WHERE NO LAWYER HAS GONE BEFORE? WHAT A CYBERSPACE ATTORNEY CAN LEARN FROM SPACE LAW'S LEGACY

David S. Weitzel*

I. BACKGROUND

This article examines the application of space law concepts to the creation and evolution of cyberlaw. Space law developed rapidly over its first two decades, and this originally military–based technology emerged from its infancy into a multi–billion dollar commercial industry. From its inception, space law transcended borders, applied new previously unimagined technology, faced new issues regarding personal rights and privileges and was played out on an international stage. Similarly, the modern evolution of cyberspace includes the intense use of technology in a rapidly commercializing international environment.

Like the emergence of space technology, the development of cyberspace is being played out on the world stage while also challenging sovereignty, jurisdiction and even citizenship. Thus, cyberlaw practitioners can learn from air law and space law, which faced all these challenges during their rapid evolutions earlier in the twentieth century.[1] Additionally, cyberlaw should be able to teach space law practitioners how to deal with issues such as personal freedoms, international cooperation with only limited government intervention, managing rapid growth and avoiding centralization by a power elite. Finally, space law seems to have abandoned the "hard law"[2] of treaty making and formal international agreements and replaced it with the "soft law"[3] forms[4] upon which cyberspace seems to rely.

Despite the apparent parallels, several factors that applied to space law's evolution do not apply to cyberlaw's maturation.[5] Space law was developed in an atmosphere of a bilateral superpower struggle with two antagonistic fingers poised on a nuclear button.[6] Space law was developed at a time of greater trust of international bodies to as-

* Senior Principal, Mitretek Systems, McLean, VA, 22102; (703) 610-2970; dweitzel@mitretek.org.

1 *See* Ruwantissa I. R. Abeyratne, *State Responsibility in Classical Jurisprudence: Reflections on the Global Navigation Satellite System*, 23 ANNALS AIR & SPACE L. 1, 5 (1998) [hereinafter *State Responsibility*] (stating that "space law constitutes one of the most recent additions to international jurisprudence").

2 Hard law is the law of formal legal processes such as legislation and formal treaty making. *See* SOVEREIGNTY INTERNATIONAL, SUSTAINABLE DEVELOPMENT, NEW TREATY IN THE MAKING, COVENANT ON ENVIRONMENT AND DEVELOPMENT 1, *at* http://www.sovereignty.net/p/sd/covenant.htm (last visited Oct. 11, 2001).

3 *See id.* Soft law, in contrast to hard law, is the law using informal agreements, standards and contracts. An example of the soft law form can be seen in the creation and operation of ICANN, the International Corporation for Advanced Names and Numbers that manages the Internet's domain name system and the process which led to its creation. *Id.*

4 *See* Valérie Kayser, *From the Sky to the Stars: Air Lawyer's and Space Lawyer's Perspectives on Future Legal Issues and Legal Teaching*, 20–1 ANNALS AIR & SPACE L. 367, 370 (1995) [hereinafter Kayser] (describing how there has been no space law treaty since the ill–received Moon Treaty twenty years ago); *see also* Marco Ferrazzani, *Soft Law in Space Activities*, *in* OUTLOOK ON SPACE LAW OVER THE NEXT 30 YEARS: ESSAYS PUBLISHED FOR THE 30TH ANNIVERSARY OF THE OUTER SPACE TREATY 429 (Gabriel Lafferranderie & Daphné Crowther eds., 1997) (describing how "soft law" forms have been used in space law and space technology standards organizations) [hereinafter Ferrazzani].

5 *See* Manfred Lachs, *The Law–Making Process for Outer Space*, *in* NEW FRONTIERS IN SPACE LAW 16 (Edward McWhinney & Martin Bradley eds., 1969) [hereinafter Lachs]. Lachs argued that there are three possible applications of current international law to a new environment: (1) Full applicability; (2) Applicability after adaptation or amendment; and (3) Non–suitability with replacement by new rules. *Id.*

6 Space law emerged in the wake of the Sputnik launch in 1957. During this time both the United States and the Soviet Union were testing nuclear weapons, developing intercontintental nuclear launch vehicles and deploying advanced launch detection systems. *See* NASA, SPUTNIK AND THE DAWN OF THE SPACE AGE 1, *at* http://www.hq.nasa.gov/office/pao/History/sputnik/ (last modified Oct. 16, 2000); *see also* NATIONAL AIR AND SPACE MUSEUM, SPACE RACE 1, *at* http://www.nasm.edu/galleries/gall14/ (last modified Sept. 29, 2001) [hereinafter SPACE RACE].

sist in the management of distrust between sovereign nations.[7] The use of space technology was not a tool of any but the wealthiest nations and was continuously integrated with those nations' military readiness.[8] Economic leadership, while having some role, was not the main policy goal of the countries involved in the early development of space technology.

Internet technology emerges from the same military roots as space technology but lives in a very different place and in a very different world than was faced by the rapid development of early space technology. Rather than being a Cold War "weapon," the Internet is seen as a new technology infrastructure upon which economic growth will develop.[9] While large companies are already in control of much of the Internet infrastructure, small companies have made the Internet popular.[10]

Cyberspace, like space technology before it, exploded in size and has undergone rapid commercialization. Recent estimates indicate the Internet/e-commerce industry is already a multi-hundred billion dollar industry and will grow to be a trillion dollar industry by 2002.[11] This rapid decade of growth requires laws and the underlying norms to quickly catch up. To do so, the cyberlaw practitioner must learn from the precedents set by the technology and business sectors. Cyberlaw must examine and apply all precedents that are relevant and discard those that are not.[12] Space law is one sector that deserves close inspection. Space law's antecedents in air law and admiralty law are similarly instructive.

After a brief introduction to space law in section II, this paper examines space law's legacy in two main areas. First, section III discusses the concept of sovereignty and borders. Second, section IV looks to the issues of jurisdiction over disputes and liability from mishaps in the borderless environment of space. Finally, section V highlights lessons learned in space law and wraps up with a list of potential next steps for cyberlaw practitioners to examine.

II. INTRODUCTION TO SPACE LAW AND CYBER LAW

Space law can be seen as having its origin in the launch of Sputnik in 1957. At once, the challenge of a space satellite crossing borders at astonishing speeds past the edge of the atmosphere focused policymakers and legal theoreticians on the present situation. The United Nations acted immediately.[13] Conferences were held, resolutions were passed and eventually numerous treaties were de-

7 After World War II, the United Nations came into existence to help avoid the type of world conflict seen in both World War I and World War II. With strong American leadership, it was this relatively new United Nations that brought together military forces from around the world to fight the Korean War in the early 1950s. *See* UNITED NATIONS, ORIGIN OF THE UNITED NATIONS 1, *at* http://www.un.org/overview/origih.html (last visited Oct. 8, 2001); *see also* UNIVERSITY OF CALIFORNIA-BERKELEY, EVENTS OF THE KOREAN WAR 1, *at* http://socrates.berkley.edu/~korea/warevents.html (last modified July 1, 2001).

8 Due to the great expense to have a sufficient scientific and engineering skill to mount a space program, only the wealthiest and most determined nations could afford such a national luxury. *See* Glenn H. Reynolds, *Outer Space and Peace: Some Thoughts on Structures and Relations*, 59 TENN. L. REV. 723, 730 (1992).

9 Despite the apparent dot-com demise, growth in electronic commerce is still occurring at a steady pace. Some commenters claim that all that has happened is that the growth has slowed to the realistic, yet robust, levels that are sustainable. *See* Michael S. Malone, *Internet II: Rebooting America, Getting Real and Getting It Right*, FORBES ASAP, Sept. 10, 2001, at 48 *available at* http://www.forbes.com/asap/2001/0910/044_print.html (last visited Oct. 7, 2001) (stating that the "Internet isn't dead—it's *molting*").

10 Companies such as WorldCom, through its UUNET subsidiary, and other large telecommunications companies control much of the Internet's American backbone. *See* UUNET, ABOUT UUNET, *at* http://www.uu.net/about/ (last visited Oct. 11, 2001).

11 *See Developments in the Law—The Law of Cyberspace I. Introduction*, 112 HARV. L. REV. 1574, 1578 n.10 (1999) [hereinafter *Developments I*] (citing Robert D. Hof, *The Net is Open for Business—Big Time*, BUS. WK., Aug. 31, 1998, at 8 (citing predictions by Forrester Research, Inc.)).

12 Dean Henry Perritt of Chicago-Kent School of Law has been a leader in bringing cyberlaw into focus. *See* Henry H. Perritt, *Cyberspace and State Sovereignty*, 3 J. INT'L LEGAL STUD. 155 (1997), *available at* http://www.kentlaw.edu/perritt/professorperritt/jilspub.html. The Chicago-Kent team of Dean Perritt and Professor Margaret Stewart were instrumental in assisting the ABA's Jurisidiction Project. *See* ABA COMMITTEE ON CYBERSPACE LAW, THE JURISDICTION PROJECT 1, *at* http://www.abanet.org/buslaw/cyber/initiatives/jurisdiction.html (last visited Oct. 19, 2001).

13 *See* Heidi Keefe, Essay, *Making the Final Frontier Feasible: A Critical Look at the Current Body of Outer Space Law*, 11 COMPUTER & HIGH TECH. L.J. 345, 348 (1995) [hereinafter Keefe] (citing the creation of the United Nations Ad Hoc Committee on Space Law as described in OGUNSOLA O. OGUNBANWO, INTERNATIONAL LAW AND OUTER SPACE ACTIVITIES xiii (1975)). This article uses space law as an historical precedent. It does not attempt to analyze current space law or space policy. For those issues it is best to look to THE ANNALS OF AIR AND SPACE LAW and THE JOURNAL OF SPACE LAW.

veloped, signed and ratified.[14] Today space technology is a well-established multi-billion dollar industry and a forum for international research cooperation on projects such as the International Space Station ("ISS").[15] Space law involves issues such as sovereignty,[16] jurisdiction,[17] freedom of speech,[18] tort,[19] contract law,[20] insurance law, military law[21] and even criminal law.[22] Worldwide conferences are held regularly to deal with emerging issues.[23] United Nations-sponsored meetings occur for coordination of asset location and frequency use in space.

Cyberlaw's origin is less well-defined. As e-commerce, cyberlaw is tied to the evolution of computer, data communications and data protection laws. However, it is probably best to link modern cyberlaw to a single event. The best candidate for the event marking the emergence of cyberlaw is a change to an otherwise obscure cooperative agreement between the National Science Foundation ("NSF") and a small government contractor named Network Solutions.[24] Network Solutions' cooperative agreement to manage the Internet's Domain Name System ("DNS")[25] was modified to provide for payments of annual registration fees by commercial users. This modification permitted commercial users to acquire domain names for commercial purposes. Since that modification in 1993, the use of the DNS[26] has exploded from 1,500 users in 1993 to over five million today.[27] Recent estimates put the dollar value of e-commerce in the billions with a continuing rise

14 *See id.* at 349.

15 *See* Andrew D. Watson & William G. Schmidt, *Legal Issues Surrounding the International Space Station*, 7 USAFA J. LEG. STUD. 159 (1996) [hereinafter Watson & Schmidt].

16 *See* Ty S. Twibell, *Circumnavigating International Space Law*, 4 ILSA J. INT'L & COMP. L 259, 267 (1997) [hereinafter Twibell, *Circumnavigating*] (describing the discussions about sovereignty during the debates leading up to the 1967 Space Treaty).

17 *See id.* at 265 n.28 (citing Agreement Between the United States and Italy for the Design, Development, Operation and Utilization of Two Mini Pressurized Logistics Modules and a Mini Laboratory for the Space Station Freedom, with Memorandum of Understanding, art. II, IV, June 1, 1992, U.S.-Italy, 1992 WL 466066). The Agreement identified that each nation retains jurisdiction over its nationals and space station components.

18 *See* Albert N. Delzeit & Robin M. Wahl, Note and Comment, *Redefining Freedom of Speech Under International Space Law: The Need for Bilateral Communications Alliances to Resolve the Debate Between the "Free Flow of Information" and "Prior Consent" Schools of Thought*, 2 ILSA J. INT'L & COMP. L. 267 (1995).

19 *See* Stacy J. Ratner, Note, *Establishing the Extraterrestrial: Criminal Jurisdiction and the International Space Station*, 22 B.C. INT'L & COMP. L. REV. 323, 324 n.10 (1999) [hereinafter Ratner] (describing the role of tort law in space) (citing Hamilton DeSaussure, *Tort Jurisdiction Over the New International Space Station*, 32 COLLOQUIM ON THE LAW OF OUTER SPACE 305 (1989)).

20 *See* Ty S. Twibell, Note, *Space Law: Legal Restraints on Commercialization and Development of Outer Space*, 65 UMKC L. REV. 590 (1997); *see also* Twibell, *Circumnavigating*, *supra* note 16, at 267.

21 *See* Watson & Schmidt, *supra* note 15, at 164 (citing Article 5 of the Uniform Code of Military Justice, which applies its reach to military members in "all places"); *see also* Maj. Douglas S. Anderson, *A Military Look Into Space: The Ultimate High Ground*, ARMY LAW, Nov. 1995, at 19 (citing the importance of an understanding of space law to the modern military lawyer).

22 *See* Ratner, *supra* note 19, at 323 (describing the role of criminal law in the International Space Station); *see also* Watson & Schmidt, *supra* note 15, at 163.

23 *See Unispace III Features Space Law Workshop*, AEROSPACE AM, May 1999, at B6 (announcing the Third United Nations World Conference on the Peaceful Uses of Outer Space, which was held in Vienna, Austria from July 19 - 30, 1999).

24 Network Solutions became a part of VeriSign after it was purchased for $21 billion in 2000. However, at the time of its cooperative agreement with the National Science Foundation, Network Solutions was operating under the Small Business Administration's 8(a) program as a small disadvantaged business. The original cooperative agreement called for a five-year operation for $4.5 million between the NSF and Network Solutions. Surely, the success of Network Solutions can be seen as one of the great success stories of the 8(a) program and of the Internet economy. *See* Brian McWilliams & Maura Ginty, *VeriSign Buys Network Solutions for $21 Billion*, INTERNETNEWS.COM, *at* http://www.internetnews.com/bus-news/article/0,,3_316101,00.html (Mar. 7, 2000); *see also* 8(a) Business Development, 13 C.F.R. §124.102 (2001).

25 MEDIA ADVISORY, NATIONAL SCIENCE FOUNDATION, DOMAIN NAME COOPERATIVE AGREEMENT TRANSFERRED TO DEPARTMENT OF COMMERCE, *at* http://www.nsf.gov/search97cgi/vtopic (Sept. 17, 1998) (announcing that the cooperative agreement had been transferred from the National Science Foundation to the Department of Commerce). Another candidate for this honor is the change to the National Science Foundation's funding of the Internet backbone. This change led to the creation of regional backbones and the rapid emergence of the modern Internet Service Provider or ISP. *See* Dave Kristula, *The History of the Internet*, 2, *at* http://www.davesite.com/webstation/net-history.shtml (last modified Aug. 1, 2001).

26 The domain name system is the method used to link easily readable Uniform Resource Locator ("URL"), *e.g.*, Pepsi.com, *at* http://www.pepsi.com (last visited Mar. 5, 2002), to its numeric Internet protocol address. *See generally* DNS RESOURCES DIRECTORY, *at* http://www.dns.net/dnsrd (last visited Oct. 6, 2001).

27 *See* VERISIGN, ABOUT VERISIGN 1, *at* http://corporate.verisign.com/about/fact.html (last visited Oct. 20, 2001); *see generally* Walt Howe, *A Brief History of the Internet*, 3, *at* http://www.walthowe.com/navnet/history.html (last modified Aug. 31, 2001).

into the trillions annually by 2003.[28] An alternate touchpoint for the emergence of cyberlaw is the ending of the National Science Foundation's funding of the Internet backbone network.

Like outer space technology a generation ago, the Internet and its management is being coordinated on a world stage.[29] As for the current state of cyberlaw's evolution, the American Bar Association ("ABA") manages much of its activities from within its Section on Business Law.[30] Organizations such as the Internet Law and Policy Forum ("ILPF") have also formed to coordinate legal and policy issues surrounding the Internet.[31] The Internet Engineering Task Force ("IETF") and Internet Society have continued their work in the areas of technical coordination and Internet advocacy.[32] The Internet Corporation for Assigned Names and Numbers ("ICANN") has been able to awkwardly bootstrap the current management structure for domestic Internet policies to international Internet policy coordination.[33] So far this technique has worked very well. But the rapid deployment of the technology and its use may lead to certain "Internet have nots" who will eventually use the intergovernmental world stage to call for their inclusion in the digital marketplace.[34] When one sees the dollar values being associated with e-commerce development, there is little reason to doubt that the international computer and communications companies, along with the retail and service industries, will be at the table as the law of cyberspace evolves.

The time and circumstances surrounding the evolution of space law similarly called for close international scrutiny and interaction. Both the United States and Soviet Union were gravely concerned that every step in the development of space launch technology was also a step forward in ICBM launch technology.[35] International meetings were called.[36] Thus, the world community—assembling under the auspices of the United Nations—developed space law. Entities such as the United Nations, the Committee On Peaceful Uses of Outer Space ("COPUOS") and the International Law Association all played a role. Along the way, United Nations resolutions were passed.[37] Launch verification regimes were demanded.[38]

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28 *See Developments I, supra* note 11, at 1578 n.10 (citing Robert D. Hof, *The Net is Open for Business—Big Time*, BUS. WK., Aug. 31, 1998, at 8).

29 *See* ICANN, MAJOR AGREEMENTS AND RELATED REPORTS 1–2, *at* http://www.icann.org/general/agreements.htm (last visited Oct. 20, 2001) (describing the activities regarding international coordination of Internet governance).

30 *See generally* COMMITTEE ON CYBERSPACE LAW, AM. BAR ASS'N, *at* http://www.abanet.org/buslaw/cyber (last visited Oct. 20, 2001).

31 *See generally* INTERNET LAW AND POLICY FORUM, OVERVIEW 1, *at* http://www.ilpf.org/about/ (last visited Oct. 20, 2001). The ILPF is an organization of large technology companies that serves as a forum to share information about emerging cyberlaw issues. ILPF has sponsored conferences and created white papers to help facilitate the exchange of this information. *Id.*

32 *See generally* INTERNET ENGINEERING TASK FORCE, OVERVIEW 1, *at* http://www.ietf.org/overview.html (last visited Oct. 20, 2001) (stating that IETF is an organization that helps define technical standards for the Internet); *see also* INTERNET SOCIETY, OVERVIEW, *at* http://www.isoc.org/isoc/ (last visited Oct. 20, 2001).

33 *See* INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, OVERVIEW, *at* http://www.icann.org/general/abouticann.htm (last visited Oct. 20, 2001). Currently, the United States government has used cooperative agreements to allow ICANN to operate. This system is not without its critics. *See* Michael Froomkin, *Wrong Turn in Cyberspace: Using ICANN to Route Around the APA and the Constitution*, 50 DUKE L.J. 17 (2000); *see also* ICANNWATCH, ABOUT US, *at* http://www.icannwatch.org/article.php?sid=7 (last visited Oct. 20, 2001).

34 *See* NAT'L TELECOMM. & INFO. ADMIN., DEP'T OF COMMERCE, FACT SHEET, *at* http://www.ntia.doc.gov/ntiahome/ntiafacts.htm (last visited Oct. 20, 2001). NTIA has continued to direct awareness of the needs of Internet "have nots" and the uneven deployment of Internet technology along socio-economic lines. *See also* Mark K. Anderson, *At MIT, A Division on the Divide*, WIREDNEWS.COM, *at* http://www.wired.com/news/culture/0,1284,39556,00.html (Oct. 20, 2000) (discussing the E-Development Conference hosted by The Berkman Center for Internet & Society at Harvard Law School); *see also* Press Release, Markle Foundation, UNDP and Andersen Consulting in Cooperation with Markle Foundation, Launch Project at G-8 Summit to Bridge the Global Digital Divide, *at* http://www.markle.org/news/_news_pressrelease_072200a.stm (July 22, 2001) (discussing the Dot Force initiatives called for in the Okinawa Declaration of the G-8 Summit).

35 *See generally* SPACE RACE, *supra* note 6, at 1.

36 Refers to the meetings that eventually led to the formation of the Warsaw Treaty Organization and the North Atlantic Treaty Organization (NATO). *See* NATO, THE ORIGINS OF THE NORTH ATLANTIC COUNCIL AND THE ROLE OF SUMMIT MEETINGS IN NATO'S HISTORY 1, *at* http://www.nato.int/docu/facts/2000/origin.html (last modified Aug. 9, 2000).

37 Refers to the United Nations Security Council resolutions that dealt with the need for international control of atomic energy after World War II. *See* U.N. SCOR, 2d Sess., 117th mtg. at 15–16, U.N. Doc. S/296 (1947); *see also* U.N. SCOR, 3d Sess., 325th mtg. at 33, U.N. Doc. S/852 (1948); U.N. SCOR, 4th Sess., 447th mtg. at 16, U.N. Doc. S/1393 (1949).

38 VERTIC, SUBMISSION TO FOREIGN AFFAIRS COMMITTEE ENQUIRY INTO WEAPONS OF MASS DESTRUCTION 1, *at* http://www.vertic.org/current/FACEWMD.htm (last visited Jan. 1, 2002). "Verification is essential to all regimes dealing with

Treaties were negotiated, signed and ratified.[39] Eventually, exchanges of technology and cooperation evolved. Commercialization never jumped into the forefront during the early years of the Space Race. A common heritage and exploration ethic undergirded the development of Internet policy and its legal regime.[40] A desire for technological superiority and to control the "high ground" during the Cold War were both evident in the actions of technologists and policymakers.[41] Such is not the case with the Internet. Commercialism is at its forefront. Despite the common roots of space and Internet technology, most of the practitioners of cyberlaw do not have a background in the prior evolutions of space law. To that end, this article reviews space law and its antecedents. It intends to show, through the evolution of space law doctrine, the issues to be examined, the lessons learned and the guideposts to be considered to assist the cyberlaw practitioner along the developing path of cyberlaw.

III. BORDERS & SOVEREIGNTY

On its first day of existence, space law dealt with the issue of borders and sovereignty.[42] Crossing borders quickly and possibly without detection was a founding hallmark of space technology.[43] At times, legal regimes such as admiralty and aerospace law did little to help space law in these areas except to act as counter-examples.[44] For example, the modern space shuttle orbit around the globe takes approximately 45 minutes. This can be contrasted to modern jet airplane technology, which allows a commercial jetliner to pass through a time zone, 1/24th of the earth, in about twice that time.[45] Yet, cyberspace, operating at the speed of the modern telecommunications network, beats them both.[46]

The Internet, while "traveling" through wires rather than space, can learn from space law's early challenges in the crossing of borders. As a technology that comes out of military research and as a technology that uses a previously unused medium to project power, the Internet has some historical antecedents in aerospace and space technology. However, data protection laws notwithstanding, the border crossings in cyberspace are rarely considered to be a threat unless the electronic transaction under way is itself illegal.[47] Nevertheless, the sanctity and protection of one's borders is considered to be one of the defining as-

weapons of mass destruction. It helps detect non-compliance, deter potential violators and builds confidence by giving treaty parties opportunities to demonstrate their compliance." *See also* NAT'L SECURITY COUNCIL, DISCUSSION AT THE 443RD MEETING OF THE NATIONAL SECURITY COUNCIL, May 5, 1960 2-5, *available at* http://www.hq.nasa.gov/office/pao/History/Sputnik/may60.html (last visited Jan. 1, 2002).

39 *See* David Krieger, *Nuclear Arms Control Treaties*, NUCLEARFILES.ORG, 1, *at* http://www.nuclearfiles.org/issues/nuclearweapons/kriegertreaties.html (last visited Jan. 1, 2002); *see also* UNITED NATIONS, OFFICE FOR OUTER SPACE AFFAIRS, UNITED NATIONS TREATIES AND PRINCIPLES ON SPACE LAW 1, *at* http://www.oosa.unvienna.org/spacelaw/treaties.html (last modified Feb. 1, 2001).

40 *See* Michael A. Stoker, *Framed Web Pages: Framing the Derivative Works Doctrine on the World Wide Web*, 67 U. CIN. L. REV. 1301, 1308 (1999).

41 *See* U.S. INFO. AGENCY, OFFICE OF RESEARCH AND ANALYSIS, IMPACT OF U.S. AND SOVIET SPACE PROGRAMS ON WORLD OPINION 1-4, *at* http://www.hq.nasa.gov/office/pao/History/sputnik/july59.html (last visited Jan. 1, 2002).

42 *See* Twibell, *supra* note 16, at 263 n.18 (describing the activities occurring immediately after the Sputnik launch).

43 Space Law determined that sovereignty and appropriation had no place in outer space. *See* Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, arts. 2, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter OS Treaty]. Some have claimed that this utopian ideal is one of the reasons that space technology and space exploration is far from meeting its potential. *See* Keefe, *supra* note 13, at 348; *see also* Harminderpal Singh Rana, *The 'Common Heritage of Mankind' & The Final Frontier: A Revaluation of Values Constituting the International Regime for Outer Space Activities*, 26 RUTGERS L.J. 225 (1994) [hereinafter Rana].

44 *See* GLENN H. REYNOLDS & ROBERT P. MERGES, OUTER SPACE PROBLEMS OF LAW AND POLICY 27-43 (2d ed. 1998) [hereinafter REYNOLDS & MERGES].

45 The circumference of the globe is about 25,000 miles. Thus, a time zone generally is just over 1,000 miles wide. A modern jet covers this distance in about one and one-half hours at its typical speed of nearly 600 miles per hour. EVERYDAY CLASSROOM TOOLS: TIME WARP 101, *at* http://hea-www.harvard.edu/ECT/pdf/Warp.pdf (last visited Oct. 20, 2001).

46 Cyberspace, using electronic communications, travels essentially at the speed of light, which is 299,792,458 meters per second (m/s). Mike Guidry, *The Speed of Light*, 1, *at* http://csep10.phys.utk.edu/guidry/violence/lightspeed.html (last visited Oct. 25, 2001).

47 *See* Press Release, Council of Europe Press Service, First International Treaty to Combat Crime in Cyberspace Approved by Ministers' Deputies, *at* http://www.press.coe.int/cp/2001/646a(2001).htm (Sept. 19, 2001) (verifying that the much debated European Union Convention on Cybercrime had been approved). The INTERPOL (http://www.interpol.int/Public/TechnologyCrime/default.asp) has been used by the international community to fight cybercrime. In the U.S., the Department of Justice (http://www.cybercrime.gov), the Federal Bureau of Investigation (http://www.NIPC.gov) and the Department of Treasury (http://www.ustreas.gov/usss/) have taken an active interest in cybercrime.

pects of sovereignty.[48]

Protecting one's citizens both inside and outside of one's borders is fundamental to our view of nationhood.[49] Furthermore, nationhood itself is sometimes seen as the linking of a set of social norms of a people to the place that the people inhabit.[50] All of these concepts are challenged by both outer space and cyberspace.[51] Cyberspace comes into the home and interacts with the residents often in total secrecy through the use of encryption technology. Thus, in cyberspace, unlike space vehicle blastoffs and detectable telemetry information, laws and social norms may be challenged without any ability to detect the infraction.[52]

A. Sovereignty and Borders in Air Law

In the years leading up to the launch of the Space Age, air law scholars[53] looked to the history of admiralty[54] and air law[55] to examine and establish the foundations leading to space law's views of sovereignty and borders.[56] The early space law practitioners cited the Romans,[57] Grotius,[58] Pufendorf[59] and other scholars[60] to explore the history of the Latin phrase that has guided air law

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48 Political philosophers have long pointed out that nations that cannot protect their borders from hostile forces quickly cease to be sovereign nations. *See* THOMAS HOBBES, LEVIATHAN 111 (J.C.A. Gaskin ed., Oxford University Press 1996) (1651).

49 *See* U.S. CONST. pmbl. ("We the People of the United States, in Order to . . . provide for the common defence").

50 Lawrence Lessig, *Emerging Media Technology and the First Amendment: The Path of Cyberlaw*, 104 YALE L.J. 1743, 1745 (1995) (arguing for the continued respect for the common law's "constructive function").

51 *See Developments I, supra* note 11, at 1585 (stating that the "Internet has rapidly become an influential social, economic, and political force of the modern world"); *see also Developments in the Law—The Law of Cyberspace II. Communities Virtual and Real: Social and Political Dynamics of Law in Cyberspace*, 112 HARV. L. REV. 1586, 1586 (1999) (stating that the "ability of online users to interact in sophisticated ways, forming 'virtual communities,' may be what most differentiates the Internet from past developments in communications technology"); Frank H. Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. CHI. LEGAL F. 207 (1996) (arguing that cyberlaw does not need to evolve into its own body of law).

52 In cyberspace, the travel is done through electronic means. Unlike visible infractions in airflight, or detectable launch and recovery in spaceflight, the only methods of detecting communication occuring in cyberspace are through relatively sophisticated electronic means. *See* Ben Charney, *The Technology Behind FBI's 'Carnivore,'* ZDNET NEWS, *at* http://www.zdnet.com/zdnn/stories/news/0,4586,2605428,00.html (July 19, 2000). To assist cyberlaw practitioners in understanding borders and jurisdiction, the Cyberspace Committee of the American Bar Association's Section on Business Law drafted a Jurisdiction Report that was delivered at the ABA's 2000 Convention in London, England. *See* COMM. ON CYBERSPACE LAW AM. BAR ASS'N, ACHIEVING LEGAL AND BUSINESS ORDER IN CYBERSPACE: JURISDICTIONAL ISSUES CREATED BY THE INTERNET, *at* http://www.abanet.org/buslaw/cyber/initiatives/jurisdiction.html (last visited Oct. 6, 2001).

53 *See* JOHN COBB COOPER, EXPLORATIONS IN AEROSPACE LAW 455 (Ivan A. Vlasic ed., McGill University Press 1968) [hereinafter COOPER]. Continuing a distinguished career as an aviation law expert, first as a Florida lawyer and later as Vice President of Pan-American Airways, Professor John Cobb Cooper was named the first Director of the Institute of International Air Law at McGill University, Montreal in 1951. He authored numerous articles during the earliest days of the Space Age, many of them are collected in this book; *see also* SENATE COMM. ON AERONAUTICAL AND SPACE SCIENCES, 87TH CONG., LEGAL PROBLEMS OF SPACE EXPLORATION—A SYMPOSIUM 271 (Comm. Print 1961) [hereinafter SENATE COMM. SYMPOSIUM 271]; Welf Heinrich, Prince of Hanover, *Air Law and Space, reprinted in* 5 ST. LOUIS U. L.J. 11 (1958) [hereinafter Heinrich]. This 1953 dissertation by the Prince of Hanover is a thorough and concise review of the issues to be faced by space law as it developed. *See generally* SENATE COMM. ON AERONAUTICAL AND SPACE SCIENCES, 87TH CONG. 1ST SESS., LEGAL PROBLEMS OF SPACE EXPLORATION—A SYMPOSIUM 779a-79h (Comm. Print 1961) [hereinafter SENATE COMM. SYMPOSIUM 779a-79h] (citing AMERICAN BAR FOUNDATION, THE LAW OF OUTER SPACE (1960)). The article stated that the newly-formed space agency, NASA, had asked the American Bar Foundation to examine the status of space law. *See also State Responsibility, supra* note 1, at 5-6 (reciting the history of sovereignty as explained by Bodin, Grotius, Hobbes and Locke).

54 *See State Responsibility, supra* note 1, at 8 (stating in "international aviation, the concept of sovereignty is the fundamental postulate upon which all other norms are based"). *See also* COOPER, *supra* note 53, at 39. Professor Cooper cited Justice Joseph Story in *The Marianna Flora*, 24 U.S. (11 Wheat.) 1, 48 (1826):

> Upon the ocean, then, in time of peace, all possess an entire equality. It is the common highway of all . . . Every ship sails there with the unquestionable right of pursuing her own lawful business . . . she is bound to pursue it in such a manner as not to violate the rights of others.

55 *See* COOPER, *supra* note 53, at 79 (citing 2 HUGO GROTIUS, DE JURE BELLI AC PACIS ch. 2 § 3 (1625): "The extent of the ocean is in fact so great that it suffices for any possible use on the part of all peoples . . . "); *see also* Stephen Gorove, *Sovereignty and the Law of Outer Space Re-Examined*, 2 ANNALS AIR & SPACE L. 311 (1977) [hereinafter Gorove] (describing JEAN BODIN, SIX LIVRES DE LA REPUBLIQUE (1576) and analyzing the foundation of sovereignty).

56 *See* COOPER, *supra* note 53, at 79 (citing Hugo Grotius: "Fowling, therefore, and similar pursuits, are subject to the law laid down by him who has control of the land." GROTIUS, ch. 2 § 3 (1625)); *see also* COOPER, *supra* note 53 at 81 (citing a 1687 law dissertation of Jean-Etienne Danck, *De Jure Principis Aereo*, as the first legal work dealing exclusively with air law).

57 *See* COOPER, *supra* note 53 at 59.

58 *See id.* at 79.

59 *See id.* at 81.

60 *See id.* at 60-61 (analyzing the writers who have studied the Roman law; the consensus opinion seems to center on

for almost a millennium. That phrase, "*Cujus est solum, ejus est usque ad coelum*"[61] has guided both air and space law since the founding of each. Professor Cooper, an aviation law expert, examined the phrase in a 1951 article researching the Justinian Digest and Institutes,[62] Grotius, English common law,[63] the French,[64] the age of flight,[65] to turn of the century developments.[66] He came to the conclusion that the landowners' right was not absolute, but the sovereign rights of the nation were absolute.[67]

A significant development in air law is the 1910 International Air Navigation Conference in Paris.[68] It was during this conference that national rights over airspace were officially recognized for the first time.[69] Differing positions by the French,[70] Germans[71] and British[72] were debated and largely reconciled,[73] but were not able to be finally agreed upon.[74] Despite the apparent lack of agreement, by the time of World War I, sovereignty over airspace had become customary international law.[75]

The work of the 1910 Paris Conference and the experience of World War I led the way for the Paris Convention of 1919 to adopt national sovereignty over airspace as the absolute rule.[76] Thus, the issue of air sovereignty was "removed from speculation" by the adoption of a general rule.[77] Although the United States signed but never ratified the Paris Convention, there was never any doubt as to the United States' views on air sovereignty.[78] The United States' view of absolute sovereignty was codified in the Air Commerce Act of 1926.[79] Through the Civil Aeronautics Act of 1938, this sovereignty was clarified to be national in scope rather than vested in the states or landowners.[80] Furthermore, the Supreme Court supported the view of absolute sovereignty over the air.[81] Near the end of World War II, all of the previous models of air sovereignty were again re-

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the right to practical use but not absolute ownership up to the heavens).

61 *See id.* at 75 (referring to scholarship and translations of a related phrase by a Bolognese glossator in the 12th Century: "Whose is the soil, his it ought to be up to the heavens").

62 *See id.* at 71.

63 *See id.* at 83–84 (citing Coke, Selden and Blackstone).

64 *See id.* at 86–87 (referencing the Coutume de Paris of the 17th century and the scholar Ferriers' 1714 commentaries dealing with the concept of *cujus est solum*); *see also id.* at 87 (stating that the findings of both the Coutume and Ferriers led to the inclusion of *cujus est solum* into the French Civil Code (Code Napoléon) in 1804).

65 *See id.* at 92–95 (reviewing the use of *cujus est solum* once balloons were discovered to be able to fly in 1783).

66 *See id.* at 96–100 (citing the Paris Convention, the Civil Aeronautics Act of 1938 and the case U.S. v. Causby, 328 U.S. 256 (1946) for the proposition that ownership is not absolute but sovereignty may be).

67 *See id.* at 118.

68 *See* I. H. Ph. Diederiks– Verschoor, An Introduction to Air Law 2 (4th ed. 1991) [hereinafter Diederiks-Verschoor] (describing the background to the 1910 Paris Conference); *see also* Cooper, *supra* note 53, at 106 (stating that the Paris Conference was called due to concerns regarding German balloon overflights into France); *see also id.* (claiming that because the overflights were a local European concern, the United States was not invited to participate).

69 *See* Cooper, *supra* note 53, at 105 (arguing that the 1910 International Air Navigation Conference, rather than the Paris Convention of 1919, was the first international assembly to recognize state sovereignty over the air).

70 *See id.* at 109–10 (stating that the concepts of "freedom of the air" were put forth by Paul Fauchille and the French delegation, however, the French reserved the right of self–preservation).

71 *See id.* at 110–12 (explaining that the Germans proposed full and absolute territorial sovereignty; no right of entry of any aircraft was granted; aircraft were to be identified with a state; and all international air routes were to be agreed to in advance by each affected state); *see also id.* (concluding that the text of the German position was used as the basis for the draft convention); *see also id.* at 115 (claiming that the Germans saw no place for the admiralty–law–based right of innocent passage).

72 *Id.* at 112–13 (stating that the British recognized both the rights of the landowner and the "full sovereignty rights of the subadjacent State").

73 *See id.* at 113–18 (explaining that compromises were reached, draft agreements were created and were largely agreed upon).

74 *See id.* at 118 (stating that at the end of the conference, only one point of disagreement separated the British position from the German and French position—the legal status of private property rights in flight–space).

75 *See id.* at 136, 141 n.7.

76 *See id.* at 137, 140 (stating that the U.S. delegate, Rear Admiral H.S. Knapp proposed "the Commission [adopt] as its first principle the acceptance of the rule that each State is sovereign in the airspace above its territory . . . ").

77 *See id.* at 145.

78 *See id.* at 175 (claiming that "the United States has in fact always been one of the chief proponents of the doctrine of air–space sovereignty").

79 *See id.* at 165 (citing Section 6 of the Air Commerce Act, giving the Government of the United States "to the exclusion of all foreign nations, complete sovereignty of the airspace over the lands and waters of the United States" Air Commerce Act of 1926 §6, 49 U.S.C. §176 (repealed 1983)).

80 *See id.* at 166 (discussing significant Constitutional issues that arose as to what powers were reserved to the States at the time of the adoption of the Constitution); *see also id.* (stating that the Civil Aeronautics Act amended the Air Commerce Act to clarify that the Federal government "exercises national jurisdiction" in the airspace above the territorial United States).

81 *See* United States v. Curtiss–Wright Export Corp., 299 U.S. 304, 318 (1936); *see also* Cooper, *supra* note 53, at 169–70 (explaining that Professor Cooper never saw the na-

viewed and agreed to in 1944 at the Convention on International Civil Aviation in Chicago by the granting of absolute air sovereignty rights to the signatory states.[82] Such was the situation regarding the five-decade-old challenge of aeronautical technology to sovereignty and borders when the United States and the rest of the world began to face the issues of the Cold War[83] and the Space Race.

B. Sovereignty and Borders in Space Law

Regarding sovereignty over airspace, by the late 1940s the world community had either rejected the sovereignty by the sea approach or extended to air law the equivalent of "territorial waters" to all airspace within the uppermost limit of flight.[84] The developments of rocket technology continued to challenge this view. By 1949 rockets had reached the altitude of 250 miles.[85] By 1951, some scholars were examining the issue of jurisdiction over spacecraft and satellites.[86] The time typically used for the slow evolution of customary international law was not available.[87] Instead, international agreements were necessary and served as foundations for current international entities such as the United Nations and the International Civil Aviation Organization ("ICAO").[88] But what was to be regulated?[89] The current rules may well have viewed a spacecraft as an illegal challenge to sovereignty.[90] To remedy the apparent inapplicability of air law to space law, many legal scholars

tional nature of sovereignty as an issue).

82 *See* Convention on International Civil Aviation, Dec. 7, 1944, art. 1, 146 U.S.T. 1944 [hereinafter Chicago Convention]; *see also* International Air Services Transit Agreement, Dec. 7, 1944, art. 1, 59 Stat. 1693, E.A.S. No. 487 (citing INTERNATIONAL CIVIL AVIATION CONFERENCE, FINAL ACT AND RELATED DOCUMENTS 60 (1944): "The contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory."); *see also* DIEDERIKS-VERSCHOOR, *supra* note 68, at 9 (describing the various competing positions of various delegations to the Chicago Convention and their eventual compromise); *but see* Kayser, *supra* note 4, at 367 (comparing the diametrically opposed air and space law views of sovereignty).

83 *See* COOPER, *supra* note 53, at 171–93 (commenting on an article entitled *Airspace over the Arctic*, which was written for the never unpublished *Encyclopedia Arctica*); *see also id.* (stating that Professor Cooper reviewed the rights of the Arctic border nations as Cold War tensions mounted and that this issue was of special concern since the U.S.S.R. was not a signatory to either the Paris Convention or the Chicago Convention); *see also id.* at 195–202 (commenting on an article entitled *Space Above the Seas*, written for the "JAG Journal" in 1959, in which Professor Cooper distinguishes between the lack of sovereignty rights over the high seas and the existence of sovereignty rights over territorial seas).

84 *See* Convention on the Territorial Sea and the Contiguous Zone, Apr. 29, 1958, art. 1, 15 U.S.T. 1606, T.I.A.S. No. 5639 [hereinafter Convention on the Territorial Sea]; *see also* COOPER, *supra* note 53, at 307 (comparing the Convention on the Territorial Sea, which recognized the right to extend sovereignty, to a territorial sea by using the phrase "belt of sea adjacent to its coast").

85 *See* COOPER, *supra* note 53, at 260.

86 *See* Heinrich, *supra* note 53, at 271 (analyzing the background and issues of sovereignty in outer space); *see also* COOPER, *supra* note 53, at 262 (stating that from "the international lawyers' point of view the question then arises: Does such an artificial satellite, flying several times per day around the earth and passing far above the surface territories of many States, enter and leave the territory of each of such States when immediately above their surface boundaries"); *see also id.* at 257 (citing a 1932 article by Vladimir Mandel entitled *Das Weltraumrecht: Ein Problem Der Raumfahrt*, which stated "this sovereignty must have a territorial boundary somewhere and it cannot extend endlessly").

87 *See* COOPER, *supra* note 53, at 38 (stating that "any sound and effective framework will require new international agreement . . . "); *see also* Lachs, *supra* note 5, at 15 ("Yet it soon became obvious . . . that law-making for outer space could not be left to custom and practice only.").

88 *See* COOPER, *supra* note 53, at 277, 280 (discussing whether the International Civil Aviation Organization ("ICAO") or a new organization was appropriate for overseeing the regulation of space and Russian concerns with ICAO given its status as a non–signatory). For the constitutive provisions establishing ICAO, *see* Chicago Convention, *supra* note 82, at art. 43.

89 *See* SENATE COMM SYMPOSIUM 271, *supra* note 53, at 345–48 (citing Oscar Schacter, *A Preview of Space Law Problems Warning: Early Unilateral Positions*, N.Y. COUNTY L. ASS'N, at 33–36, 1958); *see also* COOPER, *supra* note 53, at 275 (concerning Professor Cooper's call for the adoption of a view of airspace with its historic view of sovereignty, contiguous space where sovereignty would still extend and outer space, which would be free from sovereignty claims); *see also id.* at 277 (stating how Professor Cooper was concerned with the nationality of any spacecraft and whether the concept of attaching a "flag" to any spacecraft would be the best view).

90 *See* NICHOLAS MATTESCO MATTE, AEROSPACE LAW 125–30 (1969) [hereinafter MATTE] (reviewing the possible role of ICAO); *see also* COOPER, *supra* note 53, at 274 (citing the ICAO Convention, which provided that pilotless aircraft were not to be flown over another State without special authorization); *see also id.* at 263 (stating the competing views of sovereignty with the primary objective that sovereignty should extend to any height from which a falling object could damage the geography below); *id.* at 323 (stating that any ship without a "flag" designating national status is considered "piratical in character" under international maritime law). *But see id.* at 274 quoting C. Wilfred Jenks:

> . . . space beyond the atmosphere of the earth is and must always be incapable of appropriation by the projection into such space of any particular sovereignty based on a fraction of the earth's surface. . . It would seem important to accept this principle fully from the earliest stages . . .

C. Wilfred Jenks, *International Law and Activities in Space*, 5 INT'L & COMP. L. Q. 99, 114 (1956).

called for a new agreement.[91] At that time, the only thing for certain was the observation that "for the second time in the present century science and engineers have far outstripped the law."[92] Many of these discussions regarding satellite overflight occurred in conjunction with the International Geophysical Year ("IGY").[93]

All of the theoretical discussions by lawyers, policymakers and scientists came to an abrupt end upon the launch of Sputnik.[94] The international response was immediate.[95] Some international organizations were seen as having abdicated any effective role.[96] Limits were seen as needing practical definition[97] and uncertainty of applicable law was widespread.[98] Customary international law was not seen as an appropriate method of creating the legal regime for outer space.[99] The lack of assertion of sovereignty was seen as distinct from any establishment of a non–sovereignty concept like the law.[100] Furthermore, issues regarding sovereignty during spacecraft ascent into and descent from orbit caused special concern.[101]

The United Nations helped remedy the lack of formal agreements by quickly creating the *ad hoc* Committee on the Peaceful Uses of Outer Space ("COPUOS").[102] After several years of discussion, the United Nations, through COPUOS, took formal action regarding outer space sovereignty in 1963.[103] This agreement was argued to have created instant international customary law.[104] After

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91 *See* COOPER, *supra* note 53, at 275–76 (revising his 1951 recommendations by claiming rights for each state as high as the technical capabilities of the most advanced state and calling for a three step solution: (1) Reaffirming Article 1 of the Chicago Convention; (2) Extending sovereignty to 300 miles as part of contiguous space; and (3) Accepting the principle that space above "contiguous space" if free for the passage of all instrumentalities); *see also id.* at 276 (stating that Professor Cooper was concerned about an arbitrary limit being established until the technology showed what that limit should be); *but see* MATTE, *supra* note 90, at 62–64. A decade later, Matte offered a "functional solution" of six steps: (1) Obliterating all divisions between air and space; (2) Seeing freedom of space and sovereignty as functional; (3) Recognizing certain functional rights and sovereignty for states; (4) Determining that functional freedom is not absolute, but rather oriented toward humanitarian, scientific and exploratory functions; (5) Allowing inherent international law principles such as rights to self defense; and (6) To understand that under the functional approach, aeronautical law applies only to "aircraft" such as "planes, balloons and any device requiring air support." *Id.*

92 *See* COOPER, *supra* note 53, at 269 (stating that currently, with the introduction of the Internet, we now have a third candidate for this distinction).

93 *See id.* at 292 (citing a 1959 U.N. Report which reviewed the IGY discussions regarding peaceful overflight by space satellites being allowed so that "outer space is, on conditions of equality, freely available for exploration and use by all . . . ").

94 *See id.* at 280–84 (describing Sputnik as a 184–pound sphere, orbiting at 18,000 miles an hour at an altitude between 585 miles and 150 miles); *see also id.* at 280 (stating that the satellite and its last rocket stages circled the earth more than 200 times in its first two weeks).

95 *See id.* at 282–83 (describing the request of twenty-one nations for a draft of a United Nations General Assembly Resolution calling for the disarmament of outer space and its exclusive use for peaceful and scientific purposes); *see also id.* at 289 (describing the 1959 creation of the United Nations Ad Hoc Committee On the Peaceful Uses of Outer Space).

96 *See id.* at 258 (explaining that the United Nations was the proper forum for action since ICAO had failed to act on space law issues even though it had been on its agenda at its Caracas Assembly the year before). *But see id.* at 291–92 (describing the activities of the International Astronautical Congress and International Law Association).

97 *See id.* at 291 (calling for the pragmatic definition of outer space as the lowest altitude an artificial satellite could reach during a regular orbit).

98 *See id.* (claiming that application of international law to an area whose legal status is unknown would be unsatisfactory).

99 *See id.* at 292 (citing Arnold W. Knauth's address in Buenos Aires, which claimed that the 100 attempts and 50 launchings that had occurred by August of 1960 were insufficient for establishing any customary international law).

100 *See id.* at 293–94 (stating that no agreement existed regarding the sovereign rights of a nation in the subadjacent airspace); *see also id.* at 294 (citing Chief Justice John Marshall, Senator Daniel Webster and Senator Elihu Root for the proposition that territorial sovereignty is absolute, especially with regard to self–defense issues); *see also id.* at 342–43 (citing then Senator Lyndon Johnson in 1958, who stated that outer space should have no claims of sovereignty); *but see id.* at 287 (describing President Eisenhower's 1960 address to the United Nations, which called for space to be free from national appropriation and instead should be reserved for peaceful uses).

101 *See* Heinrich, *supra* note 53, at 320; *see also* COOPER, *supra* note 53, at 301 (explaining that it is during ascent and descent that spacecraft cross closest to the sovereign territories below the spacecraft's trajectory); Heinrich, *supra* note 53, at 320 (recalling that, in the Cold War context of space flight, descent was of special concern since the next flight might be an inbound ICBM rather than a civilian flight).

102 *See* MATTE, *supra* note 90, at 101 (describing the establishment of COPUOS and the Soviet Union's original refusal to participate).

103 *See id.* at 377–79 (citing the full–text version of G.A. Res. 1963, U.N. GAOR, 18th Sess. (1963) ; *see also* COOPER, *supra* note 53, at 299 (citing UNR 1962, which states: "Outer Space and celestial bodes are not subject to national appropriation by claims of sovereignty, by means of use or occupation, or by any other means."); *see also id.* at 328 (describing the Russian, British and American texts regarding "no national appropriation" that led to the eventual adoption of UNR 1962).

104 *See* Lachs, *supra* note 5, at 20 (claiming a special status for UNR 1962 due to its unanimous adoption); *see also* MATTE, *supra* note 90, at 275 (giving a lengthy defense for the proposition that UNR 1962 had a special status and should

the United Nations later agreed to negotiate a treaty,[105] the concept of nonappropriation was included as part of the 1967 Outer Space Treaty.[106] This theme of nonappropriation was carried forward in other space-related treaties culminating in Article XI of the Moon Treaty of 1978.[107] The only real challenge has come from several equatorial nations who have asserted rights to satellite positions over their countries.[108] Notwithstanding the views of these Bogotá Declaration signatories, those nations who have signed the Outer Space Treaty and other non-signatory nations who respect the customary international law, which has evolved over the past forty years, all recognize the fundamental proposition that outer space is free of claims of sovereignty.[109] Despite these established views, modern space law scholarship and practice has begun to question whether the protections providing non-appropriation have actually been an impediment to the use of space.[110] Others have looked to the day where sovereignty over outer space will be determined by its inhabitants rather than from nations on earth.[111]

IV. JURISDICTION AND LIABILITY

Astronauts physically go into space. The stunning launch of a large and dangerous rocket is a clear signal that travel is taking place in a manner previously unforeseen. All early astronauts were also members of the military chosen from the ranks of top test pilots.[112] They were glory-bound soldiers doing the duty that their nation had called upon them to do. They did not attach any particular rights to their status as astronauts or their travels into outer space. The very term "mission" is quite telling of their perspective on their role and function. During this time it was the futurists who were considering the need for defining space citizenship sometime in the future.[113] Even today, such concepts of space citizenship seem like a quaint remnant of the early Space Age. Only in the context of Mars missions, manning the ISS and the future colonization of the moon and planets do the rights of a citizen in

be regarded as instantaneous international custom); *see also* COOPER, *supra* note 53, at 322 (arguing that the unanimous adoption of UNR 1962 gives evidence of customary international law that subadjacent states have no right to exercise sovereignty in outer space); *see also id.* at 349 (citing D. Goedhuis, *Regimes of Air Space and Outer Space*, 2 RECUEIL DES COURS 295, 295–97 (1963) and WILFRED JENKS, SPACE LAW 171 (1965)) (claiming that instantaneous international law was created upon unanimous adoption of UNR 1962; however, Professor Cooper also cited contrary views held by Hungary, Italy, France and the Soviet Union).

105 *See* MATTE, *supra* note 90, at 108 (citing U.N. Res. 2130, U.N. GAOR, 20th Sess. (1965) that called for COPUOS to prepare a draft of an international treaty dealing with the peaceful exploration of outer space).

106 *See* OS Treaty, *supra* note 43 (stating that Art. 1 of the treaty declares that outer space, the moon and other celestial bodies "shall be the province of all mankind" and Art. 2 declares that none of these "is subject to national appropriation by claims of sovereignty," appropriation or use); *see also* Marietta Bendo & Kai-Uwe Schrogl, *Article I of the Outer Space Treaty Reconsidered After 30 Years, in* OUTLOOK ON SPACE LAW OVER THE NEXT 30 YEARS 67 (Gabriel Lafferranderie & Daphné Crowther eds., 1997) [hereinafter Bendo & Schrogl].

107 *See Agreement on Activities of States on the Moon and Other Celestial Bodies*, G.A. Res. 34/68, U.N. GAOR, 34th Sess., Supp. No. 46, at 6, U.N. Doc. A/34/664 (1979) [hereinafter Moon Agreement]. Article 11(2) states, "The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means." *Id.*

108 *See generally* D. Goedhuis, *Influence of the Conquest of Outer Space on National Sovereignty: Some Observations*, 6 J. SPACE L. 37 (1978) (describing the activities surrounding the 1976 Bogotá Declaration, which included claims by the signatory nations over sovereignty and territorial rights for geostationary orbits above their respective countries).

109 *See* Gorove, *supra* note 55, at 311 (reviewing the concept of sovereignty and how it was viewed in the various space treaties); *see also* V. S. Vereshchetin, *On the Principle of State Sovereignty in International Space Law*, 2 ANNALS AIR & SPACE L. 429 (1977) (giving the Soviet view regarding the freedom from claims of sovereignty in outer space).

110 Keefe, *supra* note 13, at 358 (arguing the preclusion of sovereignty in outer space limits space development); *accord* Twibell, *Circumnavigating, supra* note 16, at 259 (describing the great expense of investing in space technology and the risk incurred by not knowing what claims might arise from sharing the fruits of that investment); Glenn H. Reynolds, *International Space Law: Into the Twenty-First Century*, 25 VAND J. TRANSNAT'L L. 225, 233 (calling for a clarification of current treaties or the creation of new treaties to examine the allocation of property rights in space); *see also* Rana, *supra* note 43, at 225. *But see* Bendo & Schrogl, *supra* note 106, at 67 (discussing the role of lesser developed countries in space and the activities of COPUOS over the last decade to promote that role).

111 *See generally* George S. Robinson, *Frontier Law at L-5*, 4 ANNALS AIR & SPACE L. 617 (1979) (describing the history of sovereignty in space law, its relation to the history of colonialism and the possible evolution of space nations and citizens who might deserve special rights upon their visits to Earth).

112 For instance, astronauts Walter Schirra and John Glenn were both military test pilots, and astronaut Deke Slayton was a World War II B-1 Bomber pilot. *See* WALTER SHIRRA, SHIRRA'S SPACE (1995); JOHN GLENN, JOHN GLENN: A MEMOIR (1999); DEKE SLAYTON, DEKE! U.S. MANNED SPACE: FROM MERCURY TO THE SHUTTLE (1995). *See generally* TOM WOLFE, THE RIGHT STUFF (1980) (giving a fictionalized account of the early space program and its first astronauts).

113 *See* MATTE, *supra* note 90, at 353 (discussing extraterrestrial emigration and its impacts).

space take on any meaning.[114]

For their travels into cyberspace, most cybernauts never leave their chair in front of the computer. Nevertheless, cybernauts do surf around the world and may well be caught in a jurisdictional battle just as real as landing a space vehicle in an unintended country.[115] But they are not envoys of mankind.[116] Cybernauts are merely people who have become users of a new and fascinating technology whose early creators passed along a technology that has revolutionized human interaction and rivals inventions like the telegraph and telephone.[117]

Unlike cyberlaw, in space law, both technology and legal issues were largely intergovernmental for the first several decades.[118] This factor allowed technologists and policymakers to seek economic gain in the new Internet economy. The focus was on the other space power's ability to develop and deploy technology.[119] In cyberlaw, the national mandate was muted by the "gold rush mentality."[120] Rather than "asking what one can do for one's country" modern cybernauts asked what cyberspace can do for them and for their financial gain.[121] The interests of all mankind gave way to self-interest. Thus, while the issues of jurisdiction may well have parallels, the management of disputes and assignment of liability in cyberlaw are likely to be crafted very differently than first envisioned for space law. However, given that much of what now happens in space is itself commercial, namely the use of commercial satellites, modern space law may not be as foreign to cyberspace commercialism as first imagined. Both have challenged the classical ideals regarding the parties and situs of jurisdictional and liability-based disputes. Hopefully, cyberlaw practitioners can learn from the trail blazed by space law pioneers only one generation ago.

114 *See* Ratner, *supra* note 19, at 323; *see also* Watson, *supra* note 15, at 163; *but see* V.S. Vereshchetin, *Legal Status of International Space Crews*, 3 ANNALS AIR & SPACE L. 545, 546–53 (1978) (describing the current understanding regarding jurisdiction and control over multinational space station crews); *accord* Gabriella Catalano Sgrosso, *Legal Status, Rights and Obligations of the Crew in Space*, 26 J. SPACE L. 163, 172–86 (1998) [hereinafter Sgrosso] (describing the rights of astronauts to health, safety and compensation for damages and the duties of astronauts to observe civil jurisdiction, submit to criminal jurisdiction and to protect intellectual property).

115 For instance, the Internet Law and Policy Forum (ILPF) held a conference titled *Jurisdiction: Building Confidence In a Borderless Medium*, July 26–27, 1999 in Montreal, Canada. *See* INTERNET LAW AND POLICY FORUM, WORKING GROUPS & PUBL'NS, *at* http://www.ilpf.org/groups/ (last visited Sept. 28, 2001) [hereinafter *ILPF Conference*]; *see also* AM. BAR ASS'N COMM. ON CYBERSACE LAW, *at* http://www.abanet.org/buslaw/cyber (last visited Sept. 28, 2001) (providing links to the activities of the American Bar Association's Section on Business Law Committee on the Law of Cyberspace project *Transnational Issues in Cyberspace: A Project on the Law Relating to Jurisdiction*).

116 *See* Allan R. Stein, *The Unexceptional Problem of Jurisdiction in Cyberspace*, 32 INT'L LAW 1167, 1172–73 (1998) [hereinafter Stein] (arguing that cyberspace deserves no special jurisdiction and netizens do not have legal standing). Cybernauts do not explore and interact in the same manner as astronauts. While they "explore cyberspace," they are merely conducting conversations and interactions that otherwise could be done via mail or telephone.

117 *See id.* at 1167; *see also ILPF Conference*, *supra* note 115 (stating that the attendees of the conference concentrated on issues that included jurisdiction in cyberspace, commercial law, consumer protection and data privacy; and within the realm of commercial law, questions were raised as to whether the law of the seller's nation or the buyer's nation prevailed in a dispute).

118 Space law was managed through the creation of the treaties described in this article. *See* Peter Malanczuk, *Actors: States, International Organizations, Private Entities*, *in* OUTLOOK ON SPACE OVER THE NEXT 30 YEARS 23, 28–30 (Gabriel Lafferranderie & Daphné Crowther eds., 1997). The commercialization of space was limited to supporting government space programs or international communications satellite programs such as Intelsat. *See id.* at 34. Cyberlaw, until now, has not had any treaty activity or formal international agreements among nations; however, cyberspace has been rapidly commercialized over the years.

119 Again, the backdrop of the Cold War and the creation of improved launch vehicles for intercontinental ballistic missiles can be seen. *See* REYNOLDS & MERGES, *supra* note 44, at 82–83 (discussing the reliance by the United States and the Soviet Union on ballistic missiles at the time when the Outer Space Treaty was negotiated).

120 The rapid growth of the Internet had a component where venture capitalists seemingly seized on and funded any business plan that involved the Internet. These companies were then rushed into existence and rapidly set to be sold to the public through an Initial Public Offering ("IPO"). *See generally* Kip Crosby, *Anatomy of a System*, FORBES, Sept. 10, 2001, at 54–55. In more traditional venture capital investments, the company is allowed to grow for five or more years before an IPO is contemplated; thus, the timeframe gives the company time to mature and its executives some seasoning while under the watchful eye of their venture capital investors. *See id.* at 55.

121 The reference here, of course, contrasts President Kennedy's call to America from his first inaugural speech ("And so, my fellow Americans: Ask not what your country can do for you—ask what you can do for your country."), with the Internet economy's apparent "me first" explosion of young wealthy entrepreneurs with no sense of duty beyond their stock options. *See* John F. Kennedy, Inaugural Address, *available at* http://www3.cnn.com/SPECIALS/cold.war/episodes/13/documents/jfk.inaugural/ (Jan. 20, 1961).

A. Jurisdiction

In classic common law jurisprudence, one gets jurisdiction through having control of a person (*in personam*) or a thing (*in rem*)[122] that can be called before the court having proper jurisdiction over the area of law in controversy (subject matter jurisdiction).[123] Regarding space law, jurisdictional considerations were made along similar lines.[124] The following four considerations from earlier air law were made regarding how to gain jurisdiction: (1) the law of the first takeoff state; (2) the law of the first landing state; (3) the law of the state flown over; or (4) the law of the aircraft's state registration designation.[125] Using the fourth jurisdictional predicate as its foundation, ships and aircraft were associated with a sovereign nation through a registration system.[126] The term nationality is often used to describe this doctrine. Each "ship" carries a designating "flag" that has specific meaning in international law.[127] Passengers and cargo are given the protection of national and international laws.[128] Furthermore, in aircraft and ships, captains and crew must conform to special rules.[129]

One special concept of maritime and air law is worthy of special concern in cyberspace. It is the concept of cabotage.[130] In early coastal navigation, the concept of cabotage laid down the rule that for such navigation, exclusive rights to trade could be retained by the state containing both the departing and arriving port.[131] Furthermore, the state retained jurisdiction. This concept was brought forward to air law with some adaptation. The concept has been a burden upon free navigation and trade in both maritime and air transport law.[132] By declaring that Internet cabotage should not be allowed, some experts have proposed "national intranets," which exclude other nations' trade and interaction.[133]

For outer space, like its air and maritime ante-

122 *See* JOHN J. COUND ET AL., CIVIL PROCEDURE 62, 75 (7th ed. 1997) (citing Pennoyer v. Neff, 95 U.S. 714 (1877) and International Shoe Co. v. Washington, 326 U.S. 310 (1945)).

123 *See id.* at 245 (explaining subject matter jurisdiction).

124 *See* OFFICE OF TECHBOLOGICAL ASSESSMENT, SPACE STATIONS AND THE LAW: SELECTED LEGAL ISSUES 25–32 (1986), *in* GLENN H. REYNOLDS & ROBERT P. MERGES, OUTER SPACE PROBLEMS OF LAW AND POLICY 277–80 (2d ed. 1998) (describing the foundations of jurisdiction as applied to space law and reviewing five possible principles of jurisdiction: (1) The Territorial Principle; (2) The Nationality Principle; (3) The Protective Principle; (4) The Universality Principle; and (5) The Passive Personality Principle); *see also id.* (stating that the Office of Technology Assessment then reviewed United States case law and statutory guidance regarding jurisdiction in maritime law, air law and space law); Ratner, *supra* note 19, at 323 (describing the first four of these principles).

125 *See* Heinrich, *supra* note 53, at 306. Looking to modern air law, these concepts reviewed by Heinrich can be best understood in terms of the 1980's most infamous air tragedy, Pan Am Flight 103. *See* William E. Smith, *Terror in the Night; the Prospect of Sabotage Hangs Like a Pall over the Crash of Pan Am Flight 103*, TIME, Jan. 2, 1989, at 74 (describing that the state of take off for the plane is Great Britain; the never reached state of landing was the United States; the state of registry was the United States; and the state of the effect was Scotland); *see also* DIEDERIKS-VERSCHOOR, *supra* note 68, at 23 (describing a case of diamond smuggling, which shows that jurisdiction is not gained during intermediate stopovers unless national security is at stake).

126 *See* Chicago Convention, *supra* note 82, at ch. III art. 17 (stating, "[a]ircraft have the nationality of the State in which they are registered."); *see also* DIEDERIKS–VERSCHOOR, *supra* note 68, at 29 (describing three zones of jurisdiction: (1) the airspace above the national territory; (2) the territorial waters; and (3) the high seas).

127 *See* Convention on the High Seas, Apr. 29, 1958, arts. 5–6, 18, 13 U.S.T. 2312 (granting of nationality by a signatory state is found in Article 5; Article 6 states that ships shall only fly under one flag and that ship "shall be subject to its exclusive jurisdiction on the high seas," and Article 18 deals with nationality regarding pirate ships); *see also* DIEDERIKS–VERSCHOOR, *supra* note 68, at 20 (reviewing the history of the nationality of aircraft from Fauchille to the present international agreements); COOPER, *supra* note 53, at 277 (explaining that under the concept of granting the right to a ship or aircraft to use a nation's flag "such state assumes certain international responsibilities for the good conduct of that ship on the high seas and in foreign ports and at the same time acts as the protector of the ship to enforce its international rights."); Heinrich, *supra* note 53, at 323.

128 *See* Sgrosso, *supra* note 114, at 167 (stating that international space law does not yet have a distinction between crew and passengers); *see also id.* (stating that in current space law passengers and cargo are considered crew).

129 *See* DIEDERIKS–VERSCHOOR, *supra* note 68, at 24–29 (reviewing the history and current international rules regarding the commander, fight crew and ground personnel).

130 *See* BLACK'S LAW DICTIONARY 194 (7th ed. 1999) (defining cabotage as "the privilege of carrying traffic between two ports in the same country").

131 *See* DIEDERIKS–VERSCHOOR, *supra* note 68, at 18 (describing cabotage and its application to air law).

132 *See id.* at 19 (describing the negative effects of cabotage on air transport competition).

133 *See* Steven L. Telleen, *The Intranet Paradigm*, IORG.COM, 1, *at* http://www.iorg.com/papers/paradigm.html (last modified June 24, 1997); *see also* Catherine P. Heaven, *A Proposal for Removing Road Blocks from the Information Superhighway by Using an Integrated International Approach to Internet Jurisdiction*, 10 MINN. J. GLOBAL TRADE, 387–90 (2001); Scott S. Kokka, *Property Rights on an Intranet*, 3 J. TECH. L. & POL'Y 3 (1998).

cedents, a nationality-based registration system has been adopted.[134] Space ships carry the flag of their sponsoring nation.[135] The protection of people and objects in space is provided for in its own separate treaty.[136] Any nation finding astronauts or space vehicles within their borders is to promptly return them to the launching country.[137] But, despite the language of space law treaties, the reality of jurisdiction over space activities in the modern era has far more to do with choice of law provisions in private contracts than with the international treaties that would otherwise apply.[138] For nations, it is often bilateral agreements that determine which state's laws apply.[139]

Jurisdiction in cyberspace is still in flux. Contracts often state their own venue provisions. Cybercrime conventions, as well as federal cybercrime statutes, have been crafted to manage new forms of crime.[140] Privacy law is also being adapted to deal with cyberlaw issues.[141] The Hague Convention is being used as the setting to manage the international cooperation with contracts and civil judgments in cyberspace.[142]

B. Liability

Air law assigns liability through international convention and customary international law.[143] Space law has developed its own methods to deal with liability.[144] As for cyberlaw, cyberpiracy, hacking, industrial espionage and "information warfare" all lurk underneath cyberspace and call for assignment of liability for crimes and controversies in cyberspace.[145] Although space law dealt with real world mishaps, it can inform cyberlaw as it faces these challenges.

Space law practitioners knew from its outset that they were dealing with dangerous technology and with possibly lethal power.[146] The missions conducted in space and the vehicles used in space should be considered ultrahazardous activities.[147] Its early scholars and policymakers looked to their air law roots to evaluate what forms of liability should be applied.[148] They evaluated whether any existing air law liability models made sense.[149] The United States and other nations looked to these scholars and determined its national posi-

134 *See* OS Treaty, *supra* note 43, at art. 8 (providing that a state party who self-registers a space object "shall retain jurisdiction and control" over objects launched into space); *see also* Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, arts. 2, 4, 28 U.S.T. 695 (providing in Article 2.1 that launching states shall register their space objects in a national registry and in Article 4 that such information shall be forwarded to the Secretary General of the United Nations "as soon as practicable.") [hereinafter Registration Convention]; Bin Cheng, *Space Objects and Their Various Connecting Factors, in* OUTLOOK ON SPACE LAW OVER THE NEXT 30 YEARS 203, 204 (Gabriel Lafferranderie & Daphné Crowther eds., 1997) (describing the registration provisions of space law, the application of jurisdiction and control and the effects of private contracts on the provisions of the treaties).

135 *See* Registration Convention, *supra* note 134, at arts. 5-6 (describing in Article 5 that the information to be provided includes a "designator" or "registration number," while Article 6 describes the sharing of marking information with other nations).

136 *See* Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, arts. 1-10, 19 U.S.T. 7570 [hereinafter RRA].

137 *See id.* at arts. 1-2, 4 (calling for immediate notification, assistance, protection and return).

138 *See* REYNOLDS & MERGES, *supra* note 44, at 285 (stating that private contracts are replacing international agreements).

139 *See* Ratner, *supra* note 19, at 323 n.6 (reviewing the various bilateral agreements making up the corpus of agreements under which the ISS will be operated).

140 *See* Convention on Cybercrime, Nov. 23, 2001, Europ. T.S. No. 185; *see also* Michael E. O'Neill, *Old Crimes in New Bottles: Sanctioning Cybercrime*, 9 GEO. MASON L. REV. 237, 254 (2000) (citing 18 U.S.C. §1030 (2000)).

141 *See* Electronic Communications Privacy Act of 1986, Pub. L. No. 99-508, 100 Stat. 1848 (1994) (codified as amended in scattered sections of 18 U.S.C. §§2510-11, 2701-10, 3121-26); *see also* Children's Online Privacy Protection Act of 1998, Pub. L. No. 105-277, 112 Stat. 2681 (1999) (codified as amended at 15 U.S.C. §§6501-06).

142 *See generally* EUROPEAN UNION, HEARING ON THE DRAFT CONVENTION OF THE CONFERENCE OF THE HAGUE ON JURISDICTION AND FOREIGN JUDGMENTS IN CIVIL AND COMMERCIAL MATTERS 1-3, *at* http://europa.eu.int/comm/justice_home/unit/civil/audition10_01/index_en.htm (last visited Sept. 30, 2001).

143 *See* DIEDERIKS-VERSCHOOR, *supra* note 68, at 53-99, 119-46 (reviewing the Warsaw Convention and its associated protocols addressing the issues of liability, surface damage and collisions in air law.).

144 *See* Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, art. 2, 24 U.S.T. 2389 (assigning absolute liability to the launching state) [hereinafter Liability Convention].

145 *See* The Intellectual Property Constituency, IPC Synopsis Paper on the Trademark, Cyberpiracy Prevention Act, *at* http://ipc.songbird.com/cyberpiracy_paper.html (last visited Oct. 25, 2001); *see generally* The Information Warfare Site, Crime & Espionage, *at* http://www.iwar.org.uk/ecoespionage/index.htm (last modified Oct. 14, 2001).

146 *See* SENATE COMM., *supra* note 53, at 1305-28 (listing numerous failures among the many launches during the early years of the Space Age).

147 *See id.*

148 *See* COOPER, *supra* note 53, at 312-13 (reviewing liability in the case of a collision).

149 *See* MATTE, *supra* note 90, at 345-48 (looking at the nature and limits of liability as analogized between damages to third parties on the surface caused by air and aerospace

tion regarding liability.[150] This scholarship led to the position that there should be absolute liability for damage caused by spacecraft.[151]

The space law treaties express the concerns over liability raised by the early space law scholars and these concerns were brought to the attention of the COPUOS. Indicating this continuing concern for the safety of astronauts and their space vehicles, a year after the Outer Space Treaty ("OS Treaty") was put into force,[152] the Rescue and Return Agreement ("RRA") was also adopted.[153] Before the RRA was negotiated, the OS Treaty had already begun to look to the issues of rescue, recovery and return of personnel who have made an unintended landing on land or in the sea.[154] Following the OS Treaty's guidance, the RRA called for the rescue, recovery and return of items launched into space.[155] Soon thereafter, the work of the international committees bore even more fruit and the Liability Convention was passed.[156] In order to protect people in outer space, these space treaties imposed strict liability on nations for torts occurring in outer space.[157] Federal laws tried to fill in the gaps,[158] but they were inadequate.[159]

Despite all the work that went into creating these space treaties and statutes, today the commercial aspects of outer space are mostly dealt with by way of contract.[160] The satellite construction industry, the space communications industry, the launch services industry and the space insurance industry manage their affairs through complex contractual arrangements.[161] Dispute clauses are often included.[162] Because the players are usually nations and multinational corporations, the location of the space asset is often not as important as the location of its owner or overseer.[163]

Unless one looks to existing international commercial trade agreements, no space-like liability regime has yet to be accomplished for cyberspace. With technology that moves quicker and interacts differently than those ever seen before, the laws must adapt to deal with new types of problems.[164] A quicker need for management and resolution and possibly new forms and methods of dispute management may be what is needed.[165]

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navigation as well as recounts the six alternatives for liability assignment put forward by Dr. Gerald Fitzgerald: (1) Liability assumed by an international organization; (2) Liability assumed by all state members of an organization or the launching state; (3) Liability would be borne only by the state members of the international organization; (4) Liability would be borne by the state of registration; (5) Liability would be borne by the state of the victim's choosing; and (6) Liability would be in the form of a two-stage process, first by international organization, then by member states); *see also* COOPER, *supra* note 53, at 313 (evaluating whether the Rome Convention on liability to third parties should apply with Professor Cooper concluding that such a model should be followed).

150 *See* COOPER, *supra* note 53, at 313–14 (discussing the United States' draft proposal to COPUOS regarding liability for space vehicle accidents).

151 *See* MATTE, *supra* note 90, at 335–37, 340–42 (describing the early work of the *ad hoc* COPUOS and early draft treaties); *see also* COOPER, *supra* note 53, at 313.

152 *See* OS Treaty, *supra* note 43.

153 *See* RRA, *supra* note 136.

154 *See* OS Treaty, *supra* note 43, at art. 5.

155 *See* RRA, *supra* note 136, at art. 5.

156 Seee REYNOLDS & MERGES, *supra* note 44, at 212 (describing the Liability Convention); *see generally* Liability Convention, *supra* note 144.

157 *See* REYNOLDS & MERGES, *supra* note 44, at 212–14 (describing the well-defined liability rules in space law).

158 *See* Commercial Space Launch Act, 49 U.S.C. §§70101–13 (1994 & Supp. IV 1998) (mentioning that Section 70112 deals with the area of liability insurance and requirements for financial responsibility).

159 *See* James A. Beckman, *Citizens Without a Forum: The Lack of an Appropriate and Consistent Remedy for United States Citizens Injured or Killed as the Result of Activity above the Territorial Air Space*, 22 B.C. INT'L & COMP. L. REV. 249 (1999) (recounting how the realities of space law and international indemnification do not always meet the needs of U.S. citizen litigants); *see also id.* (describing the OS Treaty, the Liability Convention, the Federal Tort Claims Act, the Foreign Sovereign Immunity Act, contractual arrangements and product liability as grounds for raising claims involving outer space).

160 *See* REYNOLDS & MERGES, *supra* note 44, at 309 (reviewing the role of contracts in outer space).

161 *See id.* (describing launch service contracts, which allocate risks, plan for safety and accident prevention and contain special dispute settlement provisions); *see also* Henri A. Wassenbergh, *The Law of Commercial Space Activities*, *in* OUTLOOK ON SPACE OVER THE NEXT 30 YEARS 173 (Gabriel Lafferanderie & Daphné Crowther eds., 1997) (describing the current status of the application of space treaties, national laws and private contracts).

162 *See* REYNOLDS & MERGES, *supra* note 44, at 315.

163 It has been very rare for space-based assets to damage people or property on earth, thus it is the contracts and their forum clauses controlling these assets that are as important as the assets themselves. *See generally* INT'L SPACE INFO. SERV., COMM. ON THE PEACEFUL USES OF OUTER SPACE, TECHNICAL REPORT ON SPACE DEBRIS, *at* http://www.oosa.unvienna.org/isis/pub/sdtechrepl/index.html (last visited Oct. 25, 2001).

164 *See* LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 20 (1999) (arguing that technical architectures themselves define the laws that attempt to control those architectures).

165 New forms of dispute resolution have been attempted in cyberspace. *See, e.g.*, INTERNET CORP. OF ASSIGNED NAMES & NUMBERS, UNIFROM DOMAIN NAME DISPUTE RESOLUTION POLICY, *at* http://www.icann.org/udrp/udrp-policy-24oct99.htm (last visited Oct. 25, 2001); *see also* Michael Geist, *Fair.com?: An Examination of the Allegations of Systemic Unfairness in the ICANN UDRP*, *available at* http://

V. LESSONS LEARNED AND NEXT STEPS

A. Sovereignty & Borders

The sovereignty rules of the high seas and outer space are a better guide for cyberspace than the sovereignty rules of air law. Like outer space, in cyberspace there is no tangible *res* ["thing"].[166] But, cyberspace is not something to be conquered because it is not a *res nullis* ["thing of no one"].[167] Like outer space, cyberspace should be considered a *res extra commercium* ["a thing outside commerce"][168] or a *res communes* ["common thing"].[169]

B. Jurisdiction and Liability

Regarding jurisdiction and liability, launching and landing have parallels between outer space and cyberspace. For cybercrimes and cyberpiracy, the application of universality principles, like those applied to sea and air piracy should be considered. Also, private contracts should be utilized due to their adaptability and ability to be narrowly tailored to the issue at hand.

C. Interested parties

For cyberspace, nations should be predominantly concerned with respect to their respective citizens and infrastructure. Corporations should be involved in cyberspace as builders, architects and experts of investment optimization. Citizens may not have a significant role in the management and coordination of cyberspace, but they will have a large role as informed and active consumers.

D. Next Steps

Although, not expected in the immediate future, cyberlaw should anticipate a phase of international coordination and formalization of agreements. As seen with space law, all technology reaches a point where its continued evolution is more predictable. This is seen as prices drop, new features are added at no extra cost and new down-market opportunities are pursued. Space law's regulation and laws were adapted during this phase to manage the changes being faced, but most importantly, space technology has shown that transformative technology can lead to transformations in society, its laws and regulations and even the society's view of itself.

Cyberlaw can learn from space law's past and adapt itself as it moves forward. Cyberlaw practitioners should be mindful of space law's legacy of infrastructure development, while being mindful of universal goals such as the good of all mankind. They should continue to look to the use of "soft law" structures as well as the role of private agreements when dealing with complex international legal issues. The development of cyberlaw should serve as a catalyst, rather than a roadblock, to private commercial interests. Cyberlaw should allow private contractors to make choice of law and forum decisions unless there is unequal bargaining power between the parties. Finally, cyberlaw practitioners should evaluate other legal specialties such as banking law, securities law as well as shipping & transport law.

VI. CONCLUSION

This article has evaluated the history and evolution of air law and space law. It has looked to the evolution of the concepts of sovereignty, borders and jurisdiction to draw parallels between cyberlaw and space law. Finally, this article has summarized lessons learned and looked to some next steps guided by the challenges that air law and space law have faced in their respective evolutions.

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aix1.uottawa.ca/~geist/frameset.html (last visited Oct. 25, 2001); *see generally* Milton Mueller, *Rough Justice: A Statistical Assessment of ICANN's Uniform Dispute Resolution Policy, at* http://dcc/syr.edu/roughjustice.pdf (last visited Sept 27, 2001).

166 BLACK'S LAW DICTIONARY 1307 (7th ed. 1999) (defining *res* as "an object, interest, or status, as opposed to a person . . . ").

167 *Id.* at 1312 (defining *res nullis* as "a thing that can belong to no one; an ownerless chattel").

168 Id. at 605 (stating that "this phrase was used in Roman and civil law to describe property dedicated to public use and not subject to private ownership").

169 Id. at 1308 (defining *res communes* as "things common to all; things that cannot be owned or appropriated, such as light, air, and the sea").