 1952 *Collier's* article "Man will conquer space soon", two pictures of the rocket and the moon in the Oct. 23, 1948 *Collier's* article "Rocket Butz from the moon", two pictures of the manned moon mission in the Oct. 18, 1952 *Collier's* article "Man on the moon", three pictures of the fist space station in the June 27, 1953 *Collier's* article "Baby space station", a few illustrations of the first space suit in the Feb. 28, 1953 *Collier's* articles "World's first space suit" and "Man's survival in space" or four pictures of the first manned mission to Mars and Martian landscape in the 30 Apr, 1954 *Collier's* articles "Can we get to Mars?" and "Is there life on Mars?" (Estimation mine, KB).

credible and awe-inspiring visions of the cosmos which suggested what the origins of Earth and the universe surrounding it may have looked like (Shuetz 1999: 23). Fifty eight of the aforementioned works were later published in the first American popular science book, *Conquest of space* (1949), written by Willy Ley and illustrated by Bonestell, which provided both literary and visual effects in a highly realistic manner, describing and explaining scientific details of the possible human exploration of the solar system (Miller and Durant III 2001: 57-62). According to Schuetz (1999: 19), "the realism of the artwork in conjunction with Ley's confident expertise convinced an entire generation of post-World War II readers that spaceflight was possible in their lifetime. There are professional aerospace engineers and scientists working today who decided their careers when they saw *The conquest of space* when they were only eight or ten years old".

Many Bonestell's astronomical and space paintings were also collected and published in the classic popular science books, including *Across the space frontier* (1952), *Conquest of the moon* (1953) and *The exploration of Mars* (1956), *Beyond the solar system* (1964), *Mars* (1964) or *Beyond Jupiter* (1972) authored by Willy Ley, Wernher von Braun, Fred Whipple or Arthur C. Clarke. Particularly the last book, written in collaboration with Arthur C. Clarke, provides the readers with incredibly spectacular views of the outer solar system which turned out to bear a close resemblance to the later Voyager photos. Most visuals were considered strikingly realistic partly due to Bonestell's technique of spherical perspective (Miller and Durant III 2001: 44; Schuetz 1999: 18):

> In order to make his paintings seem as photographically realistic as possible, Bonestell developed his own technique of spherical perspective "to show the surface of the Earth, Mars or the Moon", he said, "from various high altitudes... Considering the planets as globes, covered with a series of flat planes one to 10 miles square, depending on the elevation, the centers of such squares being tangent to the globe, it is easy to find the horizon and the vanishing points of the sides of each square. The rest is just a matter of plotting the physical features on the squares". (Schuetz 1999: 18)

This remarkable technique, possible only thanks to Bonestell's broad knowledge of astronomy and an almost pedantic obsession with perfection, allowed the artist to produce an unprecedented effect of realism also utilized in early science fiction film industry. In *Destination moon* (1950), for instance, he painted a 14-foot-long composition of the interior of Harpalus; this is how Robert A. Heinlein, whose novel *Rocketship Galileo* (1947) served as the ostensible source for the picture, recalls his cooperation with Bonestell (as quoted in Schuetz 1999: 19):

> I had selected the crater Aristarchus [for the landing site]. Chesley Bonestell did not like Aristarchus; it did not have the shape he wanted, nor the height he wanted, nor the distance to an apparent horizon. Mr. Bonestell knows more about the surface of the Moon than any other living man; he searched around and found one he liked-the crater Harpalus, in high northern latitude, facing the Earth. High latitude was necessary so that the Earth would appear near the horizon where the camera could see it and still pick up some lunar landscape. Northern latitude was preferred so that the Earth would appear conventional and recognizable. (as quoted in Schuetz 1999: 19)

Bonestell's remarkable talent and lifelong career as prolific space artist and one of the most fervent advocates of the U.S. space programme coincided with the Golden Age of spaceflight in America, the period characterized by the public fascination with and support for space exploration. The artist's hyper-realistic paintings and illustrations of space subjects were even commissioned by editors of science fiction and fantasy magazines and thus featured quite regularly on the covers of *Astounding*, *Galaxy* or *The Magazine of Fantasy and Science Fiction*. His spectacular visions can be also admired in several murals, most notably a 10 x 40 feet panorama of the lunar surface painted for the Boston Museum of Science which later moved to the National Air and Space Museum in Washington, D.C.

Toward the end of his life, he engaged in numerous private projects, including the reconstruction of the great Spanish missions located along the California coast from San Diego to Sonoma, as well as devoted himself to painting various space and other subjects, such as dinosaurs, sea shells or Chinese landscapes (Shuetz 1999: 27). Interestingly, Bonestell always considered himself to be an illustrator since his works "tell a story" and "the term 'artist' has too many connotations" (Miller and Durant III 2001: 105); he also emphasized his paintings' distinction from the genre of science fiction art which he disliked. This is how he commented on his lifelong involvement in the domain of space art (as quoted in Houston 1978: 67):

> To become a space painter you must have a restless drive for drawing and painting. A few lessons on drawing and the handling of paints will suffice; a knowledge of astronomy and descriptive geometry can be acquired by study. But you should then develop your own style and technique. One has to sit in the studio and work out the problems-alone. (as quoted in Houston 1978:67)

Until today, Bonestell remains one of the most recognizable and distinguished artists working in the field of space art, having received the Science Fiction Special Achievement Award (1974), the British Interplanetary Society Special Award and Medallion for lifetime achievements in space exploration (1976) or the Dorothea Klumpke-Roberts Award from the Astronomical Society of the

Pacific (1976). He died in Carmel, California in 1986 at the age ninety eight, having left a remarkable legacy of classic astronomical and space art works, including *The Conquest of Space* (1948), *Saturn as Seen from Titan* (1948), *Saturn From Mimas* (1944), *The Surface of Mercury* (1949), *The Exploration of Mars* (1956) and many others analyzed in the present dissertation. Miller (1978: 20) summarized the artist's unique accomplishments as follows:

> Bonestell's career has not only documented the development of space exploration, but has, in very large and unique measure, contributed to its final success. The persuasive, photographic realism of his paintings, combined with a nineteenth-century romanticism and sense of wonder, helped to convince a skeptical nation of taxpayers that the exploration of space was not only a beautiful dream, but that it was well within the grasp of reality. (Miller 1978: 20)

Bonestell's unprecedented impact on popularization of space subjects and exploration was also pointed out by Carl Sagan who said that he did not realize what extraterrestrial worlds looked like until he saw his depictions of the solar system. Similarly, Joseph Chamberlain, the former Adler Planetarium director, expressed the view that "It might even be suggested that without Bonestell and his early space age artistry, the NASA era might have been delayed for many years, or it might not even have happened at all" ("Chesley Bonestell" 1989).

4.1.2. Nikolai Kolchitskii

Nikolai Kolchitskii, one of the pioneers of the Soviet space art along with G. I. Pokrovskii and A. N. Pobedinskii, was working in the genre known in Russian as *kosmicheskaia zhivopis* (space art)*, kosmorealism* (cosmorealism) or *NF (nauchno-fantasticheskaia) zhivopis* (science fiction art), the first two of which can be seen as the closest equivalents to what American sources define as astronomical art. Although there are solely few publications dealing with his life, the artist's vast legacy of innumerable space art works is commonly known and appreciated among both professional and amateur space enthusiasts in Russia and abroad. Interestingly, at the time Kolchitskii's illustrations were widely published in a number of postwar popular science journals, the terms *kosmorealism* or *nauchno-fantasticheskaia zhivopis* were still largely unknown in the Soviet artistic and intellectual circles. What follows is Nowakowski's (2014: 81) comment of the artist's legacy in the field of space and science fiction art:

> Dla masowego odbiorcy przeznaczone były też rysunki i ilustracje Nikołaja Michajłowicza Kolczickiego (1907-1979), reprodukowane (...) [w czasopismach] "Tiechnika-Mołodiożi" (...), "Ogoniok" i "Junijj Tiechnik". Malował głównie

> przestrzenie kosmiczne, surowe powierzchnie obcych planet oraz statki kosmiczne, w tym obłe rakiety, uformowane w kształt cygar, a więc typowe dla lat 50. XX wieku, zarówno dla artystów amerykańskich, jak i europejskich. Wyróżniającą je cechą były błyszczące czerwienią pięcioramienne gwiazdy na kadłubach rakiet i ścianach stacji kosmicznych. (Nowakowski 2014: 81)
>
> [Nikolai Mikhailovitch Kolchitskii's drawings and illustrations, reproduced (...) [in magazines, such as] *Tekhnika molodezhi*, *Ogonek* and *Iunii tekhnik*, served the needs of mass audience. He mostly painted the surfaces of alien planets and spaceships, including egg-shaped rockets in the shape of cigars, which was characteristic to the mid-20th century American and European artists' style. The most distinctive feature of Kolchitskii's art were the shiny red five-pointed stars depicted on the rockets' fuselages and the space stations' walls.] [translation mine, KB]

Born in 1907 in the family of a military officer, Kolchitskii received a technical education and, in the 1940s, began working as an engineer in the Central Institute of Aircraft Engine Construction ("Nikolai Mikhailovich Kolchitskii" 2014). In the next decade, he became one of the leading illustrators in the domain of science fiction art and produced numerous space themed images for several science fiction and popular science books on space exploration, including Sternfeld's *Velikoe ispytanie: Reportazh-fantastika* [The great trial: Report-fantasy] (*Ogonek*, Jan. 1952), Gilzin's *Puteshestvie k dalekim miram* [Travel to distant worlds] (1960), Zakharienko's *Puteshestvie v zavtra* [Journey into tomorrow] (1952), Lianunov's *Neotkrytaia planeta* [The undiscovered planet] (1963), Vasil'ev's *Puteshestviia w kosmos* [Travels into space] (1958), Valgard's *O zemle i vselennoi* [About the earth and the universe] (1962) or Gurevich's *Lunnye budni* [Lunar storms] (*Tekhnika molodezhi*, Oct. 1955). The most famous images produced by the artist for the aforementioned books and novels include *Nad zemlei dvigalsia novyi uskusstvennyi sputnik* [The New Artificial Satellite Has Moved Above Earth] (Zakharienko 1952), untitled paintings presenting the view of Saturn as seen from one its moons or the view of Earth as seen from the moon, *Neskolko minut raboty dvigatelia i korabl lozhitsia na krugobuiu orbitu* [A Few Minutes of Engine Work and the Spacecraft Rests in a Circular Orbit] (Vasil'ev 1958), *Vpervye na Marse* [The First on Mars], *Stroitelstvo iskusstvennogo sputnika Zemli* [The Construction of Earth's Artificial Satellite], *Zapravka mezhplanetnovo korablia na sputnike* [Setting Up an Interplanetary Spacecraft in Orbit], *Mars na nebe ego sputnika Deimosa* [Mars Seen From its Moon, Deimos], *Mezhplanetnye puteshestvenniki na sputnike Iupitera Evrope* [Interplanetary Travelers on Jupiter's Moon, Europa], *Vid Saturna c ego sputnika Tefii* [The View of Saturn From its Moon, Tethys], also known as *Vid Saturna c ego sputnika Mimasa* [The View of Saturn From its Moon, Mimas], *Mezhplanetnyi korabl pribyl na lunnuiu*

bazu [Interplanetary Spacecraft Has Arrived in the Lunar Base], *Kometa Galleia peresekaet orbitu Zemli. Na peredniem planie – Luna* [Halley's Comet Crosses Earth's Orbit. In the Foreground – the Moon] (Gilzin 1960) or a series of illustrations depicting the view of the sun as seen from alien planets, such as *Goluboe solntse* [The Blue Sun], *Krasnoe solntse* [The Red Sun], *Mir c dvumia solntsami* [The World with Two Suns] or *Stareiuschee solntse* [The Old Sun] (Valgard 1962) (Zubakin 2009).

When compared to Bonestell's works, most of these and akin images clearly border on the genres of astrorealism and science fiction art as well as appear to carry more romantic, symbolic and mystic qualities through their depiction of less realistic settings. This impression is sometimes reinforced by a poetic description accompanying a given visual like, for instance, in the portrayal of cosmonauts who have just landed on Pluto, published in Vasil'ev's *Puteshestviia v kosmos* [Travels into space] (1955):

> Мы на Плутоне. Солнце светит нам в спину, и лёгкая тень от корпуса гигантского корабля лежит на бесконечной сумрачной равнине, как дорога в неизвестное. Здесь границы солнечной системы. За ней, та, дальше, распростёрся бескрайний океан космического пространства. Но и его чёрную бездну пересекут когда-нибудь посланцы Земли, отправившиеся на разведку соседних звёзд. (Vasil'ev 1955)
>
> [We are standing on Pluto. The sun is shining at our backs and our huge spacecraft casts a subtle shadow on the endless gloomy plain like the journey into the unknown. The end of the solar system is somewhere near us. Further, there is only a vast ocean of space. However, this black abyss is occasionally crossed by messengers from the Earth who have set off to explore the nearby stars.] [translation mine, KB]

In the 1950s and 1960s, Kolchitskii served as the member of the editorial board of one of the Soviet leading popular science magazine, *Tekhnika molodezhi* [Technology for the Youth], where he published a vast number of space art works, mostly as illustrations for excerpts from popular science and science fiction articles as well as books and novels. Some of the most well known works of this kind might include the cover art for the April 1950 issue of the magazine which depicts a satellite in Earth's orbit with the sun looming on the horizon or several illustrations for popular science articles, such as Gadomskii's "Fotonnaia rakieta" [Photonic rocket] (Jul. 1957), Andreev's "Astronomia sevodnia i zavtra" [Astronomy today and tomorrow] (Jan. 1952), Khvastunov's "K solntsu" [To the sun] (Mar. 1954), Shternfeld's "Orbitalnye korabli" [Orbital spacecrafts] (May 1955), Khlebtsevich's "Put na lunu otkryt" [The road to the moon is open] (May 1956), Buianov's "Energiia atomnogo iadra" [Energy of atom's kernel] (Mar. 1952), Staniukovich's "Priroda tiagoteniia" [Nature of gravity] (Dec. 1954) or

Fesenkov's "Zvezdnye miry" [The worlds of stars] (Mar. 1954). Some of his both technical and imaginative illustrations also appeared in other popular science magazines like *Ogonek* [Little Flame], for instance, in Shternfeld's articles "LK-3 letit na lynu!" [LK-3 is flying to the moon] (16 Nov. 1954) and "Na maloi lune" [On a small moon] (16 Mar. 1952) or *Iunyi tekhnik* [Young Technician], for example, in Khlebtsevich's article "Zemlia-Mars" [Earth-Mars] (Jan. 1956) (Zubakin 2009). In a special article commemorating Kolchitskii's life and work published in the 1980 issue of *Technology for the Youth*, Romanenko (1980: 17) characterizes a unique style of the artist incorporated in most of his images as follows:

> Заатмосферные базы, лунные корабля, фотонные звездолеты… Они приходили на картины художника из специальных научных работ, посвященных будущей космонавтике, а затем перебирались и в тексты фантастических произведений. Такие деятеля искусства, как Кольчицкий, всегда следили за последними научными достижениями. Техническое образование и многолетняя инженерная практика помогала художнику по-своему интерпретировать самые сложные проекты, в том числе и те, что казались многим абсолютно нереальными. Его фантастика зрима, конкретна и убедительна. Неспроста, вероятно, орбитальные станции в виде «бублика» – по Кольчицкому – впоследствии так прочно обосновались на страницах фантастических романов и повестей… (Romanenko 1980: 17)

> [Trans-atmospheric bases, lunar spacecrafts, photonic starships… To depict them in his paintings, the artist used some special scientific papers devoted to the future of cosmonautics, and then also turned to science fiction texts. All artworks of this kind, including Kolchitskii's, always strictly followed the latest scientific achievements in the field. A technical education and a long-term engineering practice helped the artist reinterpret the most complex projects and also those seen by many as completely unfeasible. Kolchitskii's science fiction art is clear, concrete and convincing. The artist's depictions of space stations were certainly highly complicated projects, yet at the same time, they were so firmly entrenched on the pages of science fiction novels and stories…] [translation mine, KB]

At the same time, Romanenko (1980) emphasizes a remarkably realistic and credible quality of Kolchitskii's paintings, sometimes reminiscent of Bonestell's futuristic visions which often turned out to anticipate their actual condition in extraterrestrial settings. This aspect of the artist's works also makes them generically close to the genre of the U.S. astronomical art or its Russian/Soviet equivalent in the form of cosmorealism (*cosmorealism*) or simply space illustrations and space art (*kosmicheskie illustratsii/kosmicheskaia zhivopis*). Also, as both Kolchitskii's and Bonestell's illustrations appeared in similar sources, particularly in popular science and science fiction texts, they seem to have served an akin function of making the dream of spaceflight come true in

the collective mind and imagination. By many contemporary critics, Kolchitskii is seen as one of the greatest representatives and pioneers of Russian space art whose work mostly pre-dated the space age era and attempted, as put by Romanenko (1980: 17), "осмыслить место человека во все ленной, чувством постигнуть единство всех сущих вещей, отыскать неявные параллели в очертаниях микро – в мегамиров" [to redefine the place of man in the whole universe, to comprehend a sense of unity between all the living entities and to find parallels between the micro- and mega-cosmos]. After his death in 1979, the artist's works were widely appreciated for their unprecedented contribution to the development of space-themed art in the Soviet Union and were soon exhibited ("Nikolai Mikhailovich Kolchitskii" 2014).

4.1.3. Robert McCall

Born in 1919 in Columbus, Ohio, Robert McCall is known as one of the most notable and world famous American space artists often credited with "creating" the space age. He developed his lifelong interest in aviation and aerospace subjects in the early childhood and continued his passion by studying art in the Columbus College of Art and Design and the Art Institute of Chicago. During World War II, he worked as a bombardier instructor for the Army Air Corps and later in the mid-1950s, on the Air Force's request, created documentary art for their art collection. Having completed his military service, he became a professional illustrator in the field of advertising art for Bielefeld Studios in Chicago, the Charles E. Cooper Studios in New York as well as many major magazines of his time, including *Amazing Quarterly*, one of the first sources where McCall's art appeared in print (Miller 1978: 30). In 1949, he moved to New York where he turned to painting magazine illustrations depicting aviation themes, such as *Life*, *The Saturday Evening Post* or *Popular Science* ("Biography" 2014).

When the space programme began in the 1950s, McCall was naturally enthusiastic about the whole enterprise and, following the formation of the National Aeronautics and Space Administration (NASA) in 1958, he was invited to participate in their Art Programme with one of the most renowned U.S. painters, including Norman Rockwell, Paul Calle, Fred Freeman, John Solie, Robert A. M. Stephens, Peter Hurd, Ren Wicks, Martin Hoffman, Mitchell Jamieson or Robert Rauschenberg. The project officially started four years later, giving the artist a remarkable opportunity to eyewitness as well as capture the most crucial moments in the history of NASA's space missions, including the Apollo, Apollo-Soyuz, Skylab or the Space Shuttle projects ("Biography" 2014):

> For Bob McCall, NASA's rockets and astronauts were love objects at first sight. He became an eyewitness to the space program, covering every major launch, frequently at his own expense because NASA could not extend an official invitation to the same painter every time. But Bob McCall was there, every time. He was with the astronauts when they laboriously wormed into their cumbersome space suits. He even tried the task himself, to see what it was like from the inside. He went up the gantry elevator with them and watched them clamber into their spacecraft. He stood in the control center during the countdown and sketched the final tense moments before launch. He even went out on an aircraft carrier to witness the recovery of astronauts from an ocean landing. ("Biography" 2014)

One of the most well known images produced as a result of this fruitful cooperation were *Orion Leaving Space Station One* (1968), *Gemini Recovery* (mid-1960s), *Stormy Recovery* (1965), *Apollo and Coming Home* (1969), *First Man on the Moon* (1970), *Handshake in Space* (1974), *Opening the Space Frontier, The Next Giant Step* (1979), *Launch of STS-7* (1983) and many more.

However, it was not so much NASA's Art Programme that made a name for McCall as a number of his heroic and awe-inspiring space art works portraying the future visions of space travel. In fact, it was not until the 1960s when he came to public attention as the illustrator of a memorable spaceflight series produced for the April 21, 1961 issue of *Life*. This is how the artist recalls his cooperation with the editors (Kesley 2010):

> This is from the April 21, 1961 issue of LIFE magazine. Most of the issue is devoted to Iurii Gagarin, who had just returned to earth, and Americans (judging from the tone of the articles) were freaking out that the Soviets had beaten them to space. Much of the issue reads like a study of a national identity crisis. So, LIFE tried to pick up everyone's spirits by running a few drawings of what our spaceships would look like, if we ever got around to building any. (Kesley 2010)

A set of works produced for the magazine include *Space Station of the Future*, a conceptual painting of the sun-driven regatta, *An Aerospace Cop to Help Police the Beat* or *A Gigantic Atom-Powered, Bomb-Dropping Schmoo* (1961). Also, the August 24, 1962 issue featured his incredible cover art depicting two Soviet capsules in orbit and accompanied by the title "Russia's feat: Where it leaves us in the race to the moon".

The work for *Life* led to McCall's engagement in producing the world famous advertising art for Kubrick's landmark *2001: space odyssey* (1968) which, as put by Miller (1978: 30), "was his springboard to fame within the genre of science fiction and speculative technical art". The artist created three theatrical posters for the film which include *Orion leaving space station one* (1968), *The centrifuge* (1968) and *Clavius base* (1968). Since that time, McCall became involved in conceptualizing artwork for other motion pictures,

such as Fleischer's *Tora! Tora! Tora!* (1970), the American-Japanese war film about the Japanese attack on Pearl Harbor, Nelson's *The black hole*, Walt Disney's 1979 science fiction production for which he designed a spaceship called Cygnus or Wise's 1979 *Star trek: The motion picture* for which created several renowned space art works.

Since the 1960s, McCall's images appeared in virtually every American popular magazine of his time, including *Life*, *Starlog*, *Arizona Highways*; the August 1975 issue of *Arizona Highways*, for instance, features a remarkable view of Arizona's desert landscape of a distant future. Many of his artworks were collected and published in a coffee-table volume, *Our world in space* (1974), written by Isaak Asimov and famous for its cover art portraying the space station and the astronaut flowing freely in space with a huge Earth at the background. The book jacket provides a concise description of the futuristic concepts related to space exploration endeavours it discusses (Asimov 1974):

> Our World in Space is a dazzling look into the future. Through the collaboration of two extraordinary talents, we can follow the probable pattern of our world's advances outward into space in the next few decades, in the next century, and beyond. Artist Robert McCall's paintings and drawings give specific form to the machines, the techniques, and even the way of life of the future. They are based on firm technical knowledge, but they also remind us that the astronauts themselves were constantly astonished by the unimagined beauties of space. Author Isaac Asimov's text is a remarkably lucid summation of the way to the Moon and an exciting speculation on what will come after: the colonization of the Moon and Mars, and then of the outer reaches of our Solar system, and finally the exploration of other star systems incredibly distant. The scientific basis for these speculations is presented in a deceptively simple and consistently readable way that fires the imagination while making these advances into space seem all but inevitable. Edwin Aldrin has walked on the moon. He has said: "As man develops the tools and capabilities to extend his reach farther and father, there is no doubt he will feel compelled to go as far as he is capable of going". Here in this book is a forecast and a prevision of our future in space. (Asimov 1974)

McCall's art was also featured in a set of twenty one U.S. space-themed commemorative postage stamps, one of which depicts a memorable Apollo-Soyuz Test Project, NASA mission patches, book jackets as well as on the nationwide famous murals exhibited in the National Air and Space Museum, Walt Disney World Resort's Epcot, the Pentagon, the Dryden Flight Research Center, the Kansas Cosmosphere and Space Center or the Johnson Space Center. A six-floor-high *The Space Mural – A Cosmic View* (1976), housed in the National Air and Space Museum, remains one of the most well known pieces of this kind; painted over the course of eight months, the scenes range from the creation of the universe to the astronauts walking on the moon (Hardy 1989: 31).

What is perhaps one of the most significant aspects of the artist's space art is its unusual style; his dramatic visions of the universe and space exploration seemed to be both technically accurate and highly imaginative as well as captured a naive optimism and excitement of the U.S. early space programme. What follows is McCall's personal comment on varied influences which can be found in many of his paintings ("Biography" 2014):

> Today my influences are more from the past than the present. I like realism in art. The reason I now paint the future almost exclusively, and document the space program, is that I am interested in science and technology and this accumulating, snowball effect of knowledge. It's so dramatic to anticipate what's ahead, and we are learning so much, so rapidly, and we are able to cope with it and deal with it and store it and retrieve it. We've already achieved such incredible successes that it seems that anything is possible. ("Biography" 2014)

An unusual fusion of realism with sublime impressionism in McCall's visual arts is what makes it not only recognizable in the whole spectrum of American space art, but also contributes to its unique style which borders on descriptive realism and cosmic impressionism. The artist's highly imaginative and stirring visions can be seen as simultaneously realistic, precise and credible due to his lifelong interest and practice in illustrating aviation, aeronautic and aerospace subjects.

McCall died in 2010 in Scottsdale, Arizona, at the age of ninety one. His sixty year long career as a space artist resulted in a remarkable legacy of over four hundred paintings. Most of them were published in two books commemorating his life and works, Bova's *Vision of the future* (1982) and McCall's *The art of Robert McCall: A celebration of our future in space* (1992); selected paintings were also included in NASA commissioned *Eyewitness to space* (1972) and *NASA/ART: 50 years of exploration* (2008). By some hailed as the world's premiere space artist, he is credited with exerting an overwhelming influence on popularizing space exploration among the American public; in the American Society of Aviation Artists' tribute to Robert McCall, one can read (Ferris 2010):

> His fertile imagination, vision and creativity have generated images of the future, new landscapes, and the technology that will transport and serve Man in these endeavors. His many larger than life murals depict Man, machine and the Cosmos interactive in the quest to fulfill our destiny. He indeed kept the dream alive in presenting a constant glimpse of the future that makes us pause and ponder the wonders of the universe. Isaac Asimov affectionately referred to Robert as, "the nearest thing to an artist in residence from outer space". In Robert's own words, "I am living the future that I dreamed about when I was a young boy, and for me it is just as bright and wonderful as I imagined it would be". (Ferris 2010)

In recognition for his lifetime achievements for the U.S. space programme, the artist was bestowed with a number of prestigious distinctions, including an honorary doctorate from the Columbus College of Art and Design (1988), the Douglas S. Morrow Public Outreach Award by the Space Foundation (2003), a long-term service as a member of the National Space Society's Board of Governors, a nomination for an Inductee of the Arizona Aviation Hall of Fame (2001) and many others. However, most importantly, due to his works' wide use in the U.S. and NASA space-related popular culture, McCall's most notable accomplishment in the field of space art is perhaps his unprecedented contribution to chronicling space exploration efforts and simultaneously imagining their future through his unique and skillful combination of descriptive realism and cosmic impressionism.

4.1.4. Andrei Sokolov

Born in 1931 in Leningrad, Andrei Sokolov is regarded as one of the leading and most influential Soviet as well as world's space artists. He graduated from the Moscow Institute of Architecture in 1955 and soon began working as an architect while nurturing his childhood interest in science fiction, largely inspired by Iurii Gagarin's spaceflight, Ray Bradbury's *Fahrenheit 451* (1957) as well as Verne's and Tsiolkovskii's works. However, since the 1957 launch of the first sputnik, Sokolov devoted himself almost entirely to producing paintings on space exploration themes. He worked mostly in acrylics and painted a wide array of space subjects, being particularly preoccupied with documenting the key events in the Soviet space programme as well as visualizing highly futuristic scenes featuring extraterrestrial locations or space technology (Hardy 1989: 79). The 1981 art book, *Zhizn sredi zvezd* [Life among stars], remains an exception to this rule as it contains a few illustrations celebrating the U.S. space efforts. As argued by Kuleshov (1999: 4), since the late 1950s,

> Соколова можно считать космический реализм. Небольшие рисунки темперой на картоне и более крупные полотна, написанные маслом на холсте, отличает подробная пропись технических деталей — элементов конструкций космических кораблей, инопланетных пейзажей, космических явлений и эффектов. Оттого картины внутренне достоверны. Врожденный талант живописца, тонкое чувство цвета, глубокое знание любимой темы сделали Андрея Соколова основоположником нового жанра космической живописи. (Kuleshov 1999: 4)
>
> [Sokolov can be considered a realist painter. [His paintings] can be distinguished by featuring numerous technical details; the structural elements of alien spaceships as well as extraterrestrial landscapes, phenomena and effects make these depictions

> naturally authentic. The artist's inherent talent, a deep sense of colour and a broad knowledge of space subjects allow to classify him as the founder of the new genre of space art (*kosmicheskaia zhivopis*).] [translation mine, KB]

In the 1960s, Sokolov was introduced to Iurii Gagarin and some other Soviet cosmonauts, including Aleksei Leonov, also known as an accomplished space artist, with whom he began collaborating. Jointly with Leonov, credited with conducting the first extra-vehicular activity ever performed by human being and drawing the first space illustrations produced during the actual space mission, he edited and published a few major space art books which contain both artists' paintings, *Zhdite nas zvezdy* [Stars are awaiting us] (1967), *K zvezdam* [To the stars] (1970), *Zvezdnye puti* [Star-roads] (1971, republished in 1978), *Kosmicheskie dali* [Cosmic distances] (1972), *Chelovek i vselennaia* [Man and the universe] (1976, republished in 1984) or *Zhizn sredi zvezd* [Life among stars] (1981). Some images of Sokolov were also published in other space art books like *Kosmicheskaia fantaziia* [Cosmic fantasy] (1963, republished in 1965), *Chelovek v kosmose* [Man in the cosmos] (1966, republished in 1968 and 1969), *V glubinakh vselennoi* [In the depths of the universe] (1973), *Na zvezdnykh trassakh* [On star routes] (1975), *Mir 2000 goda* [The world of 2000] (1980), *Era kosmicheskaia* [The space age] (1982), *Kosmos narodnomu khaziaistvu* [Cosmos for the national economy] (1985) and *Space for peace* (1987). One of the artist's most famous works included in these volumes are a few images depicting the exploration of the Earth's orbit, the moon and other planets, such as *Luna. Sledy kosmonavtov v lunnoi pyli* [The Moon. Cosmonauts' Traces in the Lunar Dust], *Luna. Nad gorizontom Zemlia* [The Moon. The Earth Above the Horizon], *Venera. Chernye skaly* [Venus. The Black Rocks], *Mars. Na Fobose* [Mars. On Phobos], *Saturn. Na Tytane* [Saturn. On Titan] (Sokolov 1963), *Modulnaia orbitalnaia stantsiia* [Module orbital station] (Ivanova 1985), *V kontse Saturna* [In Saturn's Rings] (Kuptsov 1980) and many others. Additionally, many of Sokolov's illustrations mentioned here appeared in popular science magazines of his time, particularly *Tekhnika molodezhi* [Technology for the Youth], whose cover art for the 1966 issues features *Kosmicheskoe montazhniki* [Space Engineers] (jointly with A. Leonov) and *Cherez sto let* [In One Hundred Years] or the 1960 issue of *Znanie – sila* [Knowledge – Power], which included a few of his paintings, *Luna (voskhod Zemli)* [The Moon (The Rising Earth)], *Lunnyi vulkan* [The Lunar Volcano], *K Marsu* [To Mars] and *Na sputnike Marsa* [On the Moon of Mars] (Kuleshov 1995: 8).

Interestingly, in the 1990s, Sokolov began realizing a famous space art project jointly with Robert McCall. The two artists, commonly considered to be each other's counterparts in the field of American and Soviet space art, collaborated on the creation of a 6 x 9 feet mural *Stairway of Humanity* whose aim was to commemorate the achievements of the first three decades

of U.S.-Soviet space exploration ventures. What follows is how McCall recalls his cooperation with Sokolov in an interview conducted by Rebecca Wright in Phoenix, Arizona on 28 March, 2000 within the Johnson Space Center Oral History Project (Wright 2000):

> Andrei Sokolov (...) was sort of my counterpart in a sense, in the Soviet Union. He started out as an artist painting aircraft, their aircraft, of course. Then when their space program started — he's younger than I am by probably ten to twelve years. He had been documenting their space program in the way that I had been doing the same here. He also was acquainted with the cosmonauts and was a good friend of Alexi Leonov. Fred Durant met him, and it occurred to Fred, wouldn't it be neat if Bob McCall and Andrei Sokolov could make a painting together, whatever kind of painting that they might want that would have to do with the two space programs. He mentioned it to me, mentioned it to Andrei. Then in 1984, I was on my first visit to the Soviet Union, and I met Andrei, a neat guy, a huge man, six-foot-three or four and just huge hands and just a big head, and just monster in every way, the last person you would expect to be doing delicate detail in painting, but he was capable of it, and he did it beautifully. I met him (...) and we were in his apartment one night, and there were many other people gathered around that were a part of our group, and we talked about this idea. There was somebody videotaping it, so there's some video that I have a copy of it, of us sitting under a kind of a red lamp in the corner of his apartment, and other people, and we were discussing what this painting should be. We determined that the painting should be beautiful. It should be aesthetically appealing. The better aesthetically, the finer work of art it could be the better, of course. (...) But it should also tell a story, and it should be a positive story. Again, a lot of this came from me. I mean, I wanted it to be appealing. I didn't want it to be frightening. So I wanted it to have an optimistic aspect, and he agreed totally. (Wright 2000)

In the same interview, McCall also mentioned the chief purpose of the composition which was to enhance the two nations' cooperation and involvement in space activities as well as provided further details on his work with Sokolov (Wright 2000):

> We made a painting and it had to be fairly large. I would like it to have been much bigger, but it had to be one that we could transport back and forth so we could say it was painted in Moscow in his studio and in my studio. So we devised the notion of having it in three sections. It was a triptych. (...) But we worked on it here, started it here, and worked for about, oh, eight or ten days and got a lot done. Then he had to go back to his life. Then there was a time that elapsed and then I shipped it in the box to Moscow. Then I made a trip over there. (...) Finished it in—well, pretty much finished it in Moscow. Then because we were fearful that we couldn't get a work of art out of Russia, still Soviet Union, and there were a lot of limits and restrictions, so we demounted it from the stretchers and I carried it back like a carpet, like a rug,

> and it was a canvas about that big a roll and whatever the height was. I think it was maybe — it was just six feet high. Anyway, it was a fairly easy thing then to go through customs with and call it a carpet. We got through. Oh, I remember sweating that out, because they are so rigid, and who knows what might have happened. They might have refused letting it go if they discovered it was painting, even though we said we did it. Anyway, we got it out. Then I had it re-restretched and then I finished it here. What had to be finished, I finished. So it was a joint effort. It's been in a lot of shows and it's traveling right now. It's been traveling for about three years, four. It was a great, great idea. It was fun to do and novel, and it was a successful painting. It's in the book, as you know. (Wright 2000)

What makes Andrei Sokolov a close counterpart to Robert McCall is not only their collaboration on a joint space art painting, but also their somewhat akin style of depicting various space settings. Although popularly known as an artist dealing with fantastical realms of outer space experience (*khudozhnik fantast*), a number of sources suggest that Sokolov, along with McCall, should be seen primarily as the representative of space realism (*kosmicheskii realism*) (Kuleshov 1999: 3). Having been acquainted with the recent advancements in the Soviet space programme and cooperated with the actual cosmonauts like Aleksei Leonov, he had many opportunities to construct his visions in possibly the most feasible and convincing way (Benford 2000):

> Sokolov had cosmonauts compare his sketch (on a light cloth that could be rolled and folded) with the real scene as it passed below, writing comments on the sketch about color, form and lighting. (Alexei Leonov, the first space walker, has done primarily realistic paintings and sketches, using his own experience and Sokolov's data.) Using frequent interviews with cosmonauts, he gave this vivid description: "At the terminator, when valleys sink into darkness and a chain of snowy mountains is shining in the background. Late in the evening, just beyond the terminator, the very high mountains glow red-orange, like live coals.... Mountaintops cleave the clouds, leaving a wake like that of a ship. Tropical thunderheads, lit by lightning flashes at night, recall the blooming buds of white roses. ... The shining constellations of cities at night, enmeshed by a glittering web of highways is also very lovely. One's heart fills with pride at our accomplishments when one recognizes from orbit artificial seas and water basins, and cultivated fields, particularly in virgin lands". In this passage we see how much of Soviet society retained the pride common in 19th-century America about the domesticating hand of humanity upon the untamed wilderness. (Benford 2000)

At the same time, many of his works, similarly to McCall's, seem to retain a largely imaginative, dreamlike, romantic and mystical quality. More specifically, as argued by most artists and scholars, Sokolov's as well as other Soviet paintings of the genre tend to lean not so much toward realism as symbolism and fantasy. As noted by Sokolov himself (as quoted in Benford

2000), "the theory of relativity might yield images that could be shown only in emotional, artistic form. It could be a symbol, a fantasy, a dream".

Until today, Andrei Sokolov is commonly known as the "dean of Soviet space art" as well as the most recognizable and notable Russian representatives of the genre of space realism (Dator 2012: 14). According to Benford (2000),

> Andrei Sokolov is an oddity in Russian space art, a realistic worker who had direct access to astronauts. He could remark from inference, "Landscapes seen from an airplane are vague and colorless, because we observe them from inside the atmosphere with the light scattered from all around. Cosmonauts are not impeded by the scattered light; they see the Earth in all its magnificence". (Benford 2000)

Sokolov died in 2007, having left a number of memorable space art works which have toured different parts of the world, including the Soviet Union, Europe and the U.S. as well as appeared in several art books or on the Soviet postage stamps which featured such famous illustrations as *Sputnik vnezemnoi tsivilizatsii* [Satellite of Extraterrestrial Civilization] (1967) or *Na selenotsentricheskoi orbite* [In Selenocentric Orbit] (1967, painted jointly with Leonov). Sokolov's paintings are also exhibited in The National Air and Space Museum in Washington, D.C., the Old Masters Gallery in Dresden, selected museums of Berlin, Tokyo or Minsk as well as numerous online sources, including the International Space Art Network or International Association of Astronomical Artists (Hardy 1989: 79).

4.2. Data collection

A representative collection of 200 space art works, produced between the years 1944 and 1991, has been gathered as a result of the online and library search carried out in the years 2012-2014. Specifically, the complete data base comes from my personal resources, such as art and popular science books containing reproductions of selected visuals, as well as the following institutions and online sources: Adam Mickiewicz University Library, the Bodleian Libraries of the University of Oxford, the Library of the John F. Kennedy Institute for North American Studies in Freie Universität Berlin, McCall Studios's interactive gallery (2014),[2] interactive gallery of Leonov and Sokolov's space and science fiction art compiled by Iurii Morozevitch in the years 2001-2011 (2011)[3] as well as online articles available in the archives of American and Soviet magazines and periodicals, including *Tekhnika molodezhi* [Technology for the Youth] (2014), *Iunyi tekhnik* [Young Technician] (2014), *Ogonek* [Little Flame] (2014), *Life* (2014) and *Collier's* (2014). Where plausible, only the original source of an

[2] Available at http://www.mccallstudios.com/collections/.
[3] Available at http://scifiart.narod.ru/Albums/albums.htm.

illustration under analysis was taken into consideration. In some cases, however, it was virtually impossible to determine it as many images were reproduced in far more than one popular medium in the course of the examined period.

All the collected artworks are both pictorial and representational (see 3.1. for definitions) and each of them can be viewed as a vehicle for certain ideas proposed by Russian and American Cosmism. The unit of analysis is an individual illustration or painting produced by Chesley Bonestell, Nikolai Kolchitskii, Robert McCall and Andrei Sokolov which generally fall under one of the following three categories: i) extraterrestrial landscape; ii) space technology; iii) space exploration activities performed by humans, including space travel and planetary engineering. In particular, images classified as extraterrestrial landscapes should ideally portray alien planetary formations with no involvement of space technology or human element. Meanwhile, visuals that belong to the second group ought to represent technological devices with no or only little engagement of other objects, including extraterrestrial bodies and astronomical phenomena. Lastly, works which fall under the final category are likely depict some sort of interaction between space technology and human figures with the former being operated or observed by the latter. Naturally, many paintings tend to contain elements of all the aforementioned categories concurrently. In other words, while some of the analyzed images clearly fall under one of these classifications, others transcend them, encompassing elements belonging to either two or three concurrently (see 4.4.1. for details about categorizing the analyzed works according to a type of scene).

As noted before, for the purpose of conducting the research, a pool of 200 paintings has been collected from various sources, including art books, magazine articles and online galleries containing individual artists' works (see above). They have been then divided into four distinctive groups, each consisting of 50 visuals created by each of the aforementioned artists, namely (1) Chesley Bonestell, (2) Nikolai Kolchitskii, (3) Robert McCall and (4) Andrei Sokolov. Then, a random, stratified and systematic sampling procedure has been used by choosing every second (Bonestell's and McCall's works) or third (Sokolov's works) image from each of the four groups of images (Krippendorf 1980; Weber 1990; Rose 2001). The exception to this rule are Kolchitskii's works; as only a number of 50 illustrations has been collected from the available sources, all of them have been taken into account. Meanwhile, to perform the aforementioned procedure, the works in each group have been put in chronological order according to a specific date on which they appeared in their original source. If certain images were published at exactly the same time of the year, for instance in the same book or issue of the magazine, they have been put in the order in which they occurred in that particular source.

In the next section, I shall elaborate on particular sources used to select each artist's works for the purpose of conducting the visual content analysis. Also, I will briefly describe a specific literary and cultural context in which the analyzed imagery tends to occur.

4.2.1. Chesley Bonestell's and Nikolai Kolchitskii's works

The works of Chesley Bonestell and Nikolai Kolchitskii, which have become subject to the visual content analysis, are oil, oil and graphite or graphite paintings as well as drawings produced over the course of two decades. Bonestell's images were created between the years 1944 and 1964 and they have been collected from the following sources: i) speculative science books, including *The conquest of space* (1949) (10 images), *The exploration of Mars* (1956) (2 images), *Mars* (1964) (1 image) and *Beyond the solar system* (1964) (13 images; see 4.1.1. for details on popular science books illustrated by Bonestell); ii) *Life*, including the May 29, 1944 issue (4 images), the March 4, 1946 issue (7 images), the December 8, 1952 issue (1 image) and the December 20, 1954 issue (3 images) (see 4.1.1. for details on the magazine's special series of articles illustrated by Bonestell); iii) *Collier's*, including the March 22, 1952 issue (3 images), the October 18, 1952 issue (1 image), the October 25, 1953 issue (1 image) and the April 30, 1954 issue (4 images) (see 4.1.1. for details on the magazine's special series of articles illustrated by Bonestell). It is also important to note that to the best of my knowledge, all the aforementioned publications constitute the original source of the artist's works. When, for instance, selected paintings included in *The conquest of space* (1949) had previously come out in the 1940s *Life* and *Collier's* special spaceflight series, only the latter publication has been used as the primary source of the analyzed images.

In the case of speculative science books published in the years 1949-1964, Bonestell's works simply aimed to illustrate certain points raised in the text. Twenty eight images coming from *The conquest of space* (1949), *The exploration of Mars* (1956), *Mars* (1964) and *Beyond the solar system* (1964) are each accompanied by a caption of two, three or a few sentences whose principal function is to briefly describe a given astronomical or space exploration-related concept depicted in the artist's paintings, such as the surface of Solar System planets and their moons, remote stars and unknown extraterrestrial bodies, spacecrafts, orbital assemblies, launchers, nebulas, galaxies, etc. All of them tend to have a typically informative and explanatory character, providing the reader with detailed, scientific and often technical facts about the represented astronomical phenomena or spaceflight issues. This trend appears to be in line with the books' genre classified as speculative science which presents a mid-20th century vision of space exploration based on a factual and realistic scenario.

When it comes to cover art and materials published in the U.S. popular magazines, including *Life* and *Collier's*, they mostly represent a popular science discourse which translates scientific and technical aspects of the national space programme and astronomical facts in a more accessible and communicable manner. Particular articles illustrated by Bonestell which appeared in the aforementioned *Life*'s series included: i) "Solar system. It is modeled in miniature by Saturn, its Rings and nine moons", a technical text illustrated by the artist's depictions of the surface of Saturn as seen from its moons (19 May 1944); ii) "Trip to the moon: Artist paints journey by rocket", a brief popular text illustrated by Bonestell's portrayals of an imaginary manned flight to the Earth's satellite (4 Mar. 1946); iii) "The world we live in: The earth is born", a fact- and science-grounded story illustrated by the artist's visions of our planet's birth and early development (8 Dec. 1952); iv) "The world we live in: The star-studded reaches of measureless space", an extended article describing in detail selected astronomical objects, such as solar system inner and outer planets, the Milky Way and its components, the cosmic clouds, the life and death of stars, binary and multiple solar systems, the expanding universe, etc., all illustrated by Bonestell's vivid and highly realistic depictions (20 Dec. 1954).

Collier's special spaceflight series produced a less technical and science-based discourse aimed at laymen rather than specialized audience. The artist's awe-inspiring images were published in the following articles: i) "Man will conquer space soon" which presents "the story of the inevitability of man's conquest of space" and summarizes the chief goals of the Soviet and U.S. space programme, written by Wernher von Braun, Fred Whipple, Joseph Kaplan, Heinz Haber, Willy Ley, Osear Schachter and partly illustrated by Chesley Bonestell; the issue included 7 different stories, von Braun's "Crossing the last frontier", Ley's "A station in space", Whipple's "The heavens open", Kaplan's "This side of infinity", Haber's "Can we survive in space?" and Schachter's "Who owns the universe?", followed by a space quiz (22 Mar. 1952); ii) "Man on the moon" which provides a detailed description of the first human flight to the moon and contains three articles, "The journey" by Wernher von Braun, "Inside the moon ship" by Willy Ley and "The exploration" by Fred L. Whipple and Wernher von Braun (18 Oct., 24 Oct. 1952); iii) "Can we get to Mars? Is there life on Mars?" which includes Whipple's popular science story "Is there life on Mars?" and von Braun and Ryan's report on a trail-blazing trip to Mars titled "Can we get to Mars?" (30 Apr. 1954). Overall, it seems that the artist's images published in *Life* (1944-1954) as well as *Collier's* (1952-1954), simply aimed to visualize the narrated events and concepts in both realistic and stirring manner which would spark widespread interest in and enthusiasm for rocketry and space travel among American public. As the main goal of both series written by spaceflight

specialists and visionaries was to depict and explain some ongoing and future projects of the U.S. space programme as well as convince laymen about their feasibility, Bonestell's illustrations seemed ideal to serve the purpose as not only did they convey the message in detail, but they also managed to communicate its inspirational quality.

Meanwhile, the works of Nikolai Kolchitskii, produced in the years 1949-1962, have been collected from the following sources: i) science fiction stories published in *Tekhnika molodezhi* [Technology for the Youth], including Gurevich's "Lunnye budni" [Lunar storms] (Oct. 1955; 1 image), Dmitriev's "Puteshestvie v zavtra" [Travel to the future] (Apr. 1950; 2 images, including the issue's cover which illustrates Dmitriev's story) and *Iunyi tekhnik* [Young Technician], including an untitled image from the Nov. 1957 issue printed on the back cover as an illustration to Gurevith's "Prokhozhdenie Nemezidy" [The passage of Nemesis]; ii) popular science articles published in *Tekhnika molodezhi*, including Andreev's "Astronomia sevodnia i zavtra" [Astronomy today and tomorrow] (Jan. 1952; 2 images), Buianov's "Energiia atomnogo iadra" [Energy of atom's kernel] (Mar. 1952; 1 image), Khvastunov's "K solntsu" [To the sun] (Mar. 1954; 1 image), Fesenkov's "Zvezdnye miry" [The worlds of stars] (Mar. 1954; 1 image), Staniukovich's "Priroda tiagotenia" [Nature of the gravitational pull] (Dec. 1954; 1 image), Shternfeld's "Orbitalnye korabli" [Orbital spaceships] (May 1955; 1 image) and Khlebtsevich's "Put na lunu otkryt" [Road to the moon is open] (May 1956; 1 image), Gadomskii's "Fotonnaia raketa" [Photonic rocket] (Jul. 1957; 1 image); iii) popular science articles published in *Iunyi tekhnik* [Young Technician], including Khlebtsevich's "Zemlia-Mars" [Earth-Mars] (Jan. 1956; 1 image); iv) popular science articles published in *Ogonek* [Little Flame], including Shternfeld's "Na maloi lunie" [On a small moon] (16 Mar. 1952; 2 images) and "LK-3 letit na lunu!" [LK-3 flies to the moon!] (16 Nov. 1952; 2 images); v) popular science books, including Vasilev's *Puteshestviia w kosmos* [Travel to space] (1955; 5 images), Valgard's *O zemle i vselennoi* [About the earth and the universe] (1962; 4 images) and Shternfeld's *Polet v mirovoe prostranstvo* [Flight into cosmic space] (1949; 7 images); vi) science fiction stories and novels, including Zakharchenko's *Puteshestvie v zavtra* [Travel into tomorrow] (1952; 2 images) and Gilzin's *Puteshestvie k dalekim miram* [Travel to distant worlds] (1960; 10 images); vii) Blagoi's *Detskaia entsiklopedia* [Children's encyclopedia] (1959; 5 images). The chart representing a comparative source and time distribution of Bonestell's and Kolchitskii's works can be found in Fig. 1 and 2.

Interestingly, Kolchitskii's paintings, whether published in popular science magazines or science fiction novels, retain an akin, partly fantastical and often symbolic, sentimental or romantic quality. A clearly distinguishable mode of representation can be found only in illustrations included in *Detskaia entsiklopedia* and *Iunyi tekhnik* where more sketchy and simple

lines are used to convey space- and space exploration-related messages. On the other hand, even these publications present space subjects and settings, although less detailed, in a considerably realistic and credible manner. Meanwhile, all the aforementioned sources contain images whose principal function is to illustrate certain points raised in the articles as well as to depict selected elements of a given plot or a fictionalized scenario. Similarly to Bonestell's works then, the role of the artist's imagination and creativity in Kolchitskii's paintings is embedded in the text and thus largely limited to the context in which they occur. Also, almost each analyzed illustrations is accompanied by a single and a few sentence caption which aims to explain all the scientific and technical details depicted in a given visual. In some cases, particularly in science fiction stories and novels, the captions are more of a literary nature or are the exact quotations from the text. Most importantly, however, whether shorter or longer descriptions, they seem to serve primarily an explanatory and informative function so that the audience could grasp and interpret the represented concepts with no support of a specific literary or popular science context in which they appear. When no caption is accompanying the artist's work, a relevant fragment of the text narrating the represented scene provides a literary or scientific-technical reference point (the relevant data, i.e. the complete collection of Kolchitskii's illustrations with the accompanying captions is provided in Appendix).

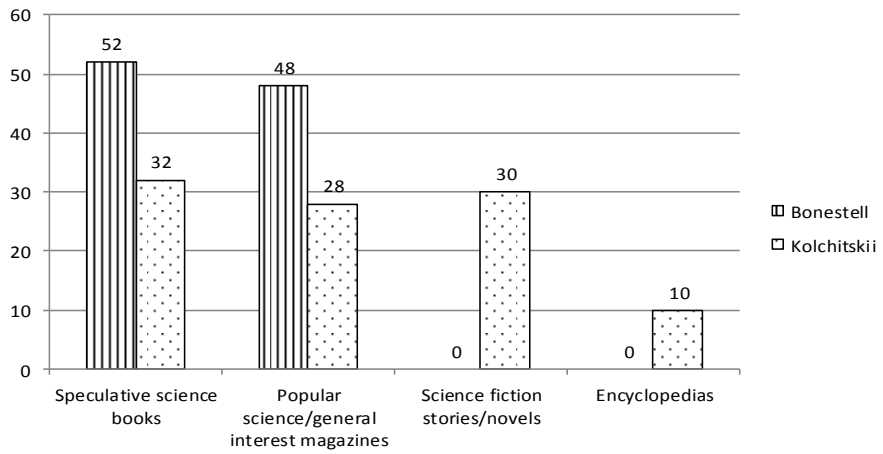

Fig. 1. Source distribution of Bonestell's and Kolchitskii's works.

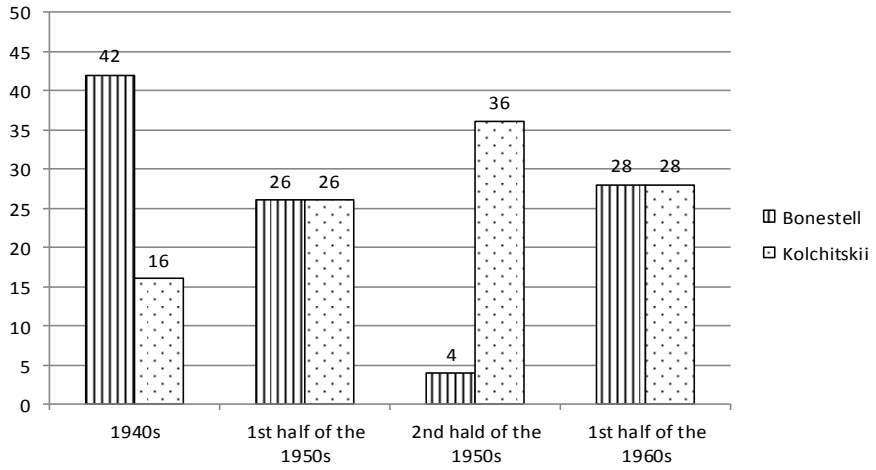

Fig. 2. Time distribution of Bonestell's and Kolchitskii's works.

4.2.2. Robert McCall's and Andrei Sokolov's works

Similarly to the former artists, the works of Robert McCall and Andrei Sokolov are oil, oil and graphite or graphite paintings and drawings. McCall's images were produced in the years 1961-1991 and they have been collected from the following sources: i) Stanley Kubrick's *2001: A space odyssey* (1968; 1 theatrical release poster); ii) *Life*, including the April 21, 1961 issue (3 images), the Oct 2, 1964 issue (1 image); iii) Asimov and McCall's *Our world in space* (1974; 24 images produced between in the years 1970-1974); iii) McCall's *The art of Robert McCall: A celebration of our future in space* (1992; 21 images produced in the years 1973-1991). The landmark theatrical release poster for Kubrick's *2001* (1968) used in the analysis was one of the few produced by the artist in the late 1960s. Although it was never included in the actual picture, this highly realistic and detailed scene depicting the astronauts exploring the surface of the moon by means of futuristic and cutting edge devices remains one of the most iconic conceptual paintings created in the space age era. Meanwhile, McCall's artworks from the 1960s issues of *Life* can be regarded as profoundly visionary portrayals of space technology which provided the audience with communicable descriptions of some imaginative concepts related to the future of spaceflight. The images, accompanied by extended explanatory captions, presented the sun-driven regatta, aerospace police vehicles and a gigantic atom powered spaceship called "schmoo". Similarly, the Oct. 2, 1964 issue of the magazine included a brief article which informed the readers about equally futuristic ideas of the

upcoming age of space travel, such as a launch platform of manned space station located in the Earth's orbit, low-cost nuclear ferries or a Mars base camp established by astronauts, all visualized by McCall (only the last concept was subject to the visual content analysis).

The two remaining sources, Asimov and McCall's *Our world in space* (1974) and McCall's *The art of Robert McCall: A celebration of our future in space* (1992), contain the largest quantity of the artist's works that have become subject to the visual content analysis. The former publication is a popular science book, written by Isaac Asimov, which presents some scientific and technical facts about various aspects of human space exploration in a remarkably accessible way. It takes its readers for a distant journey to the moon, Mars, Jupiter and further to the stars as if the colonization of these remote places was just on the verge of becoming reality. The latter publication constitutes an art book containing the collection of McCall's most notable historic and conceptual paintings. According to the book's front flap,

> It includes gallery-quality reproductions of McCall's most heralded works, as well as dozens of new paintings appearing for the first time in this volume. All the these stunning images celebrate the human spirit and our quest to explore and understand the universe we inhabit. (…) Including (…) drawings and sketches that illuminate the creative process at work, *The Art of Robert McCall* is an extraordinary tour through the imagination of the world's most honored artists of the future. (Asimov and McCall 1974: front flap)

All images that come from the art book are accompanied by a few sentence informative captions, authored by McCall, whose aim is to convey a variety of the visualized space exploration-related concepts to a broad, non-specialized audience. This mission seems to be accomplished successfully as the text, divided into five parts, including "A new dawn", "Newer worlds", "Earthlight", "Floating worlds" and "Cosmic horizons", may serve as a guide to the golden age of the human race's encounters with the cosmos which both documents and envisions its most profound events, ranging from the beginnings of the manned space programme to some futuristic scenarios of our life on Earth and in space.

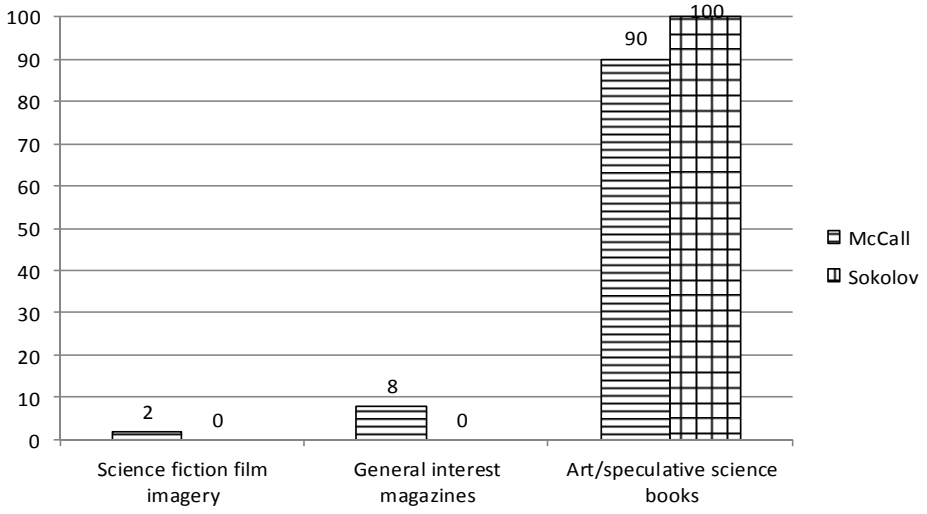

Fig. 3. Source distribution of McCall's and Sokolov's works.

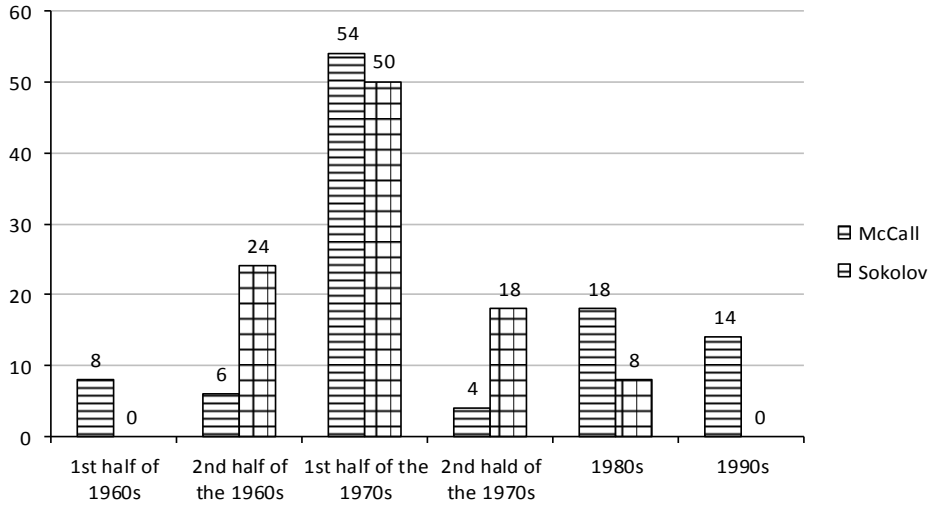

Fig. 4. Time distribution of McCall's and Sokolov's works.

Meanwhile, the works of Andrei Solokov were produced in the years 1969-1984 and they have been collected from the following sources: i) Leonov and Sokolov's *Zhdite nas, zvezdy* [The stars are awaiting us] (1967; 12 images); ii) Leonov and Sokolov's *K zvezdam!* [To the stars!] (1970; 4 images); iii) Leonov and Sokolov's *Zvezdnye puti* [Star-roads] (1971; 11 images); iv) Leonov and Sokolov's *Kosmicheskie dali* [Space in the future] (1972; 10 images); v) two editions of Senkevich's *Chelovek i vselennaia* [Man and the universe] (1976, 9 images; 1984, 4 images). All the aforementioned publications constitute art books, mostly authored jointly by Leonov and Sokolov, which contain an almost complete collection of the artists' space- and space exploration-related paintings. Similarly to *Our world in space* (1974) and *The art of Robert McCall: A celebration of our future in space* (1992), their content additionally offers extended informative captions which describe and explain a scientific, historical or technical background of each illustration. Hence, when put in such a context, Sokolov's works seem to perform an educational rather than aesthetic function as their goal is clearly to illustrate the accompanying text narrating an array of concepts rooted in space science, ranging from chronicling the most renowned accomplishments of the Soviet space programme to imagining the future of human space efforts. The chart representing a comparative source and time distribution of McCall's and Sokolov's works can be found in Fig. 3 and 4.

All the collected materials form a data base and will become subject to visual content analysis which serves to determine whether the content of Soviet and American space art works might have been affected by certain ideas proposed by Russian and American Cosmism.

4.3. Research methodology: Visual content analysis

The methodological approach used for the purpose of this work, namely visual content analysis, serves primarily to investigate the compositional modality of the site of a given image (Rose 2001: 56). It includes elements of both qualitative and quantitative research as it is theoretically based on counting the frequency of selected visual elements within a clearly defined sample of images, and then interpreting those frequencies in a wide cultural context. Moreover, content analysis has been chosen as the principal means of investigation for the following reasons: i) it allows to handle a large number of images with a considerable degree of consistency; ii) it allows to include quantitative research and qualitative interpretation of materials under analysis; iii) it allows to reveal empirical results from the study of the large-scale bulk of material under analysis; iv) it allows to prevent bias by relying on "conscious" and objective strategies (Weber 1990: 15-21; Krippendorff 1980: 130-154). On the other hand, it can also appear disadvantageous as it

tends to neglect the other sites of semiosis, namely the production as well as the audiencing of the investigated images (Rose 2001: 55-56). However, these two aspects of the image's interpretation might be ignored for the sake of achieving replicability (Ball and Smith 1992; Slater 1998). Additionally, some critics maintain the view that it lacks the resources to satisfactorily deal with the cultural significance of the analyzed materials. Nevertheless, it can be argued that the researcher's success depends mainly on creating effective and valid links between the visuals' content and a broad cultural context in which they tend to occur.

To prevent some of these problematic issues from arising, I have broadened the scope of the methodological approach by taking into account certain aspects of both production and audiencing of the investigated materials. When it comes to the former site of an image, the following matters should be considered: i) the time of an image's production (see 4.3.1., 4.3.2. and Appendix); ii) the authorship of an image (see 4.3.1., 4.3.2. and Appendix); iii) the technologies an image's production depends on (see 4.3.1. and 4.3.2.); iv) the social identities of an image's author (see 4.1.1., 4.1.2., 4.1.3. and 4.1.4.). Meanwhile, with regard to the latter facet of an image, I have attempted to tackle the following issues: i) the original audience(s) for an image (see 4.3.1. and 4.3.2.); ii) the location/medium where an image was originally displayed or reproduced (see 4.3.1., 4.3.2. and Appendix); iii) the location/medium and way of storage (see 4.3.1., 4.3.2. and Appendix); iv) a written text accompanying an image and guiding its interpretation, for instance, a caption, a catalogue entry or a larger body of a given text (see Appendix, 4.3.1. and 4.3.2.); v) the impact of the location as well as way of storage and display on the audiences' interpretation of an image (see 4.3.1. and 4.3.2.). Some of these questions have been already addressed to selected space art works mentioned in the previous chapter; others have been developed further in a quantitative description of the collected materials in the present study and Appendix. It should be also noted that as the focus of this research is an individual work of space art seen as a largely autonomous unit, such issues ought to be treated as an additional rather than core aspect of the whole investigation which aims to examine primarily the compositional modality of the visuals' site.

4.3.1. The coding categories

The selected sample of materials will become subject to visual content analysis conducted according to a set of exhaustive, exclusive and enlightening coding categories (Slater 1998: 236; Rose 2001: 59-60; Weber 1990: 23). As the purpose of this chapter is to determine the impact of Cosmism on the content of

space art works, it is crucial to interpret them in light of some the most distinctive and essential features of American and Russian Cosmist thought. In other words, the rich material present in the investigated images needs to be reduced to a series of codes, developed by myself and standing for specific themes in the form of relevant component parts of the visuals which have some analytical significance. The following set of codes depends on a theorized connection between the paintings and a broader cultural context embedded in the chief assumptions of American and Russian Cosmism. More specifically, these general categories, as explained later, will connect to the initial research question and thus the most fundamental points raised by theoretical literature on the subject, as presented in chapter one (Russian Cosmism) and chapter two (American Cosmism).

Each of 200 works in my sample was coded for: i) the type of scene; ii) the type, size, position and number of extraterrestrial bodies; iii) the type, size, position and number of status symbols; iv) the size, position and number of humans; v) the relation between the main human figures; vi) the activity type of the main human figures; vii) the type, size, position and number of technological devices; viii) the type, size, position and number of remaining objects; ix) the number of intersections of the horizon line; x) the relationship between the objects and the surroundings. The first of the above mentioned codes, namely the type of scene depicted in a given visual, will embrace the following three subcategories: i) extraterrestrial landscape; ii) space technology; iii) space exploration activities performed by humans, including space travel and planetary engineering. Also, as mentioned at the beginning of the chapter, most illustrations are likely to combine elements of at least two of the aforementioned classifications. The first subcategory encompasses depictions of extraterrestrial landscapes and remains one of the most popular mode of representation in 20th century American and Soviet space art. *Oxford Dictionary* defines landscape as "all the visible features of an area of land, often considered in terms of their aesthetic appeal" ("landscape, n." 2014) and a similar definition applies to the genre of landscape painting in art history. *American Heritage Dictionary* (2014) suggests that the term stems from the Dutch word *landschap*, which originally denoted a "region, tract of land" and in the early 1500s acquired more artistic connotations signifying "a picture depicting scenery on land". Similarly, the portrayal of extraterrestrial landscapes, drawing on the most standard definition of landscape painting derived from art theory, will feature natural scenes as present in outer space, that is "the region of space beyond the earth's atmosphere or beyond the solar system" ("outer space, n." 2014). In other words, such works of art would depict selected elements of extraterrestrial environment, defined as "the environment outside the earth or its atmosphere. The environment may refer to a closed cabin (such as a space shuttle or space station) or to space itself,

the moon, or other planets" ("extraterrestrial environment, n." 2014). Thus, the most renowned paintings portraying alien landscapes, including that of Chesley Bonestell, Nikolai Kolchitskii, William K. Hartmann or Iurii Shvets, would typically include the representation of outer space itself, denoting the void between celestial bodies, or certain physical characteristics, geological formations or geographical features of planets, moons, stars and other extraterrestrial phenomena.

The coding category which clearly relates to the first type of scene, namely extraterrestrial landscape paintings and illustrations, is the size, position and number of the depicted extraterrestrial bodies. Therefore, as the name suggests, the visual content analysis will attempt to establish and compare the type, size, position (foreground vs. background)[4] and number of extraterrestrial bodies depicted within the framework of the investigated American and Soviet space art works. The extraterrestrial bodies in question are those portrayed in selected images produced by Chesley Bonestell, Nikolai Kolchitskiii, Robert McCall and Andrei Sokolov, including predominantly the solar system planets and their moons as well as other distant and often hypothetical planetary objects. A related coding category, the size, position and number of remaining objects, might typically embrace the representations of alien life forms, the subgenre of space art which depicts mostly unknown and frequently highly imaginative extraterrestrial creatures, mostly plant-like organisms.

Meanwhile, another coding category directly associated with the second type of scene, namely space technology, is the type, size, position and number of the depicted technological devices. Here, the visual content analysis will attempt to establish and compare the aforementioned qualities of space technology, as presented within the framework of the investigated American and Soviet works. The term space technology can be defined in the most general terms as technology responsible for entering and retrieving living organisms or objects from the area of outer space (Bruce, Hilvert and Bruce 2006). Bruce, Hilvert and Bruce (2006) list a number of different kinds of such elements, including rockets and fuels, capsules, space planes, space stations, space suits, shuttles, landers, rovers, satellites, space probes and space telescopes. Most of these and related technologies are often portrayed in the analyzed images in connection to the other types of scene mentioned before, namely extraterrestrial landscapes and human-made space exploration efforts.

[4] According to the *Essential Vermeer Glossary*, foreground can be defined as "the area of the picture space nearest to the viewer, immediately behind the picture plane (...)" ("foreground, n." 2014). Meanwhile, background is understood as the area of the picture space which is the furthest away from the viewer ("foreground, n." 2014). Both concepts were developed in the early 15th century following the evolution of perspective which enabled painters to divide different areas behind the picture plane into foreground, middleground and background ("foreground, n." 2014).

Other coding categories related to the representation of astronauts and cosmonauts are i) the size, position and number of the depicted humans; ii) the relationship between the depicted main human figures; iii) the depicted activity type of the main human figures. The visual content analysis will attempt to establish and compare the size, position (foreground vs. background) and number of humans, the relation between them as well as a type of activity pursued by them in the investigated American and Soviet works. These codes are closely connected with the third type of scene, namely space exploration performed by both astronauts and cosmonauts, which embraces visual representations of various forms of discovering, taming or terraforming celestial bodies or outer space itself conducted during the manned space missions. Examples might include the depictions of human spaceflight, planetary engineering or space colonization, settlement and humanization in the form of building independent and self-sufficient human habitats beyond Earth. Also, the relation between space travelers will be taken into account as measured by analyzing the proximity between them and the way in which they seem to be connected, that is they behave toward each other.

Another code, the type, size, position (foreground vs. background) and number of the depicted status symbols, will involve the analysis of various objects and activities which might indicate the American and Soviet political, social or economic prestige. More specifically, the study will embrace its concrete external, visible and perceived denotations and indicators, such as the hammer and sickle, the national flags, the red star, inscriptions like NASA, USSR (*SSSR*) and USA on space technology or American and Soviet fashioned space suits and their attributes, etc. It should be also noted that only clearly recognizable and definable status symbols will be included in the analysis. The aforementioned objects, being mostly iconic representations of the United States and the Soviet Union, can be deemed such only when they appear to display a direct link between their visual form and certain political or social connotations representative of the two nations' goals and values.

The analysis of space art works in terms of the remaining coding categories, namely the number of intersections of the horizon line as well as the relationship between the objects and the surroundings, seems to be the most challenging task. As defined in art theory, the horizon line, a significant part of the image's compositional arrangement, is a perspectival imaginary line at the level of the viewer's eyes to which all the converging lines recede (Maleuvre 2011: 13). For the purpose of this study, however, I shall use the definition of a visible or apparent horizon as proposed by physical geography which conceptualizes it as the line dividing the Earth and the sky. Particularly, I will follow the criteria devised by Masuda, Gonzalez, Kwan and Nisbett (2008: 1274) utilized in their examination of different aesthetic and cultural variations as observable in contemporary East Asian and Western artistic styles:

> There are four types of horizontal lines. The location of horizontal lines was measured based on the following criteria: (a) if there was a flat field horizon in the picture, its location was measured; (b) if there was a flat water horizon (e.g., oceans or lakes), its location was measured; (c) if a protuberance in the horizon area (e.g., renderings of mountains or hills) obscured the identification of either a flat field horizon or a flat water horizon, the average values of the location of the summit and the bottom were measured; and (d) if a horizonless field occupied the entire space within the frame, the top part of the frame was considered. (Masuda, Gonzalez, Kwan and Nisbett 2008: 1274)

In line with the above quoted rule of measuring the height of the horizon, the horizontal line in the present study will be detected in two possible locations: i) a flat field or water horizon line; ii) a protuberant horizon line, including rocks, hills, mountains or other hummocky formations. If a horizonless field occupies the entire space within the frame, I will assume that there is no horizontal line drawn in a given image and thus a number of intersections will be impossible to determine. The main rationale behind calculating their specific number in American and Soviet works is that a frequent intersecting of the horizontal line allows to include more contextual information within the horizon area of the investigated images. The term contextual information can be defined here as incorporating a greater deal of context in the form of numerous visual objects pertaining to the main theme and interpretative potential of a given painting. Also, such a strategy enables the artist to simultaneously "disturb" a vast and spacious extraterrestrial landscape imagery common for the U.S. illustrators drawing on Hudson River School's tradition of depicting the frontier experience.

Meanwhile, the last code, the relationship between the objects and the surroundings, will be measured by examining and comparing form and style of American and Soviet space art, in particular selected compositional elements of a given painting, such as line, shape and colour. Such qualities can exert a major influence on an image's reception by the audience and have the potential to evoke an aesthetic or emotional response to its content as well as convey an array of cultural meanings. Specific measurements will include analyzing: i) concreteness and distinctiveness of lines and shapes of the depicted objects; ii) disruptiveness and fuzziness of lines and shapes of the depicted objects; iii) colour properties of the depicted objects. Employing these criteria in the analysis will allow me to determine the nature of the relationship between the objects and the surroundings in the investigated works which can be described either as distinct and thus inclining toward realism or obscure and thus lining toward romanticism and symbolism.

4.3.2. Anticipated relationships between coding categories and Cosmism

As mentioned before, a clear link has been established between the selected coding categories and the chief assumptions of Russian and American Cosmism in an attempt to study its possible impact on the content of space art works under analysis. The main premises of the two movements, as discussed thoroughly in chapter one and two, are the following:

Russian Cosmism

(1) The establishment of a universal utopia as a part of Fedorov's Common Task, understood as humanity's active spiritual and scientific-technological mission to resurrect the dead.
(2) The glorification of scientific and technological advances as the means to accomplish Fedorov's Common Task as well as to improve and regulate nature.
(3) The evolution of human beings into more advanced and mature God-like creatures guiding their own fate.
(4) An intrinsic, mutual interconnection between man and the cosmos.
(5) The presence of a supreme spirit guiding the entire universe in the form of God or other divine entity.
(6) The spirit of Russianness and the Russian soul epitomizing the wisdom, vitality and natural simplicity of the peasant as well as depth, emotional sensitivity and suffering of the Russian people.
(7) The glorification of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy which advanced Russia's global mission to pursue and expand wholeness, unity, universality and spirituality as well as to provide mankind with a sense of destiny.
(8) The pursuit of an ultimate truth and the hidden wisdom across space and time by means of pseudo- and parascientific methods which draw on esoteric, mystical and occult sources, such as astrology, magic or alchemy.
(9) Social solidarity as the means to enable humans to achieve perfection and unity in outer space.
(10) Symbolism and romanticism of outer space views which aim to expose the more "spiritual" side of space exploration.

American Cosmism

(1) Human spaceflight viewed as a spiritual quest whose ultimate goal is to lead humanity to achieving absolution, purification and finally eternity.

(2) Apollo nostalgia in the form of reflecting on the moon programme and longing for its glorious reincarnation, portraying Apollo as a transcendental, spiritual and revolutionary event.
(3) The presence of God or other supreme spirit during space missions and attributing space efforts to God's assistance.
(4) Astronauts seen as revered leaders as well as individualized, romantic and idealized heroes exploring the space frontier.
(5) The Overview Effect understood as a highly spiritual, transcendental and metaphysical awareness-shifting experience reported by astronauts during spaceflight missions.
(6) Space exploration, drawing on Turner's Frontier Thesis, viewed as a continuation of the Wild West expansion as well as a manifestation of liberal democratic values and individual initiative; the universe envisioned a territory which offers abundant prospects of finding new economic resources, wealth and freedom as well as unlimited possibilities for self-development in both physical and spiritual sense.
(7) Space exploration seen as Manifest Destiny which advances the view that the American nation is destined to expand throughout the universe.
(8) The sublimity of outer space views which draws on the tradition of American landscape movement of the 1800s.
(9) The depiction of UFO and SETI as a parapsychical and occultist phenomenon.
(10) The portrayal of space travel as fulfillment of the von Braun paradigm, founded on the premise that the U.S. space programme would follow subsequent stages, ranging from suborbital and orbital flights to the Moon and Mars landings.

The aforementioned fundamental principles of Russian Cosmism and its American variation will be examined in terms of their visual form likely to occur in the analyzed space art. Beginning with Russian Cosmism, the establishment of a universal utopia (1) might become evident in the following coding categories: i) all types of scene, namely extraterrestrial landscapes (presenting utopian-like alien planetary landscapes), space technology (presenting highly advanced, futuristic and state-of-the-art devices) and space exploration activities performed by humans, including space travel and planetary engineering (presenting utopian-like scenes of the cosmonauts exploring, taming and settling space environment); ii) the size, position and number of humans (presenting the cosmonauts as romantic, idealized and revered heroes endowed with a sense of mission); iii) the relationship between the main human figures (presenting a high level of social solidarity); iv) the activity type of the

main human figures (presenting the cosmonauts performing complex and highly demanding tasks for the sake of humanity's future survival); v) the type, size, position and number of technological devices (presenting highly advanced, futuristic and state-of-the-art devices).

Meanwhile, the glorification of scientific and technological advances (2) may inform the following number of codes: i) the two types of scene, being space technology (presenting highly advanced, futuristic and state-of-the-art devices) and space exploration activities performed by humans, including space travel and planetary engineering (presenting utopian-like scenes of the cosmonauts exploring, taming and settling space environment); ii) the size, position and number of humans (presenting the cosmonauts in the process of exploring, taming and settling space environment); iii) the type of activity of the main human figures (presenting the cosmonauts performing complex and highly demanding tasks by means of space technology); iv) the type, size, position and number of technological devices (presenting highly advanced, futuristic and state-of-the-art devices of a significant size); v) the height of the horizon line (a higher horizon line is more likely to include more space technologies, human space habitats or related objects).

The evolution of human beings into more advanced and mature God-like creatures guiding their own fate (3) can be observed in the following coding categories: i) a type of scene, namely space exploration activities performed by human beings, including space travel and planetary engineering (presenting the cosmonauts exploring, taming and settling space environment); ii) the size, position and number of humans (presenting them as idealized and individualized leaders of the human race endowed with a sense of mission and responsibility for uniting the whole mankind); iii) the relationship between the main human figures (presenting a high level of individualism); iv) the type of activity of the main human figures (presenting the space travelers performing complex and highly demanding tasks for the sake of humanity's future survival); v) the type, size, position and number of technological devices (presenting highly advanced, futuristic and state-of-the-art devices operated by humans).

An intrinsic, mutual interconnection between man and the cosmos (4) may be detected in the study of the following codes: i) all types of scene; ii) the size, position and number of humans (human figures of insignificant quantities and size presented in relation to the cosmos, mostly by expressing an emotional attitude toward the Earth and showing an admiration, astonishment or fear toward extraterrestrial bodies and phenomena); iii) the relation between the main human figures (presented both in relation to each other and the cosmos); iv) the activity type of the main human figures (presented as expressing an emotional attitude toward the Earth, showing an admiration, astonishment or fear toward extraterrestrial bodies and phenomena or operating space vehicles for peaceful

purposes); v) the height of the horizon line (a higher horizon line is more likely to include more human figures and extraterrestrial objects); vi) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize the human-space intrinsic relationship often in the form of mystic or metaphysical experiences during spaceflight missions). A related characteristic of Russian Cosmism, the presence of a supreme spirit guiding the entire universe in the form of God or other divine entity (5), might be monitored in the examination of the following coding categories: i) all scene types; ii) the type, size, position and number of remaining objects (presented in the shape of a largely indefinable or indistinct object suggestive of a divine and otherworldly god-like creature); iii) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize the presence of a divine, mystical or metaphysical spirit guiding and transcending the cosmos).

Meanwhile, the spirit of Russianness and the Russian soul (6) can be recognized in the investigation of the following codes: i) a type of scene, being space exploration activities performed by humans (presenting the cosmonauts observing as well as expressing an emotional attitude toward the Earth and showing an admiration, astonishment or fear toward extraterrestrial bodies and phenomena); ii) the type, size, position and number of extraterrestrial bodies (being of a significant size and presented in a evocative manner, indicating a clear relationship between themselves and human figures); iii) the size, position and number of humans (presented as epitomizing the wisdom, vitality and natural simplicity of the peasant); iv) the relation between the main human figures and v) the activity type of the main human figures (indicating an emotional depth or sensitivity toward each other); vi) the activity type of the main human figures (indicating an emotional depth or sensitivity toward the performed activity, mainly observing extraterrestrial bodies or astronomical phenomena); vii) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize depth, spirituality, emotional sensitivity and nostalgia of the Russian people).

The glorification of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy, often reflected in extolling the virtues and achievements of the Soviet socio-political system (7), might become evident in the following number of categories: i) the two type of scene, being space technology (presenting massive, highly advanced, futuristic and state-of-the-art devices) and space exploration activities performed by humans, including space travel and planetary engineering (presenting utopian-like scenes of the cosmonauts exploring, taming and settling space environment); ii) the type, size, position and number of status symbols (including hammer and sickle, the red star, the red inscription *S.S.S.R.* or other related elements depicted on various space technologies, such as satellites, spacecrafts, rockets as well as

cosmonauts' space suits and equipment); iii) the size, position and number of humans (presenting the cosmonauts as idealized and revered builders of a socialist utopia endowed with a sense of mission which was spreading the Soviet ideas across the universe); iv) the relation between the main human figures (presenting a high level of social solidarity as well as displaying a strong attachment to the Earth and the Soviet motherland); v) the type of activity of the main human figures (presenting the cosmonauts as the builders of the socialist utopia beyond Earth and performing complex and highly demanding tasks for the sake of humanity's future survival); vi) the type, size, position and number of technological devices (presenting massive as well as highly advanced, futuristic and state-of-the-art devices).

The pursuit of an ultimate truth and the hidden wisdom across space and time by means of pseudo- and parascientific methods which draw on esoteric, mystical and occult sources, such as astrology, magic or alchemy (8) can inform the following number of codes: i) all types of scene; ii) the size, position and number of humans (presented in a mystical or metaphysical relation to the cosmos, mostly by expressing an emotional or nostalgic attitude toward the Earth or extraterrestrial bodies and phenomena); iii) the activity type of the main human figures (presented as expressing an emotional or nostalgic attitude toward the observed extraterrestrial bodies and phenomena or performing highly secretive or mysterious activities of parascientific origins); iv) the type, size, position and number of technological devices (depicted as highly secretive or mysterious devices of unknown origins); v) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize the use of esoteric, mystical and occult sources in the search for an ultimate truth and the hidden wisdom).

Social solidarity as the means to enable humans to achieve perfection and unity in outer space (9) may be observable in the examination of the following coding categories: i) a type of scene, being space exploration activities performed by human beings, including space travel and planetary engineering (presenting the group of cosmonauts jointly exploring, taming and settling space environment); ii) the size, position and number of humans (presenting a clearly visible group of humans of a significant size); iii) the relation between the main human figures (indicating a high level of social solidarity); iv) the type of activity of the main human figures (presenting the cosmonauts jointly performing complex and highly demanding tasks by means of space technology); v) the height of the horizon line (a higher horizon line is more likely to include more human figures exploring space environment or operating space vehicles).

The last characteristic of Russian Cosmism, namely symbolism and romanticism of outer space views which aim to expose the more "spiritual" side of space exploration (10), might be detected in the study of the following

codes: i) all types of scene; ii) the type, size, position and number of extraterrestrial bodies (presenting planetary landscapes as either vast, picturesque, tranquil or confined and turbulent nature endowed with cultural and symbolic meanings); iii) the relationship between the main human figures (might indicate either a high or low level of social solidarity or imply other cultural and symbolic meanings); iv) the type of activity of the main human figures (implying a set of cultural and symbolic meanings); v) the type, size, position and number of technological devices (whose form and use indicates a set of cultural and symbolic meanings); vi) the height of the horizon line (a higher horizon line is more likely to include a greater number of human figures, space technologies and other subjects or objects related to space exploration); vii) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize both symbolism and romanticism of outer space views).

Similarly, the chief theoretical assumptions of American Cosmism mentioned at the beginning of this section will be analyzed in terms of their visual imagery likely to appear in the investigated space art. The first of them, namely human spaceflight viewed as a spiritual quest which leads humanity to achieving absolution, purification and finally eternity (1), might become evident in the following coding categories: i) the two types of scene, being space technology (presenting highly advanced, futuristic and state-of-the-art spacecrafts capable of ensuring the human race's future survival) and space exploration activities performed by humans, including space travel and planetary engineering (presenting the astronauts achieving a kind of epiphany or enlightenment during spaceflight missions); ii) the size, position and number of humans (presenting the astronauts as enlightened and self-conscious travelers or pilgrims endowed with a sense of mission); iii) the type of activity of the main human figures (presenting the astronauts completing space missions of a more spiritual than techno-scientific nature for the sake of humanity's future survival); iv) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize spiritual aspects of human spaceflight).

Meanwhile, Apollo nostalgia in the form of reflecting on the moon programme and longing for its glorious reincarnation (2), may inform the following number of codes: i) the two types of scene, being space technology (presenting Apollo programme fashioned spacecrafts in the process of completing their lunar missions) and space exploration activities performed by humans, including space travel and planetary engineering (presenting the Apollo astronauts completing particular stages of their lunar mission); ii) the type, size, position and number of status symbols (including the U.S. national flag, the inscriptions Apollo, USA or NASA, Apollo fashioned space suits and other attributes likely to evoke clear connotations with the programme); iii) the

size, position and number of humans (presented as highly individualized, bold and revered heroes and placed in clearly visible positions within a given image); iv) the type of activity of the main human figures (presenting the astronauts performing highly significant tasks during their lunar mission or simply observing transcendental extraterrestrial scenes and space exploration endeavours with a sense of devotion or nostalgia); v) the type, size, position and number of technological devices (depicted with a number of Apollo or NASA attributes); vi) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize transcendental and spiritual qualities as well as a revolutionary potential of the programme).

The presence of God or other supreme spirit during space missions and attributing space efforts to God's assistance (3) can be observed in the following coding categories: i) all types of scenes; ii) the type, size, position and number of remaining objects (presented in the form of religious attributes or a largely indefinable or indistinct object suggestive of a divine and otherworldly god-like creature); iii) the relationship between the objects and the surroundings (the more blurred and indistinct line is more likely to emphasize the presence of a divine, mystical or metaphysical spirit guiding and transcending the cosmos). A related characteristic of American Cosmism, namely the Overview Effect understood as a highly transcendental and metaphysical awareness-shifting experience reported by astronauts during spaceflight missions (5), may be detected in the study of the following codes: i) all types of scenes which include the view an extraterrestrial body or phenomenon visible from a distance; ii) the type, size, position and number of extraterrestrial bodies (depicted in clearly distinguishable positions within the image, usually near the horizon line); iii) the size, position and number of humans (human figures presented in relation to the cosmos, mostly by expressing an emotional attitude toward the Earth and showing an admiration, astonishment or fear towards extraterrestrial bodies and phenomena); iv) the relation between the main human figures (presented both in relation to the cosmos or a specific extraterrestrial object); v) the type of activity of the main human figures (presented as expressing an emotional attitude toward the Earth, showing an admiration, astonishment or fear toward extraterrestrial bodies and phenomena or operating space vehicles for peaceful purposes); vi) the relationship between the objects and the surroundings (the more concrete distinct line is more likely to emphasize realism of the depicted scene; on the other hand, the more blurred and indistinct line is more likely to highlight transcendental and metaphysical nature of the Overview Effect).

Astronauts seen as revered leaders as well as individualized, romantic and idealized heroes exploring the space frontier (4) might be monitored in the examination of the following coding categories: i) a type of scene, namely space exploration activities performed by humans, including space travel and planetary engineering (presenting the astronauts exploring, taming and settling

space environment); ii) the size, position and number of humans (presenting the astronauts as idealized and individualized leaders of the U.S. nation endowed with a sense of mission and responsibility for exploring the space frontier for the sake of the whole mankind); iii) the relation between the main human figures (presenting a high level of individualism); iv) the type of activity of the main human figures (presenting the space travelers performing complex and highly demanding tasks for the sake of humanity's future survival); v) the type, size, position and number of technological devices (presenting highly advanced and state-of-the-art devices operated by humans).

The two related traits of American Cosmism, namely space exploration viewed as a continuation of the Wild West expansion (6) and indication of Manifest Destiny (7) can be recognized in the investigation of the following codes: i) all types of scene, particularly extraterrestrial landscapes (presented as sublime and picturesque depicting the views of tranquil or turbulent nature); ii) the type, size, position and number of extraterrestrial bodies (depicted as vast, boundless and infinite as well as offering abundant prospects of finding new economic resources, wealth and freedom as well as unlimited possibilities for self-development in both physical and spiritual sense); iii) the type, size, position and number of status symbols (including, for instance, the U.S. national flag or NASA fashioned space suits and other attributes suggestive of the American nation's destiny to expand throughout the universe); iii) the size, position and number of humans (presenting the astronauts as idealized frontiersmen endowed with a sense of mission which is exploring the space frontier and spreading American ideals across the universe); iv) the relation between the main human figures (presenting both individualism and a high level of social solidarity as well as displaying a strong attachment to American ideals, including liberal democratic values and individual initiative); v) the type of activity of the main human figures (presenting the astronauts as the frontiersmen exploring yet undiscovered territories and performing complex and highly demanding tasks for the sake of humanity's future survival); vi) the type, size, position and number of technological devices (presenting highly advanced and state-of-the-art devices as the means to explore the unknown realms of outer space); vii) the relationship between the objects and the surroundings (the more concrete distinct line is more likely to emphasize realism of the depicted scene and thus evoke associations with the Wild West expansion).

Another relevant feature of the movement, the sublimity of outer space views which draws on the tradition of American landscape movement of the 1800s (8), might become evident in the following number of categories: i) the type of scene, being extraterrestrial landscapes (presented as sublime and picturesque territories depicting the views of tranquil or turbulent nature); ii) the type, size, position and number of extraterrestrial bodies (depicted as vast, boundless and infinite as well as evoking the sublime

feeling); iii) the size, position and number of humans (presented as individuals of an insignificant size, often confronted with the sublime view and thus reduced to a "vanishing nothingness" (Schopenhauer 1909: 266); iv) the activity type of the main human figures (presented while observing or confronting the sublimity of an extraterrestrial scene); v) the type, size, position and number of technological devices (depicted as insignificant when compared to the depicted extraterrestrial landscape); vi) the height of the horizon line (a lower horizon line is more likely to include a less number of human figures, space technologies and other subjects or objects related to space exploration and thus expose the sublimity of outer space); vii) the relationship between the objects and the surroundings (the more concrete distinct line is more likely to emphasize realism and sublimity of the depicted scene).

Meanwhile, the depiction of UFO and SETI as a parapsychical and occultist phenomenon (9) can inform the two codes, namely i) all types of scene, and ii) the type, size, position and number of remaining objects (in the shape of extraterrestrial life forms presented as largely paranormal phenomena experienced via parapsychical or occultist means which includes the encounter with superior and often invisible entities physically or via telepathy, trance, levitation, teleportation, apports, telekinesis, psychokinesis, materializations, astral travelling, etc.). The last assumption of American Cosmism, the portrayal of space travel as fulfillment of the von Braun paradigm, may be detected in the examination of the following coding categories: i) the two types of scene, being space technology (presenting highly advanced, futuristic and state-of-the-art NASA spacecrafts) and space exploration activities performed by humans, including space travel and planetary engineering (presenting the astronauts conducting suborbital and orbital flights as well as the moon and Mars landings); ii) the type of activity of the main human figures (presenting the astronauts conducting suborbital and orbital flights as well as the moon and Mars landings); iii) the type, size, position and number of technological devices (presenting highly advanced, futuristic and state-of-the-art NASA spacecrafts and other space-related devices fulfilling the U.S. space programme's subsequent stages).

The above descriptions should explain the major links between the selected coding categories and the chief assumptions of Russian as well as American Cosmism. In the following section I shall apply, mostly manually, the aforementioned set of codes to each of the investigated images and develop a more elaborate analysis by studying and further interpreting the relationship between them. This process will be conducted both qualitatively and quantitatively. While quantitative measures will include examining associations, statistical correlations and cross-tabulations between the variables, qualitative research will embrace possible interpretations of their

cultural meaning. However, it should be also noted that pursuing the visual content analysis can raise certain methodological problems. Some of the most problematic questions are the following: i) numbers do not necessarily translate into significance of a given category (Weber 1990; Ball and Smith 1992), ii) the employment of specific codes indicating the mood of an image might cause difficulties in determining what kind of mood is actually evoked; iii) the fragmentation of a coded image may cause difficulties in searching for any interconnections between its parts and thus determining its expressive content (Rose 2001: 67). To prevent the occurrence of these issues, I shall attempt to tackle them by, as mentioned at the beginning of this section, incorporating certain aspects of the site of the images' production and audiencing, which should help interpret them in a broader and relevant cultural context.

4.4. Research results

4.4.1. Statistical results: Analyzing individual artists' works

Below I shall present a statistical summary of the research results obtained from the visual content analysis of selected Chesley Bonestell, Nikolai Kolchitskii, Robert McCall and Andrei Sokolov's works. Each group of 50 images has been investigated in terms of ten different coding categories which shed light on specific differences between the artists' use of visual means in their construction of the cosmos and human space efforts.

Specific statistical results will consider the following number of codes: i) type of scene; ii) extraterrestrial and remaining objects; iii) human figures and space exploration tasks performed by them; iv) space technology and status symbols. A comparative schema of distribution of the average number of the aforementioned subjects as depicted in Bonestell's, Kolchitskii's, McCall's and Sokolov's works is demonstrated in Fig. 5a and 5b. The most visible distinctions can refer to i) the average number of human figures which is considerably high in McCall's images (3,36) and extremely low in Sokolov's (0,78); ii) the average number of space technologies which is relatively significant in McCall's paintings (2,56) as compared to Bonestell's (1,1); iii) the average number of remaining objects which is substantially large in Bonestell's (1,92) as compared to McCall's (0,88) and Sokolov's (0,9) visuals; iv) the average number of status symbols which is clearly the most impressive in McCall's illustrations (1,34).

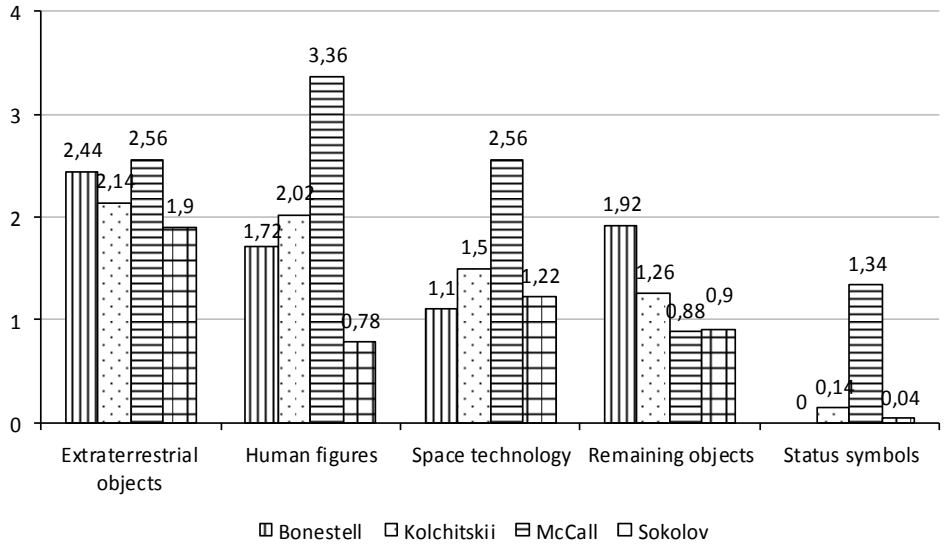

Fig. 5a. Distribution of the average number of various objects in Bonestell's, Kolchitskii's, McCall's and Sokolov's works (by category).

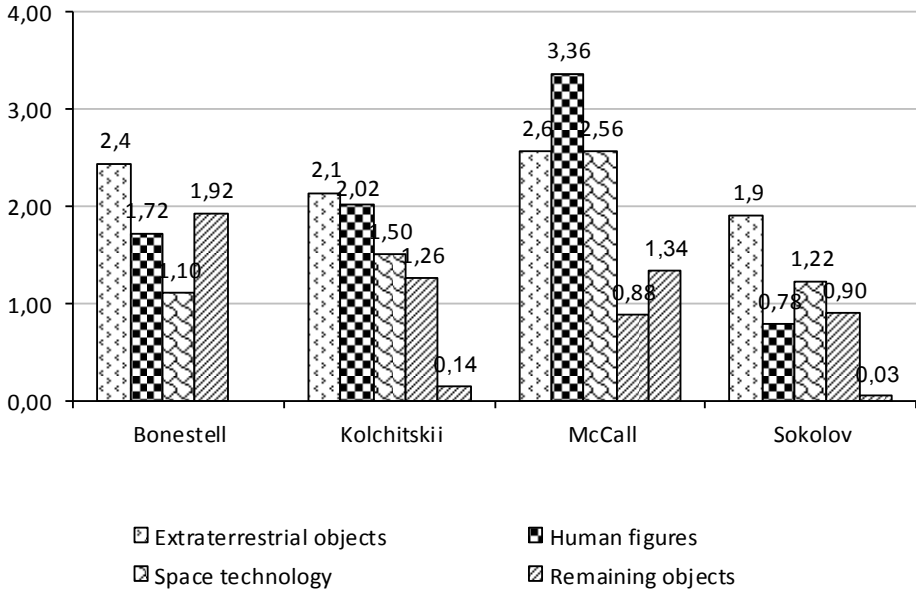

Fig. 5b. Distribution of the average number of various objects in Bonestell's, Kolchitskii's, McCall's and Sokolov's works (by author).

4.4.1.1. Type of scene

In general, out of 50 illustrations authored by Bonestell, only two can be clearly classified as portraying mainly space technology themes and twenty four as depicting extraterrestrial landscape scenes; no space exploration activities have been utilized as a predominant theme in the examined paintings. It seems, however, that the majority of the analyzed images is likely to combine at least two different motifs, namely i) extraterrestrial landscape and space exploration (10); ii) space technology and space exploration (7); iii) extraterrestrial landscape and space technology (6). In the case of paintings presenting alien planetary landscapes, the average number of intersections of the horizon line equals merely 2,44.

Meanwhile, in the group of Kolchitskii's images, eight can be categorized as depicting mainly space technology, seven as portraying extraterrestrial landscape scenes and two as envisioning predominantly space exploration activities. Again, it appears that most of the investigated visuals tend to combine at least two of the aforementioned themes, specifically i) extraterrestrial landscape and space exploration (11); ii) space technology and space exploration (9); iii) extraterrestrial landscape and space technology (13). Also, in illustrations offering extraterrestrial landscape views, the average number of horizon intersections equals 4,29.

When it comes to McCall's works, nine can be defined as containing mostly space technology motifs and merely one as depicting extraterrestrial landscapes; no space exploration activities have been utilized as a predominant theme in the examined paintings. It seems, however, that numerous paintings merge at least two various types of scene, particularly i) extraterrestrial landscape and space exploration (16); ii) space technology and space exploration (12); iii) extraterrestrial landscape and space technology (12). Interestingly, two paintings can be classified as representing bizarre alien life forms encountered in some distant parts of the universe. The average number of horizon intersections in planetary landscapes scenes equals 4,73 and remains relatively high.

With regard to Sokolov's paintings, thirteen can be regarded as envisioning space technology themes, five as visualizing space exploration activities and merely one as portraying extraterrestrial landscape scenes. Nevertheless, it seems that most images are likely to incorporate more than one category in their construction of the cosmos, namely i) extraterrestrial landscape and space exploration (9); ii) space technology and space exploration (1); iii) extraterrestrial landscape and space technology (21). In a group of illustrations presenting alien planetary landscapes, the average number of horizon intersections is 7,34 which may be perceived as highly significant when compared to that detected in other artists' works.

Summing up, extraterrestrial landscape themes were most frequently portrayed by Bonestell (48%) and almost entirely neglected by McCall and Sokolov (each 2%). Other striking differences can be observed in the depiction of: i) space technology, particularly in the case of Bonestell's (4%) vs. Sokolov's (26%) works; ii) space exploration, specifically in Bonestell's and McCall's (each 0%) vs. Kolchitskii's (4%) and Sokolov's (10%) images; iii) extraterrestrial landscape and space exploration, especially by McCall (32%) vs. Sokolov (18%); iv) extraterrestrial landscape and space technology, particularly in Bonestell's (12%) vs. Sokolov's (42%) images; v) space technology and space exploration, specifically in McCall's (24%) vs. Sokolov's (2%) illustrations. The visualization of distribution of the percentage share of scene types in Bonestell's, Kolchitskii's, McCall's and Sokolov's works is given in Fig. 6.

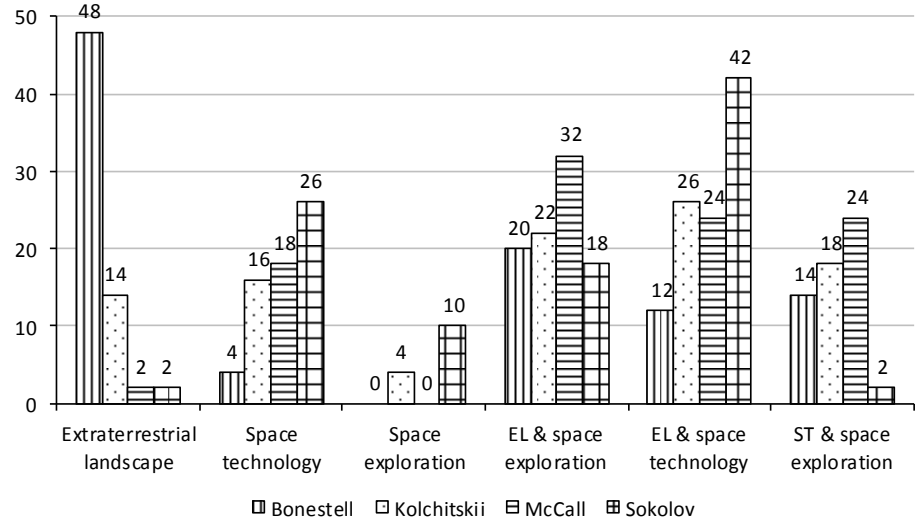

Fig. 6. Distribution of the percentage share of scene types in Bonestell's, Kolchitskii's, McCall's and Sokolov's works.

4.4.1.2. Extraterrestrial and remaining objects

The overall number of extraterrestrial objects included in Bonestell's works is one hundred and twenty two and can be regarded as relatively high. Particular extraterrestrial bodies most often depicted in the investigated illustrations are the following: i) the sun (9); ii) the Earth, its surface or orbit (16); iii) single stars (5) and binary star systems (5); iv) the stars (40); v) the moon or its surface (18); vi) other planets and their moons, including Mercury (1), Venus (1), Mars (6), Saturn (5), Pluto (1) and other unknown

extraterrestrial bodies (12); vii) other astronomical phenomena, such as galaxies (1), eclipses (1) or nebulas (1). Similarly, the total number of remaining objects included in the artist's images may be viewed as considerably significant (96). The most frequently portrayed elements of this kind involve various types of alien planetary formations, such as rocks or rocky surfaces (30), hills or mountain ranges (32), deserts (17), craters (9), canals (2), vegetation spots (2), volcanoes (2) and lavas (3).

Meanwhile, the total number of extraterrestrial and remaining objects contained in Kolchitskii's works is 107 and 63 respectively. Particular elements which fall under the former category are the following: i) the sun (13); ii) the Earth, its surface or orbit (23); iii) the stars (38); iv) the moon or its surface (19); iv) other planets and their moon, including Mars (2), Saturn (3), Jupiter and its satellites (3) and other unknown extraterrestrial bodies (5); v) other astronomical phenomena, such as comets (1). Meanwhile, the most frequently depicted remaining objects mostly include rocks or rocky surfaces (34), hills or mountain ranges (7), plants (9), water reservoirs (3), deserts (8), craters (1) and caves (1).

McCall's paintings can be characterized by a significant number of extraterrestrial bodies which equals 128 and encompasses the following elements: i) the sun (14); ii) the Earth, its surface or orbit (30); iii) the stars (37); iv) the moon or its surface (21); v) other planets and their moons, including Mars (6) and other unknown extraterrestrial bodies (15); vi) other astronomical phenomena, such as galaxies (1), asteroids (1), regions of light (1), comets (1) or nebulas (1). In contrast, the overall quantity of remaining objects included in McCall's works is merely forty four. The most frequently portrayed involve rocks or rocky surfaces (7), hills or mountain ranges (6), deserts (22), craters (8) and canals (1).

Sokolov's images seem to follow a similar pattern in their depiction of remaining objects. However, while their total number remains only forty five, the artist's visions offer a much more diverse variety of alien planetary formations, such as rocks or rocky surfaces (17), hills or mountain ranges (3), plants (2), craters (4), deserts (9), lightnings (2), fireballs (1), crystal pillars (1), clouds (1), solar flares (1), seas of liquid (1), sand storms (1), laser beams (1), soap bubbles (1), etc. Meanwhile, the overall quantity of extraterrestrial bodies can be considered relatively low (95) and embraces the following elements: i) the sun (4); ii) the Earth, its surface or orbit (17); iii) the stars (30); iv) the moon, its orbit or surface (13); iv) other planets and their moons, including Mercury (1), Venus (7), Mars (7), Jupiter (5), Saturn (1), Neptune (1), Pluto (1) as well as other unknown extraterrestrial bodies and their satellites (7); v) other astronomical phenomena, such as binary solar systems (1). Also, two paintings portray numerous, yet not clearly identifiable plant-like forms of extraterrestrial life encountered by space travelers on some alien planets.

It seems that the depiction of both number and type of alien bodies is similar in the case of each artist's works. However, the most remarkable differences in distribution of the percentage share of particular extraterrestrial objects in their overall number in every group of images can be observed in the portrayal of: i) the sun: Kolchitskii (12,5%) vs. Sokolov (4,21%); ii) solar system planets and their moons: Sokolov (24,21%) vs. McCall (4,69%). The chart representing all the results is given in Fig. 7a (see page 296).

Meanwhile, more distinctions of this kind can be detected in the visualization of a related category, namely remaining objects in the form of alien planetary formations. Specific dissimilarities are as follows: i) rocks or rocky surfaces: Kolchitskii (53,97%) vs. McCall (15,91%); ii) hills or mountain ranges: Bonestell (32,29%) vs. Sokolov (6,67%); iii) deserts: McCall (50%) vs. Kolchitskii (12,7%); iv) craters: McCall (18,18%) vs. Kolchitskii (1,59%); v) canals: Bonestell (2,1%) and McCall (2,27%) vs. Kolchitskii and Sokolov (each 0%); vi) plants and vegetation spots: Sokolov (4,44%) vs. Kolchitskii and McCall (each 0%). The representation of these statistics can be found in Fig. 7b (see page 297).

4.4.1.3. Human figures

The average number of astronauts presented in Bonestell's works is 1,72. Forty seven out of eighty six figures are located at the forefront and all can be characterized by an extremely small size when compared to other depicted objects. All of them are portrayed as completing various space exploration tasks, including investigating the surface of an extraterrestrial body (64), performing EVA and fixing some parts of the depicted spacecraft equipment (20) as well as viewing astronomical objects or phenomena as seen from the surface of the explored planet or its moon (3). Also, approximately sixty five humans are envisioned as having some sort of interaction which includes standing next to each other or jointly completing certain space-related tasks.

Meanwhile, Kolchitskii's illustrations cay be distinguished by a similarly insignificant average number of cosmonauts (2,02). On the other hand, as many as sixty one out of one hundred and one figures are located at the forefront, yet only thirty four can be regarded as having a large size when compared to other depicted objects. Also, all are depicted as engaged in accomplishing various space exploration tasks, ranging from performing EVA (18), operating a space vehicle (14) and exploring or terraforming the surface of extraterrestrial bodies (64) to admiring space technology (2) and alien views (6) or simply looking at the direction of the viewer (3). Forty three space travelers are likely to cooperate or communicate with their companions, such as looking at each other, standing or sitting next to each other, holding hands or (possibly) talking.

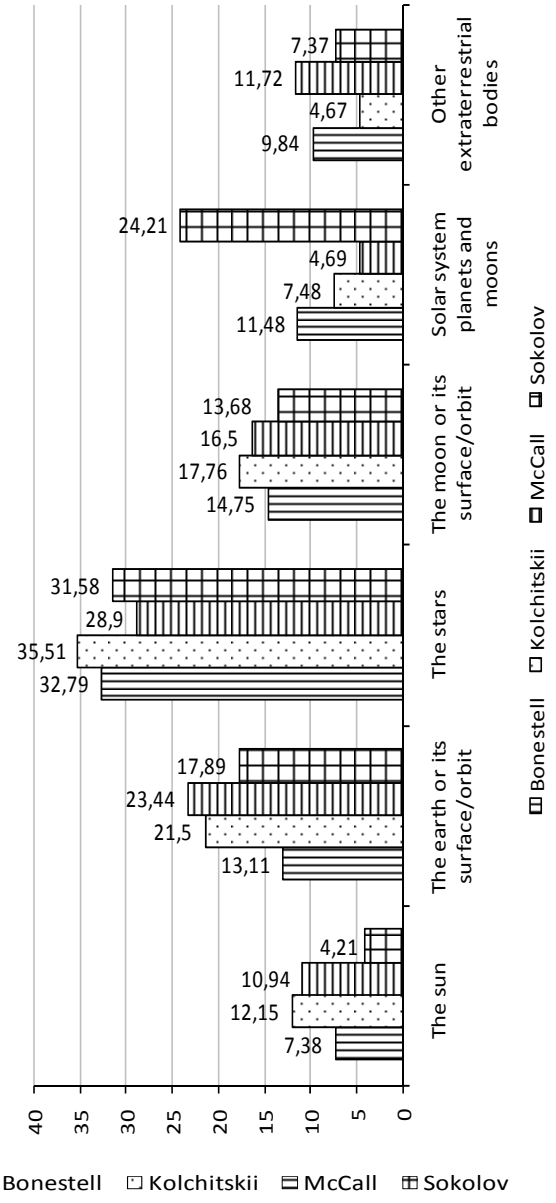

Fig. 7a. Distribution of the percentage share of objects in the overall number of extraterrestrial bodies in Bonestell's, Kolchitskii's, McCall's and Sokolov's works (I).

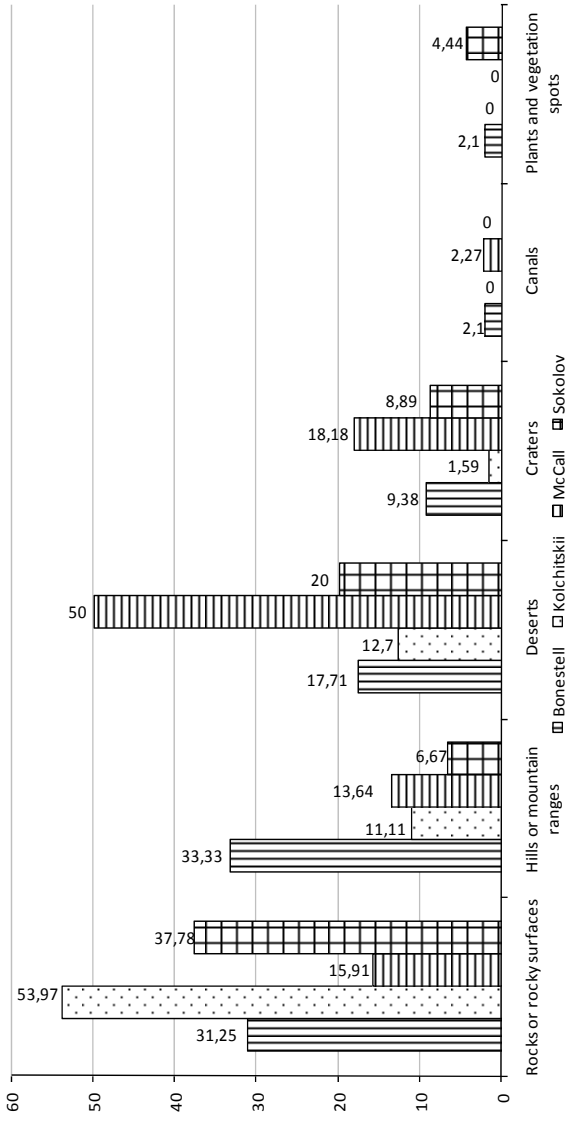

Fig. 7b. Distribution of the percentage share of objects in the overall number of extraterrestrial bodies in Bonestell's, Kolchitskii's, McCall's and Sokolov's works (II).

The depiction of space exploration activities performed by humans remains a frequent motif in McCall's paintings; the average number of astronauts may be considered relatively high and remains 3,36. However, only fifty three out of one hundred and sixty eight figures are placed at the forefront and merely twenty one can be perceived as having a highly significant size when compared to other depicted objects. The most often presented activities encompass performing EVA (30), exploring the lunar or Mars's surface as well as testing or fixing some parts of the depicted spacecraft equipment (72), operating space shuttles or other vehicles (8), viewing or admiring the lunar and Mars's bases (2) and extraterrestrial landscapes (7) as well as saluting a landing craft (1). Moreover, about ninety nine astronauts tend to interact with each other in one way or the other which involves standing next to each other or jointly completing certain space-related tasks.

In contrast to McCall's imagery, Sokolov's illustrations contain a remarkably small average number of humans which equals 0,78. On the other hand, as many as twenty five out of thirty nine figures are located at the forefront, though merely seven can be distinguished by a significant size when compared to other objects. All cosmonauts are envisioned as preoccupied with various space exploration activities, ranging from performing EVA (1), operating a space vehicle (3) to exploring and terraforming the surface of extraterrestrial bodies (9) and saluting the launching rocket (3). Interestingly, as many as twelve cosmonauts are depicted as contemplating the extraterrestrial views, two as watching alien life forms and eleven as admiring or space technology facilities, including spaceports or the launch of the Soviet rockets. What is more, thirty one humans engage in some kind of interaction, like looking at each other, standing or sitting next to each other while completing space-related tasks.

It can be concluded that not only does the average number of human figures differ in each artist's works, but also there are some substantial differences in the depiction of activities both astronauts and cosmonauts tend to be engaged in. Distribution of the percentage share of astronauts' and cosmonauts' tasks in their overall number in Bonestell's, Kolchitskii's, McCall's and Sokolov's works seem to differ in the following categories: i) exploring the surface of an extraterrestrial body: Bonestell (74,42%) vs. Sokolov (23,08%); ii) performing EVA: Bonestell (23,26%) vs. Sokolov (2,56%); iii) operating space shuttles and other vehicles: Kolchitskii (13,86%) vs. Bonestell 0%); iv) contemplating alien views: Sokolov (35,9%) vs. Bonestell (3,49%); v) viewing or admiring space technology: Sokolov (28,21%) vs. Bonestell (0%); vi) saluting a spacecraft: Sokolov (7,69%) vs. Bonestell and Kolchitskii (each 0%). Also, in reference to distribution of the percentage share of human figures characterized by a frontal location (I) and a significant size (II) in the artists' images, it appears that while in the former category the major distinctions consider Kolchitskii's (62,5%) vs. Bonestell's (0%) paintings, in the latter the most crucial dissimilarities can be found between Kolchitskii's (63,36%) and Sokolov's (64,1%) vs. McCall's (31,55%) visuals. All the results are presented in the charts in Fig. 8 and 9.

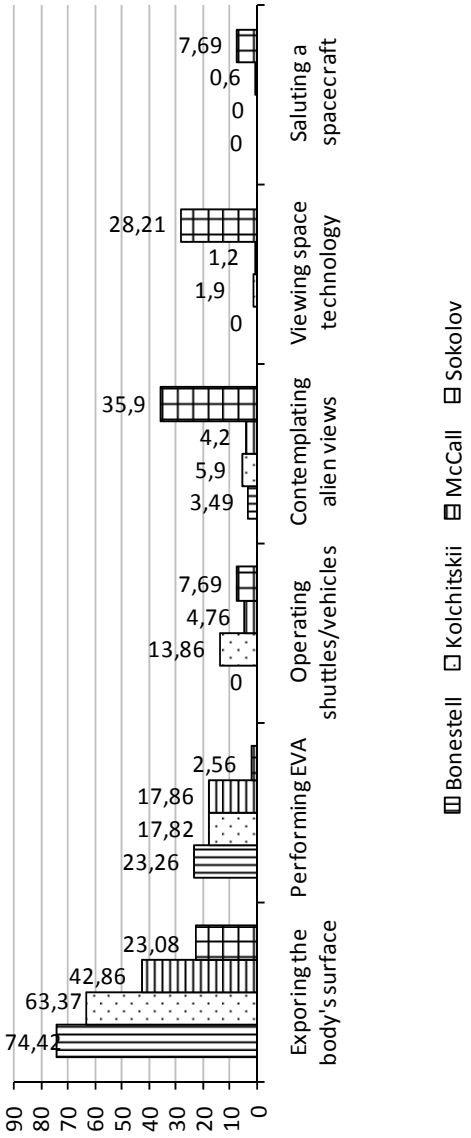

Fig. 8. Distribution of the percentage share of astronauts' and cosmonauts' activities in the overall number of space exploration tasks in Bonestell's, Kolchitskii's, McCall's and Sokolov's works.

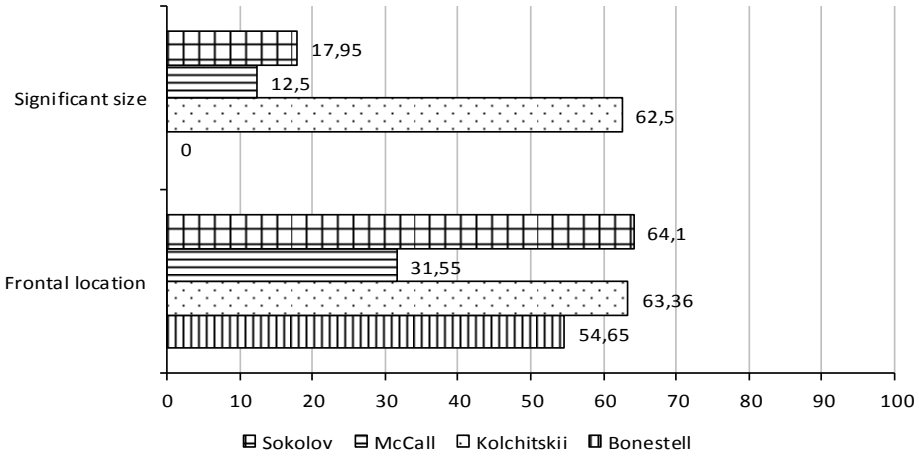

Fig. 9. Distribution of the percentage share of human figures characterized by a frontal location (I) and a significant size (II) in Bonestell's, Kolchitskii's, McCall's and Sokolov's works (1944-1991).

4.4.1.4. Space technology and status symbols

The depiction of space technology does not seem to be a predominant aspect of Bonestell's space art. Particular technological devices most often portrayed in the analyzed illustrations are the following: i) manned space stations (3); ii) rockets (6); iii) space and rover-like vehicles (3); landers (3); shuttles (12) and spacecrafts (9); iv) space habitats (3); v) space machines (9); vi) other space devices, including EVA equipment (1), platforms (4), missiles (1), etc. Moreover, out of fifty five space technologies, only twenty can be distinguished by a significant size and merely twenty two of them are clearly located at the forefront. It should be also noted that no visual elements included in Bonestell's paintings may be suggestive of the Cold War propaganda and there appeared no clear status symbols.

In contrast to Bonestell's visuals, space technology might be considered one of the most characteristic aspects of Kolchitskii's imagery. Specific devices most often portrayed in the artist's works include: i) manned space stations (10); ii) rockets (13); iii) space and rover-like vehicles (12); spaceships (14); iv) space habitats (6); v) space machines (13); vi) other space devices, including robots (1), jets (1), EVA equipment (1), space telescopes (1), etc. Also, out of seventy five space technologies, as many as fifty one can be assessed as having a significant size and forty two are clearly located at the forefront. Interestingly, although certain aspects of the artist's paintings can be indicative of the

communist propaganda, there occurred merely seven status symbols in the form of a red star, the hammer and the sickle as well as the inscription SSSR. What is more, five of them were depicted at the foreground.

Also in the case of McCall's art, the portrayal of space technology seems to be a predominant and highly diverse aspect of the artist's visions of the cosmos. His works embraced a wide variety of space-related devices, such as: i) manned space stations (12); ii) rockets (1); iii) space and rover-like vehicles (19), landers (7), shuttles (14) and spacecrafts (13); iv) space habitats (9); v) space machines (2); vi) other space devices, including space platforms (2), lunar and Mars bases (10), orbiters (4), boosters (1), payloads (1), missiles (2), space sails (3), spaceports (3), satellites (8), gas cylinders (7), solar farms (1), aerospace planes (1), Hubble telescope (1), cluster of casings (1), command modules (1), unmanned lab (2), nuclear-powered beam weapons (1), Skylab (3) and other space equipment (1). Moreover, out of one hundred and twenty eight space technologies, fifty four can be characterized by a significant size and sixty by a frontal location. Interestingly, in contrast to other artists' works, selected facets of McCall's imagery can indicate the Cold War propaganda due to the inclusion of sixty seven status symbols most of which are located clearly at the forefront (46). Particular symbols indicative of the national prestige of the U.S. space programme are as follows: i) the U.S. flag (38); ii) the inscription USA/United States (12) and NASA (15) on either astronauts' spacesuits or space technologies.

Similarly to McCall's, the representation of space technology appears to be one of the most prominent features of Sokolov's images which involved the portrayal of the following elements: i) manned space stations (4); ii) rockets (5); iii) space and rover-like vehicles (8), spacecrafts (14); iv) space habitats (3); v) space machines (2), space probes (9), landers (2), lunar bases (3), sputniks/satellites (3), spaceports (4); vi) other space devices, including automatic space devices/stations (5), radars (1), metal spheres (2), space platforms (1), etc. Also, a remarkably large number of devices, namely thirty four out of sixty one, may be singled out by vast dimensions and forty of them are placed at the foreground. On the other hand, there appeared merely two clearly identifiable status symbols in the form of a red star and the red hammer and sickle. At the same time, the aforementioned frequent depiction of excessively large space technologies might suggest the influence of the Soviet censorship practices on the artist's works.

Overall, it may be suggested that there are some considerable distinctions in the depiction of both type and number of space technologies. Distribution of the percentage share of devices in their overall number in Bonestell's, Kolchitskii's, McCall's and Sokolov's works tends to differ in the portrayal of the following categories: i) space stations: Kolchitskii (13,33%) vs. Bonestell (5,45%); ii) rockets: Kolchitskii (17,33%) vs. McCall (0,78%); iii) space and rover-like vehicles: Kolchitskii (16%) vs. Bonestell (5,45%); iv) spaceships, including landers

and shuttles: Bonestell (43,64%) vs. Kolchitskii (18,66%); v) space machines: Kolchitskii (17,33%) vs. McCall (1,56%); vi) space probes: Sokolov (14,75%) vs. Bonestell, Kolchitskii and McCall (each 0%); vii) lunar and Martian bases: McCall (7,81%) vs. Bonestell and Kolchitskii (each 0%); viii) sputniks/satellites: McCall (6,15%) vs. Bonestell and Kolchitskii (each 0%); ix) spaceports: Sokolov (6,56%) vs. Bonestell and Kolchitskii (each 0%); x) space platforms: McCall (1,56%) and Sokolov (1,64%) vs. Bonestell and Kolchitskii (each 0%); xi) other devices: Sokolov (23,44%) vs. Kolchitskii (5,33%). Also, in reference to distribution of the percentage share of space technologies characterized by a frontal location (I) and a significant size (II), it appears that both Kolchitskii's (68%, 62,5%) and Sokolov's (65,57%, 55,74%) works tend to depict devices which fulfill these two criteria. All the results are presented in the charts in Fig. 10a, 10b and 11 (see page 304-306).

4.4.2. Statistical results: Comparing American and Soviet works

Below I present a brief summary of statistical results obtained from the visual content analysis of the investigated works in a comparative American-Soviet perspective. Here, the aim is to shed light on the most vital differences between Bonestell's and McCall's as well as Kolchitskii's and Sokolov's construction of the cosmos which stem from the quantitative study of the U.S. and Soviet space art.

In reference to a type of scene depicted in the works under analysis, out of one hundred American illustrations, produced by Chesley Bonestell and Robert McCall, eleven can be clearly classified as portraying mainly space technology themes and twenty five as depicting extraterrestrial landscape scenes. Interestingly, no space exploration activities have been utilized as a predominant theme in the examined paintings. It seems, however, that the majority of images seem to combine at least two different motifs, namely i) extraterrestrial landscape and space exploration (26); ii) space technology and space exploration (20); iii) extraterrestrial landscape and space technology (18). Meanwhile, out of one hundred Soviet illustrations, authored by Nikolai Kolchitskii and Andrei Sokolov, twenty one can be clearly classified as portraying mainly space technology themes, seven as envisioning predominantly space exploration activities and eight as depicting extraterrestrial landscape scenes. Again, it appears that most analyzed images tend to incorporate more than one major theme, namely i) extraterrestrial landscape and space exploration (20); ii) space technology and space exploration (10); iii) extraterrestrial landscape and space technology (34). Hence, one can observe some crucial differences in the content of American and Soviet images under analysis. For example, the Soviet artists produced considerably more works depicting space technology themes (21>11), space exploration activities performed by humans (7>0) as well as extraterrestrial landscape and space technology

(34>18). In contrast, the U.S. illustrators created substantially more visuals portraying extraterrestrial landscape scenes (25>8), extraterrestrial landscape and space exploration (26>20) as well as space technology and space exploration (19>10). The chart representing distribution of the percentage share of scene types in American and Soviet works can be found at the end of this section (Fig. 12a and 12b).

When it comes to the representation of particular extraterrestrial bodies, it should be noted that a total number of alien objects depicted within the examined works is clearly more significant on the American (251) rather than the Soviet side (201). More specifically, the Soviet painters portrayed the following elements: the sun (17); ii) the Earth, its surface or orbit (40); iii) the stars (68); iv) the moon, its surface or orbit (32); iv) solar system planets and their satellites, including Mercury (1), Venus (7), Mars (9), Saturn (4), Jupiter (8), Neptune (1), Pluto (1) and other unknown extraterrestrial bodies (12); v) other astronomical phenomena, such as comets (1) and binary solar systems (1); vi) plant-like alien life forms (2).

Meanwhile, the U.S. images are likely to present the following number of objects: i) the sun (23); ii) the Earth, its surface or orbit (46); iii) the stars (77); iv) single stars (5) and binary star systems (5); v) the moon or its surface (39); v) other planets and their moons, including Mercury (1), Venus (1), Mars (12), Saturn (6) and other unknown extraterrestrial bodies (27); vi) other astronomical phenomena, such as galaxies (2), asteroids (1), regions of light (1), comets (1), eclipses (1) or nebulas (2); vii) alien life forms (2). Taking the aforementioned results into account, it seems that the Soviet illustrators were more prone to visualizing the following bodies: i) Venus (7>1); ii) Jupiter and its satellites (8>0); iii) Neptune (1>0); iv) Pluto (1>0). This number remains relatively insignificant when compared to their American counterparts' practices who tended to depict a greater quantity of extraterrestrial objects, encompassing: i) the sun (23>17); ii) the Earth, its surface or orbit (46>40); iii) the stars (77>68); iv) single stars (5>0) and binary star systems (5>1); v) the moon or its surface (39>32); v) other planets and their moons, including Mars (12>9), Saturn (6>4) and other unknown extraterrestrial bodies (27>12); vi) other astronomical phenomena, such as galaxies (2>0), asteroids (1>0), regions of light (1>0), eclipses (1>0) or nebulas (2>0). Also, it should be noted that both Soviet and U.S. painters envisioned an equal number of the following elements: i) Mercury (1>1); ii) comets (1>1); iii) alien life forms (2>2). Distribution of the percentage share of particular objects in the overall number of extraterrestrial bodies in American and Soviet works is visually represented in the charts at the end of this section (Fig. 13a and 13b).

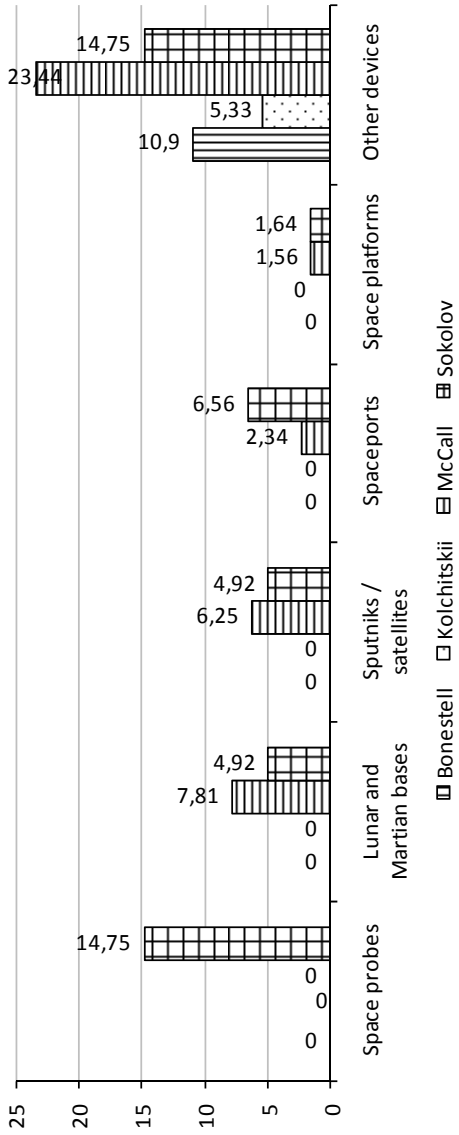

Fig. 10a. Distribution of the percentage share of devices in the overall number of space technologies in Bonestell's, Kolchitskii's, McCall's and Sokolov's works (I).

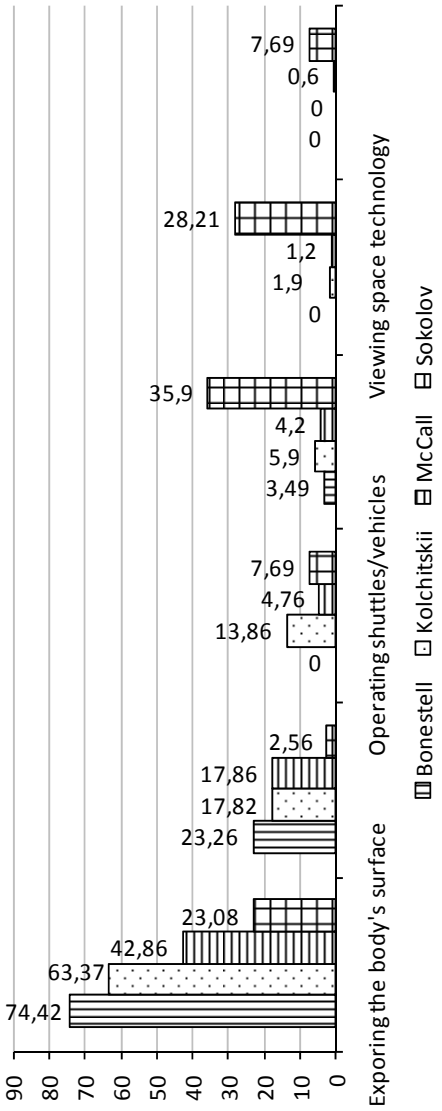

Fig. 10b. Distribution of the percentage share of devices in the overall number of space technologies in Bonestell's, Kolchitskii's, McCall's and Sokolov's works (II).

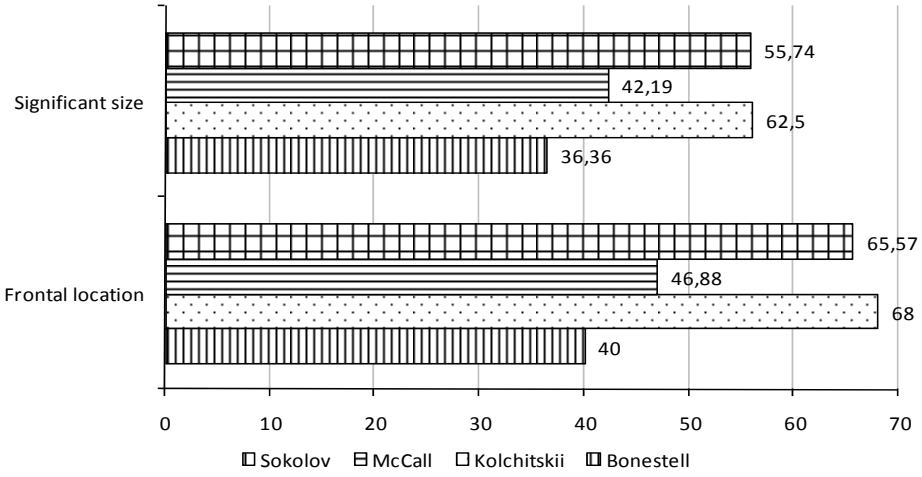

Fig. 11. Distribution of the percentage share of space technologies characterized by a frontal location (I) and a significant size (II) in Bonestell's, Kolchitskii's, McCall's and Sokolov's works.

In reference to a total number of human figures included in the illustrations under analysis, it is substantially bigger on the American (254) rather than the Soviet side (140). The average number of cosmonauts presented in the Soviet images is 1,4 which is considerably lower than the average number of astronauts depicted in the U.S. paintings that amounts to 2,54. Also, eighty six out of one hundred and forty human figures (61,42%) in the former visuals are located at the forefront, yet only forty one (29,28%) can be regarded as having a significant size when compared to other objects. In the case of the latter, one hundred out of two hundred and fifty four human figures (39,37%) are portrayed at the forefront and merely twenty one (8,26%) can be regarded as having vast dimensions. Distribution of the percentage share of human figures characterized by a frontal location (I) and a significant size (II) in American and Soviet works is represented in the chart at the end of this section (Fig. 14). What is more, seventy four out of one hundred and forty cosmonauts (52,85%) and one hundred and sixty four out of two hundred and fifty four astronauts (64,56%) are envisioned as having some sort of interaction with each other while accomplishing various space missions. Another interesting point of comparison are differences in the depiction of tasks in the completion of which cosmonauts and astronauts are engaged. For instance, the Soviet illustrators tended to present a greater number of humans performing the following activities: i) operating space shuttles or other vehicles (17>8); ii) contemplating

extraterrestrial views (20>10); iii) viewing or admiring space technology (13>2); iv) saluting a landing or launching craft (3>1); v) looking at the direction of the viewer (3>0). On the other hand, the U.S. artists were more likely to visualize a greater number of humans completing the following tasks: i) exploring the surface of an extraterrestrial body (136>73); ii) performing EVA (50>19). Therefore, it seems that while the Soviet works portray a substantially larger quantity of cosmonauts involved either in operating space vehicles or simply viewing space technology or alien landscapes, their American counterparts more often depict astronauts engaged in exploring extraterrestrial objects or performing EVA. These trends are visualized in the chart at the end of this section (Fig. 15).

With regard to the representation of space technology, it seems that a total number of devices portrayed in American and Soviet illustrations under analysis is to a large extent similar (U.S. 185 > Rus. 136). However, particular images appear to differ in both type and number of the depicted devices. For example, the Soviet works tend to present a greater number of the following elements: i) rockets (18>7); ii) space machines (15>12); space probes (9>0). Meanwhile, the U.S. paintings are likely to embrace a larger quantity of the following items: i) landers (10>2); ii) shuttles and spacecrafts (48>28); iii) space habitats (12>9); iv) lunar or Mars's bases (10>3); v) satellites (8>3); vi) space platforms (6>1). The number of the remaining technological devices in both Soviet and American images remains strikingly similar or the same, including spaceports (4>3), space telescopes (1>1) or EVA equipment (1>1). However, one of the chief differences in the artists' works lies in the fact that the U.S. illustrations, particularly McCall's, encompass a greater variety of space technologies, such as, missiles (3), orbiters (4), boosters (1), payloads (1), space sails (3), spaceports (3), gas cylinders (7), solar farms (1), aerospace planes (1), cluster of casings (1), command modules (1), unmanned lab (2), nuclear-powered beam weapons (1), Skylab (3) and other space equipment (1). In contrast, devices depicted in the Soviet visuals are considerably less diverse and include mostly robots (1), jets (1), space devices/stations (5), radars (1) and metal spheres (2). Distribution of the percentage share of devices in the overall number of space technologies in American and Soviet works is represented in the chart at the end of this section (Fig. 16a and 16b). Also, a more general conclusion would be that both Kolchitskii and Sokolov were prone to depicting numerous space technologies, frequently of excessively vast and thus largely unrealistic dimensions. Specifically, 62,5% of space technologies (as compared to 40% on the American side) can be distinguished by a significant size and 60,26% of them are clearly located at the forefront (as compared to 44,32% on the American side), as visualized in the chart at the end of this section (Fig. 17).

Interestingly, although certain visual elements included in both Kolchitskii's and Sokolov's illustrations may have been influenced by the communist propaganda, embracing mostly a frequent depiction of excessively vast space technologies, there appeared merely nine clearly identifiable status symbols in the form of a red star, the hammer and the sickle as well as the inscription SSSR, seven of which were located at the forefront. Suprisingly, this number can be considered highly insignificant when compared to McCall's paintings where sixty seven status symbols are included and forty six of which are portrayed at the forefront. The reason for a common inclusion of such elements, like the U.S. flag, the inscription USA/United States and NASA, might be the artist's lifelong engagement in the NASA Art Programme which put an emphasis on chronicling and spreading the public enthusiasm for the national space programme's missions and projects. Sokolov, though acting as the head of the USSR Union of Artists' Committee on Science and the Cosmos, never served as the official painter of the government's space efforts, mainly due to its highly secretive character and thus the public's restricted access to the Cosmodrome's administrative and technical sites.

As for the representation of the remaining objects included in the analyzed works, it appears that their total number is more significant on the American (136) than the Soviet side (115). Regarding specific differences in their type and number, both Kolchitskii and Sokolov depicted the following elements in their illustrations: i) rocks or rocky surfaces (51); ii) hills or mountain ranges (10); iii) plants (11); iv) water reservoirs or seas of liquid (4); v) craters (5); vi) deserts (17) and other objects, including caves (1), lightnings (2), fireballs (1), crystal pillars (1), clouds (1), solar flares (1), sand storms (1), laser beams (1), soap bubbles (1), etc. Meanwhile, Bonestell and McCall portrayed the following items in their paintings: i) rocks or rocky surfaces (37); ii) hills or mountain ranges (38); iii) deserts (39); iv) craters (17) and canals (3); v) plants or vegetation spots (2); vi) volcanoes (2) and lavas (3). Hence, it seems that the Soviet artists visualized a greater number of the following objects: i) rocks or rocky surfaces (51>27); ii) plants (11>2); iii) water reservoirs or seas of liquid (4>0); iv) other elements, such as caves (1>0), lightnings (2>0), fireballs (1>0), crystal pillars (1>0), clouds (1>0), solar flares (1>0), sand storms (1>0), laser beams (1>0) or soap bubbles (1>0). In contrast, their American counterparts were more likely to include the following elements: i) hills or mountain ranges (38>10); ii) deserts (39>17); iii) craters (17>5), canals (3>0), volcanoes (2>0) and lavas (3>0). Taking the aforementioned results into consideration, one can observe that the U.S. illustrations tend to embrace a larger quantity of vast, open, desert-like or mountainous landscapes replete with craters, canals and other typically extraterrestrial planetary formations. On the other hand, the Soviet images offer a more diverse variety of such objects depicted in a number of plain and rocky planetary terrains. The results are represented in the charts at the end of this section (Fig. 18a and 18b).

Summing up the statistics, one may also conclude that a total number of elements depicted in the works under analysis, including extraterrestrial bodies, human beings, space technology as well as remaining objects, is more significant on the American (826) than the Soviet side (592). The result indicates that the latter artists tended to include a smaller quantity of various space-related figures and items within their illustrations. On the other hand, their U.S. counterparts were more likely to present alien landscapes replete with a greater number of elements, the majority of which constitute astronauts and extraterrestrial bodies; each category consists of more than 250 items. Meanwhile, the largest number of objects portrayed by the Soviet painters are space technology devices which amounts to over 160 (26,21%). The charts at the end of this section represent the average number of extraterrestrial bodies (I), human figures (II), space technologies (III) and remaining objects (IV) in American and Soviet works both separately and in a comparative perspective (Fig. 19, 20 and 21). Also, the average number of intersections of the horizon in the Soviet images equals 5,81 and remains considerably high in comparison to its U.S. counterpart (3,58). This means that the former artists depicted more objects that clearly disrupted and intersected the horizon line, including space technology, cosmonauts or elements of extraterrestrial planetary formations. Lastly, the analysis of the final coding category, the relationship between the objects and the surroundings, has implied that the employment of a blurred and indistinct line is substantially more frequent on the Soviet (68%) than American side (9%).

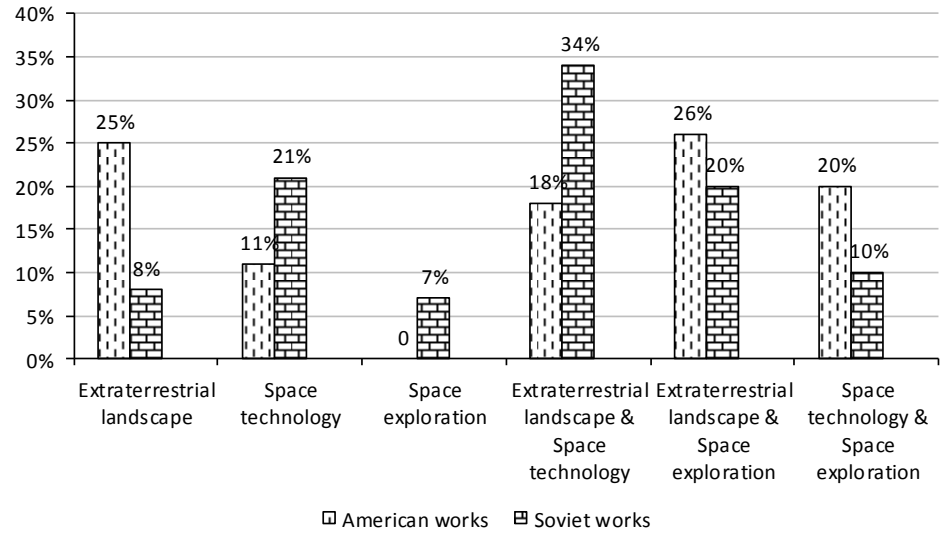

Fig. 12a. Distribution of the percentage share of scene types in American and Soviet works (by category).

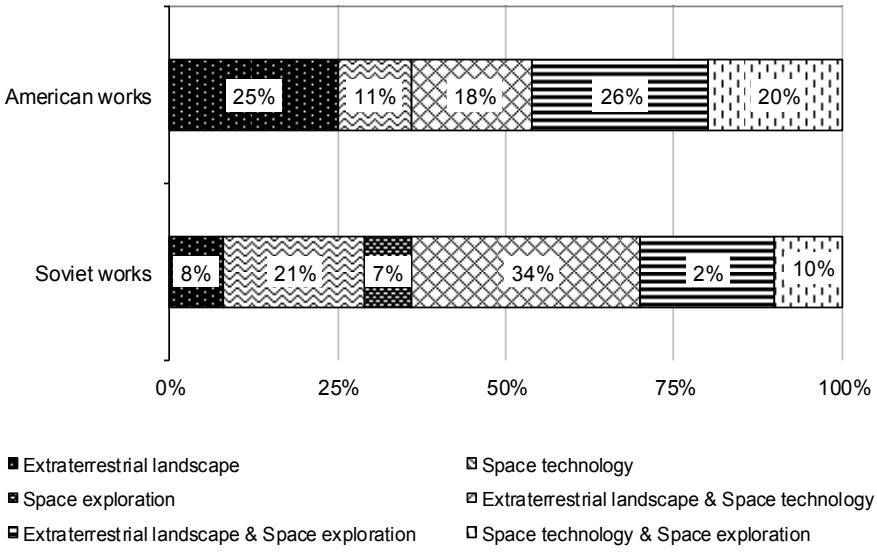

Fig. 12b. Distribution of the percentage share of scene types
in American and Soviet works (by American and Soviet works).

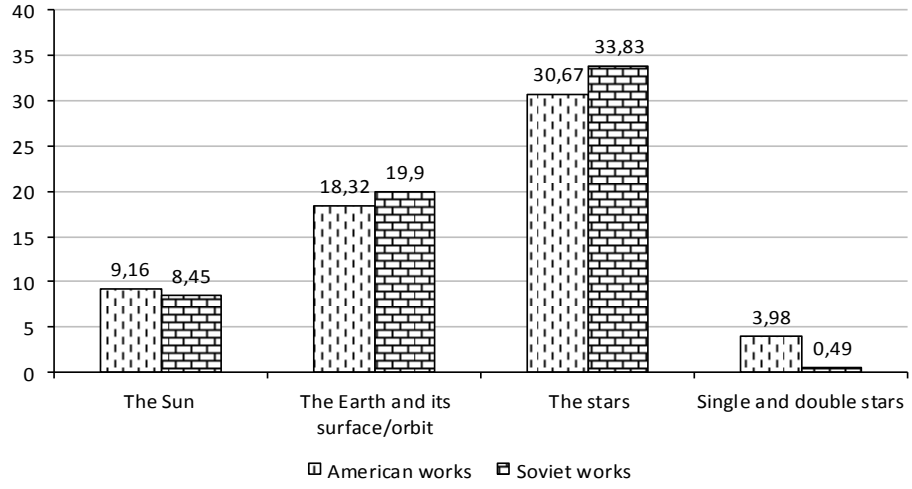

Fig. 13a. Distribution of the percentage share of particular objects
in the overall number of extraterrestrial bodies
in American and Soviet works (I).

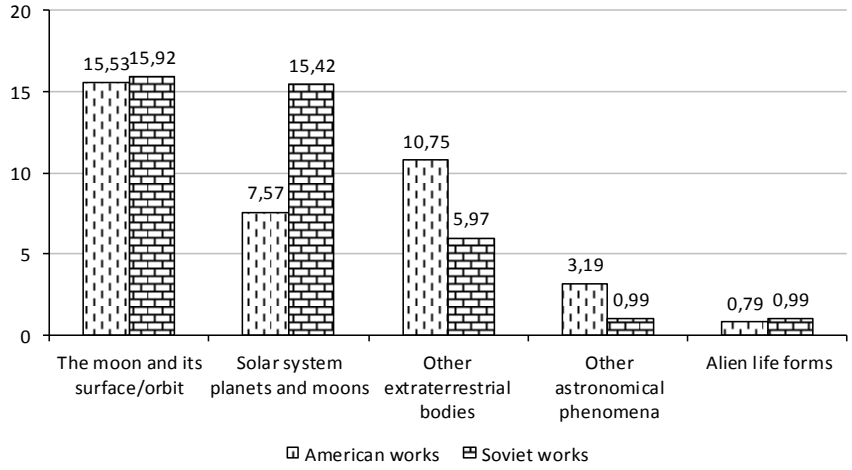

Fig. 13b. Distribution of the percentage share of particular objects in the overall number of extraterrestrial bodies in American and Soviet works (II).

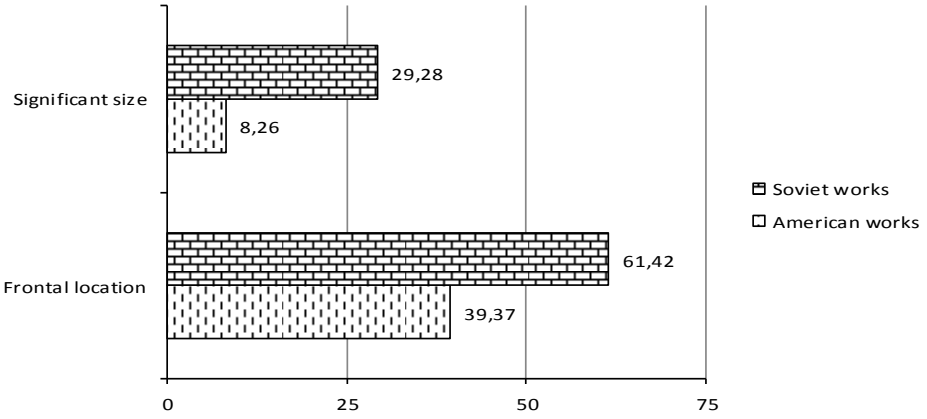

Fig. 14. Distribution of the percentage share of human figures characterized by a frontal location (I) and a significant size (II) in American and Soviet works.

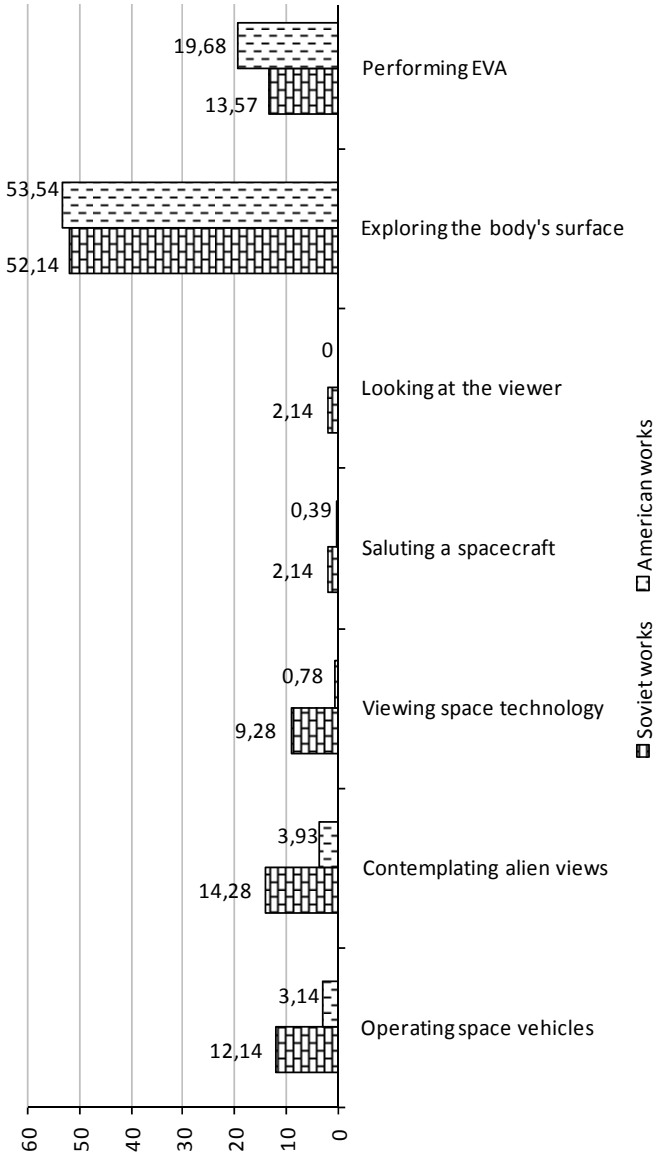

Fig. 15. Distribution of the percentage share of astronauts' and cosmonauts' activities in the overall number of space exploration tasks in Soviet and American works.

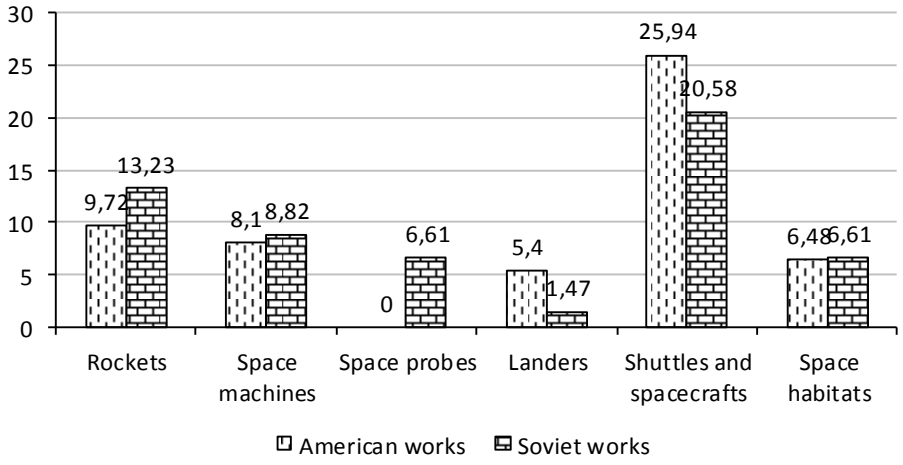

Fig. 16a. Distribution of the percentage share of devices in the overall number of space technologies in American and Soviet works (I).

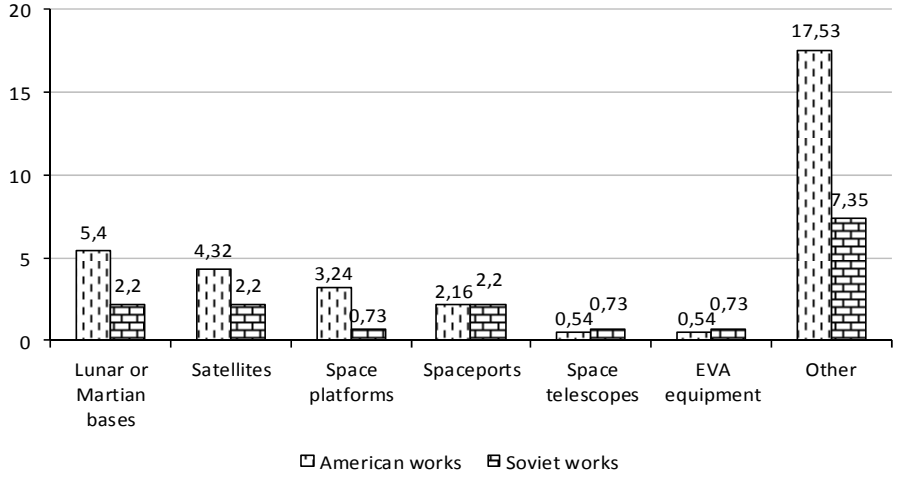

Fig. 16b. Distribution of the percentage share of devices in the overall number of space technologies in American and Soviet works (II).

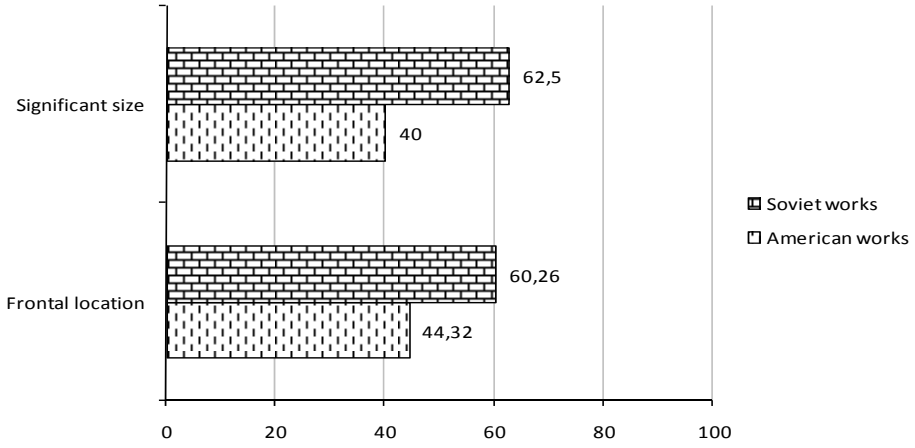

Fig. 17. Distribution of the percentage share of space technologies characterized by a frontal location (I) and a significant size (II) in American and Soviet works.

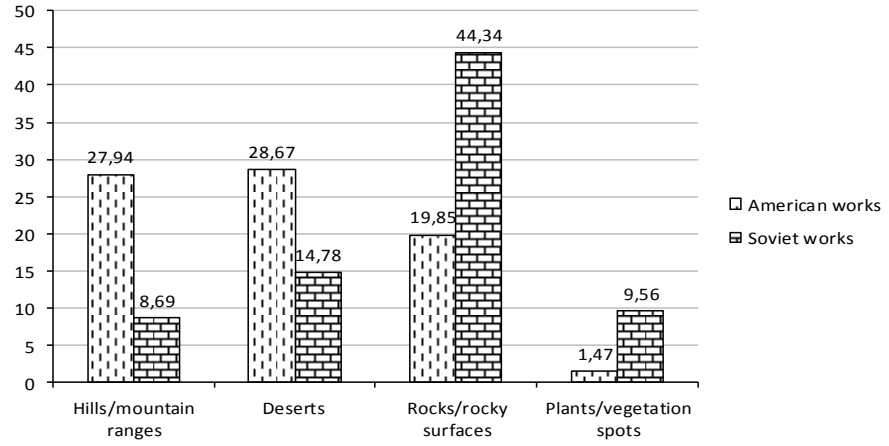

Fig. 18a. Distribution of the percentage share of devices in the overall number of remaining objects in American and Soviet works (I).

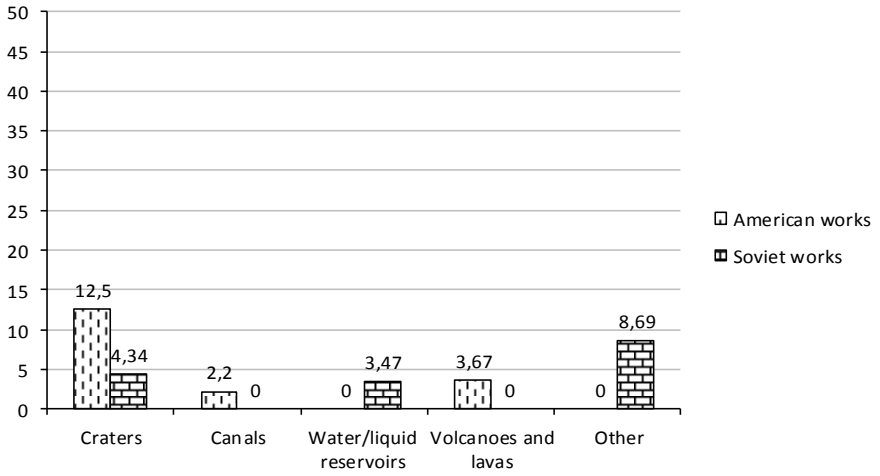

Fig. 18b. Distribution of the percentage share of devices in the overall number of remaining objects in American and Soviet works (II).

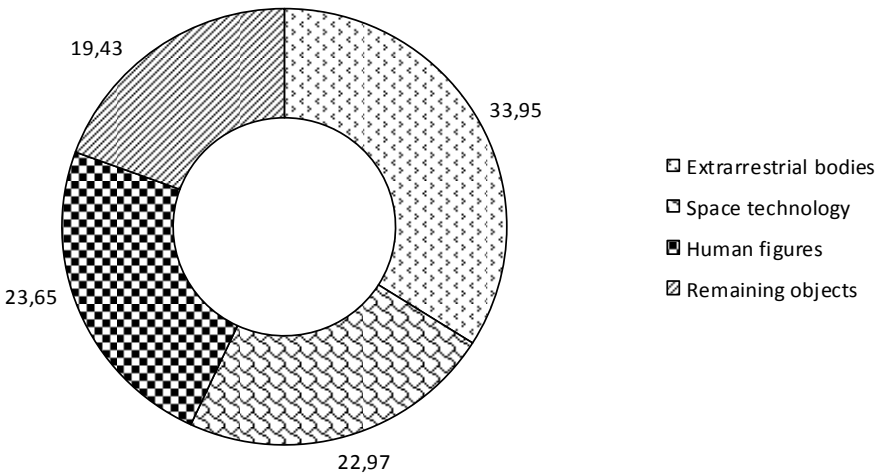

Fig. 19. Distribution of the percentage share of extraterrestrial bodies, space technology, human figures and remaining objects in Soviet works.

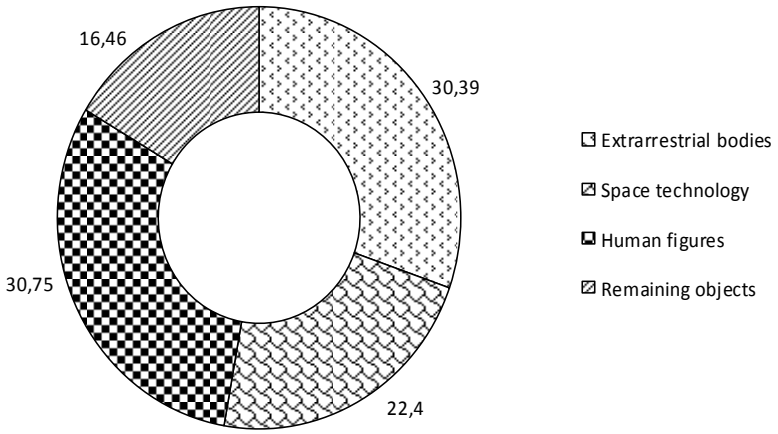

Fig. 20. Distribution of the percentage share of extraterrestrial bodies, space technology, human figures and remaining objects in American works.

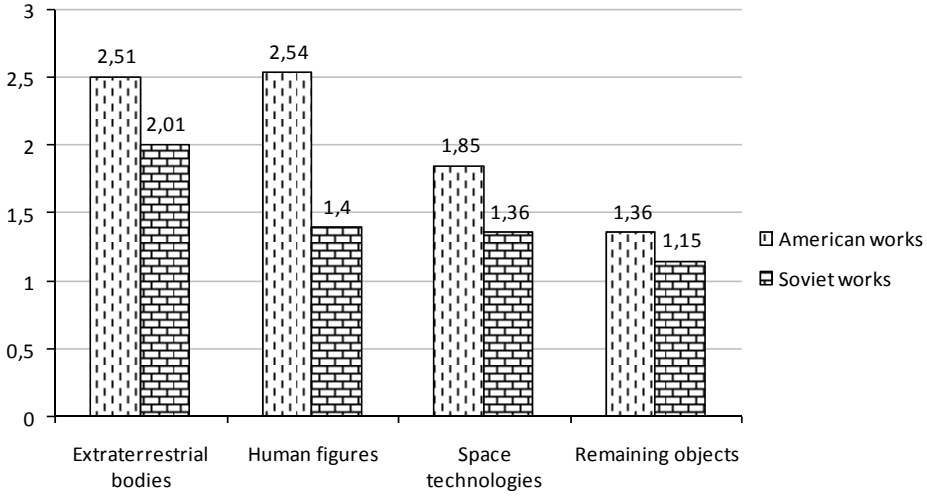

Fig. 21. The average number of extraterrestrial bodies, human figures, space technologies and remaining objects in American and Soviet works.

4.4.3. Interpreting statistical results

In the following section, I attempt to interpret the main statistical results obtained from the visual content analysis of the artists' works in light of the chief assumptions of Russian and American Cosmism formulated at the beginning of this chapter. Particularly, the study has suggested that most of the ten fundamental principles of the two variations of the Cosmist thought, here in a specific visual form, are likely to occur in the content of the investigated illustrations.

4.4.3.1. The impact of Russian Cosmism on Kolchitskii's and Sokolov's works

It seems that most Soviet works under analysis tend to present utopian-like alien planetary landscapes, highly advanced, futuristic and state-of-the-art devices as well as utopian-like scenes of the cosmonauts exploring, taming and settling space environment. The impression is largely created by the fact that the Soviet artists produced a significant number of works depicting extraterrestrial landscape and space technology (34), space technology (21), extraterrestrial landscape and space exploration (20), space technology and space exploration (10) as well as space exploration activities performed by humans (7). Also, the average number of 1,82% devices is likely to occur in the analyzed images. Therefore, it might be concluded that all illustrations contain 92% of themes suggestive of one of the chief ideas of the Russian Cosmists, namely the completion of Fedorov's Common Task; the entire universe seems to be filled with human presence and transformed into an image of the human mind. As mentioned earlier in the chapter, the concept involved a moral imperative of establishing a universal utopia understood as humanity's active spiritual and scientific-technological mission to resurrect the dead. Meanwhile, translating it into visual means would mainly embrace the glorification of scientific and technological advances operated by cosmonauts as the means to accomplish the task as well as to improve and regulate nature. It should be also noted that no signs of the actual act of raising mankind's ancestors have been observed in any of the examined images. Hence, the major manifestation of Fedorov's outlandish project, as visualized in Kolchitskii's and Sokolov's works, draws on depicting extraterrestrial scenes indicative of technological utopianism, a largely transhumanist ideology founded on the belief that scientific and technological progress in spaceflight will eventually fulfill a utopian ideal. No spiritual aspect of Fedorov's utopia though seems to be present unless manifested in a romantic and partly unrealistic quality of Kolchitskii's and Sokolov's constructions of the cosmos (see below).

Also, the Soviet artists locate the majority of cosmonauts at the forefront (61,42%) and tend to portray them as romantic and idealized heroes or builders of a socialist utopia endowed with a sense of mission (the relevant data is provided in Appendix; see e.g. Images 54, 59, 60, 61, 66, 72, 81, 82, 87, 91, 152, 153, 157, 159, 165, 170, 173, 177, 181, etc.).[5] Many of them (52,85%) present a high level of social solidarity and perform complex and highly demanding tasks for the sake of humanity's future survival (64,28%). Interestingly, however, as many as 27,85% are simply envisioned as contemplating extraterrestrial landscapes (20%), viewing or admiring space technology (13%), saluting a landing or launching craft (3%) or looking at the direction of the viewer (3%) (the relevant data is provided in Appendix; see e.g. Images 66, 81, 87, 91, 152, 153, 160, 165, 170, 175, 177, etc.). This fact might indicate an intrinsic, mutual interconnection between man and the cosmos as these works clearly present the cosmonauts in relation to the universe, mostly by depicting them while expressing an emotional attitude toward the Earth as well as showing an admiration, astonishment or fear toward extraterrestrial bodies or astronomical phenomena. Also, a blurred and indistinct line, applied to 68% of the examined paintings, is more likely to emphasize the human-space intrinsic relationship often in the form of mystic or metaphysical experiences during spaceflight missions. Meanwhile, no literal signs of the evolution of human beings into more advanced and mature God-like creatures guiding their own fate have been observed in the study. What is more, a reverse trend seems to occur; as merely 29,28% figures are characterized by a significant size when compared to other depicted objects, it appears that the level of individuality and prominence among cosmonauts is largely diminished. This mode of representation tends to be in line with a predominant master narrative advanced by the Soviet space programme which affected aesthetic qualities of the image of a space traveler portrayed as a modest rather than a highly individualized national hero. Also, most tasks performed by humans in the examined works are accomplished jointly and require no special skills or exceptional initiative, thus exposing both the heroic and the ordinary.

[5] All Kolchitskii's and Sokolov's works examined in the present book are available at http://www.fandom.ru/about_fan/koltchitsky_1.htm (Kolchitskii) and http://scifiart.narod.ru/Albums/albums.htm (Sokolov) as well as in the Appendix of my PhD dissertation, *Space exploration in 20th century American and Soviet literature and art* (2015), available online at the Adam Mickiewicz University Repository: https://repozytorium.amu.edu.pl/handle/10593/13887. (Copyright Disclaimer Under Section 107 of the Copyright Act 1976: The Appendix contains images collected from various online, library as well as my private resources and serves purely research and educational purposes. It falls under the fair use provisions of European and US copyright law and is not a copyright infringement.).

While some works present the cosmonauts observing or expressing an emotional attitude toward the Earth and showing an admiration, astonishment or fear toward extraterrestrial objects, no human figures are literally visualized as epitomizing the wisdom, vitality and natural simplicity of the peasant. Such an impression, though hardly plausible to conceptualize, might be created by depicting humans who seem to display an emotional depth or sensitivity toward each other or a performed activity. On the other hand, a frequently applied blurred and indistinct line is likely to point out to depth, emotional sensitivity and nostalgia of the Russian people which might be indicative of one of the Cosmist ideas emphasizing the spirit of Russianness and the Russian soul among the nation. However, the suggestion can be considered far-fetched and thus remains open to an individual interpretation.

Meanwhile, one may observe the presence of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy in the examined works, which advanced Russia's global mission to pursue and expand wholeness, unity, universality and spirituality as well as to provide mankind with a sense of destiny. Here, they would clearly connect to the communist principles as all images under analysis were produced in the Soviet period. As mentioned earlier, the majority of visuals depict utopian-like scenes where massive, highly advanced, futuristic and state-of-the-art devices are successfully operated by humans (the relevant data is provided in Appendix; see e.g. Images 60, 61, 66, 74, 87, 88, 89, 152, 153, 173, 177, 181, etc.). Also, they tend to portray the cosmonauts as idealized and revered builders of socialism, presenting a high level of social solidarity, displaying a strong attachment to the Earth or the Soviet motherland and committed to spreading the Soviet ideas across the universe. Interestingly, an explicit propagandistic content is hardly present as the number of status symbols, including the red star, the hammer and sickle or the red inscription SSSR depicted on various space technologies, such as satellites, spacecrafts, rockets and other equipment, amounts to merely nine. On the other hand, as noted by Sokolov himself (see 3.4.2.), the regime of Soviet secrecy would frequently censor space artist' images and force the inclusion of a number of devices characterized by excessively vast dimensions. This trend is be easily observable in both Kolchitskii's and Sokolov's paintings where technology, though not much diverse, appears to be one of the most predominant aspects of their art due to its significant size (62,5%) and frontal location (60,26%). Moreover, the artists, particularly Sokolov, concentrated on depicting items likely to extol the Soviet space programme's accomplishments, including rockets, lunar and Venus's space probes, Sputniks or orbital space stations, thus exposing patriotic sentiments.

Another characteristic feature of Russian Cosmism, the pursuit of an ultimate truth and the hidden wisdom across space and time by means of pseudo- and parascientific methods drawing on esoteric, mystical and occult sources, such as astrology, magic or alchemy, seems rather difficult to trace

down. Merely few works tend to present humans in a mystical or metaphysical relation to the cosmos, mostly by expressing an emotional or nostalgic attitude toward the Earth and other extraterrestrial phenomena. Also, no cosmonauts seem to be depicted while performing highly secretive activities of parascientific origins by means of some mysterious devices of unknown origins. On the other hand, a clearly blurred and indistinct line might indicate the use of esoteric, mystical and occult sources in search for an ultimate truth and the hidden wisdom, yet, this connection can be again considered largely far-fetched.

At the same time, no presence of either distinct or largely indefinable object suggestive of a divine and otherworldly god-like creature guiding or transcending the cosmos has been detected. This fact can be deemed a consequence of the communist propaganda which largely affected visual representations of the cosmos widespread in the Soviet media since the late 1950s. As mentioned in the previous chapter, space- and space exploration-related imagery often served a propagandist role by making use of numerous symbols or elements suggestive of social utopianism, cosmic enthusiasm, technological modernization as well as a bright future of socialism. Thus, the focus was on creating the impeccable image of the cosmonaut, extolling the virtues of technology as well as a sense of adventurous mission carried out by the Soviet space programme rather than on religious aspects of space exploration.

The presence of the final premise of Russian Cosmism, namely symbolism and romanticism of outer space views which aim to expose the more spiritual side of space exploration, has been somewhat detected. Most images present romantic planetary landscapes with either vast, picturesque and tranquil or violent and turbulent nature. Therefore, the concept of the sublime and the picturesque seem to be present in both Kolchitskii's and Sokolov's works, yet the latter artist's visions of the cosmos tend to embrace more realist modes of representation. Kolchitskii's compositions, on the other hand, are more likely to mirror some of the major trends in science fiction discourse which involves depicting outer space realms in a partly fantastical and romantic manner. At the same time, as merely 8% of illustrations portray extraterrestrial landscape themes, numerous scenes seem to be endowed with cultural and symbolic meanings revolving around the Soviet space exploration ventures. Although a total number of space-related objects within the paintings is approximately 28,33% less numerous that on the American side, most images appear to represent a more meaningful content, often grounded in and reflective of the Soviet space programme's historical, future or hypothetical missions. Moreover, according to Hartmann (1990: 15), the Soviet artists "were trying to show the more 'spiritual' side of space exploration, the response of the 'soul'" (see 3.4.3. for the full quotation). The traces of such practices, however, are too challenging to trace down as there is no concrete visual form in which this kind of ideology may occur within a

given painting. While one may argue that a more blurred and indistinct line is more likely to emphasize symbolism, romanticism or semi-realism of outer space views, the fact whether they seem to expose spirituality of the Soviet space efforts remains the matter of an individual response and interpretation.

Summing up, the impact of Russian Cosmism is primarily apparent in the artists' tendency to "populate" the depicted scenes with cosmonauts as well as space- and space exploration-related objects, thus creating a meaningful and partly symbolic content. What might attest to this impression is the fact that the average number of intersections of the horizon line within the examined images equals 5,81 and remains considerably high in comparison to its U.S. counterpart (3,58). What is more, approximately 70% of the movement's primary assumptions appear to be portrayed to a lesser or greater extent in the framework of the investigated visuals: i) the establishment of a universal utopia seen as a part of Fedorov's Common Task understood as humanity's active spiritual and scientific-technological mission to resurrect the dead; ii) the glorification of scientific and technological advances as the means to accomplish Fedorov's Common Task as well as to improve and regulate nature; iii) an intrinsic, mutual interconnection between man and the cosmos; iv) the spirit of Russianness and the Russian soul epitomizing the wisdom, vitality and natural simplicity of the peasant as well as depth, emotional sensitivity and suffering of the Russian people; v) the glorification of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy which advanced Russia's global mission to pursue and expand wholeness, unity, universality and spirituality as well as to provide mankind with a sense of destiny; vi) social solidarity as the means to enable humans to achieve perfection and unity in outer space; vii) symbolism and romanticism of outer space views which aim to expose the more spiritual side of space exploration.

Hence, it seems that the presence of the following three characteristics of Cosmism has not been detected in the examined works: i) the evolution of human beings into more advanced and mature God-like creatures guiding their own fate; ii) the presence of a supreme spirit guiding the entire universe in the form of God or other divine entity; iii) the pursuit of an ultimate truth and the hidden wisdom across space and time by means of pseudo- and parascientific methods which draw on esoteric, mystical and occult sources, such as astrology, magic or alchemy. Religious elements, including the evolution of human beings into more advanced and mature God-like creatures as well as the presence of a supreme spirit in the form of God or other divine entity, may be not present due to the widespread censorship practices of the communist propaganda. Meanwhile, esoteric, mystical and occult aspects of the visuals can be considered too demanding to identify as their presence does not rely on any concrete visual form but rather aesthetic connotations brought about by the use of light, colour or line.

It should be also noted that in the case of 70% of the movement's premises, whose traces have been observed in the analysis, the question whether they can be deemed the influence of Cosmism or the communist propaganda remains open to debate. Particularly, it might refer to the following characteristics: i) the establishment of a universal utopia seen as a part of Fedorov's Common Task (here, it seems difficult to distinguish between Fedorov's universal utopia and the Soviet social and technological utopianism); ii) the glorification of scientific and technological advances as the means to accomplish Fedorov's Common Task as well as to improve and regulate nature (here, it might be confused with technological utopianism or cosmic enthusiasm of the Soviet nation); iii) the glorification of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy; iv) social solidarity as the means to enable humans to achieve perfection and unity in outer space (the last two can be confused, as implied earlier in this section, with the communist propaganda which aimed to advance and spread the socialist worldview as well as ideology).

Regardless of the aforementioned research problems, it appears that the major results coming from the visual content analysis are likely to confirm a clear distinctiveness of the Soviet works from their American counterparts. Some of the examined patterns reflect a unique style of one of the nation's leading space artists who often tended to incorporate more abstract, impressionist or symbolic elements in their depictions. In other words, a frequently applied realistic mode of outer space representation was combined with romantic, largely "non-technical" and seemingly "spiritual" renderings of space subjects often drawing on more optimistic and fantastical early science fiction imagery. These trends, as mentioned in the previous chapter, were already acknowledged by some of the most notable U.S. space artists, including William K. Hartmann, who regarded some of his colleagues' paintings as less scientifically and astronomically inspired (see 3.4.3.). They also appear to be in line with the visual rhetoric of the Soviet space age which not only generated numerous manifestations of techno-utopia, but also portrayed various concepts of the future, which served as the material and spiritual base for both the global and a newly formed communist society. Richers and Maurer (2011: 25) suggest that mystical and spiritual dimensions of depicting outer space realms, particularly during the Thaw, took form of the cosmonauts referred to or represented as "the new conquerors" and "gods of the cosmos" or sometimes the "sons of Heaven":

> It is no coincidence that, in the realm of spirituality and religion, the 'Thaw' was to a far lesser extent a period of liberalization than in other areas of cultural life, as, for example, in literature and art. The antireligious campaign of the Soviet leadership which intensified in 1954 implicitly recognized the fact that Heaven had been 'conquered' but not yet fully 'Sovietized'. In this sense, the cosmonauts

> were referred to as the new 'conquerors' or even 'sons' of Heaven. The celestial sphere was connotated differently, but again: spiritually – through the presence of these new 'Titans', these new 'gods' of the cosmos. (Richers and Maurer 2011: 25)

Also, a mystical or spiritual quality of some of the analyzed images could have partly replaced religion officially demystified and superseded by an atheist thought. Such associations do not only make an interesting contrast to more realist, science-grounded and sublime characteristics of American paintings, but also seem to connect to the Cosmist ideas which successfully combined a sense of futuristic utopianism with a largely esoteric understanding of science and technology. While commenting on the 1920s space fad in Russia, Trotsky (1975: 211) suggested that "(…) Cosmism contains the suggestion of very nearly deserting the complex and difficult problems … on earth so as to escape into the interstellar spheres. In this way Cosmism turns out quite suddenly to be akin to mysticism … [and may] lead some … to the most subtle of matters, namely to the Holy Ghost".

Other characteristic features which evolved in the course of the genre's development involve portraying elements deemed to have been influenced by the communist propaganda, especially an occasional inclusion of status symbols or a frequent representation of space technology of excessively vast dimensions. Selected trends of this kind may be considered a reflection of the Cosmist ideals coinciding with some of the chief ideological premises of social utopianism and cosmic enthusiasm that advanced highly optimistic utopian visions, the worship of science and technology as well as the victory of a modern man over nature. As quoted in the previous chapter, space artists might have followed certain practices common among the Soviet publishers who often released materials conveying "the new and modern symbiosis of man, technology, and adventure that the Soviet space program represented" (Siddiqi 2011: 71). This distinctive mode of representation was also mirrored in the widespread image of a space traveler depicted as a modest, courageous, skilled and hardworking hero devoted to the national cause. What is more, mythicizing the cosmonaut, as argued by Porri (2011: 261), gave rise to the concept of a god-like figure which embraced and united "the entire progressive self-concept of the Soviet Union" as well as almighty communism. Such characteristics created a highly futuristic impression in numerous depictions of outer space and human space efforts often combined with a nostalgic and mystic spirit of the past commemorating the Slavophile, Orthodox and esoteric ideals as well as the Russian and Soviet triumphs in space research and exploration. As pointed out by Siddiqi (2011: 284):

> This combination of forward-looking utopianism and backwardlooking storytelling was central to the Soviet space narrative from its inception, and embodied in the very first communiqué on the launch of Sputnik on 4 October

> 1957. The past is communicated in a direct allusion to the 'father' of Soviet cosmonautics, Konstantin Eduardovich Tsiolkovskii, while the future is grounded in utopian expectations, specifying that 'artificial earth satellites will pave the way to interplanetary travel, and … our contemporaries will witness how the freed and conscientious labour of the people of the new socialist society makes the most daring dreams of mankind a reality'. This link between the history of Russia and the future of socialism was a common trope that served a useful framing narrative that frequently omitted the present, a time that was difficult to illuminate in too much detail because of the draconian demands of secrecy surrounding the Soviet space programme. (Siddiqi 2011: 284)

Undoubtedly, with the coming of a socialist and cosmic era in Russia, except the Stalinist period, many visual representations of the cosmos, including space art, were likely to embody "the space of the future, of perfection, and paradise" (Richers and Maurer 2011: 24). Also, many works of space art did not connote any clearly definable religious motifs; instead, it seems that some of them aimed to conceptualize the *shturm neba* (storming of heaven) ideology based on the contemporary atheist discourse which advanced one's self-perfection and self-deification as well as "the unreserved worship of science and technology and the creative, godlike power of man who would be capable of subjugating and transforming nature, space and time" (Richers and Maurer 2011: 24).

Some of the aforementioned trends relevant to the major assumptions of Russian Cosmism are also visible in captions accompanying Kolchitskii's and Sokolov's images. Here, a twofold tendency might be observed. In popular science discourse, mostly utilized by popular science journals and speculative science books, descriptions of the represented space exploration-related concepts are clearly scientific in nature, focusing on conveying a number of technical details to a wide, unspecialized audience (Sternfeld 1949: 32; the relevant data is provided in Appendix, image 51): "Космический корабль в полёте. Его форма, необычная по сравнению с формой самолётов и земных ракет, объясняется тем, что в межпланетном пространстве сопротивление среды отсутствует и поэтому придание космическому кораблю удобообтекаемой формы является излишним." [The spacecraft during the flight. Its form, unusual in comparison with that of aircrafts or terrestrial rockets, can be explained by the fact that there is no air resistance in interplanetary space and therefore giving the spacecraft a streamlined form can be deemed superfluous.]. Meanwhile, when put in a literary context, which involves primarily science fiction stories and novels, the works depict such notions using a more figurative language for the purpose of portraying elements of a largely fantastical plot. Examples include a fragment of Vasilev's *Puteshestviia w kosmos* [Travels into space] (1955: 14), illustrated by

Kolchitskii (the relevant data is provided in Appendix, image 74): "На мертвые камни Луны ступили первые астронавты. Развернуты надувные дома, соединенные надувными же коридорами из прозрачной пластмассы. Гелиоэлектростанция дает первый ток, установлена прочная радиосвязь с Землей. Наш вечный спутник стал обитаемым." [The astronauts first set foot on lifeless moon rocks. The inflatable houses have been deployed and connected by corridors made of transparent plastic. The solar power plant gives the first current which establishes contact with the Earth on radio waves. Our eternal satellite has finally become habitable.].

Meanwhile, Sokolov's works, published mostly in art/speculative science books co-authored with Leonov, seem to combine popular science with science fiction discourse, characterized by a blurred distinction between fantasy and reality of space exploration. The focus, however, was on exposing the latter feature, thus making the text both reliable in terms of communicating the scientific as well as technical facts and accessible to a wide circle of readers. At the same time, some of these short narratives, particularly those published in the 1960s, tend to retain a partly fantastical quality, speculating about the existence of alien life forms or the possibility of human space travels to the most distant and unknown places in the universe: "Так вот он какой, «город» другой цивилизации! Для его строительства были максимально использованы природные материалы. Жители словно лепили свою архитектуру, добиваясь предельной гармонии с окружающей средой." [So that's what the "city" of another civilization looks like! The most natural materials were utilized for its construction. Residents literally molded its architecture, achieving an ultimate harmony with the natural environment.] (Leonov and Sokolov 1967; the relevant data is provided in Appendix, image 162). Later publications contain images accompanied by more concrete and scientifically accurate descriptions of the represented concepts, usually related to the Soviet achievements in space research and exploration. Examples include the caption narrating Sokolov's depiction of the Soviet probe examining the surface of Venus, *Snova u Venery* [Approaching Venus Again] (Leonov and Sokolov 1972; the relevant data is provided in Appendix, Image 182):

> Изучение планеты с помощью автоматических межпланетных станций в будущем примет систематический характер. Оно усложнится и расширится по мере получения результатов предыдущих исследований и с учетом возможностей, предоставляемых космической техникой. На картине художник изобразил решение одной из интереснейших задач по изучению Венеры: в атмосфере планеты дрейфует научная станция, с борта которой на поверхность посылаются шары-зонды для сбора научной информации. (Leonov and Sokolov 1972)

> [The study of the planet with the help of automatic interplanetary stations in the future will be performed systematically. It will expand and get more complicated and will expand in line with the results of previous studies and the possibilities offered by space technology. In the picture, the artist depicted a solution to one of the most interesting challenges of the study of Venus: in the planet's atmosphere the research station is drifting and sending balloons-probes which collect scientific information from its surface.] [translation mine, KB]

It appears that, similarly to the examined images, the impact of Russian Cosmism, as detected in the content of captions accompanying them, is manifested in the following premises of the movement: i) the establishment of a universal utopia seen as a part of Fedorov's Common Task as well as the glorification of scientific and technological advances as the means to accomplish it (descriptions of automatic scientific devices and space technology or those operated by cosmonauts which may possibly aim to realize Fedorov's project as well as to improve and regulate nature and is sometimes suggestive of technological utopianism; the relevant data is provided in Appendix; see e.g. Images 58, 59, 60, 77, 79, 153, 156, 179, 181); ii) an intrinsic, mutual interconnection between man and the cosmos (descriptions indicating the author's or space travelers' an emotional attitude toward the Earth and showing an admiration, astonishment or fear toward celestial bodies or astronomical phenomena; the relevant data is provided in Appendix; see e.g. Images 62, 65, 193, 194); iii) the spirit of Russianness and the Russian soul (descriptions indicating the author's or space travelers' emotional attitude toward or longing for the Earth; see e.g. Images 62, 72, 152, 193); iv) the glorification of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy (descriptions which extol the communist ideals of the Soviet period, including depicting utopian-like scenes where massive, highly advanced, futuristic and state-of-the-art devices are successfully operated by humans and often commemorate the national space programme's accomplishments, including the launch of rockets, lunar and Venus's space probes, Sputniks or orbital space stations, etc.; the relevant data is provided in Appendix; see e.g. Images 63, 64, 68, 159, 163, 168, 178, 189, 192, 197); v) social solidarity as the means to enable humans to achieve perfection and unity in outer space (descriptions of the cosmonauts presented as idealized and revered builders of socialism who display a high level of social solidarity and a strong attachment to the Earth or the Soviet motherland and are clearly committed to spreading the Soviet ideas across the universe; this is often implied by the use of plural rather than singular forms; the relevant data is provided in Appendix; see e.g. Images 65, 66, 68, 71, 78, 170, 175, 199); vi) symbolism and romanticism of outer space views which aim to expose the more spiritual side of space exploration (descriptions which combine the

language and style of popular science and science fiction discourses, including the use of figurative and sometimes poetic expressions; the relevant data is provided in Appendix; see e.g. Images 65, 68, 72, 73, 74, 151, 165, 193, 198). Therefore, one may argue that there is considerably consistent link between the analyzed visuals and their textual context which only contributes to the fact that the former served primarily as an illustration to the narrated space exploration-related concepts and astronomical phenomena.

In the following section, I attempt to determine to what extent American Cosmism has affected the content of Chesley Bonestell's and Robert McCall's works. I also incorporate certain remarks which may shed light on cross-cultural differences observable in the impact of Russian and U.S. variations of the Cosmist ideology on the investigated illustrations.

4.4.3.2. The impact of American Cosmism on Bonestell's and McCall's works

It appears that most works of the U.S. space artists present highly advanced, futuristic and state-of-the-art NASA spacecrafts capable of ensuring the human race's future survival and operated by astronauts surrounded by a large background of empty and alien space. The impression is largely created by the fact that both painters produced a significant number of works depicting mainly extraterrestrial landscape and space exploration (26), space technology and space exploration (19), extraterrestrial landscape and space technology (17) as well as space technology (12). What is more, practically all of the depicted scenes which fall under these categories (76%), seem to follow the von Braun paradigm, one of the central premises of American Cosmism. As discussed earlier in the chapter, space travel should be ideally portrayed as a realization of von Braun's ideology, founded on the premise, which originated in the 1950s *Collier's* spaceflight series, that the U.S. space policy would follow subsequent stages. Therefore, most illustrations, especially McCall's, tend to envision astronauts conducting suborbital and orbital flights, the Moon and Mars landings as well as establishing space stations or lunar and Mars's bases by means of highly advanced and often futuristic technology produced by NASA, such as landers (5,4%), shuttles and spacecrafts (25,94%), space habitats (6,48%), lunar or Mars's bases (5,4%) or space platforms (3,24%). Another visual aspect which emphasized the paradigm's influence on the space art works' content is the fact that the greatest number of astronauts (53,54%) was depicted while completing NASA's missions and exploring the Earth's orbit (18,32%) or the surface of an extraterrestrial body, mainly the moon (15,53%) and Mars (4,78%). Also, a

significant number of status symbols (67) included in American works, such as such as the U.S. flag, the inscription USA/United States and NASA, appears to confirm the above statement; moreover, 68,65% of them were portrayed at the forefront which clearly contributed to its relevance.

Similarly, other assumptions of American Cosmism, namely Apollo nostalgia in the form of reflecting on the moon programme and longing for its glorious reincarnation as well as astronauts seen as revered leaders, connects to the aforementioned representation of the von Braun paradigm. The majority of works produced since the late 1960s, particularly McCall's, present NASA and Apollo fashioned spacecrafts in the process of completing the moon landing project as well as Apollo astronauts completing particular stages of their missions (the relevant data is provided in Appendix; see e.g. Images 104, 106, 113, 145, 146, 147, etc.).[6] Also, a relatively high number of humans (an average of 2,54) and status symbols (see above) in the analyzed images, including Apollo fashioned space suits or other attributes, are likely to evoke clear connotations with the programme. Moreover, astronauts are often envisioned as highly individualized, bold and revered heroes or the chosen leaders of the U.S. nation placed in clearly visible positions within a given image (the relevant data is provided in Appendix; see e.g. Images 104, 106, 113, 116, 122, 126, 139, 142, 146, 148). Also, the majority of them is depicted while performing highly complex tasks during their missions (53,54%) or simply observing or admiring transcendental extraterrestrial scenes and space exploration endeavours with a sense of devotion or nostalgia (5,11%). Interestingly, as many as 64,56% of space travelers are portrayed as having some sort of interaction with each other which may underscore a level of individuality displayed by the depicted humans (the relevant data is provided in Appendix; see e.g. Images 14, 18, 30, 32, 37, 106, 122, 128, 145, 146, etc.).[7] On the other hand, it might as well as accentuate a sense of

[6] The majority of McCall's works are available at http://www.mccallstudios.com/collections/. All artist's works examined in the present book can be found in the Appendix of my PhD dissertation, *Space exploration in 20th century American and Soviet literature and art* (2015), available online at the Adam Mickiewicz University Repository: https://repozytorium.amu.edu.pl/handle/10593/13887. (Copyright Disclaimer Under Section 107 of the Copyright Act 1976: The Appendix contains images collected from various online, library as well as my private resources and serves purely research and educational purposes. It falls under the fair use provisions of European and US copyright law and is not a copyright infringement.).

[7] Some of Bonestell's works are available at http://www.bonestell.org/. All artist's works examined in the present book can be found in the Appendix of my PhD dissertation, *Space exploration in 20th century American and Soviet literature and art* (2015), available online at the Adam Mickiewicz University Repository: https://repozytorium.amu.edu.pl/handle/10593/13887. (Copyright Disclaimer Under Section 107 of the Copyright Act 1976: The Appendix contains images collected from various online, library as well as my private

mission and joint, mutual responsibility for exploring the space frontier for the sake of the U.S. nation and the whole mankind which clearly relates to Turner's frontier thesis and Manifest Destiny. At the same time, a rarely applied blurred and indistinct line (9%) and a frequent employment of realist modes of representation do not emphasize transcendental and spiritual qualities as well as a revolutionary potential of the programme. Concurrently, McCall's art is widely known and praised for its visionary and imaginative quality by means of which the artist constructed his highly inspiring and often futuristic space settings. Hence, some of his paintings are additionally characterized by a soft line or luminous effects which are more likely to emphasize transcendental, spiritual and revolutionary aspects of Apollo programme as well as a sense of grand mission bestowed upon astronauts (the relevant data is provided in Appendix; see e.g. Images 107, 111, 132, 134, 139, 143, 144, 149, etc.).

Meanwhile, the representation of White's Overview Effect understood as a highly transcendental and metaphysical awareness-shifting experience reported by astronauts during spaceflight missions, has been also observed in the investigated works. When it comes to the former concept, numerous images tend to include the view an extraterrestrial body or phenomenon visible from a distance and depicted in clearly distinguishable positions within the image, usually near the horizon line. As suggested in the statistical study, both artists, especially Bonestell, created a significant number of extraterrestrial landscape scenes (25%) which featured tiny human figures, thus transferring the overview experience to the audience by exposing them to highly inspiring and uncanny visions of the cosmos (the relevant data is provided in Appendix; see e.g. Images 2, 3, 5, 11, 15, 18, 36, etc.). Also, the U.S. space artists are likely to depict 19,92% more extraterrestrial bodies than their Soviet counterparts and offer a greater variety of such objects, including the sun (9,16%), the Earth, its surface or orbit (18,32%), the stars (30,67%), single stars (1,99%) and binary star systems (1,99%), the moon or its surface (15,53%), other planets and their moons, including Mars (4,78%), Saturn (2,39%) as well as other unknown extraterrestrial bodies (10,75%), such as galaxies, asteroids, regions of light, eclipses or nebulas. At the same time, a relatively high number of human figures is presented while performing EVA (19,68) which might connote a close relationship between humans and the cosmos, where the former are likely to experience highly uplifting, metaphysical or transcendental feelings (the relevant data is provided in Appendix; see e.g. Images 6, 30, 38, 107, 110, 111, 120, 124, 137, 143, etc.). Interestingly, while a concrete distinct line is more likely to emphasize realism of the depicted scene and thus reinforce the

Overview Effect, a more blurred and indistinct line tends to highlight its transcendental and metaphysical nature. The latter, however, can be encountered merely in selected works of McCall where the view from the Earth's orbit or depictions of astronauts performing EVA are portrayed in a more symbolic and romantic manner (the relevant data is provided in Appendix; see e.g. Images 111, 117, 139, 142, 143, 144, etc.).

A related aspect of American Cosmism, the representation of human spaceflight viewed as a spiritual quest, may be again detected only in some of McCall's paintings where astronauts are often depicted as enlightened and self-conscious travelers endowed with a sense of mission or achieving a kind of epiphany or enlightenment during spaceflight. Although as many as 45% of the analyzed visuals contain space exploration themes, only few of them might be considered indicative of spiritual dimensions of space missions whose ultimate goal is to lead humanity to achieving absolution, purification and finally eternity. Examples include primarily the depiction of futuristic space settings where astronauts are envisioned as juxtaposed against a black, starry and almost mystical background or surrounded by a circle of light while floating in space or over the surface of an alien body (the relevant data is provided in Appendix; see e.g. Images 107, 111, 139, 142, 143, 144, etc.). Moreover, a possible encounter with extraterrestrial intelligence, as portrayed in McCall's two futuristic and highly imaginary illustrations, may suggest both technological and spiritual advancement of mankind (the relevant data is provided in Appendix; see e.g. Images 134, 135). Interestingly, it seems that there are no literal traces of the two relevant facets of Cosmism, namely the presence of God or other supreme spirit during space missions or attributing space efforts to God's assistance as well as the depiction of UFO and SETI as a parapsychical and occultist phenomenon. Considering the former concept, no clearly indefinable objects presented in the form of religious attributes or suggestive of a divine and otherworldly god-like creature have been detected in the conducted analysis. On the other hand, a few of McCall's works, unique in their visionary style and colour, are likely to emphasize the presence of a divine, mystical or metaphysical spirit guiding and transcending the cosmos (the relevant data is provided in Appendix; see e.g. Images 107, 111, 132, 133, 139, 143, 149, etc.). This suggestion, however, remains open to an individual viewer's interpretation and thus can hardly serve as a credible concluding remark. In the case of the latter concept, the research has indicated a rather insignificant presence of extraterrestrial life forms. What is more, virtually none of them is presented as paranormal phenomena experienced by parapsychical or occultist means which includes the encounter with superior entities or spirits.

Lastly, the impact of the U.S. variation of the Cosmist thought can be clearly observed in the following aspects of Bonestell's and McCall's space art works: i) space exploration, drawing on Turner's Frontier Thesis, viewed as a

continuation of the Wild West expansion; ii) space exploration seen as Manifest Destiny; iii) the sublimity of outer space views. As mentioned earlier, 25% of illustrations, particularly Bonestell's, can be classified as portraying mainly extraterrestrial landscapes in a manner reminiscent of the Hudson River School's tradition of depicting the Western frontier. Yet, also in the case of remaining categories, namely extraterrestrial landscape and space exploration as well as extraterrestrial landscape and space technology (43%), most scenes are presented as sublime and picturesque. Specifically, the audience becomes exposed to tranquil or turbulent alien views and specific extraterrestrial bodies are depicted as vast, boundless and infinite spaces offering abundant prospects of finding new economic resources, wealth and freedom and unlimited possibilities for self-development in both physical and spiritual sense (the relevant data is provided in Appendix; see e.g. Images 1, 2, 8, 10, 11, 13, 16, 23, 29, 33, 43, 50, 101, 107, 113, 119, 132, 136, 139, 141, 143, 147, 150, etc.). Other features of American space art which contribute to this impression are as follows: i) the average number of intersections of the horizon line is rather insignificant 3,58 when compared with the Soviet images (5,81); ii) a total number of the depicted extraterrestrial objects is 19,92% larger on the American than the Soviet side; iii) a total number of remaining objects, mainly including elements of alien planetary formations, is 15,44% larger on the American than the Soviet side. Meanwhile, the astronauts in McCall's paintings are often portrayed as idealized frontiersmen exploring yet undiscovered territories, performing complex and highly demanding tasks for the sake of humanity's future survival and spreading American values across the universe (the relevant data is provided in Appendix, see e.g. Images 104, 106, 111, 117, 121, 126, 139, 140, 146, etc.). Many figures seem to represent both individualism and a high level of social solidarity as well as display a strong attachment to the national ideals, encompassing liberal democratic values and individual initiative. One the other hand, Bonestell's works are likely to depict humans of extremely insignificant sizes and numbers, often confronted with the sublimity of an extraterrestrial scene and thus reduced to a "vanishing nothingness" (Schopenhauer 1909: 266) (the relevant data is provided in Appendix; see e.g. Images 2, 3, 5, 11, 12, 14, 15, 18, 28, 32, 36, 40, etc.). Such an effect tends to reinforce the sublimity, wilderness and ruggedness of outer space landscapes, yet, in contrast to most Hudson River School's paintings, the artist tended to expose astronomical realism rather than romanticism and pastoralism of space settings. At the same time, McCall's illustrations seem to provide a more idealized portrayal of extraterrestrial nature which might be interpreted as an ineffable manifestation of God or other divine spirit (the relevant data is provided in Appendix; see e.g. Images 111, 133, 134, 135, 139, 143, 149, etc.). Meanwhile, a frequently applied concrete and distinct line (91%) in all the examined works is more likely to emphasize realism of the depicted scenes and thus evoke associations with the Wild West expansion as envisioned by the American

landscape movement. It is also important to note that the aforementioned features, particularly in McCall's works, tend to reinforce aesthetic and ideological connotations with Manifest Destiny, largely through their use of a significantly high number of status symbols suggestive of the U.S. nation's destiny to expand throughout the cosmos (the relevant data is provided in Appendix; see e.g. Images 101, 104, 113, 120, 121, 127, 137, 140, 143, 145, 148, etc.).

In conclusion, the impact of American Cosmism becomes apparent primarily in the works' display of numerous qualities which point out to the embedment of space subjects and settings in the frontier myth. As suggested in the study, most illustrations tend to evoke aesthetic and ideological connotations with Turner's Frontier Thesis, Manifest Destiny and Hudson River School's paintings as well as some related concepts, including the image of astronauts as frontiersmen, White's Overview Effect or spiritual and religious dimensions of human spaceflight. Also, certain historical and cultural facets of a widely understood culture surrounding the U.S. space programme often come to fore in the analyzed works, such as the von Braun paradigm or Apollo nostalgia, whose visual manifestations can be considered rather straightforward. Overall, it seems that approximately 80% of the movement's chief assumptions are likely to be visualized to a lesser or greater extent in the framework of the investigated images: i) human spaceflight viewed as a spiritual quest whose ultimate goal is to lead humanity to achieving absolution, purification and finally eternity; ii) Apollo nostalgia in the form of reflecting on the moon programme and longing for its glorious reincarnation, portraying Apollo as a transcendental, spiritual and revolutionary event; iii) astronauts seen as revered leaders as well as individualized, romantic and idealized heroes exploring the space frontier; iv) the Overview Effect understood as a highly transcendental and metaphysical awareness-shifting experience reported by astronauts during spaceflight missions; v) space exploration, drawing on Turner's Frontier Thesis, viewed as a continuation of the Wild West expansion; vi) space exploration seen as Manifest Destiny; vii) the sublimity of outer space views which draws on the tradition of American landscape movement of the 1800s; viii) the portrayal of space travel as fulfillment of the von Braun paradigm.

It should be also noted that no literal traces of the two remaining premises of American Cosmism have been detected in the conducted analysis, namely i) the presence of God or other supreme spirit during space missions and attributing space efforts to God's assistance; ii) the depiction of UFO and SETI as a parapsychical and occultist phenomenon. One of the reasons for such a trend might be that both concepts remain complex to visualize and interpret. On the other hand, it seems that the ideas, despite constituting rather prominent ideological aspects of the movement, tend to be neglected in Bonestell's and McCall's works. In other words, no signs of strictly religious

dimensions of the U.S. space art or its preoccupation with extraterrestrial intelligence have been observed in all the examined imagery.

Overall, it seems that the principal results coming from the visual content analysis tend to confirm an evident uniqueness of American works of space art, particularly when compared with their Soviet counterparts. First, both content and aesthetic qualities of many examined images are likely to connote America's exceptional frontier experience, the idea central to the nation's geographical imagination and often viewed as "the touchstone of what sets the United States apart from other countries" (Agnew and Sharp 2002: 79-80). As the imagined community (Campbell 1992), the U.S. still rely on their own imaginary concept of the frontier defined as a "space of openness and possibility" and inseparably connected with a popular ideology of the American Dream and Manifest Destiny (Agnew and Sharp 2002: 82-83):

> It was not constructed and corrupted by centuries of histories and power struggles as was in Europe. (…) The ideology of the American Dream, an ideology that stresses that everyone can be successful given hard work, luck and uninstrusive government, marks out the American historical experience as unique or exceptional. (…) The mindset of limitless possibility was reinforced by the frontier experience of individual social mobility, of the energy of a youthful country in contrast to the social stagnation and economic inequality of "old" Europe. Americans were free to set themselves up in the vast expanse of "empty" land available on the frontier, discounting the presence of natives whose self-evident technological and religious "backwardness" justified the exploration of their land. All settles were equal on the frontier, as the myth goes, and those who were successful, succeeded due to their own hard work, not through any advantage of birth. (…) The initial presumption was that as long as the frontier continued to expand American would flourish. This mindset remained influential beyond the physical expansion of the United States across the continent as "the frontier" was reconfigured around the necessity to "expand the American way" and "American good" beyond American shores, especially in the years following the end of the Second World War when another power (the Soviet Union) offered a competing utopian rendering of political economy. (Agnew and Sharp 2002: 82-83)

The traces of such an ideology can be clearly observed in American space artists' works which often expose their audiences to vast, untamed, boundless, uninhabited or unrestrained territories culturally and visually embedded in the frontier myth. As already mentioned in the previous chapter, the impression is largely created by drawing on the Hudson River School's tradition of portraying the country's unexplored wilderness as well as Westward expansion and thus conveying many of the U.S. self-defined values, including individual freedom, wealth, hard work, innovation and many others. They also make a striking contrast in the Cold War era which was often seen as "an inevitable clash between

two systems: one (American) represented freedom, democracy and individualism whereas the other (the Soviet Union) represented collectivism, communism and totalitarianism" (Agnew and Sharp 2002: 91). This trend is frequently confirmed in various sources which elaborate on some permanent patterns in narrating and depicting the U.S. space programme's objectives as well as an individual tantalizing experience of space travel (see e.g. Dean 1998; Kauffman 1994; Launius 2013; McCurdy 2011; Nye 1997; Sage 2014). For instance, according to Nye (1997: 147), "to many Americans voyage into outer space seemed to represent the continuation of the frontier experience in a new area" whose spirit was officially evoked in John F. Kennedy's "New Frontier", today persisting mainly in its technological and commercial dimension. Also, as pointed out by Kauffman (1994: 34), space exploration narrative possessed the most crucial constituent elements of the frontier adventure, including an unknown and hostile geographical location (an outer space landscape or scene), a malevolent antagonist (the Soviets) as well as a heroic adventurer (an astronaut), which contributed to both romanticizing and concretizing the conquest of space in the eyes of American public. The announcement and realization of the Apollo programme, for example, perfectly fit the aforementioned idea.

Interestingly, the myth frontier has also reinforced the memory and collective representation of the moon landing which over the past decades gained a powerful nostalgic meaning and gave rise to the ecology movement. The latter, however, relying heavily on a set of potent cultural icons, including a highly appealing and evocative image of the Earth, did not become a predominant constituent of the U.S. space culture. What is more, as put by Nye (1997: 159), "it is surely an exaggeration to say that this visual epiphany turned Americans away from the exploration of outer space". Instead, Nye (1997: 159-160) argues that the major social, political and cultural implications of the Apollo programme for the popular mind are as follows:

> The meaning of the moon landing may ultimately reside in the powerful memories it has engendered. (...) The astronauts unfurled an American flag on the moon partly in order to claim supremacy on the earth. In retrospect, by 1969 the United States had already reached the zenith of its power and influence, and national self-confidence was beginning to crumble as the nation was wracked by internal turmoils. The Apollo Program itself came to an end in the 1970s, the decade of the defeat in Vietnam, Watergate, the energy crisis, the weakening dollar, high interest rates, and a long period of stagnation in personal income. In retrospect, Americans have found the lunar landings to be one of the most satisfying recollections of the time. (...) That memory focuses not on the uninhabitable surface of the moon, which remains mere space. The Apollo Program is recalled with affection because it succeeded as dramatic action, not because Americans could imagine settling this "new frontier" themselves. (Nye 1997: 159-160)

A related notion, namely that of an astronaut portrayed as the frontiersman in space, can be also found in the analyzed depictions of space endeavours. As mentioned in chapter two, the image of a space traveler promulgated in the U.S. popular media constituted an important part of a positive coverage of the national space programme (Kauffman 1994: 56). Most Cold War sources tended to celebrate the astronauts' heroism, endurance and individualism, often mythologizing their involvement in space missions through some profound comparisons with historical voyages of the first explorers discovering the new lands. Of course, since the early 1960s, there also appeared more realistic and down-to-earth descriptions, emphasizing loneliness, isolation and psychological problems frequently encountered during spaceflight. This aspect of the U.S. space programme, however, did not find any visual equivalent in the investigated space art works. Instead, they tend to follow the former, more idealistic mode of representation, well described by Dean (1998: 80):

> This initial coverage of the astronauts set the tone for subsequent coverage of the space program from the Mercury astronauts' training through the Apollo program. (…) The types of images – family man in domestic space, lone hero in outer space, cyborgian inhabitant of a technological space – continued to appear, commenting upon and unsettling the official image of the astronaut NASA sought to contain. (Dean 1998: 80)

Additionally, such images, circulated by *Life* on a large scale, occasionally attempted to include a more transcendental, spiritual and often religious dimension of space travel, also in the form of the Overview Effect. As argued by Oliver (2013) and some other scholars (see e.g. Harrison 2013; McCurdy 2011; Launius 2005, 2013; White 1987, etc.), in contrast to NASA's institutional secular and technocratic culture, popular depictions of outer space and space efforts also drew on the space age theology and Christian cosmological tradition where spaceflight may be regarded as a religious and spiritual experience and astronauts can be considered its communicators. In space art, although merely metaphorically, such subtle undertones can be present in selected aesthetic qualities of a painting, such as style, line, contour or colour, rather than its actual content. These and similar features might be interpreted as suggestive of the divine presence or various forms of epiphany and enlightenment experienced by space travelers. Moreover, the depicted extraterrestrial scenes themselves may serve as a symbol of the initial step toward reflecting upon and possibly redefining the relationship between man and God or other metaphysical spirit. In particular, through its promise of a cosmic destiny for humanity, they have the potential to revive religious feelings and give rise to more unconventional forms of one's faith or spiritual development.

Some of the aforementioned trends relevant to the central premises of American Cosmism can be also observed in captions accompanying Bonestell's and McCall's works. Interestingly, both artists' images served merely as an illustration to highly specialized and scientific descriptions of the represented concepts which, in contrast to their Soviet counterparts, did not display more literary or figurative inclinations. The most probable reason is that the analyzed visuals appeared mainly in popular science discourse, here utilized by popular science magazines and speculative science books, thus aiming to communicate a number of technical details to a wide audience in a considerably accessible manner. Examples of this kind of rhetoric include a caption narrating Bonestell's famous painting, *Saturn as Seen from Titan*, published in the May 29, 1944 issue of *Life*:

> From Titan the sky seems blue instead of black because Titan is only satellite which has an atmosphere to give color to the sky. Here Saturn appears in its "new" phase, like a new moon. Largest of the satellites, Titan has a diameter of 3,000 miles (Earth's is 7,900). It is 771,000 miles from its planet and was first satellite to be discovered – by Huyghens in 1655. (1944: 78)

Meanwhile, captions accompanying McCall's works, published primarily in art/speculative science books, tend to retain a similar techno-scientific quality, familiarizing the readers with a wide array of contemporary and futuristic space exploration-related notions and projects, though in a more vapid manner. What follows is Asimov's explanation of the artist's depiction of the first manned mission to Mars, published in Asimov and McCall's *Our world in space* (1974: 114):

> The first manned mission to Mars, perhaps in the 1990s. Inside a space station in orbit two scientists observe the launch of the mission. The two spacecraft were assembled in Earth orbit and are now being simultaneously launched for the planet Mars. The outer boosters craft reaches the vicinity of the planet. There it might be used and adjust the orbit, and later it will be fired for the return journey. The nuclear-powered ships, each manned by a crew of six, will travel as a pair for safety's sake. Each is capable of accommodating the crew of the other in the event of a breakdown. (Asimov and McCall 1974: 114)

Naturally, the style and content of the above and many other captions narrating McCall's images might stem from the artist's specialization in portraying the U.S. space programme's past, present-day and future missions. Summing up, it seems that the impact of American Cosmism can be not only detected in the content of the examined works, but also in a specific textual content in which they occur, especially in the following assumptions of the movement: i) Apollo nostalgia (descriptions of Apollo's missions and spacecrafts operated by astronauts); ii) astronauts seen as revered leaders as well as individualized,

romantic and idealized heroes exploring the space frontier (descriptions of the astronauts performing highly complex tasks during their missions); iii) space exploration, drawing on Turner's Frontier Thesis, viewed as a continuation of the Wild West expansion and Manifest Destiny as well as the sublimity of outer space views (descriptions of extraterrestrial bodies presented as the vast, boundless and infinite spaces and the final frontier in the process of being explored and tamed by the astronauts); iv) the portrayal of space travel as fulfillment of the von Braun paradigm (descriptions of the U.S. space programme's subsequent stages, including suborbital and orbital flights, the Moon and Mars landings, establishing space stations or lunar and Mars's bases by means of highly advanced and often futuristic technology produced by NASA). However, it should be noted that no spiritual aspect of American Cosmism, namely the idea of human spaceflight viewed as a spiritual quest or White's Overview Effect, is narrated in the accompanying captions. Therefore, one may argue that though there is a substantially coherent link between the analyzed works and their textual context, the visual material offers a more varied interpretation of a number of space exploration-related concepts and astronomical phenomena portrayed within its framework, particularly in relation to the nationwide space age ideology in the form of American Cosmism.

In the following section, I attempt to provide the most paramount conclusions regarding the impact of Cosmism on selection of American and Soviet depictions of space exploration described earlier in the chapter. Furthermore, I shed light on some crucial similarities between the analyzed images, particularly concerning both literary and cultural context in which they appear, as well as differences in the extent to which the two variations of the Cosmist ideology might have affected their content. Finally, I briefly discuss the chief reasons for which some of the observed patterns of that representation could have occurred.

4.5. Concluding remarks. The impact of Cosmism on American and Soviet space art works

The present chapter aimed to investigate the impact of Cosmism on the content of a carefully conducted selection of American and Soviet space art works produced by Chesley Bonestell, Nikolai Kolchitskii, Robert McCall and Andrei Sokolov between the years 1944 and 1991. All the analyzed imagery occurs in a specific literary and cultural context whose study has suggested that the visuals' principal goal was to illustrate the scientific and technical details of the described concept or certain fictional aspects of the narrated scene. At the same time, it seems that their reliance on the contextual information, usually in the form of an extended caption and a fragment of a

science fiction text or a popular science article, did not largely affect the reception of a given artist's individual style and the overall vision of space exploration and outer space realms. Therefore, the site of the images' production and audiencing has been taken into account not so much in the visual content analysis as in the final interpretation of the research results in light of some salient principles of the Cosmist thought.

The task of determining the impact of Cosmism could be considered rather challenging as particular features of the movement's theory were rarely literally conceptualized and visualized. Instead, most of them took form of visual metaphors and thus their meaning is open to a broad interpretation. Examples in Russian Cosmism include tracing down the portrayal of such characteristics as the establishment of a universal utopia seen as a part of Fedorov's Common Task, the evolution of human beings into more advanced and mature God-like creatures, an intrinsic, mutual interconnection between man and the cosmos, the presence of a supreme spirit in the form of God or other divine entity, the spirit of Russianness and the Russian soul, the glorification of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy or the use of esoteric, mystical and occult sources in pursuit of the ultimate truth and hidden wisdom. Meanwhile, in its American variation, difficulties of this kind embrace detecting the depiction of such concepts as human spaceflight viewed as a spiritual quest, Apollo nostalgia, the presence of God or other supreme spirit, space exploration seen as Manifest Destiny or the depiction of UFO and SETI as a parapsychical and occultist phenomenon. Therefore, a successful analysis depended primarily on the selection of ten coding categories which allowed me to study the content of the artists' works in detail and thus draw some relevant conclusions in connection with specific assumptions of the Cosmist ideology.

Hence, selecting the main premises of Russian and American Cosmism constituted an equally important part of the analysis. It was conducted on the understanding that both variations of Cosmism should be treated as a cultural and ideological movement rather than a genuine branch of philosophy viewed as a separate and cosmology-related field of scientific enquiry. The reason for taking such an assumption is that the former concept is often defined, particularly in contemporary Russian sources, either as a project or a philosophical and cultural space-oriented movement which entailed combining multiple and interdisciplinary elements of space science with aspects of philosophy, religion, ethics as well as history of the origins, evolution and future fate of the universe and mankind. Similarly, its U.S. counterpart, as formulated by Harrison (2013), should be described parallel with the major interpretations of the original Cosmist thought which emerged in the late 19th century Russia. In practice, it means embracing a diverse cluster of cultural and ideological phenomena rather than forming a distinctive area of philosophical concerns. Therefore, both schools have

evolved a into a nationwide rationale which often served as a credible explanation of the American and Soviet governments' pursuit of space exploration. In line with such a reasoning, the chief assumptions of Cosmism were grounded both in the movements' theoretical claims formulated by Harrison and the leading Cosmist thinkers as well as some prominent characteristics and popular conceptions of the national cultures, like Russianness, the Russian soul, Apollo nostalgia, Manifest Destiny, Turner's Frontier Thesis, Slavophile ideals, etc.

As mentioned in the previous section, the research results obtained from the visual content analysis have suggested that most of the fundamental principles of Russian Cosmism and its American variation are likely to occur in the analyzed works either in a specific or a more metaphorical visual form. It also seems that the impact of the latter is more clearly visible on the U.S. side as approximately 80% of its main characteristics are portrayed within the framework of the investigated images. The reason might be the fact that not only have the chief assumptions of American Cosmism been formulated recently, but also that they embraced and summarized the major cultural, historical and social trends and phenomena related to the space age era. Not suprisingly then, the leading space artists, who were active in the same period, produced a variety of works which mirrored some of these trends in one way or the other. Therefore, the central ideas of the movement include an array of widely known and firmly established ideas as well as practices embedded in both popular and NASA culture generated by the U.S. national space efforts. On the other hand, the core premises of Russian Cosmism, whose impact can be observable in approximately 70% of the visuals' content, were defined over a century ago by a group of largely independent thinkers who often made claims which contradicted some of the previously developed theories. Hence, one of the central concerns of the study is that its possible influence on the Soviet space artists' works, although quite evident in some cases, may be easily questioned or confused with some current trends surrounding popular culture of space exploration in the USSR. As noted before, examples might include certain difficulties in distinguishing between the depiction of Fedorov's universal utopia and the Soviet social and technological utopianism, Fedorov's scientific utopia and technological utopianism or cosmic enthusiasm of the Soviet nation or Slavophile ideals and elements of the communist propaganda. Hence, some of these and similar classification issues are likely to pose problems with regard to drawing the final conclusions of the conducted research and thus remain impossible to resolve unless supported by arguments made by the artists themselves.

When it comes to some general distinctions between Soviet and American space art, one may contend that while the former is likely to present utopian-like and often romantic or symbolic visions of outer space and space

exploration, the latter tends to depict more realistic and science-based scenes of planetary landscapes and human space efforts. Both nations seem to have incorporated a different set of visual and cultural codes in their portrayals; whereas American artists drew on a specific mode of representation derived largely from the Hudson River School's paintings, their Soviet counterparts sought inspiration from science fiction discourse and ways of depicting space subjects in this and related literary genres. Also, the Russian Cosmists' ideas as well as the influence of the communist propaganda and the regime of Soviet secrecy become reflected in the content of numerous works many of which expose highly advanced and cutting edge devices. However, the impact of the latter becomes clearly identifiable in many images where the role of a cosmonaut is largely diminished and often limited to operating space technology as well as performing akin and partly deindividualized tasks. At the same time, almost all imagery create the impression of being more "populated" with humans and space exploration-related objects, thus providing the audience with a meaningful or even symbolic content which aimed predominantly to illustrate the current and future national space programme's objectives. Meanwhile, American space artists excel at designing space settings whose qualities might indicate a strong influence of the frontier myth which largely contributed to the romanticization and idealization of alien planetary landscapes, astronauts as well as other remaining objects, including space technology, extraterrestrial bodies and elements of planetary formations. In other words, numerous aesthetic and ideological aspects of the analyzed works can be deemed the influence of certain spin-off phenomena related to a historical exploration of the Wild West and space frontier, such as, for instance, Manifest Destiny, or other like White's Overview Effect, Apollo nostalgia or the von Braun paradigm.

It appears that American and Soviet ways of envisioning space subjects and settings have played an unprecedented educational as well as cultural role in the space age, exposing the public to the beauty and meaning of the cosmos. Not only did popular space art works serve as an inspiration for space enthusiasts, but also as a dream-like and symbolic continuation of human expansion into extraterrestrial worlds, most of which still remain within a largely unknown and mysterious realm of human experience. Above all, however, the present study has suggested that the content of selected American and Soviet space illustrations was somewhat affected by the ideology of Cosmism. Its various manifestations point out to the fact how diversely the two nations' visions of space exploration can be interpreted and how distinct visual and cultural modes of representation they tend to seek inspiration from. Specific codes derive both from literary and cultural context surrounding the U.S. and Soviet 20th century space endeavours, ranging from science fiction and popular science discourse to artistic traditions of depicting

exploration, space or fantastic and imaginary themes. Particularly the latter practices, which aimed to portray human space efforts as well as space and astronomical objects, could have been influenced by elements of the Cosmist ideology which helped transfer the spirit, values and beliefs of the national culture to the material. Aspects of Cosmism incorporated either metaphorically or literally into many works of space art did not only provide them with a meaningful content, but also contributed to making the cosmos seem real and space exploration purposeful.

Conclusion

In the most general terms, the present dissertation aimed to examine and compare the representation of space exploration in selected 20th century American and Soviet space art works in the context of the two nations' culture and literature of the period. The major differences in the concept's depiction could have been influenced by Russian and American Cosmism which are believed to have given rise to, shape or even constitute the national space age ideologies.

In particular, what has been done is i) to discuss the main assumptions of Russian and American Cosmism, the latter of which, as coined by Harrison (2013), should be seen as a variation of the Russian Cosmist thought, as well as to compare and contrast their central tenets and impact on 20th century U.S. and Soviet national space efforts; ii) to define as well as compare and contrast the genre of American and Soviet space art as well as to outline its history and chief generic and theoretical assumptions in the context of 20th century culture, literature as well as the major trends in space science and technology; iii) to investigate whether the ideology of Russian and American Cosmism might have affected the representation of space exploration in American and Soviet space art works under analysis as well as to determine possible reasons for the artists' varying depiction of the concept.

The answer to the first question is that both Russian and American forms of Cosmism, although vitally differing in terms of their historical and generic features, tend to share many common themes, having assimilated utopian, prophetic, religious and national influences. The former, having been founded on the core principles of Eastern Orthodoxy, aero- and cosmonautics, transhumanism as well as mysticism and panpsychism, developed into a nationwide rationale which often served as a spiritual explanation of the Soviet pursuit of space efforts (Siddiqi 2008: 260-288; Thomas 2011: 9; Trotsky 1975: 211). Also, although remaining a largely disregarded intellectual tradition of the pre- and Soviet period, many scholars argue that Russian Cosmism gave rise and continued to form the national space age ideology, particularly its technological utopian, mystical and occult dimensions, often reflected in contemporary media, literature, arts, film and other realms of popular culture (Djordjević 1999; Rogatchevski 2011; Schwartz 2011; Siddiqi 2008; Thomas 2011). Similarly to Russian Cosmism,

its American variation is often credited with defining and continuously shaping the nationwide rendering of space exploration activities carried out since the dawn of the space age era. Also, the main characteristics of American Cosmism, to a large extent parallel to its Russian predecessor, lie in the nations' distinct i) human spaceflight regarded as a religious and transcendental experience; ii) visionaries of the national space programme; iii) national mythologies underlying both countries' interest in space research and exploration; iv) the interplay between science, imagination and the occult accompanying the evolution of the cosmic thought (Harrison 2013). On the other hand, however, when analyzing the aforementioned categories, one can conclude that there are some crucial differences between the movements considering primarily i) a historical period in which both of them have originated; ii) various ideas grounded in national cultures in the form of technological and spiritual means proposed for mankind to achieve perfection and unity in outer space (see 2.4. for details).

With regard to the second research question, American and Soviet space art, although largely disregarded by art historians and other scholars, might be seen as a valuable cultural artifact whose analysis sheds light on diverse ways in which the two nations "materialize" the cosmos and some of their greatest accomplishments of the space age era. One of the major differences between the two genres stem from their definitions given by American and Russian sources the study of which suggests that the latter occasionally confuse space and astronomical art (*kosmicheskaia zhivopis*, *kosmorealizm*) with science fiction and fantastic art (*nauchno-kosmicheskaia zhivopis*, *khudozhniki-fantasty*). On the other hand, both emphasize the genre's major aesthetic and educational mission which is to visualize and communicate different ideas about the universe and human space efforts to both to scientists and members of the general public as well as to inspire the future generations of space enthusiasts and explorers. Some other differences can be found in the early history of the U.S. and Soviet space art where it seems that while the former demonstrated clearly astronomical art and astrofuturist influences, the latter tended to combine science fiction and fantastical elements with reality of space travel. Also, whereas American space artists were likely to present the American public with mostly realistic, promising and sometimes fearsome visions of space endeavours embedded in the frontier myth, their Soviet counterparts visualized space subjects in the style combining both optimism of social realism with spirituality, mysticism as well as esotericism of medieval icons. Although these diverse trends in the representation of space exploration continued throughout the 20th century, a common feature of the U.S. and Soviet space art, including that of Chesley Bonestell, Nikolai Kolchitskii, Robert McCall and Andrei Sokolov, might be that both genres attempted to combine science education with realistic

portrayals of space adventures and extraterrestrial landscapes. On the other hand, in the area of artistic and cultural production the two appear to draw on some distinctive concepts and ideologies embedded in the national cultures. For instance, the U.S. space art expression relies on the Hudson River School's depiction of romantic landscapes which makes use of the sublime and the picturesque, Anglo-American realistic tradition of astronomical art or a number of significant breakthroughs in 20th century space research and exploration. Meanwhile, the Soviet tradition might have been affected by a wider variety of styles, ranging from realism to symbolic, romantic or partly fantastical imaginary, the communist propaganda or the regime of Soviet secrecy applied to portraying the national space ventures.

When it comes to the final research question central to this dissertation, it seems that the ideology of Russian and American Cosmism did affect the investigated representation of space exploration on both U.S. and Soviet side. In particular, it can be observed that the impact of the latter is more clearly visible on the U.S. side as approximately 80% of its main characteristics are depicted, either literally or metaphorically, within the framework of the investigated images, namely i) human spaceflight viewed as a religious and spiritual quest; ii) the Apollo nostalgia; iii) astronauts seen as revered leaders as well as individualized, romantic and idealized heroes exploring the space frontier; iv) White's Overview Effect; v) space exploration, drawing on Turner's Frontier Thesis, viewed as a continuation of the Wild West expansion; vi) space exploration seen as Manifest Destiny; vii) the sublimity of outer space views; viii) the portrayal of space travel as fulfillment of the von Braun paradigm (for details see 4.4.3.2). In the case of the Soviet works, approximately 70% of the core premises of Russian Cosmism can be observable in the visuals' content, namely i) the establishment of a universal utopia seen as a part of Fedorov's Common Task; ii) the glorification of scientific and technological advances as the means to accomplish Fedorov's Common Task as well as to improve and regulate nature; iii) an intrinsic, mutual interconnection between man and the cosmos; iv) the spirit of Russianness and the Russian soul; v) the glorification of Slavophile ideals of messianism, nationalism, autocracy and Orthodoxy; vi) social solidarity as the means to enable humans to achieve perfection and unity in outer space; vii) symbolism and romanticism of outer space views which aim to expose the more spiritual side of space exploration (for details see 4.4.3.1.)

Undeniably, it seems that some Cosmist-inspired practices have affected the mode of outer space representation in the examined works, particularly that of space exploration. In the analyzed Bonestell's and McCall's works, the influence of American Cosmism becomes apparent mainly in the works' display of numerous qualities indicative of the frontier myth, especially through certain aesthetic and ideological connotations with

Turner's Frontier Thesis, Manifest Destiny and Hudson River School's tradition of depicting the westward expansion across the United States (see 4.4.3.2. for details). Meanwhile, in Kolchitskii's and Sokolov's images, the impact of Russian Cosmism is primarily apparent in the artists' tendency to "populate" the depicted scenes with cosmonauts as well as space- and space exploration-related objects, thus creating a meaningful and partly symbolic or romantic content (see 4.4.3.1. for details). Also, both American and Soviet space art might have been influenced by a specific cultural and literary context where it appeared, aspects of which were sometimes incorporated by the Cosmist ideology itself. Examples include certain popular ideas deeply rooted in the national cultures, like the concepts of Russianness, the Russian soul, Apollo nostalgia, Manifest Destiny or Turner's Frontier Thesis. As a result, the viewer might note that whereas the Soviet portrayal of human space efforts often gains utopian-like as well as more mystical and dreamlike qualities, its U.S. counterpart can be considered more realistic, sublime as well as fact- and science-grounded.

Wpływ amerykańskiego i rosyjskiego kosmizmu na obraz podboju kosmosu w XX-wiecznej amerykańskiej i radzieckiej sztuce kosmicznej

Streszczenie

Celem niniejszej rozprawy doktorskiej jest zbadanie i porównanie wpływu idei rosyjskiego i amerykańskiego kosmizmu na obraz podboju kosmosu w wybranych dziełach XX-wiecznej amerykańskiej i radzieckiej sztuki kosmicznej w ich kontekście kulturowym i literackim. Materiałem źródłowym jest 200 dzieł amerykańskiej (100) i radzieckiej (100) sztuki kosmicznej (1944-1991), które poddane są analizie treści wizualnej mającej na celu zbadanie relacji między głównymi założeniami ideologii rosyjskiego i amerykańskiego kosmizmu a wizerunkiem podboju kosmosu skonstruowanym przez amerykańskich i radzieckich artystów. Termin podbój kosmosu rozumiany jest tutaj jako eksploracja przestrzeni kosmicznej poza atmosferą ziemską za pomocą załogowych pojazdów kosmicznych i bezzałogowych próbników oraz wykorzystanie pozyskanych informacji w celu zwiększenia wiedzy na temat kosmosu oraz zapewnienia postępu naukowego i przetrwania ludzkości („space exploration" 2014). Definicja ta zakłada, iż badany obraz obejmuje nie tylko reprezentacje astronautów i technologii kosmicznych w procesie jego eksploracji, ale również wyobrażenia krajobrazu pozaziemskiego opartego na naukowych danych z dziedziny astronautyki lub astronomii.

Rosyjski kosmizm, podwaliny którego sformułował Nikolaj Fiodorow (1982), narodził się w Rosji pod koniec XIX wieku jako ruch kulturowy i intelektualny zorientowany na zbadanie szeroko rozumianej relacji między człowiekiem a wszechświatem (zob. np. Semenova, and Gacheva 1993; Young 2012). Jego główne założenie, idea „zwykłego czynu" Fiodorowa, głosi konieczność wskrzeszenia wszystkich zmarłych przodków oraz stworzenia uniwersalnej utopii we wszechświecie, zarówno w sensie duchowym, jak i naukowo-technologicznym. Według myśliciela, realizacja tego projektu powinna stanowić dla ludzkości imperatyw moralny i spełnienie jednego z głównych założeń kosmizmu, będącego twórczym, konstruktywnym przekształcaniem świata i otaczającej jednostkę rzeczywistości. Inne koncepcje wspólne dla rosyjskich kosmistów to m.in. i) wiara w nierozerwalną, immanentną relację między człowiekiem a kosmosem, organiczny związek wszystkich bytów we wszechświecie oraz kosmiczny wymiar ludzkiej

egzystencji; ii) wiara w nieograniczone możliwości nauki i technologii kosmicznej, które umożliwią eksplorację i kolonizację całego wszechświata; iii) obecność istoty wyższej kierującej wszechświatem w postaci Boga lub innej siły sprawczej; iv) dążenie do poznania ostatecznej prawdy oraz całkowitej integracji wiedzy za pomocą pseudo- i paranaukowych metod, wywodzących się z ezoterycznych i okultystycznych źródeł; v) powstanie nowych form życia oraz noosfery, zaproponowanej przez Wiernadskiego i oznaczającej nowy, duchowy wymiar ludzkiej myśli i egzystencji (zob. np. Alekseeva 2007: 5; Bashkova 2011: 16-17; Fesenkova 2003: 124-134; Obolevitch 2007: 45 124-134; Young 2012: 4). Co więcej, ideologia ta zarówno w swoim religijnym, jak i naukowo-technologicznym wymiarze, łączy w sobie elementy światopoglądu narodowego, na przykład koncepcji „rosyjskiej duszy" (ros. „russkaia dusha"), autokracji, prawosławia i innych ideałów sławofilskich, oraz światopoglądu zachodnioeuropejskiego, promującego implementację wartości racjonalizmu, empiryzmu i pozytywizmu w sferach życia publicznego. Pomimo faktu, iż kosmizm uważany jest w dużej mierze za zapomnianą rosyjską tradycję intelektualną, zdaniem wielu krytyków ruch ten przyczynił się do powstania i ukształtowania narodowej ideologii ery kosmicznej, w szczególności jej technologiczno-utopijnych, mistycznych oraz okultystycznych wymiarów, mających wpływ na współczesne media, literaturę, sztukę, film oraz inne obszary kultury (zob. np. Bashkova 2013; Deliagin and Sheianov 2011; Djordjević 1999; Harris 2008; Rogatchevski 2011; Schwartz 2011; Siddiqi 2008, 2010; Thomas 2011; Trotsky 1975).

Tymczasem ruch ten posiada również swój amerykański odpowiednik w postaci amerykańskiego kosmizmu (ang. „American Cosmism"), zaproponowanego przez Alberta A. Harrisona (2013) i będącego rozszerzeniem koncepcji etosu kosmicznego Philipa Harrisa (1992; zob. 2.2.2.). Termin ten oferuje bogatszą interpretację ww. zjawiska i może zostać zdefiniowany jako „produkt nauki, religii i kultury narodowej, który znalazł odzwierciedlenie w akademickich i popularnych poglądach na temat naszego miejsca we wszechświecie, eksploracji kosmosu oraz ostatecznego przeznaczenia ludzkości" (Harrison 2013: 25; tłum. KB). Szerokie spektrum amerykańskiego kosmizmu obejmuje liczne XX-wieczne wartości, poglądy i zjawiska kulturowe związane z podbojem kosmosu, które ze względu na głębokie zakorzenienie w kulturze narodowej miały wyraźny wpływ na jego reprezentację w sferze życia publicznego oraz artefaktach kulturowych. Zgodnie z sugestią Harrisona (2013), podstawowe elementy ruchu obejmują percepcję lotów kosmicznych jako doświadczenia religijnego i transcendentalnego, istotną rolę wizjonerów kosmosu oraz narodowych mitologii w sformułowaniu i konceptualizacji głównych założeń programu kosmicznego, a także wzajemne relacje między nauką, ezoteryką i okultyzmem, znajdujące swoje odzwierciedlenie m. in. w zjawisku Efektu Nadwidzenia Franka White'a (ang. „Overview Effect") (1987),

parapsychicznych i okultystycznych aspektach SETI lub niektórych wierzeniach ruchu Nowej Ery (ang. „New Age"). Podobnie jak w przypadku rosyjskiemu kosmizmu, jego amerykańskiej odmianie przypisuje się zdefiniowanie i nieustanne kształtowanie ogólnonarodowej i popularnej interpretacji misji programu kosmicznego.

Istotnym wydaje się również omówienie głównych powodów podjęcia samego tematu pracy. Po pierwsze, analiza wybranych XX-wiecznych dzieł sztuki kosmicznej w świetle głównych założeń rosyjskiego i amerykańskiego kosmizmu motywowana jest faktem, iż według krytyków obie koncepcje mogły wywrzeć istotny wpływ na publiczną percepcję przestrzeni kosmicznej i podboju kosmosu, widoczny chociażby w licznych domenach kultury, takich jak sztuka, literatura, film, media itd. Dlatego też wydaje się prawdopodobne, iż wpływ ten może również zostać zaobserwowany w sztuce kosmicznej, której cechy powinny korespondować z wybranymi założeniami tych dwóch dominujących ideologii ery kosmicznej. Ponadto, jako że zarówno rosyjska, jak i amerykańska idea kosmizmu może być postrzegana jako produkt kulturalnych, literackich, filozoficznych i artystycznych tradycji obu narodów, badanie jej wpływu na sztukę kosmiczną ma także na celu wyeksponowanie różnic międzykulturowych w sposobie obrazowania tematyki podboju kosmosu przez wybranych przedstawicieli tego gatunku. Po drugie, wybór XX-wiecznych dzieł amerykańskiej i radzieckiej sztuki kosmicznej jako głównego materiału badawczego wynika z faktu, iż analiza dzieł tego gatunku stanowi niszę badawczą, o czym świadczyć może ograniczona liczba zarówno akademickiej, jak i popularnej literatury krytycznej dotyczącej tej tematyki. W większości źródeł sztuka kosmiczna definiowana jest jako „wyobrażenia wszechświata poza atmosferą ziemską," które „reprezentują wiekową fuzję nauki i sztuki" oraz podejmują próbę zareprezentowania i skomunikowania różnorodnych koncepcji związanych z kosmosem i osiągnięciami ery kosmicznej (Miller 1996: 139; Hartmann 1990: 132, zob. 3.1.). Pomimo występowania różnorodnych form tego gatunku, takich jak obrazy, ilustracje, przedstawienia abstrakcyjne lub cyfrowe, sztuka w warunkach zero grawitacji, fotografia, rzeźba, instalacje, wideo i inne, w niniejszej dysertacji skupiam się jedynie na analizie tych najbardziej rozpowszechnionych w literaturze i kulturze XX wieku, czyli figuratywnych (ang. „representational") i obrazkowych (ang. „pictorial") reprezentacji podboju kosmosu. W szczególności analizie poddane są wybrane dzieła (1944-1991) czterech wiodących przedstawicieli sztuki kosmicznej w Stanach Zjednoczonych i Związku Radzieckim, Chesley Bonestella i Nikolaja Kolczyckiego oraz Roberta McCalla i Andrieja Sokołowa ze względu na fakt, iż i) ich dzieła występują w ilościach wystarczających do przeprowadzenia analizy treści wizualnej oraz ii) między życiem i twórczością ww. artystów można odnaleźć liczne analogie (zob. 3.2.4.2.).

Należy również podkreślić w dużym stopniu interdyscyplinarny i nowatorski charakter niniejszej rozprawy. Po pierwsze, poświęcona jest ona w sensie ogólnym studiom nad przestrzenią kosmiczną i podbojem kosmosu w świetle nauk humanistycznych, do tej pory podejmowanych głównie przez pryzmat historii i polityki zimnowojennej oraz nauki i technologii kosmicznej związanej z rozwojem programu kosmicznego (zob. np. Bell 2009; Geppert 2012; McCurdy 2011; Sage 2014). Po drugie, analiza wybranych dzieł amerykańskiej i radzieckiej sztuki kosmicznej jako gatunku niemalże „zapomnianego" w kręgach akademickich może przyczynić się do rozwoju dyskusji naukowej na ten temat. Ponieważ liczba źródeł dotyczących sztuki kosmicznej jest w dużej mierze ograniczona, moim celem było zgromadzenie i przeprowadzenie systematycznej analizy wszystkich dostępnych materiałów, w tym literatury naukowej i popularnej, a także wzbogacenie dzisiejszego stanu wiedzy w tej dziedzinie w oparciu o uzyskane przeze mnie wyniki badań. Kolejną moją intencją było zbadanie wpływu idei kosmizmu na wybrane dzieła sztuki kosmicznej, jako iż zadanie to nie stanowiło dotychczas osobnego przedmiotu badań naukowych, szczególnie w amerykańsko-rosyjskiej perspektywie komparatystycznej. Ponadto, badanie jego wpływu na reprezentację podboju kosmosu może być postrzegane jako spore wyzwanie, zwłaszcza biorąc pod uwagę fakt, że istnieje niewiele źródeł, które omawiają, przeważnie pośrednio, konkretny związek między aspektami ideologii kosmizmu a omawianym gatunkiem sztuki (zob. np. Henry i Taylor 2009; Malina 1989; McCurdy 2011; Siddiqi 2008; Soluri 2008).

Niniejsza praca składa się z czterech rozdziałów. Rozdział pierwszy podejmuje próbę zdefiniowania i zareprezentowania różnych poglądów na temat rosyjskiego kosmizmu, w tym faktów dotyczących jego pochodzenia, rozwoju, dzisiejszego statusu oraz wpływu na wybrane aspekty XX-wiecznej rosyjskiej i radzieckiej historii i kultury związanej z ogólnonarodową percepcją programu kosmicznego. W części wprowadzającej badam kosmizm w perspektywie wybranych aspektów rosyjskiej filozofii, kultury i literatury przełomu XIX i XX wieku, takich jak religia prawosławna lub ruchy intelektualne i artystyczne analizowanego okresu, jak również omawiam mistyczne, ezoteryczne i okultystyczne wymiary tejże ideologii. Następnie przedstawiam podstawowe założenia religijnego i naukowego nurtu kosmizmu oraz myśli jego głównych przedstawicieli, w tym ojca założyciela ruchu, Nikołaja Fiodorowa, jak również Vladimira Sołowjowa, Siergieja Bułhakowa, Pawła Florenskiego, Nikołaja Bierdiajewa, Aleksandra Sukhovo-Kobylina, Konstantego Ciołkowskiego, Aleksandra Czyżewskiego, Władimira Wiernadskiego oraz Wasiliego Kupriewicza. Wymienione przez mnie główne idee ww. filozofów i naukowców analizowane są przede wszystkim pod kątem ich wkładu w teorię kosmizmu nawiązującego do szeroko pojętej relacji między człowiekiem a kosmosem. Wreszcie, jak wspomniałam powyżej, przechodzę do dyskusji na

temat potencjalnego wpływu kosmizmu na wybrane aspekty XX-wiecznej rosyjskiej i radzieckiej kultury związanej z podbojem kosmosu, takie jak początki radzieckiej kosmonautyki i ideologii ery kosmicznej czy też występowanie tematyki podróży kosmicznych w ówczesnych mediach, w szczególności w licznych artykułach publikowanych przez czasopisma popularno-naukowe od początku XX wieku, a także w literaturze, filmie i sztuce tego okresu. Omawiam również główne trendy i zjawiska kulturowe, w których radziecka fascynacja przestrzenią kosmiczną i podbojem kosmosu wydaje się być szczególnie widoczna. Skupiam się zwłaszcza na analizie wybranych wizualizacji kosmosu lub programu kosmicznego okresu stalinowskiego, biografiach i pamiętnikach kosmonautów, czasopismach, filmach oraz dokumentach popularno- i fantastyczno-naukowych, będących niejako manifestacją ducha ery kosmicznej. W zakończeniu podsumowuję podstawowe założenia i osiągnięcia religijnego i naukowego kosmizmu, jednocześnie podkreślając główne cechy wspólne dla obu nurtów ideologii, a także komentuję współczesny jej status, pielęgnowany przez liczne instytucje, środowiska intelektualne i rosnącą liczbę publikacji akademickich i popularnych na ten temat.

W rozdziale drugim przechodzę do przedstawienia głównych cech i teoretycznych założeń koncepcji amerykańskiego kosmizmu, zaproponowanej przez Harrisona (2013), w tym wpływu tejże koncepcji na wybrane aspekty XX-wiecznej kultury amerykańskiej związanej z podbojem kosmosu, a także jej potencjalnego wkładu w rozwój badań nad kulturowymi aspektami relacji człowieka i kosmosu. We wstępie badam obecność tematyki eksploracji kosmosu i przestrzeni kosmicznej w szeroko pojętych naukach humanistycznych, do tej pory omawianej głównie przez pryzmat historii i zimnowojennej polityki oraz naukowych i technologicznych osiągnięć programu kosmicznego. W swojej argumentacji powołuję się na przykłady wiodących publikacji naukowych, które łączą metodologię historiograficzną ze społeczno-kulturową w dyskusji nad ww. zagadnieniami. Następnie próbuję zdefiniować grupę zjawisk i terminów nawiązujących do humanistycznych aspektów podboju kosmosu, w szczególności formy filozofii kosmicznej, jak również pojęcia astrokultury (ang. „astroculture") (Geppert 2012) i etosu kosmicznego (ang. „space ethos") (Harris 1992). W dalszej części rozdziału przedstawiam szczegółową analizę amerykańskiego kosmizmu zgodnie z propozycją Harrisona (2013) oraz omawiam jego główne założenia, obejmujące percepcję lotów kosmicznych jako doświadczenia religijnego i transcendentalnego, rolę wizjonerów kosmosu oraz narodowych mitologii w sformułowaniu i konceptualizacji głównych założeń programu kosmicznego, a także wzajemne relacje między nauką, ezoteryką i okultyzmem. Wspominam również o szeregu zjawisk historycznych i kulturowych związanych z postrzeganiem podboju kosmosu

i jednocześnie kluczowych dla rozwoju amerykańskiej ideologii ery kosmicznej, takich jak sprawozdania i wypowiedzi astronautów, Efekt Nadwidzenia White'a (1987), nostalgia za programem Apollo (ang. „Apollo nostalgia") lub SETI. Następnie omawiam ich reprezentacje w literaturze faktu i popularno-naukowej, w tym w (auto)biografiach i pamiętnikach astronautów, filmach dokumentalnych, programach telewizyjnych, artefaktach kulturowych i innych płaszczyznach XX-wiecznej kultury amerykańskiej. Podsumowując rozdział dokonuję porównania rosyjskiego kosmizmu i jego amerykańskiego odpowiednika, a także komentuję kulturowy i filozoficzny potencjał koncepcji kosmizmu Harrisona, który w przyszłości może stać się podstawą dla rozwoju ruchów pro-kosmicznych (ang. „pro-space movements").

Rozdział trzeci streszcza historię, jak również główne założenia teoretyczne i cechy gatunkowe amerykańskiej i radzieckiej sztuki kosmicznej w kontekście XX-wiecznej kultury i literatury oraz najważniejszych odkryć programu kosmicznego obu krajów. We wstępie prezentuję podstawowe definicje sztuki kosmicznej w oparciu o źródła amerykańskie i rosyjskie oraz przestawiam tło historyczne gatunku, zwłaszcza jego występowanie w literaturze faktu i fantastyczno-naukowej, amerykańskich i radzieckich czasopismach i tekstach popularno-naukowych oraz mediach, takich jak filmy science-fiction i dokumenty popularno-naukowe. W tym miejscu wspominam również o licznych literackich, politycznych i kulturowych zjawiskach, które mogły wywrzeć znaczący wpływ na analizowane dzieła, w tym o powstałym w latach 50-tych ruchu astrofuturystycznym (ang. „astrofuturist movement"), technicznej i naukowej złożoności dyskursu popularno- i fantastyczno-naukowego w powojennej Ameryce, rozwoju instytucjonalnej kultury NASA, ateistycznej ideologii szturmu nieba, zjawisku propagandy w radzieckich wizualizacjach przestrzeni kosmicznej i eksploracji kosmosu czy kosmicznym entuzjazmie (ang. „space enthusiasm") połowy lat 60-tych, a także najistotniejszych tendencjach w przed- i postalinowskim naukowym paradygmacie przedstawiania tematyki kosmicznej. Następnie prezentuję życie i twórczość jednych z najbardziej znanych i rozpoznawalnych artystów kosmicznych poprzedniego wieku, Chesley Bonestella i Roberta McCalla oraz ich radzieckich „odpowiedników," Nikolaja Kolczyckiego i Andrieja Sokołowa. W dalszej części rozdziału analizuję liczne tradycje kulturowe, które według większości tekstów krytycznych miały znaczący wpływ na uformowanie najbardziej dystynktywnych cech gatunkowych amerykańskiej i radzieckiej sztuki kosmicznej. Przede wszystkim skupiam się przedstawieniu głównych założeń amerykańskiego ruchu Hudson River School, których estetyka inspirowana była romantyzmem, w szczególności koncepcjami „wzniosłości" (ang. „sublime") oraz „malowniczości" (ang. „picturesque"), teorii pogranicza Turnera (ang. „Frontier Thesis"), ideologii „Boskiego Przeznaczenia" (ang.

„Manifest Destiny"), programu artystycznego NASA (ang. „NASA Art Programme"), jak również realistycznej tradycji sztuki astronomicznej i kosmicznej kontynuowanej i rozpowszechnianej przez członków organizacji IAAA (Międzynarodowe Towarzystwo Astronomicznych Artystów; ang. „International Association of Astronomical Artists"). Przechodząc do analizy dzieł radzieckich przedstawicieli gatunku, omawiam status sztuki kosmicznej w Związku Artystów ZSSR, wpływ komunistycznej propagandy na wizualne reprezentacje przestrzeni kosmicznej i podboju kosmosu, schematy cenzury stosowane przez radzieckich wydawców czy też rosyjską tradycję dyskursu popularno-naukowego, często łączącego elementy dyskursu fantastycznego i fantastyczno-naukowego. Następnie podejmuję dyskusję nad wpływem XX-wiecznych odkryć w dziedzinie eksploracji kosmosu na analizowane dzieła sztuki kosmicznej, nakreślam pewne różnice między amerykańskimi i radzieckimi artystami oraz sugeruję możliwe przyczyny, dla których stosowali oni w pewnym stopniu odrębne praktyki w przedstawianiu ciał niebieskich i zjawisk astronomicznych. W podsumowaniu podejmuję próbę porównania głównych założeń teoretycznych amerykańskiej i radzieckiej sztuki kosmicznej. Omawiam również wspólne cechy między życiem i twórczością Chesley Bonestella, Nikolaja Kolczyckiego oraz Roberta McCalla and Andrieja Sokołowa, jak również krótko charakteryzuję dzisiejszy status tego gatunku zarówno w Stanach Zjednoczonych, jak i w Rosji.

W rozdziale czwartym streszczam główne założenia metodologii badawczej wykorzystanej w rozprawie, a następnie prezentuję główne rezultaty analizy amerykańskiej i radzieckiej sztuki kosmicznej. W szczególności przestawiam materiały źródłowe, główne kryteria analizy treści wizualnej wybranych dzieł oraz podejmuję próbę sprecyzowania możliwego wpływu ideologii kosmizmu na ich zawartość. W pierwszej części rozdziału prezentuję ilościowy i jakościowy opis zebranych materiałów źródłowych, w tym liczbę, autorstwo, pochodzenie i datę publikacji dzieł poddanych analizie, oraz omawiam kontekst popularno-naukowy i literacki w jakim występują. Zamieszczone dodatkowo grafy i tabele mają na celu aplikację komparatystycznej amerykańsko-radzieckiej perspektywy w przedstawieniu danych oraz wykazanie podobieństw i różnic między nimi. Następnie przedstawiam poszczególne kategorie (10) wykorzystane w celu kodowania analizowanego materiału, opisuję relacje między nimi a ideologią rosyjskiego i amerykańskiego kosmizmu oraz wymieniam najważniejsze powody ich selekcji. Praktyczne zastosowanie danych jakościowych w analizie treści wizualnej amerykańskiej i rosyjskiej sztuki kosmicznej pozwala na wyciągnięcie stosownych wniosków dotyczących wpływu idei kosmizmu na badane dzieła. W kolejnej części rozdziału podejmuję próbę interpretacji uzyskanych rezultatów badania i określenia i) w jakim stopniu kosmizm rosyjski mógł wpłynąć na zawartość radzieckiej sztuki kosmicznej autorstwa Nikolaja

Kolczyckiego i Andrieja Sokołowa, oraz ii) w jakim stopniu kosmizm amerykański mógł wpłynąć na zawartość amerykańskiej sztuki kosmicznej autorstwa Chesley Bonestella i Roberta McCalla. W szczególności argumentuję, że obie odmiany kosmizmu wywarły znaczący wpływ na reprezentację podboju kosmosu w sztuce kosmicznej, jednak wpływ ten jest bardziej widoczny w po stronie amerykańskiej. Podsumowując rozdział streszczam główne rezultaty badania, zarysowuję pewne trudności napotkane w przeprowadzonej analizie oraz sugeruję możliwe powody występowania danego paradygmatu w konceptualizacji ww. wizerunku eksploracji kosmosu. Podkreślam również zainspirowane ideologią kosmizmu różnice między amerykańską i radziecką sztuką kosmiczną, które prowadzą do bardziej ogólnych refleksji dotyczących istnienia odmiennych wizji wszechświata i podróży kosmicznych w kulturze i literaturze obu tych narodów.

Wyniki przeprowadzonej analizy treści wizualnej potwierdziły niejako odrębność paradygmatu przestawienia podboju kosmosu i przestrzeni kosmicznej stosowanego przez wybranych amerykańskich i radzieckich artystów. W szczególności badanie wykazało, że w reprezentacji eksploracji kosmosu w amerykańskich dziełach można zaobserwować wpływ około 80% głównych założeń ideologii amerykańskiego kosmizmu. Tymczasem jego odpowiednik w radzieckiej sztuce może odzwierciedlać około 70% głównych założeń rosyjskiego kosmizmu. W tym miejscu nakreślam również pewne trudności w sformułowaniu ww. wniosków, z których niektóre przyjmują jedynie formę niejednoznacznych wizualnych metafor, a zatem pozostają w dużym stopniu otwarte dla indywidualnej interpretacji odbiorcy. Ponadto, w przypadku rosyjskiego kosmizmu pewne rezultaty badań mogą zostać również odczytane jako wpływ innych zjawisk charakterystycznych dla popularnej kultury podboju kosmosu w Związku Radzieckim, takich jak społeczny techno-utopianizm, kosmiczny entuzjazm, ateistyczna ideologia szturmu nieba (ros. „shturm neba") lub elementy komunistycznej propagandy i cenzury.

W toku analizy wykazałam również, że większość radzieckich dzieł prezentuje wizję utopijnych pozaziemskich światów, nierzadko mających romantyczne, symboliczne i mistyczne konotacje, zaawansowanej technologii służącej realizacji misji radzieckiego programu kosmicznego, jak również częściowo zdeindywidualizowanych kosmonautów w procesie eksploracji i zaludniania środowiska kosmicznego. Tymczasem amerykański obraz podboju kosmosu wydaje się być mocno osadzony w micie amerykańskiego pogranicza, widocznym m. in. w licznych wyobrażeniach wyidealizowanych i częściowo romantycznych światów pozaziemskich, gdzie element ludzki jest mocno zredukowany. Z drugiej strony, artyści mają też tendencję do przestawiania realistycznych krajobrazów planetarnych, astronautów jako śmiałych, zindywidualizowanych i świadomych swojej misji pionerów, a także

ultranowoczesnych i futurystycznych statków kosmicznych NASA, będących w stanie zapewnić przetrwanie rasy ludzkiej. Co więcej, liczne estetyczne i ideologiczne aspekty analizowanych materiałów wywołują asocjacje z innymi założeniami kosmizmu, takimi jak ideologia Boskiego Przeznaczenia, Efekt Nadwidzenia, nostalgia za programem Apollo lub paradygmat von Brauna. Rezultaty badania, poparte odpowiednimi statystykami, sugerują również, iż specyficzny charakter amerykańskiej i radzieckiej sztuki kosmicznej, będącej w większym lub mniejszym stopniu pod wpływem ideologii kosmizmu, może wynikać zarówno z szerszego kontekstu kulturowego, jak i literackiego ogólnonarodowej wizji podboju kosmosu. W szczególności różnice między amerykańskim i radzieckim wizerunkiem podróży kosmicznych mogą być efektem pewnych cech dyskursu popularno- i fantanstyczno-naukowego, w którym często występują, lub tradycji wizualizacji tematyki podboju kosmosu czy szerzej nieodkrytej przestrzeni ziemskiej i pozaziemskiej w analizowanych domenach i tekstach kultury oraz literatury.

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Complete list of Chesley Bonestell's, Nikolai Kolchitskii's, Robert McCall's and Andrei Sokolov's works

Appendix

(1) Chesley Bonestell's works.[1]

Image 1. *Saturn as Seen from Titan*. (*Life*, 29 May 1944: 78).
Caption: From Titan the sky seems blue instead of black because Titan is only satellite which has an atmosphere to give color to the sky. Here Saturn appears in its "new" phase, like a new moon. Largest of the satellites, Titan has a diameter of 3,000 miles (Earth's is 7,900). It is 771,000 miles from its planet and was first satellite to be discovered – by Huyghens in 1655.

Image 2. *Saturn from Iapetus*. (*Life*, 29 May 1944: 78).
Caption: From Iapetus, which is 2,225,000 miles from the planet, Saturn shines brightly by daylight over a bleak landscape. This satellite has a diameter of 2,000 miles, about that of Earth's moon.

Image 3. *Saturn From Mimas*. (*Life*, 29 May 1944: 80).
Caption: From Mimas, innermost of the satellites, Saturn looms immensely over the horizon. Mimas, which is only 600 miles in diameter, is 117,000 miles from the planet. The big shadow lying across Saturn's surface is cast by its ring. Small shadow at lower left is thrown by one of the other satellites. Shadowy figures on Mimas are purely imaginary, put in to give scale.

[1] Some Bonestell's works are available at http://www.bonestell.org/. All artist's works examined in the present book can be found in the Appendix of my PhD dissertation, *Space exploration in 20th century American and Soviet literature and art* (2015), available online at the Adam Mickiewicz University Repository: https://repozytorium.amu.edu.pl/handle/10593/13887 (Copyright Disclaimer Under Section 107 of the Copyright Act 1976: The Appendix contains images collected from various online, library as well as my private resources and serves purely research and educational purposes. It falls under the fair use provisions of European and US copyright law and is not a copyright infringement.).

Image 4. Untitled. (*Life*, 4 Mar. 1946: 72).
Caption: Starting for the Moon, the rocket climbs 200 miles above the U.S. east coast. Inside the earth's shallow atmosphere (luminous band on the horizon) it flies like an ordinary airplane at a comparatively low speed. At the lower right is Long Island. At its left end is New York City. In the distance are the Great Lakes.

Image 5. Untitled. (*Life*, 4 Mar. 1946: 72).
Caption: OVER EUROPE AT SUNSET, 600 miles up in its climb above the earth, the rocket uses the full power of its atomic-fueled engines. Below is the south coast of England. The boot of Italy stretches toward the horizon.

Image 6. Untitled. (*Life*, 4 Mar. 1946: 73).
Caption: THE ROCKET FALLS toward the moon with its motors shut off. Since its occupants fall at the same speed, they are able to climb out weightlessly in special suits.

Image 7. Untitled. (*Life*, 4 Mar. 1946: 73).
Caption: CIRCLING THE MOON, the rocket passes 200 miles above the crater Albategnius. Seen from the earth, Albategnius is in the center of the moon's visible disk.

Image 8. Untitled. (*Life*, 4 Mar. 1946: 73).
Caption: ON THE MOON'S SURFACE the tiny figures of the rocket's occupants (at the lower right) view their earth, shining brilliantly in the lunar night. Since the earth is a better reflecting surface than the moon, its light is 20 times brighter than moonlight. For comparative size, the earth is shown near the belt of the constellation Orion.

Image 9. Untitled. (Life, 4 Mar. 1946: 74).
Caption: CLIMBING THE RIM of Theophilus, the rocket explorers look down on the crater floor from the escarpment at upper left. The opposite wall of the crater is 64 miles away and 18,000 feet high. The broken peaks in the center rise 8,000 feet. The explorers climb easily in heavy suits because of the moon's small gravitational pull.

Image 10.Untitled. (*Life*, 4 Mar. 1946: 75).
Caption: THE ROCKET RETURNS to the earth after taking off from the moon. Setting beyond the earth is the sun, surrounded by its corona and zodiacal light. At the top is the moon, 240,000 miles from the earth. Ahead of the rocket is the Mediterranean Sea. The rocket makes several circuits of the earth to slow down to landing speed.

Image 11. Untitled. (*Conquest of Space*, 1949: 76).
Caption: XII. One of the most impressive mountain ranges on the moon, the Leibnitz Mountains, which Camille Flammarion called "the mountains of eternal light." They are 30,000 feet high, probably surpassing te highest mountain ranges on earth. They are pictured during an eclipse of the sun by the earth.

Image 12. Untitled. (*Conquest of Space*, 1949: 80).
Caption: XVI. Beginnings of the lunar base; the weekly transport to earth, which illuminates the landscape, is being readied. The distant mountains are already illuminated by the rising sun.

Image 13. Untitled. (*Conquest of Space*, 1949: 85).
Caption: XIX. A study in apparent sizes. The constellations Orion and the earth over a lunar valley. Orion's belt is 3 degrees wide, the earth in the lunar sky about 2 degrees. Valley shows signs of "thermal erosion" (see Chapter 2).

Image 14. Untitled (*Conquest of Space*, 1949: 88).
Caption: XXIV. The ship, having landed on its tale, will take off from this position for the return to earth.

Image 15. Untitled. (*Conquest of Space*, 1949: 121).
Caption: XXV. Surface of Mercury. The sun appears three times as large as we see it and since Mercury always points the same hemisphere to the sun, the temperature in the center of that hemisphere must be about that of melting lead. Even though clad in asbestos suits, the explorers could not leave the protection of their ship for long. (Visual angle 40 degrees.)

Image 16. Untitled. (*Conquest of Space*, 1949: 124).
Caption: XXVIII. Surface of Venus, which might be a dust bowl, with hazy and cloudy skies and wind-blown dust etching the rocks into fantastic shapes.

Image 17. Untitled. (*Conquest of Space*, 1949: 125).
Caption: XXIX. Surface of Mars. Although it is considerably colder than earth and clothed in only a threadbare chilly atmosphere, the fourth planet still is provided with more earthlike features than any other. This is what an explorer would see if he were standing on the thin snowdrifts of the polar cap, looking toward the setting sun. (Checked for color by Dr. Edison Pettit of Mount Wilson and Palomar Observatories.)

Image 18. Untitled. (*Conquest of Space*, 1949: 128).
Caption: XXXII. Mars seen from Deimos. Again the polar cap and *Syrtis major* are the most prominent features. (Checked for color and "canals" by Dr. Edison Pettit.)

Image 19. Untitled. (*Conquest of Space*, 1949: 130).
Caption: XXXIVb. Saturn as it appears from the surface of its satellite Rhea (visual angle 30 degrees). Four inner satellites are visible as are the edge and the shadow of the rings.

Image 20. Untitled. (*Conquest of Space*, 1949: 135).
Caption: XXXIX. Pluto, the outermost planet of our solar system. Suprisingly, Pluto, unlike the other outer planets of our solar system, turned out to be small and massive. Its atmosphere must lie frozen on the rocks. From that distance the sun looks like a brilliant distant are light, without perceptible disk.

Image 21. Untitled. (*Conquest of Space*, 1949: 158).
Caption: XLVI. Jupiter's surfacce. Hydrogen flames and "lava" pour out off top of cliff. Lake below is liquid ammonia; cliffs are lava and ice.

Image 22. Untitled. (*Conquest of Space*, 1949: 159).
Caption: XLVIIa. Saturn's rings seen from a spot at 15,5 degress southern latitude on the planet (visual angle 40 degrees). They are illuminated by light reflected from the surface. The brilliant edges seen in 1907 by Barnard during an over-edge view which showed dark side foreshortened.

Image 23. *Seperation of Stages*. (*Collier's* cover, 22 Mar. 1952).
Caption: Man will conquer space soon. Top scientists tell how in 15 startling pages.

Image 24. Untitled. (*Collier's*, 22 Mar. 1952: 23-24).
Caption: Men and materials arrive in the winged rocket and take "space taxis" to wheel-shaped space station at right. Men wear pressurized suits. Three space taxis can be seen – one leaving rocket, another reaching satellite, a third near the already-built astronomical observatory.

Image 25. Untitled. (*Collier's*, 22 Mar. 1952: 32-33).
Caption: Specially designed round-the-moon ship hovers 200 miles above lunar surface as space scientists take close-up photographs. One-way journey from station in space will take five days to cover 239,000 miles. Never-seen face of the moon is to right. Trip will have to be timed so that sun lights hidden side.

Image 26. Untitled. (*Collier's* cover, 18 Oct. 1952).
Caption: Man on the moon. Scientists tell how we can land there in our lifetime.

Image 27.Untitled. (*Collier's*, 18 Oct. 1952: 52-53).
Caption: Weightless in orbit 1,075 miles above earth, workers in space suits assemble three moon ships. Hawaiian islands lie below. Winged transports unload

supplies near wheel-shaped space station top left. Engineers and equipment cluster around cargo ship lower ship, passenger ships center and right.

Image 28. Untitled. (*Collier's*, 25 Oct 1952: 38-39).
Caption: The unloading on the moon. Twenty-four hours after landing, supplies have been stowed in caterpillar tractors. Hold of cargo ship (r.) is being lowered to ground in sections, to be used as prefabricated headquarters. Earth is at center: halo effect is caused by the sun, hidden behind sphere of rocket ship at left. Diagonal streak in sky, the zodiacal light, is caused by the sun's rays reflecting from cosmic dust. The red star at left is Mars.

Image 29. Untitled. (*Life*, 8 Dec. 1952: 92-93).
Caption: THE CONTINENTS CONGEAL amid seas of molten stone when granitic blocks cool, crystallize and cohere, spreading and thickening as pack ice spreads and thickens on a polar sea. Some drift on the incandescent mass; others come to rest on sunken platforms of basalt that have solidified below. In this vista of the cooling planet the observer is a half mile above the surface; the continental cliffs rise 1,200 feet; the moon rides barely 10,000 miles away. Meteorites of all sizes bombard the earth incessantly, blasting craters in the hardening rocks. From the inferno beneath the crust, fountains of lava, like the 400-foot spout in left foreground, continually erupt; water vapor, carbon dioxide, and other gases, hissing through volcanic fissures, rise and mass in ever thicker clouds above – the future oceans of the earth. Over the cooling protocontinents, here and there, rain prematurely condenses, tries to fall, and at once boils back into the sky.

Image 30. Untitled. (*Collier's*, 30 Apr. 1954: 22).
Caption: Near wheel-shaped space station 1,000 miles from the earth, built especially for assembly of the Mars exhibition, weightless workers put together the ten rocket ships required for the flight. Three of the huge space craft have torpedo noses which convert to planes for landing on the planet.

Image 31. Untitled. (*Collier's*, 30 Apr. 1954: 23).
Caption: Near wheel-shaped space station 1,000 miles from the earth, built especially for assembly of the Mars exhibition, weightless workers put together the ten rocketships required for the flight. Three of the huge space craft have torpedo noses which convert to planes for landing on the planet.

Image 32. Untitled. (*Collier's*, 30 Apr. 1954: 29).
Caption: After 13-month exploration, the Mars expedition prepares for return flight to earth. Two landing planes are set on tails with wings and landing gear removed. They will rocket back to the 600-mile orbit on first leg on journey.

Image 33. Untitled. (*Life*, 20 Dec. 1954: 46).
Caption: THE WASTES OF MERCURY shimmer beneath the baleful eye of the sun, which glares down hot and white, undimmed by atmosphere or fall of night. Here on the perpetually sunlit side, the solar disk appears two to three times as large as it does from the more distant Earth. Windless, waterless, airless, the Mercurian landscape is diversified only by occasional craters gouged by meteoric bombardment, and jagged mountains and cliffs formed during the initial solidification of the planet.

Image 34. Untitled. (*Life*, 20 Dec. 1954: 47).
Caption: THE DESERTS OF MARS, studded with crescent dunes, are swept by dust storms that rise recurrently in the thin air. Lighted by the small disk of the remote sun, the Martian sky is relatively cloudless, the Martian land relatively arid. Yet seasonal changes are reflected by burgeoning of green areas in spring and summer. The rounded reddish rocks in the foreground have been eroded by rapid temperatures changes, resulting in a flaking-off of exterior irregularities.

Image 35. Untitled. (*Life*, 20 Dec. 1954: 60).
Caption: A DOUBLE STAR, RW Persei, casts two-toned shadows on the jagged surface of a hypothetical planet. One member of the pair is a large orange-colored star, the other a smaller, brighter, blue star engirdled by a ring of glowing hydrogen.

Image 36. Untitled. (*The Exploration of Mars*, 1956: 68).
Caption: Mars as it appears to the naked eye when seen from its outer moon Deimos.

Image 37. Untitled. (*The Exploration of Mars*, 1956: 148-149).
Caption: The ground station has been set up on Mars, and the explorers are about to investigate the vicinity of the landing site.

Image 38. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 28 and 29).
Caption: Orbital assembly of the deep-space craft, 450 miles above sea level. Cargo ship at left has brought fuel pods and extra technicians for the final check-up. At right the ion-propulsion craft is being loaded with mercury capsules. The sweep of land below shows Costa Rica to the left, and the northern end of Colombia at the lower right-hand corner. On the horizon near the center lies Florida, at the distance of 1825 miles.

Image 39. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 28 and 29).
Caption: The top stage of the deep-space craft on its way, five days after crossing the orbit of Neptune, and still accelerating. The type of propulsion mechanism required for such a mission is still to be developed. The triangular, faintly glowing fins of the ship are radiators.

Image 40. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 28 and 29).
Caption: Antares, a red supergiant as viewed from a hypothetical inhabited planet at a distance of about 3240 million miles. Like the other red-supergiant stars, Antares does have a clearly defined surface.

Image 41. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 28 and 29).
Caption: A nova's intense radiation has begun to melt the red-hot mountains of hypothetical earthlike planet. A long time before the nova explosion, the star had reached such high activity that the heat had evaporated all the seas and most of the atmosphere had escaped into space.

Image 42. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 28 and 29).
Caption: Pletone, a naked-eye star of the Pleiades cluster. This type-B star is rotating about a hundred times faster than our sun, and hence is strongly flattened. Its radiation is so intense that a hypothetical planet at an orbital distance of 93 million miles would be red-hot.

Image 43. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: Mira Ceti. The red-supergiant star Mira in the constellation Cetus (the Whale) is, like nearly all supergiants, a long-period variable. Its period is 331 days. Mira Ceti had been known for a long time before the discovery that it is the larger star of a binary, the smaller component of which is a white-dwarf star. In this painting the small star is shown is transit across the surface of Mira, as viewed from a hypothetical planet at an orbital distance of 450 million from Mira's surface, and about 50 million miles from the orbit of the small star.

Image 44. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: The binary Beta Lyrae, viewed from a hypothetical planet. The two stars are so close to each other that both components are distorted into egg

shapes by mutual gravitational attraction. There is a continuous exchange of mass. The smaller star loses mass that forms a spiral trail.

Image 45. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: RW Persel, a close binary with a short period of only 2 weeks. Both stars of this unusual binary share a common envelope of luminous gas, and the smaller component has developed a ring similar to the ones surrounding the planet Saturn. The view is from a hypothetical planet.

Image 46. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: AE Aquarii, a close binary consisting of a large type-K star (orange) and a smaller blue star. The larger star has moderate nova-like outbursts; some of the expelled matter is captured by the blue star.

Image 47. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: The binary U Sagittae, as viewed from a hypothetical planet. Like the RW Persei binary (see Plate 21), the U Sagittae system consists of two close stars that share a common envelope of a faintly glowing gas.

Image 48. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: The eclipsing binary Zeta Aurigae. The red component is a supergiant (type K-4) with a diameter of 200 million miles, while the blue-white component is a Main Sequence star (type B-8), about 3 million miles in diameter and a hundred times as luminous as our own sun. The time between eclipses is 972 days. During an eclipse the large tenuous atmosphere of the blue-white star can be observed. This view of the binary is from a hypothetical planet about 900 million miles from the red supergiant.

Image 49. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: The incredible system of Epsilon Aurigae. The main component is not visible from the earth, but in this painting it is depicted as glowing faintly at its center, which is likely to be the case. The diameter of the faint supergiant star has been estimated to be about 2300 million miles. This is so huge that if our sun were situated at the center of the star, the orbit of the planet Saturn would be located inside the star's surface. This view is from a hypothetical planet of the small bright component.

Image 50. Untitled. (*Beyond the Solar System*, 1964: insert between the pages 76 and 77).
Caption: The Milky Way galaxy as viewed from a distance of 300,000 light-years, from a hypothetical planet so located that the galaxy appears wide open. The central portion is assumed to consist mainly of Population II stars. Our solar system is located in one of the spiral arms.

(2) Nikolai Kolchitskii's works.[2]

Image 51. Untitled. (A. Sternfeld, *Polet w mirovoe prostranstvo* [Flight into Cosmic Space], 1949: 32).
Caption: Космический корабль в полёте. Его форма, необычная по сравнению с формой самолётов и земных ракет, объясняется тем, что в межпланетном пространстве сопротивление среды отсутствует и поэтому придание космическому кораблю удобообтекаемой формы является излишним. [The spacecraft during the flight. Its form, unusual in comparison with that of aircrafts or terrestrial rockets, can be explained by the fact that there is no air resistance in interplanetary space and therefore giving the spacecraft a streamlined form can be deemed superfluous.] (translated by KB)

Image 52. Untitled. (A. Sternfeld, *Polet w mirovoe prostranstvo* [Flight into Cosmic Space], 1949: 34).
Caption: Создание на космическом корабле искусственной тяжести: две части космического корабля, соединенные тросами, приводятся во вращательное движение вокруг общего центра масс. [Creating an artificial gravity in the spacecraft: the two parts of the spacecraft are connected by cables, rotationally driven around a common center of mass.] (translated by KB)

Image 53. Untitled. (A. Sternfeld, *Polet w mirovoe prostranstvo* [Flight into Cosmic Space], 1949: 45).
Caption: Казалось бы, что сделав туннель круговым, можно значительно укоротить его по сравнению с прямолинейным туннелем. Однако для

[2] All Kolchitskii's works examined in the present book are available at http://www.fandom.ru/about_fan/koltchitsky_1.htm and in the Appendix of my PhD dissertation, *Space exploration in 20th century American and Soviet literature and art* (2015), available online at the Adam Mickiewicz University Repository: https://repozytorium.amu.edu.pl/handle/10593/13887 (Copyright Disclaimer Under Section 107 of the Copyright Act 1976: The Appendix contains images collected from various online, library as well as my private resources and serves purely research and educational purposes. It falls under the fair use provisions of European and US copyright law and is not a copyright infringement.).

того чтобы перегрузка при разгоне в круговом туннеле была такой же, как в прямолинейном туннеле, круговой туннель должен быть в 12,6 раза длиннее прямолинейного. [It seems that by making a circular tunnel, you can significantly shorten it compared with a straight tunnel. However, in order to make the gravity overload during acceleration in a circular tunnel the same as in a straight tunnel, a circular tunnel must be 12,6 times longer than the straight one.] (translated by KB)

Image 54. Untitled. (A. Sternfeld, *Polet w mirovoe prostranstvo* [Flight into Cosmic Space], 1949: 85).
Caption: Медленное вращение космического корабля в нужном направлении мошно будет вызвать быстрым вращением небольшого диска в обратном направлении. [A slow rotation of the spacecraft in the right direction can be caused by a rapid rotation of a small disk in the opposite direction.] (translated by KB)

Image 55. Untitled. (A. Sternfeld, *Polet w mirovoe prostranstvo* [Flight into Cosmic Space], 1949: 106).
Caption: Примерная конструкция искусственного спутника Земли. С такого спутника космические корабли будут отправляться в межпланетное пространство. Вращение спутника вокруг своей оси будет вызывать на нём искусственную тяжесть. [An exemplary construction of the earth's artificial satellite. From such a satellite, spacecrafts will be sent into interplanetary space. The satellite rotation around its axis will create an artificial gravity.] (translated by KB)

Image 56. Untitled. (A. Sternfeld, *Polet w mirovoe prostranstvo* [Flight into Cosmic Space], 1949: 107).
Caption: Космический корабль улетает в мировое пространство с искусственного спутника Земли. [The spaceship is going out into space from the earth's satellite.] (translated by KB).

Image 57. Untitled. (A. Sternfeld, *Polet w mirovoe prostranstvo* [Flight into Cosmic Space], 1949: 121).
Caption: В момент погружения в атмосферу Земли посадочный планер отделяется от ставшего ненужным корпуса космического корабля. Отброшенный корпус, обладающий большим аэродинамическим сопротивлением, быстро раскаляется от сопротивления воздуха и сгорает подобно метеорному телу. [At the time of immersion in the Earth's atmosphere, the landing glider is separated from the now obsolete spacecraft. The spacecraft, having a strong aerodynamic resistance, is heated rapidly by air resistance and burns like a meteor.] (translated by KB)

Image 58. Untitled. (*Tekhnika molodezhi*, Apr. 1949: cover).
[No caption]. The image serves as an illustration of Dmitriev's "Puteshestvie v zavtra" [Travel to the Future]. A fragment narrating the scene: Это было весьма странное на первый взгляд сооружение. Представьте себе огромный металлический «бублик», который, вращаясь вокруг своей оси, висел рядом с нами в пространстве. В самом центре этого колоссального «бублика» — там, где пустоту издавна положено было называть «дыркой от бублика», — находилось большое шаровидное помещение. Посредством нескольких труб оно было соединено с металлическим тором — телом спутника. Со стороны, с которой мы приближались к острову, — как мне казалось, сверху,— центральный шар был накрыт большим зонтообразным куполом. Над ним острым шпилем вздымалась радиоантенна. Из нижней части центрального шара, — мне казалось, вниз, — опускалась широкая труба; на конце которой находились два металлических цилиндра, разделенных круглым экраном. Я заметил, что они медленно вращались в сторону, обратную круговому движению спутника, так что один из цилиндров постоянно находился в тени, а другой был залит ярким солнечным светом. [At first glance, it was quite a strange construction. Imagine a huge metal "donut", which rotates around its axis and hovers in space, just like us. At the heart of this colossal "donut" – whose void has been long called a "donut hole" – was a large spherical room. It was connected with the metal torus – the body of the satellite – through a pipe. From the side we approached the island – from the top, it seemed to me – the central ball was covered with a large umbrella-like canopy. A sharp spike of the radio antenna was heaving over it. From the bottom of the central ball, it seemed to me, a wide tube was released at the end of which there were two metal cylinders separated by a circular screen. I noticed that they slowly rotated in the direction opposite to the circular motion of the satellite, so that one of the cylinders was in the shadow, while the other was in the bright sunlight.] (translated by KB)

Image 59. Untitled. (*Tekhnika molodezhi*, Apr. 1949: 20).
[No caption]. The image illustrates a fragment of Dmitriev's "Puteshestvie v zavtra" [Travel to the Future], titled ГЛАВА 5. В КОТОРОЙ ЧИТАТЕЛЬ ПОСЕТИТ ОСТРОВ ИМЕНИ К. Э. ЦИОЛКОВСКОГО [Chapter 5 in which the reader will visit K. E. Tsiolkovsk's Island.]. A fragment of the story narrating the scene: Я впился глазами в черный бархат космического неба, чтобы там, среди немигающих холодных звезд и планет, увидеть новый спутник Земли, созданный руками моего народа. Наше «приземление» заняло довольно продолжительное время. И пока пилот, связавшись по радио с начальником острова и включив дополнительные сопла поворота и торможения ракетоплана, медленно выравнивал

скорость машины соответственно с движением искусственного спутника, я в окно успел подробно рассмотреть его. [I glared at the black velvet sky to get the glimpse of the Earth's new satellite, created by the hands of my people, among the cold unblinking stars and planets, to see the new moon of the Earth, created by the hands of the Soviet people. Our "landing" took quite a long time. And while the pilot communicated with the commander of the island by the radio, and, by turning on extra nozzles of turning and inhibiting the rocket plane, he slowly leveled the machine's speed at the motion of an artificial satellite, I had some time to admire the view behind the window in detail.] (translated by KB)

Image 60. Untitled. ("Astronomia sevodnia i zavtra" [Astronomy Today and Tomorrow], *Tekhnika molodezhi*, Jan. 1952: 31).
Caption: Предполагаемая космическая обсерватория будущего, находящаяся вблизи искусственного спутника. Здесь, в мире без тяжести, возможно сооружение огромных рефлекторов, которые покажут астрономам мельчайшие подробности поверхности планет нашей солнечной системы. В этих идеальных условиях пелена воздуха не затуманит, не исказит изображения. Такой рефлектор изображен справа. Слева – в прозрачном шаре ученые проводят исследования спектров далеких звезд. В третьей части лаборатории, вверху, установлены гигантские радиотелескопы. Сообщение между отдельными частями космического острова поддерживается с помощью прозрачных одноместных шаров, снабженных реактивными двигателями. [An estimated future space observatory, located near the earth's artificial satellite. Here, in the world without gravity, it is possible to construct huge reflectors that show astronomers the smallest details of the surface of solar system planets. Under these ideal conditions, the air does not blur or distort the image. This kind of reflector is shown on the right. On the left there is a transparent bowl where scientists are studying the spectra of distant stars. In the third part of the lab, at the top, giant radio telescopes are installed. Communication between different parts of this space island is supported by transparent single balls fitted with jet engines.] (translated by KB)

Image 61. Untitled. ("Na maloi lunie" [On a Small Moon], *Ogonek* [Little Flame], 16 Mar. 1952: 29).
[No caption]. The image illustrates a fragment of Shternfeld's "Na maloi lunie" [On a Small Moon] [Travel to the Future]: Человек невесом и за бортом нашего корабля. Он, как и космический остров, мчится по замкнутому кругу и не может упасть вниз. Каждый знает, что если быстро вращать ведро с водой, то она не выливается и тогда, когда ведро переворачивают: центробежная сила уравновешивает силу земного

притяжения. [Man is weightless and is outside our spaceship. He, like a cosmic island, is running in a closed circle and cannot fall down. Everyone knows that if one rapidly rotates a bucket of water, it does not come out when the bucket upside down: the centrifugal force balances the force of gravity.] (translated by KB)

Image 62. Untitled. ("Na maloi lunie" [On a Small Moon], *Ogonek* [Little Flame], 16 Mar. 1952: 30).
[No caption]. The image illustrates a fragment of Shternfeld's "Na maloi lunie" [On a Small Moon] [Travel to the Future]: В этот же день из Калуги поднялась ракета, унося на искусственный спутник новых людей. Отдохнув в привычной земной обстановке, мы вернемся на космический остров, чтобы отправиться оттуда, как от промежуточной станции, на Луну. [On the same day the rocket was launched from Kaluga, taking the new crew to an artificial satellite. After resting in the earth's familiar surroundings, we will return to the cosmic island in order to set off to the moon from there.] (translated by KB)

Image 63. Untitled. (Buianov's "Energiia atomnogo iadra" [Energy of Atom's Kernel], *Tekhnika molodezhi*, Mar. 1952: 33).
Caption: Величайшее достижение науки – атомную энергию – капиталисты запрятали в атомную бомбу, которой грозят всему прогрессивному человечеству. Их художники изощряются в изображении картин разрушений которые может принести атомное оружие. [Capitalists hid the greatest achievement of science – nuclear power – in the atomic bomb that threatens the whole humanity. Their artists excel at depicting the destruction that can be brought by nuclear weapons.] (translated by KB)

Image 64. Untitled. ("LK-3 letit na lunu!" [LK-3 Flies to the Moon!] (*Ogonek* [Little Flame], 16 Nov. 1952: 22).
[No caption]. The image illustrates a fragment of Shternfeld's "LK-3 letit na lunu" [LK-3 Flies to the Moon!]: 11 мая 19... года. 22 часа 12 минут по московскому времени. Кабина озаряется красноватым отблеском вспышки ракетных двигателей. Какая-то доля секунды, и наш «ЛК-3» плавно отделяется от Малой Луны — спутника Земли, созданного мыслью и руками советского человека, откуда межпланетные корабли отправляются в космический полет. [11 May 19 .... 10:12 p.m. of Moscow time. The cabin is illuminated by the flash reflection of the rocket engines. Within seconds, our "LK-3" is smoothly separated from the Little Moon – the Earth's satellite, created by thoughts and hands of Soviet man, who sends interplanetary spaceships into space.] (translated by KB)

Image 65. Untitled. ("LK-3 letit na lunu!" [LK-3 Flies to the Moon!] (*Ogonek* [Little Flame], 16 Nov. 1952: 23).
[No caption]. The image illustrates a fragment of Shternfeld's "LK-3 letit na lunu!" [LK-3 Flies to the Moon!]: 17 мая. 14 часов 25 минут. Вспышка ракетных двигателей. «ЛК-3» быстро катится по каменистой пустыне. Секунда, другая, и наши гусеницы отрываются от Луны. Они больше не нужны, и мы сбрасываем их. Горы, скалы, светлые лучи, цирки, расщелины, кратеры с нарастающей скоростью набегают друг на друга и наконец вовсе скрываются из глаз. Огромный уменьшающийся диск повис над нами в пространстве. Прощай, Луна! Впрочем, нет: до скорого свидания! [17 May. 2:25 p.m.. The start of rocket engines. "LK-3" is rolling fast on the stony desert. Within seconds, our tracks are detached from the Moon. They are no longer needed, and we drop them. As we increase speed, the mountains, rocks, rays of light, cirque glacier, crevices, craters blur with each other and finally are all hidden from our eyes. A huge disc is getting smaller and smaller and is hovering over us in space. Farewell, the Moon! Or rather, see you soon!

Image 66. Untitled. (V. Zakharchenko, *Puteshestvie v zavtra* [Travel into Tomorrow], 1952: cover).
[No caption]. A fragment which might narrate the scene: На зеленовато-сером экране радиолокатора я увидел маленькое, ярко светящееся колечко с небольшим шариком посередине. Это был искусственный спутник Земли — маленький островок, созданный советскими людьми в межпланетном пространстве. [On the greenish-gray radar screen, I saw a small, brightly glowing ring with a tiny ball in the middle. It was a man-made satellite – a small island created by the Soviet people in the interplanetary space.] (translated by KB)

Image 67. Untitled. (V. Zakharchenko, *Puteshestvie v zavtra* [Travel into Tomorrow], 1952).
Caption: Над Землёй двигался новый искусственный спутник. [A new artificial satellite has moved beyond the earth.] (translated by KB)

Image 68. Untitled. (*Tekhnika molodezhi*, Mar. 1954: cover).
Fragment of Khvastunov's "K solntsu" narrating the scene: Сквозь ряд экранов, пропускавших только лучи очень узкого участка видимого спектра, человек впервые так близко лицом к лицу увидел пылающее гневное Солнце – с черными рябинками пятен, с косматыми завитками протуберанцев, в сверкающем блеске его великолепной короны. Словно разогнавшийся при падении снаряд, пролетел космический корабль мимо центрального светила и, двигаясь по другой ветви эллипса, начал

удаляться от него. Задание было выполнено. Земля уже ждала своих отважных скитальцев, с помощью науки, с помощью знаний проникших в запретные до этого области вселенной и возвращающихся назад победителями. [For the first time ever, through a series of screens which allow only a very narrow portion of the visible spectrum, a man comes face to face with a flaming sun – with the black sunspots and shaggy, curly solar prominences glittering in the splendor of its magnificent corona. Like a falling speeding projectile, a spaceship flew by the central light, and having moved to another branch of the ellipse, began to move away from it. The mission has been accomplished. The earth was already waiting for its brave travelers who, by means of science and knowledge, managed to penetrate the unknown areas of space science and come back as winners.] (translated by KB)

Image 69. Untitled. (V. Fesenkov, "Zvezdnye miry" [The Worlds of Stars], *Tekhnika molodezhi*, Mar. 1954: 7).
Caption: На рисунке в заголовке художник Н. Колчитский попытался узобразить как выглядит двойная звезда с одной из планет, входящух в ее систему. [In the title picture, the artist N. Kolchitskii attempted to envision a double star with one of the planets from the solar system.] (translated by KB)

Image 70. Untitled. (K. Staniukovich, "Priroda tiagotenia" [Nature of the Gravitational Pull], *Tekhnika molodezi*, Dec. 1954: 3).
[No caption]. Although the image is a clear reference to Staniukovich's "Priroda tiagotenia" [Nature of the Gravitational Pull], there is no direct mention of the astronauts/cosmonauts in the earth's orbit in the article.

Image 71. Untitled. (*Tekhnika molodezi*, May 1955: cover).
[No caption]. The image illustrates Shternfeld's "Orbitalnye korabli" [Orbital Spaceships]. A fragment of the story narrating the scene: Огромная ракета отрывается от Земли, в несколько мгновений пересекает атмосферу и с громадной скоростью уносится в бесконечную даль межпланетного пространства. Смелые астронавты отправились в очередной космический рейс. Их цель — далекая Венера, о которой столько споров ведут уже несколько поколений астрономов. Споры будут разрешены, когда корабль приблизится к загадочной планете. [A huge rocket, detached from the earth, crosses the atmosphere with a tremendous speed and goes further into the interplanetary space. Courageous astronauts have set off on their next journey. Their goal is to reach a distant Venus, about which there has been much controversy for several generations of astronomers. Disputes will be resolved when the spaceship gets closer to the mysterious planet.] (translated by KB)

Image 72. Untitled. (Gurevich's "Lunnye budni" [Lunar Storms], *Tekhnika molodezhi*, Oct. 1955: 31).
[No caption]. A fragment which might illustrate the scene: Но жить на Луне очень скучно, куда хуже, чем в Арктике. Сидишь взаперти в герметическом домике, внизу четыре комнаты, наверху под куполом склад. Наружу выходишь только в скафандре, а выйдешь, не на что смотреть — пыль и камень, камень и пыль. Как вам сказать, на что похоже? Видите за рекой у электростанции горы шлака? Вот и представьте: таким шлаком засыпано все кругом на тысячи километров. Горизонт на Луне короткий, все время кажется, что ты на холме, а дальше обрыв. Вот стоишь на этом пятачке, глядишь на звезды. Тишина мертвая, уши как будто ватой заткнуты. Днем жара, хоть блины пеки в пыли, ночью — морозище. Небо черное днем и ночью, и на нем Земля огромная, голубая, куда ярче, чем Луна в Кременье. Глянешь на нее, и сердце щемит. [But living on the moon is very boring, much worse than living in the Arctic. You live in an airtight house with four rooms downstairs and the warehouse upstairs under the dome. You go outside only in the spacesuit and when go out there is not much to look at – only the dust and stones. I am just wondering what to compare it with? Can you see the mountains of slag behind the river? So now imagine that thousands of kilometers are covered with this slag. The horizon on the Moon is short, so it seems to you that you stand at the edge of the hill all the time. Here you stand there, looking at the stars. There is a dead silence and your ears seem to be plugged with cotton wool. There is the heat in the afternoon, where you can fry pancakes in the dust, and at night it is freezing. The sky is black, day and night, and there is a huge blue earth, much brighter than the moon in Kremene. When you look at it, your heart hurts.] (translated by KB)

Image 73. Untitled. (M. Vasilev, *Puteshestviia w kosmos* [Travel to Space], 1955: 1).
Caption: Словно перечеркнутый тонким зигзагом кольца висит в небе огромный Сатурн, окруженный узкими серпами своих многочисленных спутников. [Like a ring crossed by a thin zigzag, a huge Saturn is hanging in the sky, surrounded by narrow sickles of his numerous satellites.] (translated by KB)

Image 74. Untitled. (M. Vasilev, *Puteshestviia w kosmos* [Travel to Space], 1955: 14).
Caption: На мертвые камни Луны ступили первые астронавты. Развернуты надувные дома, соединенные надувными же коридорами из прозрачной пластмассы. Гелиоэлектростанция дает первый ток, установлена прочная радиосвязь с Землей. Наш вечный спутник стал обитаемым. [The astronauts first set foot on lifeless moon rocks. The

inflatable houses have been deployed and connected by corridors made of transparent plastic. The solar power plant gives the first current which establishes contact with the Earth on radio waves. Our eternal satellite has finally become habitable.] (translated by KB).

Image 75. Untitled. (Khlebtsevich, "Zemlia-Mars" [Earth-Mars], *Iunyi tekhnik* [Young Technician], Jan. 1956: 36).
[No caption]. A fragment might illustrate the scene: Значит, жизнь на Марсе возможна? «Да!» — отвечают специалисты. Но какие формы жизни, кроме растительной, могут существовать на Марсе? Имеется ли на нем животный мир? Может быть, там живут и мыслящие, разумные существа? Это спорные вопросы. Дать правильные ответы на них сейчас невозможно. Ведь даже в мощный современный телескоп из-за помех, создаваемых атмосферой, астрономы во время противостояний видит Марс примерно в 1000 раз ближе, то-есть как бы с расстояния 57 тыс. км. С этого расстояния можно увидеть лишь объекты размером в несколько сот километров. Где уж тут рассмотреть, обитаема ли планета! [So, is life on Mars possible? "Yes!" – the experts answer. But what kind of alien life forms, except plants, may exist on Mars? Does the animal world exist there? Maybe there some intelligent beings live there? These are controversial questions. It is now impossible to give the right answers to all of them. Even a modern and powerful telescope, due to interference from the atmosphere, allows astronomers to see Mars approximately 1000 times closer, that is, from a distance of 57 thousand kilometers. From this distance, you can see only objects of the size of a few hundred kilometers, let alone to consider whether the planet is inhabited!]

Image 76. Untitled. (Khlebtsevich, "Put na lunu otkryt" [Road to the Moon is Open], *Tekhnika molodezhi*, May 1956: 32).
A fragment narrating the scene: Каждый год наука открывает новые тайны природы и ставит их на службу человеку. 1956 год является годом, когда впервые одновременно в районах северного и южного полюсов Земли действуют постоянные научные станции. Хотя эти районы никогда не обживались человеком, интересы науки и практики потребовали их изучения. В 1957-1958 годах в околоземном пространстве начнут стремительный бег автоматические спутники Земли. Недалек тот день, когда.... [Every year science discovers the new secrets of nature which are put at the service of man. 1956 is the year when the first permanent research stations are working simultaneously in the areas of the Earth's north and south poles. Although these areas have never been inhabited by humans, they have been studied in the interests of science and practice. Between 1957 and 1958, in the Earth's orbit the automatic satellites will be installed. The day is coming when...] (translated by KB)

Image 77. Untitled. (Gadomskii, “Fotonnaia raketa” [Photonic Rocket], *Tekhnika molodezhi*, Jul. 1957: 33).
A fragment narrating the scene: Давно уже никто не сомневается в возможности межпланетных полетов. Но ракета, в которой сжигается хими-ческое горючее, не сможет быть ис-пользована астронавтами. В лучшем случае она позволит поднять на высоту более 1 000 км искусственный спутник Земли, весящий около 50 кг. Скорость ракеты зависит от скорости истечения газа из сопла. При использо-вании химического горючего может быть достигнута скорость истечения до 3,5 км в секунду. Атомная энергия позволит повысить эту скорость до десятков тысяч километров в секунду. Фотонная ракета будет двигаться со скоростью, близкой к скорости све-та (около 300 тыс. км в секунду). Дви-гателем послужит предложенная Зенгером ядерная лампа. [For a long time no one has questioned the possibility of interplanetary flight. However, the rocket, which burns chemical fuel cannot be used by astronauts. At best, it will raise to the height of more than 1000 km of the Earth’s artificial satellite, weighing about 50 kg. The speed of the rocket depends on the velocity of the gas from the nozzle. When using a chemical fuel the speed up to 3.5 kilometers per second can be achieved. Nuclear power will increase this speed to tens of thousands kilometers per second. The photonic rocket will travel at speeds close to the speed of light (about 300 thousand kilometers per second). A nuclear lamp, proposed by Zenger, will serve as the rocket’s engine.] (translated by KB)

Image 78. Untitled. (*Iunyi tekhnik* [Young Technician], Nov. 1957: 93).
[No caption]. The illustration was published as the back cover of the issue as a reference to Gurevith’s “Prokhozhdenie Nemezidy” [The Passage of Nemesis]. The following fragment might illustrate the scene: Закройте глаза на миг, представьте себе чужую планету. День или ночь, не разберешь. Слепящее Солнце заливает светом снежную равнину. Искрятся жесткие сухие снежинки, чуть вьется пар над прозрачными лужами, застоявшимися между сугробами. От сверкающей белизны больно глазам... а над ней угольно-черное небо с пылью звезд, прозрачная кисея Млечного Пути и на фоне его одна звезда всех ярче – не блестка, не светлячок, а массивный брильянт на бисерном пологе неба. [Close your eyes and imagine an alien planet. One cannot tell between day and night. The blinding sunlight at the snowy plain. The hard dry snowflakes sparkle and some vapour hovers above transparent puddles between the snowdrifts. Our eyes hurt from the sparkling white ... above that the pitch black sky filled with the dust of stars, a transparent muslin of the Milky Way, and amid all these stars, one was brighter – not a spangle or a glow, but a bright diamond on the beaded canopy of the sky.] (translated by KB)

Image 79. Untitled. (M. Vasilev, *Puteshestviia w kosmos* [Travel to Space], 1958: 4).
[No caption]. A fragment which might illustrate the scene: Конечно, космические корабли будут совершенствоваться. Место двигателя, работающего на химическом горючем, займет двигатель, работающий на энергии расщепленного атома. И жалкими, неудобными, тихоходными покажутся первые космические корабли, о которых мы сейчас так мечтаем!vКогда на космическом корабле будет установлен атомный реактивный двигатель, резко изменятся и межпланетные маршруты. Не нужно будет дрожать в полете над каждой крохой энергии, над каждым килограммом горючего. В несколько раз увеличатся скорости космических кораблей, как вдвое увеличились скорости самолетов при переходе на реактивный двигатель. С нескольких месяцев до нескольких недель сократятся сроки перелетов. И не эллиптические, но более короткие – параболические, а в некоторых случаях и прямые траектории станут обычными для межпланетных перелетов. Но это уже не завтрашний, а послезавтрашний день астронавтической техники. [Of course, the spacecrafts will be improved. The engine that uses a chemical fuel will be replaced with the engine that uses the energy of a disintegrated atom. And the first spaceships that we currently dream of seem to be miserable, uncomfortable and slow. When a nuclear jet engine will be installed in the spacecraft, the interplanetary routes will quickly change. Travelers will not have to tremble over a single particle of energy or every kilogram of fuel during spaceflight. The speed of the spacecraft will increase a few times similarly to the speed of the aircraft which will double after the installation of a jet engine. The length of the flight of up to a few months will be reduced to that of a few weeks. And the trajectory will not be elliptic, but shorter – parabolic, and in some cases even direct trajectories will become the norm for interplanetary missions. But the vision is not for tomorrow, but the day after tomorrow of astronautical engineering.] (translated by KB)

Image 80. Untitled. (M. Vasilev, *Puteshestviia w kosmos* [Travel to Space], 1958: 13).
Caption: Несколько минут работы двигателя – и корабль ложится на круговую орбиту... [A few minutes of the engine's working and the spaceship goes into a circular orbit....] (translated by KB)

Image 81. Untitled. (M. Vasilev, *Puteshestviia w kosmos* [Travel to Space], 1958: 14).
Caption: Мы на Плутоне. Солнце светит нам в спину, и лёгкая тень от корпуса гигантского корабля лежит на бесконечной сумрачной равнине, как дорога в неизвестное. Здесь границы солнечной системы. За ней, та,

дальше, распростёрся бескрайний океан космического пространства. Но и его чёрную бездну пересекут когда-нибудь посланцы Земли, отправившиеся на разведку соседних звёзд. [We are standing on Pluto. The sun is shining at our backs and our huge spacecraft casts a subtle shadow on the endless gloomy plain like the journey into the unknown. The end of the solar system is somewhere near us. Further, there is only a vast ocean of space. However, this black abyss is occasionally crossed by messengers from the Earth who have set off to explore the nearby stars.] (translated by KB)

Image 82. Untitled. (*Detskaia entsiklopedia* [Children's Encyclopedia], 1959).
Caption: На спутнике Юпитера. [On Jupiter's moon.] (translated by KB)

Image 83. Untitled. (*Detskaia entsiklopedia* [Children's Encyclopedia], 1959: 457).
Caption: Автоматическая танкетка с телевизионным передатчиком на Луне. [Automatic tankette with a television transmitter on the Moon.] (translated by KB)

Image 84. Untitled. (*Detskaia entsiklopedia* [Children's Encyclopedia], 1959: 458).
Caption: Первые люди на Луне. [The first men on the moon.] (translated by KB)

Image 85. Untitled. (*Detskaia entsiklopedia* [Children's Encyclopedia], 1959).
Caption: Атомная космическая ракета в полёте. [A nuclear space rocket in flight.] (translated by KB)

Image 86. Untitled. (*Detskaia entsiklopedia* [Children's Encyclopedia], 1959).
Caption: Вид Земли с Луны. [The view of the earth from the moon.] (translated by KB)

Image 87. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Впервые на Марсе [The first men on Mars.] (translated by KB)

Image 88. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Строительство искусственного спутника Земли. [Construction of the Earth's artificial satellite.]

Image 89. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Заправка межпланетного корабля на спутнике. [Fueling an interplanetary spaceship on the satellite.] (translated by KB)

Image 90. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Марс в небе его спутника Деймоса. [Mars as seen from its moon, Deimos.] (translated by KB)

Image 91. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Межпланетные путешественники на спутнике Юпитера Европе. [Interplanetary travelers on Jupiter's moon, Europa.] (translated by KB)

Image 92. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Вид Сатурна с его спутника Тефии. [The view of Saturn from its moon, Tethys.] (translated by KB)

Image 93. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: «Межпланетный поселок» на высоте 1670 километров. ["Interplanetary village" at the altitude of 1,670 kilometers.] (translated by KB)

Image 94. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Межпланетный корабль идет на посадку. [Interplanetary spaceship is landing.] (translated by KB)

Image 95. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Комета Галлея пересекает орбиту Земли. На переднем плане — Луна. [Halley's comet crosses the Earth's orbit. The Moon can be seen in the foreground.] (translated by KB)

Image 96. Untitled. (K. Gilzin, *Puteshestvie k dalekim miram* [Travel to Distant Worlds], 1960).
Caption: Межпланетный корабль прибыл на лунную базу. [Interplanetary spaceship has arrived to the lunar base.] (translated by KB)

Image 97. Untitled. (S. Valgard, *O zemle i vselennoi* [About the Earth and the Universe], 1962).
Caption: Голубое солнце [The blue sun.] (translated by KB)

Image 98. Untitled. (S. Valgard, *O zemle i vselennoi* [About the Earth and the Universe], 1962).
Caption: Красное солнце. [The red sun.] (translated by KB)

Image 99. Untitled. (S. Valgard, *O zemle i vselennoi* [About the Earth and the Universe], 1962).
Caption: Мир с двумя солнцами. [The world of two suns.] (translated by KB)

Image 100. Untitled. (S. Valgard, *O zemle i vselennoi* [About the Earth and the Universe], 1962).
Caption: Стареющее солнце. [The old sun.] (translated by KB)

(3) Robert McCall's works.[3]

Image 101. *Sun-driven Regatta*. (*Life*, 21 Apr. 1961: 48-49).
Caption: Like the wind, the sun is a source of power for travel. These huge solar sails made of thin aluminized plastic would be pushed through space by the steady, gentle force of light emanating from the sun. They could be rolled up in a ball for launching into solar orbit, then spread and set adrift with crews manning capsules fastened to each corner. Rockets mounted on capsules would guide the sail by twisting and turning it so it could tack like a sailboat in the wind. Here Artist McCall shows a spaceship hovering nearby as one crew relieves another and other space-yachts race onward over the moon (left) and earth.

Image 102. *An Aerospace Cop to Help Police the Beat*. (*Life*, 21 Apr. 1961: 50-51).
Caption: As vehicles of all kinds are spewed into space, the problem of policing the traffic will arise. Some of the objects will be harmless derelicts whose only crime is that they are blocking the road. Others, like the cluster of casings show drifting past earth (upper right) may turn out to be military platforms orbited by an enemy to release bombs on command. The U.S. must be prepared to look them all over from maneuverable interceptors, like this one, equipped with sensing devices to detect dangerous weapons and armed with rockets to destroy the offenders.

[3] The majority of McCall's works are available at http://www.mccallstudios.com/collections/. All artist's works examined in the present book can be found in the Appendix of my PhD dissertation, *Space exploration in 20th century American and Soviet literature and art* (2015), available online at the Adam Mickiewicz University Repository: https://repozytorium.amu.edu.pl/handle/10593/13887 (Copyright Disclaimer Under Section 107 of the Copyright Act 1976: The Appendix contains images collected from various online, library as well as my private resources and serves purely research and educational purposes. It falls under the fair use provisions of European and US copyright law and is not a copyright infringement.).

Image 103. *A Gigantic Atom-powered, Bomb-dropping "Schmoo"*. (*Life*, 21 Apr. 1961: 52).
Caption: The huge contraption above – which is nicknamed the "Schmoo" because of its resemblances to Al Capp's comic-strip animal – would propel itself through space by the intermittent explosion of small atomic charges inside its spherical chamber. A jet of water injected into the chamber forms a hot gas which helps push the ship forward and leaves the trail of puffs like those behind the Schoo passing the moon at the bottom of the picture. The payload of this craft would be tremendous and would enable it to replace a whole fleet of present-day SAC bombers. The crew rides up front in the triangular -shaped wing which can detach and return to earth, leaving the Schoo floating around the orbit to wait for a new nose and a fresh crew.

Image 104. *Exploring on Mars, half a year from home*. (*Life*, 2 Oct. 1964: 80-81).
Caption: Within the next few weeks NASA plans to launch two photoreconnaissance vehicles on a trajectory that will take them close to Mars eight weeks later. Hopefully they will send back data indicating that a manned flight to the planet would be feasible, perhaps within the next two decades. When and if men do attempt the trip, they may aim for the edge of one of the vast flat desert areas believed to exist on Mars. In this painting the Astronauts – wearing suits designed for a landing on the moon – have established a Mars base camp. They have set up inflatable igloo-shaped shelters (lower left and right) with materials brought in their capsule, and they communicate with earth on radio waves beamed from parabolic antennas. Gas jets strapped to their backs help them get around.

Image 105. *2001*, 1967 (R. McCall, *The Art of Robert McCall*, 1992: 35).
Caption: A space plane launches from a half-completed space station, in McCall's classic poster art for the 1968 MGM film *2001: A Space Odyssey*. The image is not only a startlingly accurate depiction of the future of space travel, but a powerful symbol of hope, a visual affirmation that humanity has the resource and ingenuity to prosper and thrive in the century to come.

Image 106. Theatrical release poster for Stanley Kubrick's *2001: A Space Odyssey* (1968).
Caption from Asimov and McCall's *Our World in Space* (1974: 96) accompanying the image: Exploration continues: astronauts in the foreground on a surveying mission. On the lunar surface is a very advanced circular city; the spaceship above it is bringing passengers to land at the lunar city.

Image 107. *Astronaut Edward H. White II. First American to Walk in Space*, 1970. (I. Asimov and R. McCall, *Our World in Space*, 1974: 1).
Caption: Astronaut firing his maneuvering unit, with space station and shuttlecraft below.

Image 108. *International Space Station, 21st Century*, 1973 (R. McCall, *The Art of Robert McCall*, 1992: 63).
Caption: By the middle of the twenty-first century massive space stations such as this docking and repair station may be deployed in orbit high above the Earth. Experts in space development believe that full utilization of the resources of space will require a partnership between the world's governments and the private sector. Though the financial risks are great, the rewards will be far greater: unlimited solar energy and an abundance of mineral wealth and organic compounds. Even the adverse conditions of space, such as radiation, lack of atmosphere, near vacuum, and weightlessness, provide opportunities for scientific research and industrial use.

Image 109. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 10).
Caption: Lunar survey system. The astronaut uses a hypothetical advanced surveyor's instrument.

Image 110. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 13).
Caption: Astronaut entering recovery port of a space station.

Image 111. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 16).
Caption: Space station in Earth orbit, perhaps a hundred years hence. The transparent hemisphere shelters a nuclear power facility, an observation and control is at right, and inhabited maneuverable spheres are in left background.

Image 112. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 33).
Caption: The lunar lander Eagle touches down on the surface of the Moon: the first landing. A cutaway view showing astronauts Armstrong and Aldrin at the controls, and to the left the earlier stages in the operation – the lunar lander separating from the command module and the lander descending.

Image 113. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 34-35).
Caption: The first men on the Moon: Neil Armstrong and Edwin E. Aldrin, Jr., July 20, 1969.

Image 114. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 38).
Caption: Skylab – frustration, suspense, and Yankee ingenuity. The first orbiting space laboratory was scheduled for an 8-month mission, manned successively by three crews of three. One of its primary goals was to test the effects on the human body of prolonged living and working in a weightless environment. During Skylab's launch on May, 14,1973, a thermal shield was torn away, taking with it one of the main solar panels and jamming the other. The resulting scorching temperatures inside Skylab and severe loss of power seemed to doom the mission, but a series of inventive – if dangerous – operations saved it. Astronauts Conrad and Kerwin took a space walk to free the jammed solar panel. The painting shows Skylab after this rescue operation.

Image 115. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 39).
Caption: The command module that brought the crew up to the unmanned lab is shown docked to its nose. The four windmill-like solar wings are mounted on Skylab's complex telescope, which was used to make extensive, and extraordinarily significant, observations of the Sun.

Image 116. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 39).
Caption: The astronauts float about their tasks inside Skylab. In addition to the all-important biomedical experiments, the crew undertook extensive Earth resource studies and mapping operations, and conducted tests on metals in weightlessness that might someday lead to space manufacture.

Image 117. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 40).
Caption: Skylab crewman testing astronaut maneuvering unit. (The unit was tested inside Skylab, although it is intended for exterior use; courtesy of artist's license, it is shown that way here.) At right is the Apollo telescope mount surrounded by the four solar wings that were the principal source of solar power for Skylab before the crippled panel was deployed.

Image 118. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 61).
Caption: The orbiter as it separates from the booster – in this advanced concept the booster is manned also and will return to its launch base to be used over and over again.

Image 119. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 64).
Caption: A shuttle in Earth orbit deploying its payload. The cargo has its own little thrusters for controlling attitude; these are operated by the astronaut at its right working at an external control panel. The tethers at the top of the painting extend from a space station that uses the shuttle system to replenish supplies.

Image 120. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 64).
Caption: Space shuttles at work. In the background a space station cluster extends its manipulating arms to assist a shuttlecraft in docking.

Image 121. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 66).
Caption: Repairman in space. An astronaut tethered to a two-man spacecraft designed for this kind maintenance works on the antenna from an orbiting satellite.

Image 122. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 68).
Caption: Inside the cockpit of a shuttlecraft, with the pilot and co-pilot preparing for docking with a space station.

Image 123. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 68).
Caption: The shuttlecraft docked with the station – in this case a top docking, but a nose docking is also possible. Two other shuttlecraft are seen, each of a slightly different configuration, since this scene looks forward to a time when shuttles, like aircraft today, will be specially designed according to their functions.

Image 124. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 70-71).
Caption: Small space station in orbit. Four solar arrays are deployed to provide power for the station, and below one of them is a maneuverable scientific instrument capsule. On the top of the station is a high-gain antenna to communicate with Earth, and other communication and navigations antennas. There are four docking ports around the circumference at top and another four at bottom; a shuttlecraft is about to dock at the one seen below. The cutaway shows the living and working quarters of the crew; a central core connects the levels. In the lowest section (which has sleeping quarters at left) astronauts suited up for departure prepare to pass through the air lock and enter the shuttle, which will deposit the replacement crew and take the old crew back to Earth.

Image 125. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 89).
Caption: Rendezvous in lunar orbit resupplies a moon base – the glowing cross of lights at lower right. At the far end of a nuclear ferry used to shuttle men and supplies from Earth orbit to lunar orbit, a stumpy “space tug” grasps cargo containers on its top, then descends to the base to unload and return. Sunlight glints on a solar panel of a space station as astronauts tethered to it maneuver by individual rocket packs. All three crafts are in synchronous orbit above the Moon base.

Image 126. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 93).
Caption: Three types of lunar vehicles. In the foreground a one-am flying vehicle with an antenna, a rocket system for forward thrust mounted aft, and a gimbaled rocket engine underneath. Right is a land rover with a solar power for collecting energy from the Sun and a high-gain antenna for communication with the Earth. Flying in the distance is a lunar bus, a vehicle designed for long-distance travel and capable of carrying 10 to 15 passengers.

Image 127. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 113).
Caption: Some time in the mid 1970s: The Viking spacecraft at rest on the surface of Mars. This unmanned mission scheduled for 1976 will obtain vital data and perhaps give some answer to centuries of speculation about the possibility of life on the red planet. The extended arm of the lander is scooping up a sample of Martian soil for analysis, while the television cameras in the yellow-topped poles swing around to scan the landscape. The data and pictures will be transmitted back to Earth by means of the mother craft (upper left).

Image 128. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 114).
Caption: The first manned mission to Mars, perhaps in the 1990s. Inside a space station in orbit two scientists observe the launch of the mission. The two spacecraft were assembled in Earth orbit and are now being simultaneously launched for the planet Mars. The outer boosters craft reaches the vicinity of the planet. There it might be used and adjust the orbit, and later it will be fired for the return journey. The nuclear-powered ships, each manned by a crew of six, will travel as a pair for safety's sake. Each is capable of accommodating the crew of the other in the event of a breakdown.

Image 129. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 118).
Caption: A more advanced Mars base, perhaps early in the 19th century. A specialized Mars lander with an astronomical observatory on top is in the foreground; four other landers have opened their hatches and unloaded equipment – including some for the mining operation taking place at night. In the distance another Mars lander is about to touch down.

Image 130. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 120).
Caption: Spaceport, 21st century. Eventually space facilities of this type may serve as way stations for interplanetary travelers, while also acting as orbiting scientific bases, rescue areas, weather stations – even space factories for the

manufacture of sophisticated goods that could be produced only in the vacuum and zero gravity in space. The illuminated portal is the launch deck, where spacecraft can discharge passengers and cargo and be launched back into space to continue their journeys to the Moon, the planets, or to return to Earth. This large station would be assembled in space from prefabricated geodesic elements.

Image 131. Untitled. (I. Asimov and R. McCall, *Our World in Space*, 1974: 147).
Caption: Voyage to Jupiter, a scene from the film *2001: A Space Odyssey*. An astronaut (just visible through the window) maneuvers his one-made pod for some exterior task, while the huge spaceship "Discovery" drifts toward Jupiter.

Image 132. *Apollo-Soyuz Linkup*, 1974 (R. McCall, *The Art of Robert McCall*, 1992: 12).
Caption: During a thaw in the Cold War, Earth's two greatest political powers worked together to explore the heavens, as a U.S. Apollo orbiter and a Soviet Soyuz spacecraft joined in high orbit over the Earth on June 17, 1975. The sun gleaming behind the two craft signals the promise of such cooperation for all humanity.

Image 133. *Starfarers*, 1979 (R. McCall, *The Art of Robert McCall*, 1992: 112-113).
Caption: The realms we discover in our exploration of the cosmos will be filled with scenes of stunning beauty and awesome power. This impressionistic starscape depicts a comet streaking toward a rift in the fabric of space beyond a cracked and desolate alien world.

Image 134. *Alien Intellect*, 1979 (R. McCall, *The Art of Robert McCall*, 1992: 118-119).
Caption: Probability and the universal laws of biology and physics suggest that life exists throughout the universe. These concept drawings for *Star Trek: The Motion Picture* depict a bizarre alien "creature", part machine and part organism, moving through the vast depths of space.

Image 135. *Fantasy*, 1981 (R. McCall, *The Art of Robert McCall*, 1992: 117).
Caption: The distances of interstellar space are vast beyond imagining. To cross them will require either generations of pioneers willing to live out the space of their lives in miniature worlds in space, or new discoveries that will allow us to bend space and time to our will. But the day will one day come when we meet other intelligent beings for the first time. Here, a colossal interplanetary craft is

suspended over a distant world. The city in the foreground may have been built by our descendents, or we may be the star voyagers who are encouraging a new race for the first time. When that encounter comes at last, it will be the most profound event in all of human history.

Image 136. *Rendezvous*, 1986 (R. McCall, *The Art of Robert McCall*, 1992: 37).
Caption: McCall updated the theme of his famous 2001 painting, nearly two decades later, for a report of the National Commission on Space. Here, an aerospace place approaches a spaceport in Earth orbit. In the upper right, a lunar transport vehicle is returning from the moon. NASA projects that the first generation of space stations will be operational within a decade.

Image 137. *Spaceport*, 1986 (R. McCall, *The Art of Robert McCall*, 1992: 41).
Caption: Between the orbits of the Earth and the moon are areas called "libration points" or "Lagrange points", where the gravitational pulls of the two worlds cancel each other out. Here, spacecraft require less energy to construct and launch. In this painting, astronauts service a transfer vehicle bound for Mars at a spaceport located at Libration Point 1.

Image 138. *Mars Transfer Vehicle*, 1986 (R. McCall, *The Art of Robert McCall*, 1992: 51).
Caption: An interplanetary transfer vehicle leaves Earth orbit for Mars. Prepared for NASA, this painting shows a new type of spacecraft that will make the journey to other worlds in the second decade of the next century.

Image 139. *Pioneering the Space Frontier*, 1986 (R. McCall, *The Art of Robert McCall*, 1992: 58-59).
Caption: A Mars colonist salutes a landing craft returning to space from a large Mars base, circa AD 2025. The bases may be supplied by Earth-Mars shuttles that cycle in permanent orbits between the two worlds, bringing vital materials and relief crews every few months.

Image 140. *Exploring the Asteroids*, 1986 (R. McCall, *The Art of Robert McCall*, 1992: 61).
Caption: Between the orbits of Mars and Jupiter lies the asteroid belt. Thousands of large asteroids, and hundreds of millions of smaller bodies, lie within the belt. Because the asteroids are rich in metals, they may have become a source of elements used in the construction of interplanetary spacecraft, as well as materials needed to sustain permanent colonies in deep space. From the asteroids, missions can be launched to the large moons orbiting Jupiter, Saturn, and the other outer planets.

Image 141. *Tomorrow's Weapons*, 1987 (R. McCall, *The Art of Robert McCall*, 1992: 37).
Caption: America's civilian space effort is paralleled by a military space program, focused on research, reconnaissance, and defense. For the U.S. military, Robert McCall has prepared a number of conceptual illustrations of projected weapons systems, based on state-of-the-art defense technology. Here, a nuclear-powered beam weapon strikes a target from an orbital position high above the Earth. The brightly glowing cylinder is discharging waste heat and radiation, At the middle of the beam are two swiveling rocket pods designed to defend the weapon itself from attack.

Image 142. *Mars Arrival*, 1987 (R. McCall, *The Art of Robert McCall*, 1992: 56-57).
Caption: Two astronauts perform an EVA from their Earth-Mars transfer vehicle. Phobos, the larger of Mars's two moons, is at upper left. Stations on Mars's moons may be used for communications, materials transfer, and observation of the planet.

Image 143. *A Window to the Universe*, 1989 (R. McCall, *The Art of Robert McCall*, 1992: 24).
Caption: The space shuttle program resumed in September 1988, two and a half years after the *Challeger* disaster. Since its beginning, NASA's space shuttle fleet has carried out over forty scientific, technical, and defense-related missions, including the deployment of the Hubble Space Telescope by the shuttle Discovery in April 1990. This massive orbiting stellar observatory offers astronomers wide new vistas by allowing them to view the heavens without the interference of the Earth's atmosphere.

Image 144. *Peace on Earth/Peace in Space*, 1990 (R. McCall, *The Art of Robert McCall*, 1992: 16).
Caption: This luminous vision of two astronauts soaring together through space illustrates McCall's belief that the full exploration of the cosmos will require the efforts of all the Earth's peoples, working together in harmony and peace. *Peace on Earth/Peace in Space* arose from McCall's experience in collaborating with Andrey Sokolov.

Image 145. *Eye in the Lunar Sky*, 1990 (R. McCall, *The Art of Robert McCall*, 1992: 44-45).
Caption: Because the moon has no atmosphere and no strong seismic activity, it is an ideal site for an interstellar telescope. The observatory shown here has been placed in a sheltered trench to protect the sensitive lens from the sun's radiation.

Image 146. *Return to the Moon*, 1991 (R. McCall, *The Art of Robert McCall*, 1992: 40).
Caption: NASA plans a new series of missions to the moon, beginning in the next decade with unmanned robot probes and culminating with manned missions by the year 2005. By 2010, NASA hopes to establish working lunar bases such as the one depicted here, to perform scientific and industrial missions.

Image 147. *Cultivating the Moon*, 1991 (R. McCall, *The Art of Robert McCall*, 1992: 42-43).
Caption: Survival on the moon require the basic materials needed to sustain life hydrogen, oxygen, carbon, and nitrogen, to produce air, water, and organic materials. The expense of lifting such materials out of Earth's gravity well will drive the effort to mine these compounds on the moon itself. The vehicle in the foreground is a lunar combine, powered by a solar antenna, which tills the fine lunar dust, forcing it into an extracting chamber where gasses are separated from silicon and other minerals. Gas cylinders are stored to the left. To the right is a vast "solar farm" beaming microwave energy back to Earth.

Image 148. *Searching for Life*, 1991 (R. McCall, *The Art of Robert McCall*, 1992: 55).
Caption: Although the Viking missions to Mars did not discover life, they did find complex organic molecules capable of sustaining life. Early in the planet's history, water flowed on the surface of Mars, cutting deep channels in its surface. One of the most important scientific objectives of the next series of Mars missions will be to sample the soil near these channels to search for evidence of primitive life-forms that may have flourished on Mars millions of years ago.

Image 149. *Valley of a Billion Stars*, 1991 (R. McCall, *The Art of Robert McCall*, 1992: 111).
Caption: Our search to expand our cosmic horizons is symbolized is this recent work depicting a far-future starship moving out of a dark nebular cloud into a glowing region of light. "Man's future lies along the space frontier", says McCall. "I search constantly for ways to convey my feelings of awe, my love for the whole subject".

Image 150. *Silent Running*, 1991 (R. McCall, *The Art of Robert McCall*, 1992: 115).
Caption: It was the fullness of time, the human race will its way out of our own solar system and cross the vast ocean of night that separates us from other worlds. What we will find there will be stranger and more wonderful than anything we can imagine.

(4) Andrei Sokolov's works.[4]

Image 151. *Start lunnoi rakety* [The Launch of the Moon Rocket]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: До свидания, Луна! Люди были рады знакомству с тобой. Это была их великая победа, добытая нелегким трудом. Они вернутся еще к тебе. Но сейчас их ждут планеты... [Fairwell, the Moon! People are glad to have acquainted with you. It was their great victory achieved by hard work. They will return to you. But now the planets are awaiting them...] (translated by KB)

Image 152. *Zdravstvui rodnaia planeta!* [Welcome, our home planet!]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Заканчивается глобальное обследование Луны. Научная экспедиция возвращается с той стороны, где долгое время не было видно Земли, – на свою базу. По мере движения людей из-за горизонта показывается родная планета – Земля. [A global survey of the Moon in coming to an end. A scientific expedition has returned to their base from the lunar side, where the Earth has not been seen for a long time. The home planet – the Earth – is looming on the horizon at the direction of which people are moving.] (translated by KB)

Image 153. *Na sputnike Marsa* [On the Moon of Mars]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: До загадочной планеты осталось совсем немного. Естественный спутник – маленькая марсианская луна стала удобной промежуточной станцией для ракет. Отсюда с небольшой начальной скоростью сейчас полетит к Марсу легкая космическая система с экипажем на борту. [We are now approaching the mysterious planet. A natural satellite – a small Martian moon has become a convenient intermediate station for rockets. From here, a light space system with the crew on board will now set off to Mars with a small initial velocity.] (translated by KB)

[4] All Sokolov's works examined in the present book are available at http://scifiart.narod.ru/Albums/albums.htm and in the Appendix of my PhD dissertation, *Space exploration in 20th century American and Soviet literature and art* (2015), available online at the Adam Mickiewicz University Repository: https://repozytorium.amu.edu.pl/handle/10593/13887 (Copyright Disclaimer Under Section 107 of the Copyright Act 1976: The Appendix contains images collected from various online, library as well as my private resources and serves purely research and educational purposes. It falls under the fair use provisions of European and US copyright law and is not a copyright infringement.).

Image 154. *Peschanaia buria* [Dust storm]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Через эти бушующие марсианские пески может пройти только лаборатория-автомат. Надолго ли эта буря? Возможно, что такая же была видна на Марсе из Земли. Тогда ее отметили астрономы. [Only an automatic laboratory can move through these raging Martian sands. How long will this storm last? It is possible that such a Martian storm was already visible from the Earth when it was observed by astronomers.] (translated by KB)

Image 155. *Na puti – sharovaia molnia* [On the Way – Ball Lightning]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Венера – беспокойная планета. Ураганы, тысячекилометровые молнии, часто бывают шаровые. Вот и сейчас на пути вездехода – огромная шаровая молния. Здесь она чем-то напоминает земные полярные сияния. [Venus is a restless planet. Hurricanes, thousands of kilometers of ball lightnings. And now on the way of a space vehicle there is a huge ball lightning. Here, it is slightly reminiscent the earth's aurora.] (translated by KB)

Image 156. *Venera – raskalennaia* [The Red-hot Venus]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Очень тяжело даже вездеходу, когда вокруг плавятся скалы... [It is very hard, even for a rover, when there are melted rocks all around...] (translated by KB)

Image 157. *Naiden vympel* [A Pennon Has Been Found]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Трудна обстановка на Венере. Ее грозные силы подстерегают человека на каждом шагу. Но мощная техника оберегает людей. И как радостно увидеть здесь маленький металлический шарик: ведь этот Вымпел был доставлен сюда космической ракетой с родной Земли и сброшен на поверхность в контейнере как символ разума Человека. [A situation on Venus is difficult. Its formidable powers are threatening humans everywhere. But a powerful technology protects them. And how glad they are to see a small metal ball – the remains of the pennon which had been brought here by the rocket and dropped onto the surface in the container as a symbol of the human mind.] (translated by KB)

Image 158. *Na planete dvukh solnts* [On the Planet of Two Suns]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: А на этой планете два солнца – синее и желтое – дают в сочетании пронзительно зеленый цвет, который озарил неведомые

образования, похожие на гигантские мыльные пузыри. [The two suns on this planet – the blue and the yellow – generate a sharply green colour which illuminates the alien life forms, similar to giant soap bubbles.]

Image 159. *Cherez sto let* [In One Hundred Years]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Неожиданная и трагическая встреча на планете другой звезды. Какую тайну скрывает погибший космонавт, в руках которого вот уже сто лет горит под действием космического излучения сигнальная лампа?.. [The sudden and tragic meeting on the planet of a distant star. What secret hides the dead cosmonaut in the hands of whom a pilot lamp has been lit for a hundred years by the cosmic radiation?..] (translated by KB)

Image 160. *Organizamy okhotiatsia* [The Organisms are Hunting]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Безобидные «растения» оказались хищниками. С космического аппарата люди с изумлением наблюдают «обед» внеземного чудовища. [Harmless "plants" turned out to be predators. Having left their spacecraft, people watched in amazement the "lunch" of these alien creatures.] (translated by KB)

Image 161. *Vnezemnaia zhizn* [Alien Life Forms]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Эти прозрачные, словно медузы, живые организмы как будто парят в плотной атмосфере планеты чужой звезды. Люди поначалу принимают их за растения. Но это не так. [These transparent, jellyfish-like living organisms somewhat float in the dense atmosphere of the planet of a distant star. People initially take them for plants, but they are wrong.] (translated by KB)

Image 162. *Na poroge* [On the Verge]. (A. Leonov and A. Sokolov, *Zhdite nas, zvezdy* [The Stars are Awaiting Us], 1967).
Caption: Так вот он какой, «город» другой цивилизации! Для его строительства были максимально использованы природные материалы. Жители словно лепили свою архитектуру, добиваясь предельной гармонии с окружающей средой. [So that's what the "city" of another civilization looks like! The most natural materials were utilized for its construction. Residents literally molded its architecture, achieving an ultimate harmony with the natural environment.] (translated by KB)

Image 163. *Venera-4 bedet radioperedachu* [Venera-4 Conducts a Radio Broadcast.] (A. Leonov and A. Sokolov, *K zvezdam!* [To the Stars!], 1970).
Caption: Сравнительно недавно завершился многомесячный полет автоматической станции «Венера-4». Полученные данные позволили художникам создать убедительные картины этого замечательного перелета. На фоне оранжевого венерианского неба – раскрытый купол парашюта, под ним темный обгорелый шар. Ураганные ветры вытянули в полосы темные облака на небе. А внизу, уже близко, – мрачные, черно-фиолетовые скалы. [A long-term flight of an automatic station "Venera-4" has relatively recently accomplished its mission. The collected data allowed the artists to create a compelling vision of this wonderful trip. An open canopy is depicted against the background of an orange sky and just beneath it there is a dark charred ball. The dark clouds are pulled into strips by hurricanes. And at the bottom, just near the viewer, there are some gloomy, black and purple rocks.] (translated by KB)

Image 164. *Nad lunoi stykovka rakety c kosmicheskim korabliem* [A Space Rendezvous of the Rocket and the Spacecraft.] (A. Leonov and A. Sokolov, *K zvezdam!* [To the Stars!], 1970).
Caption: Капсула выйдет на селеноцентрическую орбиту, сблизится с ожидающим ее кораблем. Внизу – знакомый по фотографиям, лунным картам участок поверхности планеты. А над ней космонавты переходят из капсулы в корабль, который доставит их к Земле. Фон картины умышленно лишен характерных для Луны контрастов света и тени. Благодаря этому удался эффект глубины, стыкующиеся корабли четко вышли на передний план. [The capsule will enter the lunar orbit and approach the spacecraft waiting for it. At the background there are there is the surface of the moon widely known from the photographs and lunar maps. And over it the cosmonauts are transferred from the capsule to the spacecraft that will take them to the Earth. The background pattern is intentionally deprived of contrasts of light and shadow typical for the Moon. Due to this, the effect of depth has been achieved and the spacecrafts clearly have come to the fore.] (translated by KB)

Image 165. *Im svetit zemlia* [The Earth Shines to Them] (A. Leonov and A. Sokolov, *K zvezdam!* [To the Stars!], 1970).
Caption: Человек всегда останется человеком, со всем сложным комплексом чувств. И, кто знает, может быть на Луне влюбленные также будут совершать ночные прогулки при свете нашей Земли. [A man will always be the same, with the whole complex variety of feelings. And who knows, maybe the lovers on the Moon will also have nightly walks in the light of our Earth.] (translated by KB)

Image 166. *Posadka na planetu golubogo solntsa* [Landing on the Planet of the Blue Sun] (A. Leonov and A. Sokolov, *K zvezdam!* [To the Stars!], 1970).
Caption: Огромное голубое солнце. Оно во много раз больше, ярче, горячее нашего. Порожденные его могучим излучением, бушуют на планетах этой системы электромагнитные бури, бродят по океанам светящиеся в перенасыщенной электричеством атмосфере смерчи. Автоматическая станция, заброшенная в этот мир с космического корабля, окружена защитным полем. Само по себе поле невидимо, но под ударами молний оно обрисовывается, высвечивается, становится реальным, видимым. Нет сомнения, что в единоборстве с грозными силами природы победит человек. [A huge blue sun. It is many times larger, brighter and hotter than ours. The electromagnetic storms, generated by its powerful radiation, rage on all the planets of this solar system and roam around the oceans glowing in the atmosphere supersaturated by tornadoes. An automatic station, abandoned in this world by a spacecraft, is surrounded by a protective field. The field is invisible, but when it is struck by lightnings, it becomes real and visible. There is no doubt that humans will emerge victorious in a confrontation with the formidable forces of nature.] (translated by KB)

Image 167. *Orbitalnaia stantsia* [Orbital Station] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: Художественно-эстетическое восприятие играет важную роль при строительстве космических аппаратов. В будущем красота и целесообразность станут основным принципом художественного конструирования, главной задачей художников-конструкторов космических аппаратов. [The artistic and aesthetic perception plays an important role in the construction of a spacecraft. In the future, the beauty and expediency will be the main principles of artistic construction and the main task of the artists-designers of a spacecraft.] (translated by KB)

Image 168. *Miagkaia posadka na lunu* [A Soft Landing on the Moon] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: Сентябрь 1970 года. Очередной советский космический аппарат «Луна-16» опускается на Луну. Уже избрано место посадки. Начался участок управляемого торможения: включены двигатели малой тяги. Управляемый с Земли аппарат как бы зависает над безмолвной каменистой пустыней нашего естественного спутника. Светящийся сферический ореол в нижней части ракеты не фантазия художника. Это результат работы двигателей в условиях космоса. [September 1970. Another Soviet space probe “Luna-16” lands on the moon. The landing spot has been already chosen. A controlled deceleration has begun and an electrically powered spacecraft propulsion has been switched on. The

machine, controlled from Earth, hovers over the silent rocky desert of our natural satellite. A glowing spherical halo at the lower part of the rocket is not a fantasy of the artist. This is the effect of the engines' working in the space environment.] (translated by KB)

Image 169. *Pered budushchim startom k lune* [Before the Future Launch to the Moon] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: Один из возможных вариантов полета к Луне космического корабля — старт с платформы, движущейся по орбите искусственного спутника Земли. Сейчас еще чувствуется притяжение Земли, но скорость корабля все увеличивается, его путь — к Луне. [One of the possible variations of the flight to the Moon is the launch from a platform moving in an orbit of the Earth's artificial satellite. The gravity of the Earth is still in force, but the speed of the spacecraft is increasing – its trajectory is to the moon.] (translated by KB)

Image 170. *Lunnyi kosmodrom polden* [The Lunar Cosmodrome at Noon] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: Необычен наряд космонавтов. Возможно, именно так будет выглядеть защита человека от ослепительного света солнечных лучей. От других видов радиации космонавтов оберегают специальные скафандры. [The cosmonauts wearing an unusual outfit. Perhaps, this is what the human protection from the sunlight will look like. Special spacesuits will protect them from other types of radiation.] (translated by KB)

Image 171. *Start k Venere* [Launch to Venus] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: С орбиты искусственного спутника Земли стартует к Венере автоматическая межпланетная станция. Сейчас кончает работу последняя ступень ракеты — разгонный блок, и станция, достигнув второй космической скорости, вырывается из оков земного притяжения. Впереди многомесячный полет к одной из самых загадочных планет солнечной системы. Разгадка некоторых из ее тайн может быть самой неожиданной. [An automatic interplanetary station is launching to Venus from the orbit of an artificial Earth's satellite. The last stage of the rocket now ends its work – the upper stage, and the station, having reached escape velocity, breaks free from the shackles of the Earth's gravity. The long-term flight to one of the most mysterious planets of the solar system is ahead of us. It might unexpectedly unravel some of its secrets.] (translated by KB)

Image 172. *Signal Zemlii* [A Signal from the Earth] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: Кроме радиосигналов, на Венеру со скоростью около трехсот тысяч километров в секунду полетят световые импульсы мощных лазеров с космических станций, движущихся по орбитам спутников Земли и Венеры. Этот лазерный пучок будет обладать колоссальной плотностью световой энергии и большой направленностью излучения. В дальнейшем лазерный импульс станет прекрасным каналом передачи информации. [In addition to radio signals, light impulses of high-power lasers from the space stations orbiting the Earth's and Venus's moons will reach Venus at the rate of about three hundred thousand kilometers per second. This laser beam will have a tremendous density of light energy and a high radiation directivity. In the future, the laser impulse will become a great channel for transmitting information.] (translated by KB)

Image 173. *Na ekrane lokatora – Mars* [On the Radar Screen – Mars] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: Все ближе красноватая планета. Сквозь слабую атмосферу уже хорошо видны неровности марсианского рельефа. Еще радиолокация Марса с Земли показала, что возвышенности на планете могут достигать нескольких километров. [The reddish planet is getting nearer. The irregularities of the Martian terrain are already clearly visible through a weak atmosphere. The radar of Mars from the Earth revealed that hills on the planet can reach several kilometers.] (translated by KB)

Image 174. *Skaly Marsa* [Martian Rocks] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: И вот уже самоходный аппарат прокладывает первую борозду на холодном Марсе. О родной планете здесь немного напоминают скалы, стоящие точно скульптуры, высеченные древним ваятелем... [And now, a self-propelled machine paves the first furrow on the cold surface of Mars. The rocks may be slightly reminiscent of our home planet, the firmly standing sculptures carved by ancient sculptors...] (translated by KB)

Image 175. *Dolina priznakov* [The Valley of Ghosts] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: С изумлением смотрят люди на призрачные, словно хрустальные, «столбы». Может быть, это какое-то неизвестное явление в разреженной атмосфере, содержащей водяные пары и углекислый газ? Но от «столбов» падают тени... Еще одна загадка Марса. [People are

watching with amazement the ghostly, crystal-like “pillars”. Maybe it is some unknown phenomenon in the rarefied atmosphere, containing water vapour and carbon dioxide? But the “columns” cast shadows… This is another mystery of Mars.] (translated by KB)

Image 176. *Solnechnie fontanny* [Solar Fountains] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: На наскальных рисунках первобытного человека историки находят изображения нашего дневного светила, а в старинных летописях упоминания о видимых на Солнце темных пятнах. Древние не знали, что такое Солнце. И мы, люди XX века, тоже не можем еще сказать: «Мы знаем о Солнце все». Земли достигает только одна двухмиллиардная часть солнечной энергии. Невообразимое количество ее рождается в недрах Солнца, где водород превращается в гелий. Каждую секунду масса Солнца уменьшается на четыре миллиона тонн! Температура в его недрах достигает 13000000 градусов. Если бы такой горячей была поверхность Солнца, температура на нашей планете в полдень была бы 600000 градусов! На картине показаны гигантские выбросы солнечного вещества – протуберанцы. [In the cave paintings of a prehistoric man historians find images of our daily sunlight and ancient chronicles mention the sun’s dark spots. The ancient people did not know what the sun was. And we, the people of the 20th century, cannot even say that we know all about the sun. Only one of the two billion part of the solar energy reaches the Earth most of which is born in the depths of the Sun, where hydrogen is converted into helium. Every second, the Sun’s mass is reduced by four million tons! The temperature in the subsoil reaches 13000000 degrees. If the surface of the sun was so hot, the temperature on our planet in the afternoon would reach 600,000 degrees! The painting shows a giant emission of the solar material – prominences.] (translated by KB)

Image 177. *Kosmodrom na sputnike Iupitera* [Cosmodrome on Jupiter’s Moon] (A. Leonov and A. Sokolov, *Zvezdnye puti* [Star-roads], 1971).
Caption: На ближайшем к Юпитеру спутнике – Ио построен космодром. Отсюда готовится к старту на планету исследовательская ракета. Она должна сообщить дополнительную информацию о природе Юпитера. [A spaceport has been built on the nearest moon of Jupiter – Io. A rocket is preparing for the launch to the planet which should provide additional information about the nature of Jupiter.] (translated by KB)

Image 178. *Zemnye tsvety na lune* [The Earth’s Flowers on the Moon] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Созданный руками людей аппарат устойчиво расположился на поверхности нашего «ночного светила» и передает на Землю панораму

окружающего ландшафта, в летучих лучах Солнца поблескивают металлические лепестки станции, вытянулись вверх штыри четырех антенн, медленно вращается головка телекамеры, высматривая самое интересное. Фантастика? Нет, вчерашняя реальность… А завтра? Далекие потомки «Луны-9» заселят салые отдаленные области Селены и повседневно будут исследовать наш естественный спутник, чтобы раскрыть все его тайны, дать в руки ученых новые сведения о строении и характеристиках этого небесного тела. [The apparatus, created by the human hands, has been placed on the surface of our "nightly celestial body" and is transmitting to the Earth panoramas of the surrounding landscape, the metallic petals of the station are gleaming in the sunlight, spreading its four antennas, slowly rotating the camera and searching for the most interesting objects. Science fiction? No, it is the reality of the past… And the future? Distant descendants of "Moon-9" inhabit the remote areas of Selena and every day they will explore our natural satellite to reveal all its secrets and give the scientists new information about its structure and characteristics.] (translated by KB)

Image 179. *Lunnyi marafonets* [The Lunar Marathon Man] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Трудно переоценить все те широкие возможности, которые открыла для нас первая в мире передвижная лунная лаборатория, оснащенная самой современной аппаратурой. Она позволила исследовать самые разнообразные районы лунной поверхности. Полностью оценить все значение этого этапа возможно только в будущем, когда человечество, наряду с проводимыми сегодня исследованиями, приступит к непосредственному освоению и заселению Луны. Луноходы найдут широкое использование в строительстве научных баз, поселений и лунных городов. Они будут выполнять перевозку грузов, бульдозерные работы, рытье котлованов, ремонтные работы и многое другое. [It is difficult to overestimate all the opportunities provided by the world's first mobile lunar laboratory equipped with the most modern equipment. It is now possible to study a variety of areas of the lunar surface. However, to fully appreciate the full significance of this stage of advancement in space science will be only possible in the future, when humanity, along with the development in the ongoing space research, will begin the conquest and settlement of the Moon. The rovers will be widely utilized in the construction of scientific bases, settlements and lunar cities. They will carry out the freight, dozing, digging ditches, repairs and many more.] (translated by KB)

Image 180. *V gorakh Seleny* [In the Mountains of Selena] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Советская автоматическая станция прилунилась в горном районе. Взяв образцы лунного грунта, она доставила их на Землю. Это наше сегодня. И в дальнейшем Луна будет интенсивно изучаться многочисленными автоматами. Специфика их деятельности будет разнообразной. Можно предположить, что на Селене появятся буровые установки промышленного значения, которые будут извлекать из лунных недр «дефицитные» для землян породы. Вездесущие луноходы доставят добытые образцы к автоматическим ракетам, которые с бесценным грузом отправятся на родную планету. [The Soviet automatic station is stationed in a mountain area. Having taken samples of the lunar soil, it sent them to the Earth. This is the present-day situation. In the future, the Moon will be intensively examined by numerous machines. The specifics of their work will vary. It can be assumed that there will appear drilling rigs of commercial and industrial value on Selena that will be removing species detrimental for earthlings from the lunar bowels. The omnipresent rovers will deliver the obtained samples to automatic rockets that will take them to our home planet.] (translated by KB)

Image 181. *Lunnyi poselok* [The Lunar Village] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Наступит время, когда на Луне будет создана стационарная база для размещения достаточно большого числа специалистов по изучению и освоению ее природных богатств. Художник изобразил на картине лунный «поселок». Мы видим научное и служебное оборудование, защищенное от действия солнечных лучей и радиации, вращающимися по кругу специальными экранами — солнечными батареями, а также жилой комплекс и транспортный космический корабль экспедиционного обеспечения. [The time will come when a stationary base will be established on the Moon to accommodate a sufficiently large number of specialists studying the use of its natural resources. In the picture, the artist depicted the moon “settlement”. We can see the scientific and technical equipment, which protect from the sunlight and radiation, the solar panels with special screens rotating in a circle, as well as a residential complex and a transport spaceship for secure expedicitons.] (translated by KB)

Image 182. *Snova u Venery* [Approaching Venus Again] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Изучение планеты с помощью автоматических межпланетных станций в будущем примет систематический характер. Оно усложнится и расширится по мере получения результатов предыдущих исследований и

с учетом возможностей, предоставляемых космической техникой. На картине художник изобразил решение одной из интереснейших задач по изучению Венеры: в атмосфере планеты дрейфует научная станция, с борта которой на поверхность посылаются шары-зонды для сбора научной информации. [The study of the planet with the help of automatic interplanetary stations in the future will be performed systematically. It will expand and get more complicated and will expand in line with the results of previous studies and the possibilities offered by space technology. In the picture, the artist depicted a solution to one of the most interesting challenges of the study of Venus: in the planet's atmosphere the research station is drifting and sending balloons-probes which collect scientific information from its surface.] (translated by KB)

Image 183. *Na Merkurii* [On Mercury] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Яркий, ослепительный свет заставит будущих исследователей этой планеты постоянно находиться в очень темных, почти черных светофильтрах. Через эту оптику они с интересом будут разглядывать поверхность Меркурия, ярко освещенную заходящим Солнцем. Вся планета темно-красного цвета и чем-то похожа на Марс и на Луну. Они увидят какие-то россыпи камней, похожие на разрушенные скалы, остатки кратеров... Здесь высокая температура и губительные излучения от Солнца. Безводную раскаленную пустыню Меркурия, полную неизвестностей и опасностей, будут исследовать стационарные и самоходные автоматические аппараты, подобные тем, которые показаны на картине. [The bright, dazzling light will make future researchers of this planet work in very dark, almost black optical filters. Through this optics they will be examining the surface of Mercury, brightly lit by the setting sun. The whole planet is dark red in color and is somewhat similar to Mars and the Moon. The probes will see some placers of stones like broken rocks, craters... There are high temperatures here and a harmful radiation from the sun. The stationary and self-propelled automatic machines, such as those shown in the picture will investigate a waterless and hot desert of Mercury, full of suspense and danger.] (translated by KB)

Image 184. *Na sputnike Iupitera* [On the Moon of Jupiter] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Автоматическая станция будущего передает научную информацию с Ганимеда — самого большого спутника Юпитера. В тумане видны скалы, прямо над горизонтом повис Юпитер, похожий на огромное оранжево-полосатое Солнце. Видны темные, почти черные полосы, параллельные экватору планеты и видимо связанные с большой

скоростью ее врашения. Поверхность Ганимеда в ряде мест покрыта льдом, тускло отсвечиваюшим на фоне окружающих возвышений. [An automatic station of the future transmits scientific information from Ganymede – the largest moon of Jupiter. The rocks and Jupiter hovering just above the horizon like a huge orange-striped sun are clearly visible in the mist. Also, the visible dark, almost black stripes parallel to the equator of the planet are probably related to the high speed of its rotation. In some places Ganymede's surface is covered with ice, dimly shining against the backdrop of the surrounding hills.] (translated by KB)

Image 185. *V koltsakh Saturna* [In the Rings of Saturn] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Вот какими представляются художнику знаменитые кольца Сатурна. Автоматические аппараты достигли их окрестностей и передают первые снимки на Землю. Картина достаточно впечатляющая... Когда-нибудь мы получим первую информацию о химическом составе этих небесных тел, узнаем о их происхождении, и тогда, возможно, станут ясны причины столь необычного группирования колец вблизи Сатурна. [This is how the artist envisions the famous rings of Saturn. The automatic devices have reached their surroundings and transmit the first images to the Earth. The picture is impressive... Someday we will receive the first information about the chemical composition of these celestial bodies, learn about their origins, and then perhaps it will become well known why such an unusual set of rings appears near Saturn.] (translated by KB)

Image 186. *Ocherednoi "zond" idet k Saturnu* [Another Probe Goes to Saturn] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: С орбиты будущего искусственного спутника Нептуна, которым стала автоматическая станция, видно, что рельеф этого «малахитового» небесного тела не совсем ровный. Все пространство покрыто льдом, которого здесь, по-видимому, очень много, ведь температура 220 градусов мороза! Изучение Нептуна будет вестись как с околопланеткой станции, так и с помощью спускаемых аппаратов — зондов. [From orbit of the future artificial satellite of Neptune, which the automatic station has become, it is clear that the terrain of this "malachite" celestial body is not quite smooth. The entire body is covered with much ice as the temperature here is 220 degrees below zero! The examination of Neptune will be conducted from the circumplanetary station as well as by probes.] (translated by KB)

Image 187. *Posadka na Pluton* [Landing on Pluto] (A. Leonov and A. Sokolov, *Kosmicheskie dali* [Space in the Future], 1972).
Caption: Продолжаем наше воображаемое многолетнее путешествие. Мы на окраине Солнечной системы в темной бездне, освещаемой только светом звезд. На миг яркая вспышка двигателя осветила бесформенные неясные глыбы, окружающие район посадки, и снова наступает мрак. Да здесь не только неуютно, но и страшно! При температуре —230°С (уже достаточно близкой к абсолютному полюсу холода!) замерзла не только вода, но даже газы, такие как кислород и азот! В небольшом количестве имеется только газообразный водород — таковы результаты первого зондирования. Форм жизни мы не нашли, использовать эти «кладовые природы» тоже трудно! Так стоило ли лететь сюда? Да, стоило. Получены пока только первые сведения, первые подтверждения гипотезам и теориям ученых, так что практическая работа только начинается. Все открытия еще впереди! [We continue our long-term imaginary journey. We are on the edge of the solar system in a dark abyss, illuminated only by the light of stars. For a moment, a bright flash of the engine illuminated vague shapeless clods surrounding the landing area, and then the darkness came again. Yes, it is not only comfortless in here, but also scary! At the temperature of -230 ° C (close enough to the absolute Pole of Cold!) not only water freezes, but also gases such as oxygen and nitrogen! Only hydrogen gas is available in small amounts – these are the results of the first probe. We have not encountered any alien forms of life we do not cough, utilizing there “pantries of nature” is also hard! So was the trip worth it? Yes, it was. So far we have only obtained the first information which confirmed the hypotheses and theories put forward by scientists, so all the practical work is just beginning. All discoveries are still to come!] (translated by KB)

Image 188. *Pervyi sputnik vykhodit na orbitu* [The First Satellite Goes into Orbit] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: 4 октября 1957 года запуском первого советского искусственного спутника Земли осуществилась вековая мечта человечества о полетах в космос. В истории земной цивилизации наступила новая эра — космическая. Но это был не только символ самоутверждения. За период своего существования спутник массой 83,6 килограмма совершил около 1400 витков вокруг Земли и позволил проверить ряд научных и инженерных решений, исследовать прохождение волн через ионосферу. По торможению спутника удалось экспериментально определить плотность атмосферы на высотах, которых ранее не достигал ни один летательный аппарат. Первый посланец в космос блистательно выполнил свои задачи. Сегодня сотни его «космических братьев» помогают людям в земных делах и раскрытии тайн Вселенной. [On

October 4, 1957 the ongoing dream of mankind about human spaceflight has come true with the launch of the first Soviet artificial satellite. The history of human civilization has entered a new era – the space age. But it was not only a symbol of our self-affirmation. During its existence, the artificial satellite weighing 83.6 kilograms has orbited the Earth about 1,400 times and allowed to make a number of scientific and engineering solutions as well as to explore the waves going through the ionosphere. After the satellite finished its work, scientists were able to experimentally determine the density of the atmosphere at an altitude not reached by any aircraft. The first missionary into space brilliantly fulfilled its task. Today, hundreds of his "space brothers" help people in their earthly affairs and unravel the mysteries of the universe.] (translated by KB)

Image 189. *Isskustvennaia planeta "Mechta"* [The Artificial Planet "Dream"] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: В течение многих тысячелетий человек видел на ночном небосклоне Луну, звезды... И теперь настало время, когда советские люди научились отправлять им навстречу творения своих рук. Разведчиком лунной трассы стала советская автоматическая станция «Луна-1», получившая поэтическое название «Мечта». Последняя ступень ракеты-носителя впервые в мире развила вторую космическую скорость, около 11,2 километра в секунду, и, преодолев земное тяготение, вывела станцию на трассу, ведущую к Луне, и далее, на орбиту вокруг Солнца. Это произошло в январе 1959 года. [For many centuries, people have seen the moon and the stars in the night sky... And now the time has come when the Soviet people learn how send their creations to meet them. The scout of the lunar route was the Soviet probe "Luna-1", which received a poetic name "Dream". For the first time ever, the last stage of the launch vehicle has developed the escape velocity, about 11.2 kilometers per second, and, having overcome the Earth's gravity, released the station on its way to the Moon, and beyond, into the Sun's orbit. All this happened in January 1959.] (translated by KB)

Image 190. *Vpervye na lune* [The First on the Moon] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: Так символически художник представил первую посадку на Луну. Это произошло 14 сентября 1959 года, югда станция «Луна-2» совершила жесткую посадку на поверхность Луны восточнее «Моря Ясности», вблизи кратеров Аристид, Архимед и Автолик. Впервые за всю историю человечества посланец Земли достиг другого небесного тела. Станция «Луна-2» доставила на Луну вымпел с Гербом нашей Родины и надписью: «СССР, сентябрь 1959». Затем в сторону Луны был запущен еще ряд

советских автоматических станций серии «Луна», которые и подготовили решение задачи мягкой посадки контейнера с научной аппаратурой. [The artist has symbolically represented the first landing on the moon. It happened in September 14, 1959, when the probe "Luna-2" made a hard landing on the lunar surface east of "Sea of Clarity" and near the craters Aristides, Archimedes, and Autolycus. For the first time in human history, the messenger of the Earth has reached another celestial body. "Luna 2" brought to the moon a pennant with the coat of arms of our homeland and the inscription "The USSR, September 1959". Then, a number of Soviet probes series "Luna" has been launched to the Moon which prepared the ground for a soft landing of the container with scientific equipment.] (translated by KB)

Image 191. *Pervyi lunnyi sputnik* [The First Lunar Probe] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: Решение ряда проблем науки о Луне требовало длительного пребывания научной аппаратуры вблизи её и охвата измерениями значительных пространств. И вот впервые за миллиарды лет у нашего естественного спутника появился свой спутник. Это произошло в апреле 1966 года, когда на окололунную орбиту была выведена советская автоматическая станция «Луна-10». [Solving a number of problems of the lunar science required a long stay of the scientific equipment near the Moon and taking specific measurements. And now for the first time in its history our natural satellite has its own artificial satellite. This happened in April 1966 when the Soviet probe "Luna-10" entered the lunar orbit.] (translated by KB)

Image 192. *Stynovka kosmicheskikh korablei "Soiuz-4" i "Soiuz-5"* [The Rendezvous of Spacecrafts "Soiuz-4" and "Soiuz-5"] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: Сущность нового космического эксперимента заключалась в осуществлении стыковки двух космических кораблей в космосе и создании из них первой в мире экспериментальной орбитальной станции. Телезрители были свидетелями этой грандиозной по своим перспективам космической стройки. [The aim of the new space experiment was to implement the docking of two spacecrafts in space and the establishment of the world's first experimental space station. The viewers witnessed this grand space construction on television.] (translated by KB)

Image 193. *Nad Afrikoi* [Above Africa] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: Из иллюминатора космического корабля открываются величественные панорамы Земли. Космический корабль пролетает над Африкой, реки и горные хребты которой хранят память о подвигах их

первооткрывателей: Фернандо По, по имени которого назван остров в Гвинейском заливе, Васко да Гама, обогнувшего мыс Доброй Надежды, Лендера, открывшего устье Нигера, Крамфа и Ребмана, которые открыли самые высокие горы Африканского континента — Килиманджаро, русских ученых Ковалевского, Норова, исследовавших Северо-Восточную Африку. Съемка из космоса бесстрастно подтверждает и уточняет точность данных, достигнутых жизнью и трудом исследователей — моряков и землепроходцев прошлых веков. [The view from the spacecraft's window offers a magnificent panorama of the Earth. The spacecraft is flying over Africa, rivers and mountain ranges protect the memory of their discoverers: Fernando Poe, after whom the island in the Gulf of Guinea is named, Vasco da Gama, who discovered the Cape of Good Hope, Lender, who discovered the mouth of the Niger, Kramf and Rebman who discovered the highest mountains of the African continent – Kilimanjaro, the Russian scientists Kovalevsky, Norova who investigated the north-east Africa. The picture from space clearly confirms and clarifies the accuracy of research results obtained through the life and work of these discoverers – sailors and explorers of the past.] (translated by KB)

Image 194. *V illiuminatore: tsiklon* [Behind the Window: Cyclone] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976)
Caption: Из иллюминатора космического корабля хорошо видна поверхность Земли, местами закрытая облаками. Отчетливо просматриваются вихревые образования зарождающегося мощного циклона. С помощью космических средств можно эффективно изучать самые разнообразные процессы, происходящие в природе, а в будущем и осуществить конечную цель — помощь человеку в управлении погодой. [From the window of the spacecraft the surface of the Earth, sometimes covered by clouds, is clearly visible. Here, we can see the formation of a vortex and the emerging powerful cyclone. With the help of space resources a variety of processes occurring in nature can be effectively studied, and achieve the ultimate goal in the future – to help people control the weather.] (translated by KB)

Image 195. *Vperedi Mars* [Approaching Mars] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: В ноябре 1962 года был запущен первый космический аппарат к Марсу. Им была советская автоматическая межпланетная станция «Марс-1», с которой было проведено свыше 60 сеансов радиосвязи и получена важная научная информация. Сближение станции с планетой произошло в июне 1963 года. В 1971 году наступил период великого противостояния Марса, когда расстояние между Марсом и Землей

становится минимальным. Поэтому в мае этого года к Марсу были запущены три автоматические станции – две советские «Марс-2» и «Марс-3» и американский аппарат «Маринер». [In November 1962, the first spacecraft to Mars was launched. It was the Soviet probe "Mars-1", which conducted over 60 sessions of radio communication system and provided important scientific information. The probe approached the planet in June 1963. In 1971, a period of Mars opposition, when the distance between Mars and the Earth becomes minimal. Therefore, in May this year, three probes have been launched to Mars – the two Soviet probes "Mars-2" and "Mars-3" and the American probe "Mariner".] (translated by KB)

Image 196. *Reportazh c Venery* [The Report from Venus] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1976).
Caption: 22 октября 1975 года межпланетная автоматическая станция «Венера-9», преодолев за 136 суток полета более 300 миллионов километров, была выведена на орбиту вокруг Венеры и стала первым в истории искусственным спутником планеты Венера. Спускаемый аппарат станции совершил мягкую посадку на поверхность Венеры. [On October 22, 1975 the interplanetary probe "Venera-9", after 136 days of the flight and covering the distance of more than 300 million kilometers, was launched into orbit around Venus and became the first ever artificial satellite of this planet. The space capsule made a soft landing on the surface of Venus.] (translated by KB)

Image 197. *Voskhod rukotvornoi zvezdy – pervyi sputnik vyshel na orbitu* [The Sunrise of the Man-made Star – The First Satellite in Orbit] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1984).
Caption: На картине — волнующий момент выхода рукотворной звезды на орбиту. Пройдет еще немного времени после отделения от последней ступени ракеты-носителя и сброса обтекателя, и спутник приступит к выполнению намеченной программы исследований и экспериментов. О нем скоро узнает мир, и люди планеты, говорящие на разных языках, улыбаясь, будут произносить по-русски: «Спут-ник, спут-ник, спут-ник!» [In the painting – an exciting moment of the launch of a man-made star into orbit. It will take some time after it separates from the last stage of the launch vehicle and ejection of the fairing, and the satellite will begin conducting the planned programme of research and experimentation. The world will soon learn about it, and all nations of the planet, speaking different languages, will say in Russian, smiling: "sput-nik, sput-nik, sputnik!"

Image 198. *Sovershilos!* [Done!] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1984).
Caption: Человеческий разум бросил вызов силам природы и одержал величайшую победу: над Землей — первый в мире искусственный спутник. Вслед за ним на околоземные орбиты были выведены сотни его «братьев». Сегодня они помогают людям в земных делах и раскрывают тайны Вселенной. [The human mind has defied the forces of nature and achieved a great victory: the world's first artificial satellite is hovering above the Earth. Hundreds of its "brothers" followed the suit and today, they help people in earthly affairs and reveal the secrets of the universe.] (translated by KB)

Image 199. *Rabota v otkrytom kosmose* [Working in Open Space] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1984).
Caption: В процессе пилотируемых полетов космонавтам иногда приходится совершать выход в космическое пространство, чтобы производить внешний визуальный осмотр станции, заменять аппаратуру и датчики, функционирующие в космическом пространстве. Операции выхода и работы в космическом пространстве хорошо освоены еще со времени полетов кораблей «Восход-2», «Союз-4» и «Союз-5». В будущем деятельность космонавтов в открытом космосе будет занимать все больший объем в программе полетов в связи с предполагаемым проведением всякого рода сборочно-монтажных, ремонтно-восстановительных и профилактических работ с автоматическими и пилотируемыми космическими аппаратами различного целевого назначения. [In the course of the manned spaceflight mission, the cosmonauts sometimes go into outer space to produce a visual inspection of the space station and to replace the equipment and sensors which function in outer space. Such operations have been already performed since the first flights of "Voskhod-2", "Soyuz-4" and "Soyuz-5". In the future, the cosmonauts' work in outer space will take a larger part of the space mission in connection with the alleged conduct of any kind of assembly, installation, repair and maintenance work by means of automatic and human spaceflight apparatus for various purposes.] (translated by KB)

Image 200. *Orbitalnyi kompleks nad Chernym morem* [The Orbital Complex above the Black Sea] (Senkevich, *Chelovek i vselennaia* [Man and the Universe], 1984).
Caption: На картине показан тот же пейзаж, что и на предыдущем эскизе, но с учетом замечаний, высказанных художнику летчиками-космонавтами В. Ляховым и В. Рюминым. Здесь же художник изобразил орбитальный комплекс «Союз» — «Салют-6» — «Союз» в момент, когда он закрыл собой заходящее солнце. [The painting represents the same

outer space landscape as in the previous sketch,[5] but it takes into account comments made by the cosmonauts V. Lyakhov and V. Rumin. Here, the artist has depicted the orbital complex "Soyuz" – "Salyut-6" – "Soyuz" when it covered a setting sun.] (translated by KB)

[5] The caption accompanying the previous painting titled *Nad Kaspiem. Stykuettsia "Progress"* [Over the Caspian Sea "Progress" is Docking]: Год 1978-й. 20 января. К станции «Салют-6» с пристыкованным кораблем «Союз-27» стартует новый автоматический аппарат — грузовой корабль «Прогресс-1». Космический комплекс совершал очередной рабочий виток. Для станции он был уже 1819-м, а для пассажирского корабля—189-м. В расчетное время к космическому причалу пришвартовался «Прогресс-1». На околоземной орбите стала функционировать система из трех аппаратов. Что стоит за этим фактом? Как подсчитали специалисты, на сутки работы в космосе экипажу станции «Салют-6» необходимо 20—30 килограммов различных материалов. Для полетов продолжительностью порядка года потребуется уже до 10 тонн дополнительного груза! Объем же станции ограничен. Значит, нужно что-то доставлять, а что-то снимать со станции. В то же время за один пуск пилотируемого корабля можно доставлять всего 50 килограммов груза, а с помощью автоматического грузового корабля типа «Прогресс» уже 2300 килограммов. Грузовые корабли стали незаменимыми тружениками на трассе Земля — космос — Земля. И вот над вечерним Каспийским морем летит на встречу со станцией «Салют-6» очередной посланец из Байконура. [Year 1978. January 20. The new automatic machine — a cargo ship "Progress-1" is launching to the spacecraft "Soyuz-27" with the docked the station "Salyut-6". The space complex has made another round of work, already the 1819th for the station, and the 189th for a passenger spaceship. "Progress-1" has moored to a berthing mechanism in the estimated time. The operational system made of three vehicles began functioning in the Earth's orbit. What are the consequences of this fact? As experts estimate, the crew of "Salyut-6" need 20-30 kilograms of various materials for a day of work in space. Long-duration flights need to have up to 10 tons of extra cargo and space within the station is limited. So, something needs to deliver something from the station. Normally, a total of 50 kilograms of cargo can be delivered with a single launch of the manned spacecraft, yet with the help of an automatic cargo ship like "Progress" it is possible to deliver 2,300 kilograms. Cargo ships have become indispensable toilers on the route Earth — space — Earth. And now another messenger from Baikonur is flying over the evening Caspian Sea to meet with the station "Salyut-6"] (translated by KB)

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