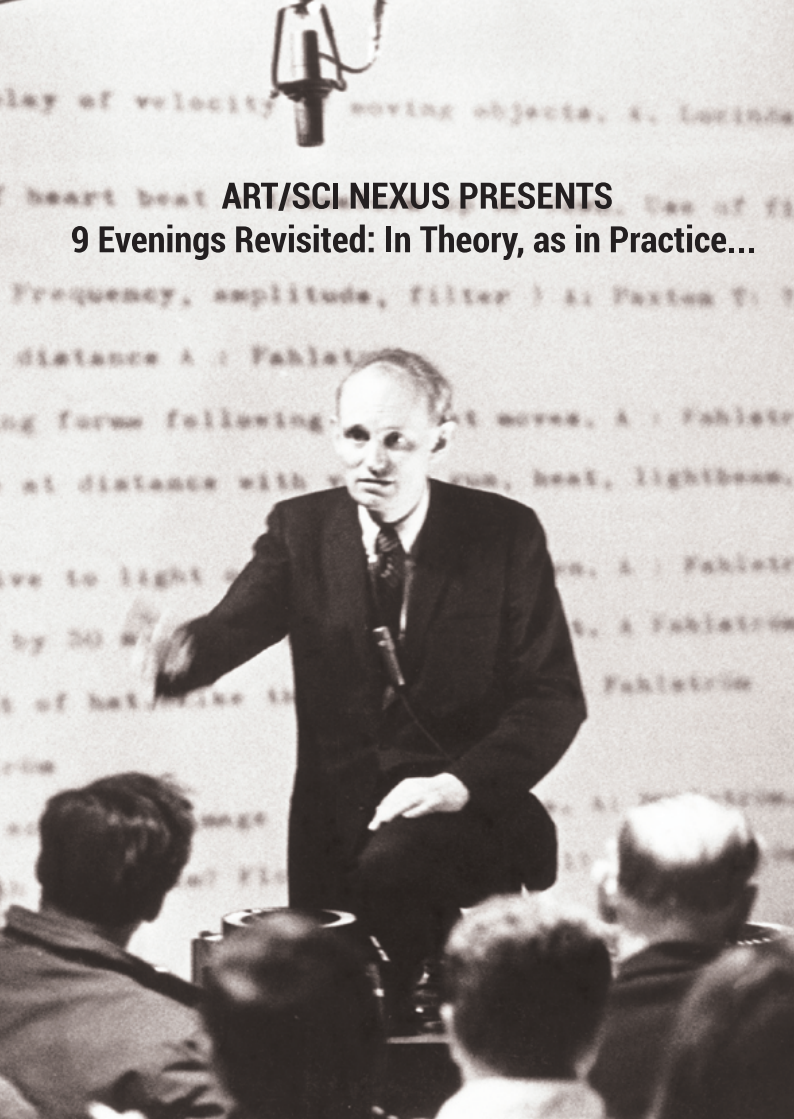

ART/SCI NEXUS PRESENTS

9 Evenings Revisited: In Theory, as in Practice...

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HISTORICAL CONNECTION

In the style of avant-garde theater, improvisational orchestra, with a hint of Actionist sensibilities, **9 Evenings: Theatre and Engineering**, opened to an eager public in October 1966 in the 69th Regiment Armory in New York City. The space itself still held the faint scent of the spectacular shock of its last major exhibition, notably Cubism's debut on the New York scene (1913). 9 Evenings was the culmination of a year's worth of organized chaos, involving 30 engineers from Bell Laboratories collaborating with 10 established artists. The production of the works, installation, and performances were filled with failed experiments, explosive successes, an overall playful waking dream of endless creative possibilities.

As a tribute to this monumental exhibition, **9 Evenings Revisited: In theory, as in practice**, stands apart from its predecessor because it involves cellular and molecular life scientists, physicists, and mathematicians, rather than engineers, and therefore reflects the diversity and breadth of scientific culture. Working with scientists and artists representing several European countries, Russia, the United States, Canada, Taiwan and Japan we will focus on the theme "Bandwidth in Biology." We will place emphasis on exploring the culture of information exchange between scientists, a rapidly evolving feature of the global research community and the world at large. We will also incorporate bandwidth, parallelization, and Big Data as they apply to living systems and the study thereof – underscoring the symmetry between the behavior of researchers, the systems they study, and the tools they use to achieve this.

We are all aware of the fact that any phenomenon, any event, or for that matter, any "knowledge," any transfer of information implies

> - Jacques Monod, Proceedings of the 11th Nobel Symposium, Södergarn, Lidingö, Sweden, Aug. 1968.

an interaction, and that no interaction may take place without an alteration, an evolution of the interacting system.

9 Evenings Revisited: In theory, as in practice... is a collaborative art exhibition, which explores the interface between science and art in contemporary practice. In 2015, the first stages of the network called ART/SCI NEXUS was established by artist/curator Candace Goodrich, and biochemists Dr. John LaCava and Dr. Dmitry Alexeev. The 9 Evenings project is a first attempt at this process of interdisciplinary symbiosis.

The Basics of the ART/SCI NEXUS

ART/SCI NEXUS is an independent platform that enables curiosity within and between the humanities, arts, and sciences, introducing professionals and the public to new creative modes of thinking. As these disciplines are epistemologically diverse, the transgression of their borders and expansion of their frontiers could allow for new forms of scientific research and artistic practice to develop.

ART/SCI NEXUS invites international artists and scientists to become members of a growing community and network, whose common ground is their curiosity in interdisciplinary exchange. Membership is on a voluntary basis and members can choose which level of commitment they are to offer, which is not fixed and can change over time, or on a project-to-project basis. Whether an exhibition host, a workshop host, a project leader, or a participating artist or scientist, ART/SCI NEXUS allows for one's role to fluctuate, so that members are able to experience different aspects of the collaborative process.

During mobile workshops, artists and scientists gather and educate one another about their respective practice and research, through artist talks, demonstrations, and scientific lectures, followed by open forum discussions.The public is invited to attend and participate in the discourse. This active debate leads to brainstorming new conceptual designs for interdisciplinary, collaborative works, which can result in new research and experiments, the creation of objects, happenings, performance, and even new modes of representation and interactivity. Once several concepts are established and agreed upon, the artists and scientists will collide, forming into teams of interacting matter. As the arrangements between forces and masses change, the change is manifested in terms of energy, bringing the new works to life. This may require independent exchange, institutional partnership, and/or the introduction of additional experts and practitioners. This frame encourages an equal contribution from each field in the creative process, while additionally educating its members and public in regards to contemporary culture and science. The workshops can happen anywhere, and is constituted by a minimum number of participants of at least 2 artists and 2 scientists. Final exhibitions may take place in a variety of different kinds of venues, however scientific museums, contemporary art spaces, and universities are preferred. The theme of each workshop will change annually. Each workshop and exhibition is funded through the hosting body, universities, foundations, and ministries of culture.

First Experiment

To echo the achievement of our historic brother, 9 Evenings: Theatre and Engineering, the exhibition will be open for 9 full days and 9 spectacular nights. The density of the whirlwind experience will contribute a spontaneous energy and concentration on the "happenings".

We believe it is important to expand the communication of science beyond the laboratory, scientific journals, and symposium settings. With this end in mind, we propose to develop methods of public engagement through the experimental use of the artistic medium. Creative expression is an open, flexible, and inventive vehicle to extend the exposure of scientific themes to the public, using creative analogies and representations to make ideas accessible, promot-

ing interest and literacy in the sciences.

9 Evenings Revisited: In theory, as in practice... will focus on one particular aspect of science that is especially shrouded from public perception - the worldwide sharing of information now fundamental to the scientific community. This is the soul of the scientific effort, without it, progress and discovery would move (by todays standards) impossibly slow. Technological advancements that assist scientists in collecting data and analysing effects have exponentially increased the flow of information between researchers. This is true even for traditionally data sparse sciences (e.g. the advent of the 'Omics' revolution and systems biology in life sciences), and a whole field of 'information science' exists to catalog, quantify, and coordinate information both as a concrete and abstract resource. For artists, technology has also provided them with a new set of tools and an entrance point into scientific topics. Throughout the exhibition, we will incorporate and explore a thematic component of "parallelization" and "bandwidth" within the artistic offerings. This, we feel, is a fitting subject to investigate, as these same terms apply to the enhancement of communication between people – broadening modes of education, fostering interconnectivity, diversifying our identities and ways of thinking.

9 Evenings Revisited: In theory, as in practice... will include aspects of sculpture, audio/visual, print, and performance-based art. Fittingly, the event will itself constitute an experiment - in it's attempt to validate the efficacy of science communication through art. Furthermore, popular science lectures will be given by local and international scientists throughout the duration of the festival, in parallel with the artistic events. These lectures will crucially enable the public to engage directly with cutting edge science developments, as well as wrestling with the more general and abstract concepts that permeate science as a discipline – to further satisfy the crucial educational component of our scientific outreach objectives.
In preparation for the production of new works, in April 2016 we will host a five-day THINK TANK at the Kunstkraftwerk Leipzig. We have invited scientists from various fields and artists that utilize different mediums and techniques to participate in this THINK TANK. The ultimate aim of the work is to build teams between the scientists and artists so that over the following 6 months they are equipped to independently consult with one another in the realization of new works. We hope that the first stages of these encounters will be only the beginning of longöterm collaborations.

Art Director Candace Goodrich,
Dr. John LaCava and Dr. Dmitry Alexeev

Artists Tom Gormley and Hans Haacke talking to an engineer at the E.A.T. booth, at the annual meeting of the IEEE to interest engineers in working with artists, 1968.

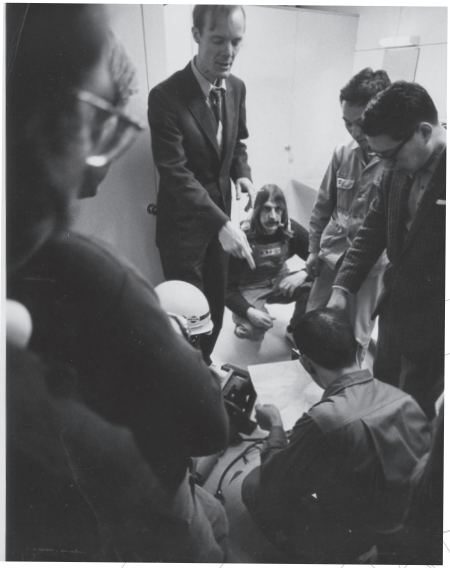
Photo courtesy of Julie Martin and Shunk-Kender

	MONDAY
10:00-11:00	Introduction by Art Director Candace Goodrich
11:00-11:30	Alexa Wright
11:30-12:00	Andrew Carnie
12:00-12:30	Ana Domingos PhD
13:30-14:30	Henrik Isaksson Garnell Workshop
14:30-15:00	Prof. Dr.Markus Loeffler
15:00-15:30	Wolfgang Ganter
16:00-16:30	Ya Wen Fu
16:30-17:20	Introduction by Irina Belikh Film Screening - Music Man, Cyberg Foundation, Symmetry Unravelled
17:20-18:00	Anton Koch and Mark Matthes Performance by Chamberlab

	TUESDAY
10:00-10:30	Gustav Hellberg
10:30-11:00	Anders Ledberg
11:00-11:30	James Nizam
11:30-12:00	Prof. Dr. Thomas Fritz
12:00-12:30	Arnar B. Sigurbjörnsson
13:30-14:00	Dr.John LaCava
14:00-14:30	Dr. Dmitry Alexeev
14:30-15:00	Dr.Alexander Kagansky
16:00-16:30	Bosch&Simons
16:30-17:00	Film Screening Silent Signal
17:00-18:00	Dr. Sergey Kostryko Performance by Sergey Kostryko/Daichi Yoshikawa

WEDNESDAY
17:00-18:00 Film screening - Nourathar

THURSDAY
17:00-18:00 Film screening Sonic Magic: The Wonder and Science of Sound



Engineer Niels Young in a meeting in the E.A.T. office in the Pepsi Pavilion in Osaka, Japan, talking with Japanese construction workers and engineers about Frosty Myers' sculpture Sun Track.

Photo courtesy of Julie Martin and Shunk-Kender

Dr. Dmitry Alexeev - Moscow Institute of Physics and Technology

Gut microbiota and disease

Our gut is full of bacteria – trillions of tiny microbes that support us during our lifetime. This diverse microbial community is called the gut microbiota and it plays an important role in human life: it is involved in nutrient absorption and vitamin synthesis, protects against pathogens, and regulates the immune, endocrine and higher nervous functions. Major advances in the scientific understanding of the role of microbiota in human health have occurred over the last 20 years, largely due to the development of molecular genetic methods in biology. The high scientific interest in microbiota is demonstrated by the fact that nearly $500 million have been spent on microbiota studies since 2008. A comprehensive way to explore microbiota - to define which microbes comprise it - is to sequence the DNA of the gut. This yields a combination of DNA sequences attributable to the different microbes. This collection of genomes, representing each bacteria found in the gut, is referred to collectively as the metagenome. This information has revealed the fact that microbiota consist of an immense biodiversity including hundreds of species, many of which are non-culturable (can not be grown in a laboratory). Interestingly microbiota can be viewed as a huge chemical reactor, yielding many products never seen in a lab. Although the composition of microbiota varies significantly from person to person, it changes only slightly in an average person over time, and the main factors that influence it include diet, lifestyle and antibiotics intake.

Scientific research projects devoted to studying microbiota specific to patients with different diseases prove that we can use the microbes for diagnostics. While it is important to understand that there is no single "BAD BUG" in the community, we can identify changes in the proportions of different bacteria that signal the onset of disease. The gut microbiota is viewed as a novel organ of the human body, which is very much adaptive in its nature. The level and degree of adaptation can actually provide insights on the state of the organism and the environment the organism is living in: level of pollution, food, water, climate and so on. Scientists are trying to diagnose and cure human diseases using this vast data. Some examples include inflammatory bowel disease, type 2 diabetes, atherosclerosis, metabolic syndrome, and colorectal cancer. For many of these diseases, significant changes from the healthy bacteria profile were reported, which provides a basis for a new generation of therapy and diagnostics at the same time – a new term being coined – theranostics. Theranostics is a perspective wherein the goal is to diagnose and cure disease at the same time. The microbiota may provide an opportunity to intervene at the earliest stage of the disease development.

Ana Domingos PhD - EMBO IG - Principal Investigator Obesity Laboratory Gulbenkian Science Institute

The science of body shape

The human body has always been a focus of artistic expression. Along the centuries, art has been the vehicle that has documented how societies have sculpted and idealized the shape of human bodies, particularly that of females. The collection of body shape archetypes that art has created over the centuries is incredibly diverse, ranging from very obese, to extremely thin. Indeed, obesity has been among us for a long time, the oldest evidence being the Venus of Willendorf, an archaeological statuette found in Austria, dated 24.000-22.000 B.C.E. Back then, during times of starvation, obesity was regarded as a divine gift. However, it is not until now that obesity has been classified as a disease, and has attained epidemiological levels, catering to an enormous industry that pretends to curb it. Can we really significantly change body shape (ie, non-surgically)? Just like eye color or height, body weight is genetically encoded, and subject to biological control. Only two decades ago, with the discovery of the hormone Leptin, the first step was given towards a biological understanding of body weight and adiposity. I will elaborate on how our genes and hormones mediate a crosstalk between the brain and the adipose tissue, to control body shape and obesity.

Prof. Dr. Thomas Fritz - Dept of Neurology - Max Planck Institute for Human Cognitive and Brain Sciences

Self-Reflection-Machines

Through learning we generate expectations about the effects of our actions. In music, for example, we talk about auditory-motor mapping – a mental representation of movements and their acoustic-musical effects. Such a mapping will for example help a musician to create sounds that correspond to their musical imagination. This coupling that we experience as „agency" can have a strong influence on how we experience ourselves, among others our self-efficacy, how exhausting we perceive actions, and how fast or slow we perceive time to go by.

With the Self-Reflection-Machines, a series of devices that are a hybrid between art installations and scientific experiments the correlation of action and perception is specifically manipulated. In the process either new action-effect routines are established (e.g. during "Jymmin", where participants play fitness machines like musical instruments), or previously learned routines are deliberately disturbed so that the perceived irritation enhances the experience of this routine (e.g. in the "Kaleidoscope of Time" where participants visually see representations of themselves from multiple time points in the recent past).

These installations are both used as experimental setups at the Max Planck Institute for Human Cogntive and Brain Sciences in Leipzig, and as public laboratories in exhibitions/art shows. Here, when the visitors quit their passive observer role they can systematically experiment on themselves.

Dr. Alexander Kagansky - University of Edinburgh Institute of Genetics and Molecular Medicine

Epigenetics: 'Karma' and 'Soul' at the onset of the Genetic and Molecular Medicine

Can analogies be made for the ancient and metaphysical concepts of 'Karma' and 'Soul' in the age of molecular biology? Perhaps epigenetics holds the key? The Greek term epi- (επι-) means over, above, outer, or beyond. Epigenetics are therefore 'above' or 'beyond' genetics. Epigenetics, a concept proposed by Conrad Waddington during the time of World War II, has recently attracted a lot of attention in biology. After Watson and Crick helped to elucidate the genetic language, the question remained how DNA is read in our cells. At first epigenetics was believed to be all about chemical modifications of DNA and proteins in contact with DNA. James Watson proposed, "the major problem is chromatin... you can inherit something beyond the DNA sequence. That's where the real excitement of genetics is now". Chromatin refers to molecules of proteins and DNA formed together, which produce chromosomes. Thomas Jenuwein has pointed out: "The difference between genetics and epigenetics can probably be compared to the difference between writing and reading a book. Once a book is written, the text (the genes or DNA: stored information) will be the same in all the copies distributed to the interested audience. However, each individual reader of a given book may interpret the story slightly differently, with varying emotions and projections as they continue to unfold the chapters. In a very similar manner, epigenetics would allow different interpretations of a fixed template (genetic code) and result in different read-outs, dependent upon the variable conditions under which this template is interrogated."

Karma is the sum of a person's actions in this and previous states of existence, viewed as deciding their fate in future existences. In many religions, philosophical, and mythological traditions, the soul is the incorporeal, immortal essence of a living being. Over the last several decades, we have learned that genes direct and mold who we are in terms of things like physical traits, and our potential susceptibility to certain diseases. Yet, identical twins with exactly the same DNA, often exhibit different physical and health characteristics over time. Having identical DNA (identical instructions) does not lead to identical outcomes. Perhaps the way the DNA is read is what matters? This is precisely why different cells in different tissues in the body (which have the same DNA sequences) develop drastically differently – they have different epigenetics.

Epigenetics is still poorly understood, but in a broad sense may link unique human qualities to what traditionally is considered the "soul" or aspects of the personality. Ways in which our brains functioning are linked to epigenetic regulation. And here the analogy to the soul may come to play more apparently. Importantly what we consume in our food, drink, and air, also affects epigenetics to steer the fate or our cells, tissues, organisms, and ultimately societies. Therefore epigenetics is also proxy for karma in biology.

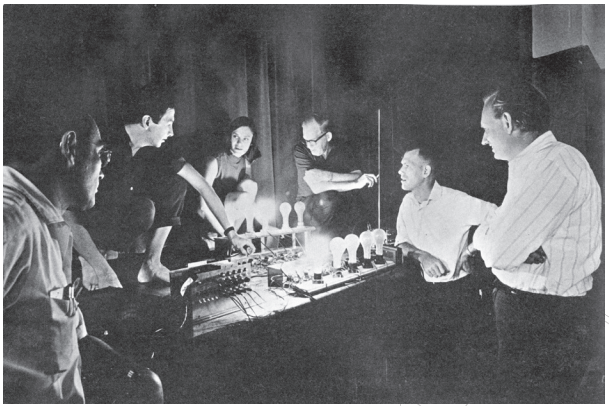
Dr. Sergey Kostyrko - St. Petersburg State University

The mechanics of thin film materials.

Thin film materials range from hundreds of nanometers down to only a few nanometers in thickness. To put this size-scale in perspective, a bacterial cell is about 500 nanometers thick. Recently attention has been focused on the development and investigation of thin film materials because they are able to provide performance improvements in the properties of mechanical, thermal, optical, electrical, magnetic, chemical and even biological products. Some applications include ultrahigh-density data storage, high-frequency components for wireless communications, and sensors for medical diagnostics. In fact, thin films represent major components in such advance areas like electronics, computers, optics, chemical and biological systems.

However, these benefits can only be achieved if defects in the thin film are kept to a minimum. Analyzing patterns in thin films, it was found that even slight variations in the surface consistency could lead to cracks and splitting of the film layers. Interestingly, neither is the goal to obtain absolute uniformity, as limited variations in the surface impart benefits to the material. Therefore, accurate control of thin film surface character is needed to improve manufacturing techniques. To obtain such a level of control we need to simulate this process computationally to gain a better theoretical understanding.

How to do this? Should we take into account the atomic structure of the film or instead consider the average properties of material? While atomistic simulations provide more proper description of behavior, there is an important limitation related to computational power. Even super-computers are not up to the task. At the opposite extreme crude models based on the average properties of the bulk material do not predict behavior at the nanometer scale accurately. Thus, a main current challenge in thin film science is the development of more efficient simulations that take advantage of both bulk- and atom-level calculations to provide a better understanding of thin film production and ease the development of cutting edge materials.



'Artists and engineers testng the equipment for the TEEM system for 9 Evenings: Herb Schneider, Robert Rauschenberg, Lucinda Childs, Robby Robinson, Per Piron, Billy Klüver.

Photo courtesy of Julie Martin and Shunk-Kender

Dr. John LaCava - Rockefeller Institute New York, NY

Notions of self: genes and agendas.

Genes are chemical blueprints made of DNA (deoxyribose nucleic acids) that instruct a cell how to make proteins. Proteins are the chief effector molecules of life – those molecules that facilitate the essential chemistry of life, termed biochemistry. Thus, genes critically define which proteins need to be present in each of the approximately thirty-seven trillion cells of the human body for it to be healthy and alive.

However, compared to the total amount of DNA in a cell (called the genome), only a relatively small proportion of DNA (~1-2%) comprises genes. In contrast, an enormous amount of our DNA has resulted from the proliferation of DNA sequences referred to as transposons (~40%). Transposons are called such because these DNA sequences have the ability to move (or transpose) from one location to another within the genome. A particular class of these transposons has been able to multiply within the human genome to an enormous extent because it employs a 'copy and paste' mechanism: the original sequence is maintained, and a new copy of that sequence is created and inserted elsewhere in the genome. Over our evolutionary history, these sequences have accumulated in vast numbers, littering our genome. We will focus on this class of transposon, known as retrotransposons.

These elements do not appear to meaningfully contribute to the maintenance of our health but have clearly been shown to contribute to cancer and disease. To counter this threat, our genes have evolved in ways that attempt to exert control over the expansion of transposons. It can therefore be said that each living cell and the genes that contribute to the maintenance of life are locked in an arms race with selfish elements whose only function appears to be expansion within the genome at any cost. This struggle has persisted throughout our entire evolutionary history (> 600 million years), from single cells to human beings, illustrating the degree to which even at our most fundamental molecular level, life is an unending succession of struggles, victories, and defeats. We are the stage of a living drama, an internal struggle: genes and their agendas.

Frosty Myers examining sample of Hexel material at a lecture at the E.A.T. loft on new materials for artists.

Photo courtesy of Julie Martin and Shunk-Kender

Anders Ledberg - Centre for Social Research on Alcohol and Drugs SoRAD, Stockholm University

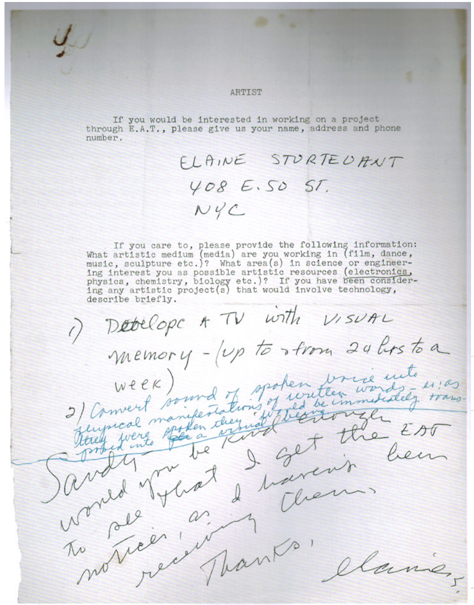
Coordination through synchronization

Biological systems often consist of multiple interacting subsystems. An important step in the analysis of such systems is to uncover how the activity of the subsystems are coordinated to generate purpos and meaningful action. A prominent example of a biological system with interacting subsystems is the brain, having interconnected units at many different levels of description: e.g. neurons, microcircuits, and brain regions. It is the current belief that much of what we associate with brain function comes about through coordinated interactions between these different subsystems, and to characterize these interactions and their effects is one of the greatest challenges of the Neurosciences.

One of the best understood mechanisms of coordination is synchronization, roughly meaning that activities in different subsystems are time-locked to each other. Synchronous activity is ubiquitous in the nervous system and is found at many different scales of measurement. The synchronous activity has been associated with different functions, including consciousness, but there is little consensus about the role of synchronization in brain function.

Social systems can also be thought of in terms of interacting units (agents). In this case both units, and their interactions, are much more complex than what is the case in the nervous system. Still, synchronous activity between different agents has been shown to occur and to have non-trivial consequences.

In our project we will draw on results from the large body of theoretical and experimental works on synchronization to create a situation where the audience is invited to interact with each other and with external equipment through their coordinated activity. We are currently in the development phase.



ARTIST

If you would be interested in working on a project through E.A.T., please give us your name, address and phone number.

ELAINE STURTEVANT
408 E. 50 ST.
NYC

If you care to, please provide the following information: What artistic medium (media) are you working in (film, dance, music, sculpture etc.)? What area(s) in science or engineering interest you as possible artistic resources (electronics, physics, chemistry, biology etc.)? If you have been considering any artistic project(s) that would involve technology, describe briefly.

1) Develope a TV with VISUAL memory - (up to from 24 hrs to a week)

2) Convert sound of spoken voice into physical manifestations of written words – i.e. as they were spoken they would be immediately transposed into a visual

Sandy would you be kind enough to see that I get the EAT notices, as I haven't been receiving them. Thanks, elaine s.

21 Sturtevant's application to E.A.T. (Experiments in Art and Technology). 1967
Getty Research Institute, Los Angeles. Experiments in Art and Technology records, 1966–97

Elaine Sturtevant E.A.T application

Photo courtesy of Julie Martin and Shunk-Kender

Prof. Dr. Markus Loeffler - Institute for Medical Informatics, Statistics and Epidemiology - University of Leipzig

Swarm intelligence in tissue formation – the tale of the gut

Tissues of the outer surface like the skin and tissues of the inner surfaces as in the intestine have multiple functions. They protect against the invasion of foreign organisms and toxic chemicals and against loss of body fluid and cells. The gut also serves as an organ for taking in nutrients. The outer lining of these tissues (above the connective tissue) is covered by specialized cells called epithelial cells. They are tightly connected with one another to produce a dense spatial coverage. On the other hand epithelia are highly dynamic tissues. The epithelium of the human small intestinal gut is exchanged every 5 days, in the colon it lasts about 2-3 weeks and in the skin between days and weeks depending of the location and challenge. It has been found that the intestinal cell population residing in the intestinal crypts (ie pockets of cells embedded in the gut wall) have an impressive self-organization potential. A crypt with 300 cells can be fully regenerated from 1 cell after damage .

The understanding of the dynamic self-organization of the tissue has intrigued cell scientists for decades and the key mechanisms are getting slowly unraveled. We have recently demonstrated that one underlying principle of epithelial self-organization is swarm intelligence. Cells communicate with their neighbour cells and reactions are induced based on the communication. Cells process signals to their neighbors and receive signals from them. Depending on the status they find themselves in they react in different ways to these signals determining cell proliferation and cell differentiation. Cell biologists have perturbed communication signaling in many ways and the tissues reacted in deregulated ways. To understand whether the concept of swarm intelligence (ie simple rules of neighbor interactions explain the complex behavior of macroscopic swarms of birds, fish or insect states) we undertook computer simulations of the gut crypt. In the computer we created populations of cell agents in a 3D-crypt like structure. The agents can change their status (ie proliferative status, cell speciality, age) while signals are coming in signals are sent. We could show that this simple "socio-cellular" system has a great potential to explain a vast spectrum of observations and experiments. This understanding also has major implications of our understanding of tissue stem cells and their potential.

This finding indicates that the incredible complex genomic and epigenomic machinery is "invented" to make simple rules work. It is remarkable also that this system can tolerate a lot of damage to its individual components before it fails as a whole. We can speculate that evolution has selected these systems for their robustness against damage. I will illustrate the tale from the crypt with animated computer simulations created in my team of bioinformaticians in cooperation with cell biologists from any different laboratories.

In addition I suggest to play a game with all participants of the workshop in which we will experience the effect of rules on the movement of a group of persons and we will try to create a swarm ourselves.

Bosch & Simons
The Music Machines

"In 1896, Nikola Tesla, one of the great geniuses of the electrical age, strapped a small oscillating motor to the central beam in his Manhattan laboratory and built up a powerful physical resonance that conducted through the building and into the earth to cause an earth-quake in which buildings shook, panes of glass broke and steam pipes ruptured over a twelve block area. He was forced to stop the motor with a blow from a sledge hammer. Tesla stated that he could calculate the resonant frequency of the earth and send into a strong vibration with a properly tuned driver of adequate size and specific placement. " (*)

This supposition is still true for our vibratory projects. While working on the theme "Resonances stimulated by mechanical vibrations" our main interest is not to amplify just one existing frequency, but to create a complex system in which various frequencies influence each other. This gave rise to unstable balances which the slightest change could disturb enough to produce an unpredictable outcome. Alongside unstable balances and order and chaos, another element is sound. The pure power of sound and the pure existence of sound (music) manifest remains an integral part of our installations.

Andrew Carnie – Alexa Wright
Hybrid Bodies and Other Art-Science Collaborations

Seen as both the seat of human identity and the archetypal symbol of love, the heart is an organ that has been ascribed qualities and associations far beyond its anatomical functions. Since the first heart transplant in 1967, the technical aspects of the operation have been streamlined and now heart transplantation is the accepted therapy for end-stage heart failure. Yet few researchers have explicitly connected organ recipients' experiences and cultural views about transplantation to the notion of embodiment.

Since 2010 four artists, (Alexa Wright GB; Andrew Carnie GB; Ingrid Bachmann CA and Catherine Richards CA) have had access to an innovative research study exploring the process of emotionally and psychologically incorporating a transplanted heart. They have been working as part a larger interdisciplinary team, based at Toronto General Hospital, led by Canadian Cardiologist, Dr Heather Ross and British philosopher, Dr Margrit Shildrick and other scientific partners. The project is highly innovative in that artistic research has been undertaken not only in response to, but also in parallel with, the scientific research. The artists and scientists have been in dialogue throughout the research process, which has also been opened up to heart transplant patients, their friends and families. The artworks that have come out of the Hybrid Bodies project will be exhibited at KKW in August/September 2016. We hope that they will provide a tangible focus for discussion.

Andrew and Alexa will give an overview of the Hybrid Bodies project and the different artworks created for it so far after giving a brief introduction to some of their previous individual collaborations.

CHAMBERLAB

Anton Koch and Mark Matthes

Chamberlab is a project by Anton Koch and Mark Matthes dealing with experimental artistic practice in the field of musical composition and performance. Their primary focus lies in recomposing and re-contextualizing classical music in a conceptually connected audiovisual installation.

With very different backgrounds in Fine Arts and a classical musical eduction on the violin, as well as a purely code-based and algorithmic approach to both music and visualization, they meet at the intersection of musical performance. Finding a conceptual framework that truly fuses and incorporates both seemingly opposing fields is their project's current foremost objective.

For "9 Evenings Revisited" they are working on a translation of the (western) harmonic system based on the circle of fifths into graphic forms and algorithmic compositions that make use of the complex mathematical and musical connections between chords.

These compositions or concepts will function like a tool for analyzing classical and contemporary compositions. Filtering certain elements and deconstructing an existing piece allows Chamberlab to recompose and perform under new conditions including the visualization and translation into a reactive installation. The challenge is to shift the perception of rather well-known compositions by performing them in a completely different way.

Starting with a basic setup of violin, computer and analog effects in the composition process, an ensemble can later be assembled to perform the final piece. Using both traditional stochastic methods and modern machine learning algorithms, the computer extracts and transforms patterns that in turn become building blocks for the compositional process.

The movement through the harmonic system (disharmony included), can be visualized in graphic forms making the underlying compositional structure of the performance visible and accessible through an alternative abstract perspective, realized in a combination of elements in the exhibition space and projections. At the same time it can function as an interface to the computer creating algorithmic composition based on sensor input turning the performance into an interactive installation.

Chamberlab will explain and perform work samples of their composition-process and give insights to the technical setup. Going through the stages of deconstruction and translation of audio and visuals will describe the "feedback-loop" of mutual influences. The developed tools will be summarized in a short improvised concert.

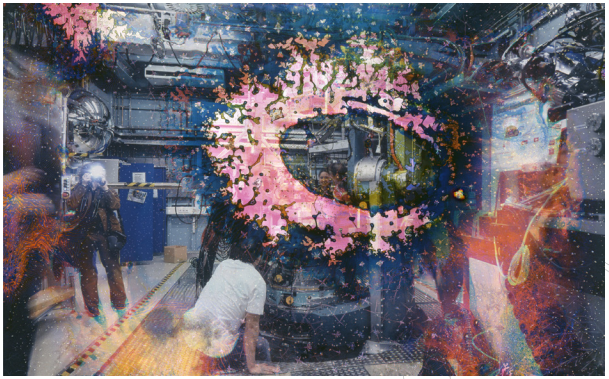
Ya Wen Fu

Ya Wen Fu's works examines issues pertaining to the definition of the human body and the relationship between the individual body and its external surroundings. As Maurice Merleau-Ponty describes: "The human body inhabits space; moreover, it itself is an expressive space." Body movement is not like playing a musical instrument. A musical instrument is an object detached from us, yet an extension of our body. Through body movement, a dialogue is created, by which we define our surroundings. Which means that not only are our behaviors in daily life related to time, space, culture and society, they are also connected with the conditions and experiences of our body.

The perceptions, behaviors and movements of the body is the source of inspiration for Ya Wen Fu's objects and performative installations. The combination of Ya Wen's Taiwanese background and the cultural influences of living in Germany, contribute to her work in terms of reflecting upon cultures relationship to self-identity. How can we strive for co-existence within our own body under diverse circumstances? How can we make it more of a passive medium for information, transition and activity? How does living in various social environments alter our abstract imagination of body perceptions?

Wolfgang Ganter

In the presentation by Wolfgang Ganter, he will illustrate his work with an analog slide show displaying original pieces of photographic film infected by bacteria colonies feeding off of it.



Henrik Isaksson Garnell

Elements of an abstract thinker. A controlled way to move in to abstraction and back. In this workshop we will reconstruct a workflow of Henrik Isaksson Garnell and do some exercises that will aid the development of your own fantasy landscapes.

Limited number of participants: 30

Gustav Hellberg

Gustav Hellberg, Chung-Ang University, Republic of South Korea

Practice

The last year I have been working with a series of objects and installations where sensors monitor various changes caused by human activities in the artwork's near surroundings. I have used sensors that read light, temperature, humidity and CO2 to mimic photosynthetic organisms. In other works I have also used sensors measuring radiation and sound. In this first phase of the project the data produced by the sensors have been used to control light. The artworks change their visual appearance according to what data the sensors deliver.

The concept in these works has been to create machines which interact with their surroundings like organisms. Depending on changes in for instance light or CO2 levels the works alter their appearances or activities.

One example is the artwork XYZ. It was commissioned for the Uppsala Biomedical Center, Uppsala University, Sweden. XYZ has been an opportunity to develop sensor-controlled technology to be used in my art practice. In the process of creating the technical units for XYZ I gained access to technology to connect with my public space projects.

9 Evenings Revisited

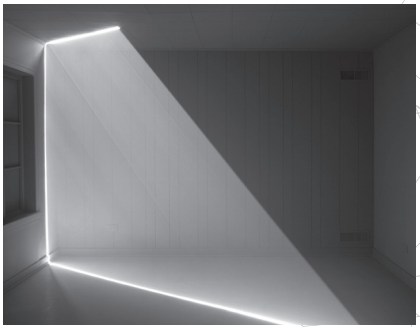
When I was given the opportunity to participate in the art and science project 9 Evenings Revisited I contacted my old and close friend Anders Ledberg, who is a neuro scientist.

Although we have known each other for many years, we cannot really communicate the core subject of our respective works to each other. We share similar difficulties in our specific fields, which we also discuss a lot. When we sat down, a year ago, to see if we could find a common ground to work from it was the difficulty of communication in general that unveiled itself as a suitable, if not obvious, topic. A year later we have started an endeavour into the unknown. We have different approaches. Our main divergence is what and how one can present a project that is neither aesthetic nor scientific. Ledberg brought an unsolved experiment about synchronisation in nerve cells to my attention and I think we've found something which we playfully can work with. I do personally think that play is the way through this project. Play doesn't mean that we leave serious thought behind. At this point in the project it opens up doors to creativity and thought. I believe that with this spirit we can honor the original 9 Evenings concept, to bring different thought processing traditions together with an aim to gain new or different knowledge.

James Nizam

James Nizam's art is a correspondence made between the structure of a room and that of a camera. His earlier Anteroom series is the most explicit example, wherein he transformed abandoned rooms into straightforward camera obscura. Under these conditions, Nizam observed the way that light entering through an aperture materialized into an illuminated beam, which led him to consider that an aperture might not only focus an image into visibility but could also focus light into form.

Situating his talk within the conference of 9 Evenings Revisited, Nizam will discuss the experimental and pseudo-scientific nature of his jury-rigged setups. His studies and observations of light position his investigations somewhere between a reinvention (for repurposing) of the box / aperture structure, and a tear down of the technology of photography, along with its associated examination of medium-specific concerns. Whether exploring the optics, breaking points, and possible patterning that extend outwards from its foundation; or reflecting on the artful possibilities that lie within its mechanism, Nizam returns us to an essentialist conversation on photography's still-evolving language.



Arnar Begmann Sigurbjörnsson

Arnar B Sigurbjörnsson is an multi media artist that incorporates science theory in his artwork to create objects, installations and videos that reflects his own non-scientific theories about the universe. In the last three years he has been working on a series called Svarthol(Black Hole) in which he tries to mix reality and fiction through sound sculptures that are merged into physical structures. In Svarthol 1-5 he focuses on different aspects of gravity, time, sound and light.

The concept behind his own conception of the black hole is based on the Schrödingers cat-thought experiment. It says that if you put a cat in a closed box then you are not able to know if the cat is either dead or alive or both. The same thought experiment can question the existence of a vacuum in a black hole: it is either there or not or both. Hence there is either sound, no sound or both. The sound sculptures are trying to imitate this possibility of sound in space. In addition Arnar Bergmann Sigurbjörnsson explores and suggests what sound might sound like if it existed in space and around black holes.

FILM PROGRAM

The film program is prepared in partnership with the Contemporary Science Film Festival (Russia). The idea of the program is to show a variety of ways of interaction between art and science. When speaking about the cinema as an artform, the first example to be mentioned can be the new cinematographic interpretation of science. Unlike the traditional TV documentaries new science films are not trying to teach or explain. They give an artistic interpretation of the theme and are aimed to inspire and awake curiosity.

In some cases the filmmakers are following creative teams on their ways to convert scientific data into visual images, music and choreography and documenting every step that scientists and artists are making towards each other.

Finally, the films show similarities and differences between the scientific and artistic approach to perceiving the world and demonstrate how deeply they are connected and how much they can enrich one another.

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SCIENCE
FILM
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Music Man 3 min

MUSIC MAN tells the story of professor and inventor Ge Wang who teaches computer music at Stanford University where he began the innovative Stanford Laptop Orchestra. Wang believes everyone who loves music should be able to play it. To that end, Wang was the first to turn the IPhone into a musical instrument when he created the "Ocarina" phone app which became one of the most popular in the world when it was launched in 2009.

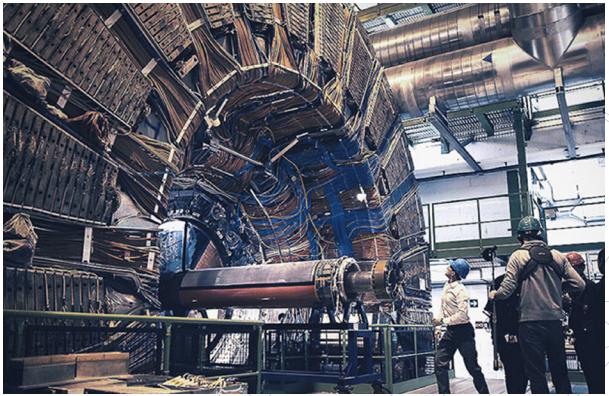
Cyberg Foundation 3 min

Neil Harbisson was born with achromatopsia, a rare condition that causes complete colour blindness. In 2004, Harbisson and Adam Montandon developed the eyeborg, a device that translates colours into sounds.

Symmetry Unravelled 2x19 min

Symmetry is a dance-opera film, in which Cern scientist Lukas is thrown off balance, while working on the theory of everything and the smallest particle. Through Claron's singing he rediscovers love, in an endless landscape. She takes him back to the moment before the big bang, when time didn't exist; a love with no end…

The project has 2 parts - dance-opera film and a documentary of how it was created.



SILENT SIGNAL

32 min (6 titles)

Our bodies perform a soundless internal dialogue between cells using the universal cypher of genetics. These signals are fundamental to how our bodies operate and how they adapt to fight disease. Silent Signal takes you on a journey: starting at the microcosm of the infection fighting internal landscapes of our cells, through the personal experiences and opinions of individuals and scientists, to the application of the research in the wider world of infectious disease modelling and genome sequencing. The works raise questions about what our genetic code is, how our immune system functions, how disease is spread, and what the future applications and impact of the research into these areas might be for us all.

Animations exploring how the human body communicates with it self.

Each work is the result of a close collaboration between an artist and a scientist, exploring the similarities and differences in the way they work and the technologies they each use.

AFTERGLOW

BOREDOMRESEARCH AND DR. PADDY BROCK
UNIVERSITY OF GLASGOW

A terrain progressively illuminated by glowing trails, evocative of mosquito flight paths. These spiralling forms represent blood carried by mosquitos infected with a malaria parasite found to jump the species barrier from monkey to human.

SLEEPLESS

ELLIE LAND AND PROFESSOR PETER OLIVER
UNIVERSITY OF OXFORD

Sleepless is the result of a two year conversation about the links now being discovered between sleep and mental health.

BATTLE OF BLISTER

GENETIC MOO AND DR. NEIL DUFTON
IMPERIAL COLLEGE LONDON

An immersive animated film that takes the viewer on a fantastic voyage through the inflammation process. Each sequence in Battle of Blister has been generated by human performers in an interactive film set.

LOOP

SAMANTHA MOORE AND DR. SERGE MOSTOWY
IMPERIAL COLLEGE LONDON

Loop is about what can be seen and what cannot, how scientists imagine their work and how they describe it.

IMMUNECRAFT

ERIC SCHOCKMEL AND DR. MEGAN MACLEOD
UNIVERSITY OF GLASGOW

Adopting the form of a video game trailer, Immunecraft presents a fictional game which gives users agency over a real life cell culture to compete against opponent players.

THE SIGNAL AND THE NOISE

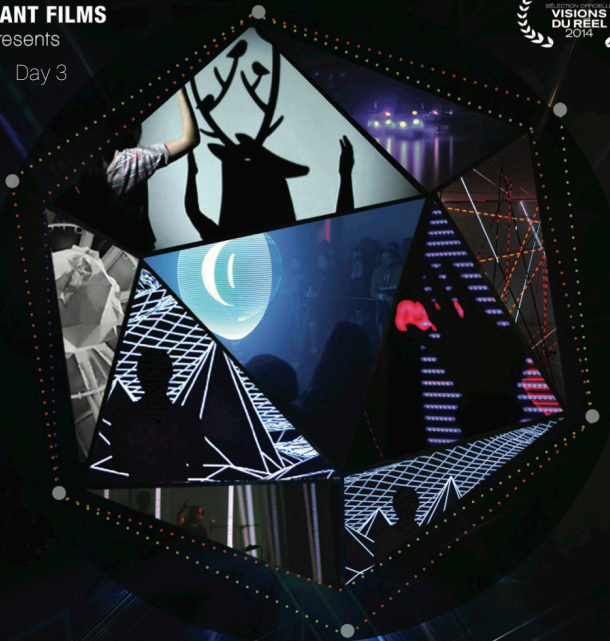
CHARLIE TWEED AND DR. DARREN
LOGAN WELLCOME TRUST SANGER INSTITUTE

The film draws upon the latest advances in DNA sequencing technology to propose a future vision of hybrid computing devices used to monitor and repair living things, resulting in better performing humans and animals.

ELEFANT FILMS
presents

Day 3

SÉLECTION OFFICIELLE VISIONS DU REEL 2014



NOUR ATHAR

light essence *art science*

Yannick Jacquet | Mandril | Thomas Vaquié | Joanie Lemercier | Daniel Canogar
Camille Scherrer | Frederik De Wilde | Alex Kettler | Insanë | The Erasers

EDITOR Serban Georgescu SOUND DESIGN / ORIGINAL MUSIC Marius Lefrarache
DIRECTED BY Milla Quixote and Jérôme Monnot PRODUCED BY Alex Iordachescu
A COPRODUCTION Elefant Films AND Mapping Festival

WITH THE SUPPORT OF
RTS Radio Télévision Suisse | ERNST GÖHNER STIFTUNG | kolectiv

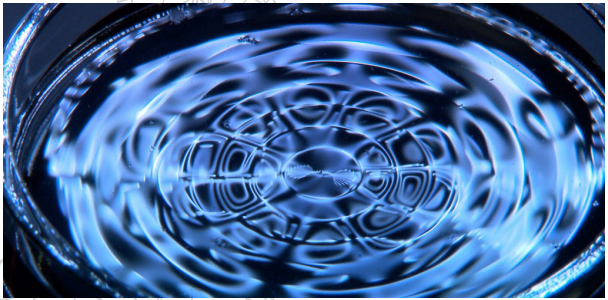
The film explores the relationship between art and technology, as seen through the eyes of six artists who use new technologies in their own artworks. An investigation of the technologic trends in the visual arts as well as an open question of their extension in our real lives.

Day 4

Eyeful of sound - 6 min

Sonic Magic: The Wonder and Science of Sound - 44 mins

Sound has the power to charm, annoy, and even change history. Sonic Magic: The Wonder and Science of Sound reveals the historic force, promise, and potential of sound - and a strange phenomenon called cymatics that has created a new scientific mystery. Sonic Magic explores how sound has shaped our history, introducing us to fields of acoustic ecology and also research labs where sound is eliminating cancer tumours and much more.



Kunstvermittlung im Kunstkratftwerk Leipzig Kunst und Wissenschaft – „Cogito ergo sum?“ Programm 2016

Projektleitung Kunstvermittlung: Angela Straube-Bornberg
T: 0176/640 67 341 E-Mail: straube@graustraube.de

Kunst- und Wissenschaftsfestival „9 Evenings Revisited: In theory, as in practice…“ Workshopreihe „9 Evenings/9 Workshops“

Vom 11. bis 15. April 2016 findet der erste Teil des Kunstfestivals „9 Evenings Revisited: In theory, as in practice…“ im KKW statt. Fünf Tage lang ist das KKW Gastgeber für zahlreiche Künstler und Wissenschaftler aus aller Welt.

Mitten in diese kreative Auseinandersetzung haben wir zwei Workshopreihen für Kinder und Jugendliche geplant.

Workshopreihe I „Vibration Motor“

Roboter tanzen und drehen sich, alte Hemden, Socken oder Stühle bewegen sich und erzeugen dabei ihre eigenen Klangwelten. Der Künstler Peter Bosch baut diese „Maschinen“ zusammen mit Kindern einer DaZ-Klasse aus der 46.Grundschule. Unterstützt wird er dabei von Dr. Sergey Kostyrko.

Termine: 11., 12. und 13. April 2016
Künstler: Peter Bosch, Valencia
Wissenschaftler: Dr. Sergey Kostyrko, Universität Sankt Petersburg

Workshopreihe II „ Karma and Soul – Genetik und Epigenetik“

Künstler: Mark Matthes, Hamburg
Wissenschaftler: Dr. John LaCava, Rockefeller University NY
Dr. Alexander Kagansky, Institute of Genetics and Moleculare Medicine, Edinburgh

Kritisches Denken erfordert Unabhängigkeit und den Mut, Dinge in Frage zu stellen. Mitunter bedeutet es Gewissheiten einzutauschen gegen Unbekanntes. Es kann in die Irre führen oder belohnt werden. Doch eines ist ganz klar: Ohne diese Fähigkeit wären viele Entdeckungen in den Wissenschaften nicht möglich gewesen. John LaCava und Alexander Kagansky sind kritische Geister und den Spaß, den sie daran haben, möchten sie weitergeben. Zusammen mit dem Künstler Mark Matthes und einer Gruppe Jugendlicher entsteht in einem ungewöhnlichen Projekt Kunst aus Wissenschaft. Oder ist es doch andersherum?
Termine: 11., 12. und 13. April 2016

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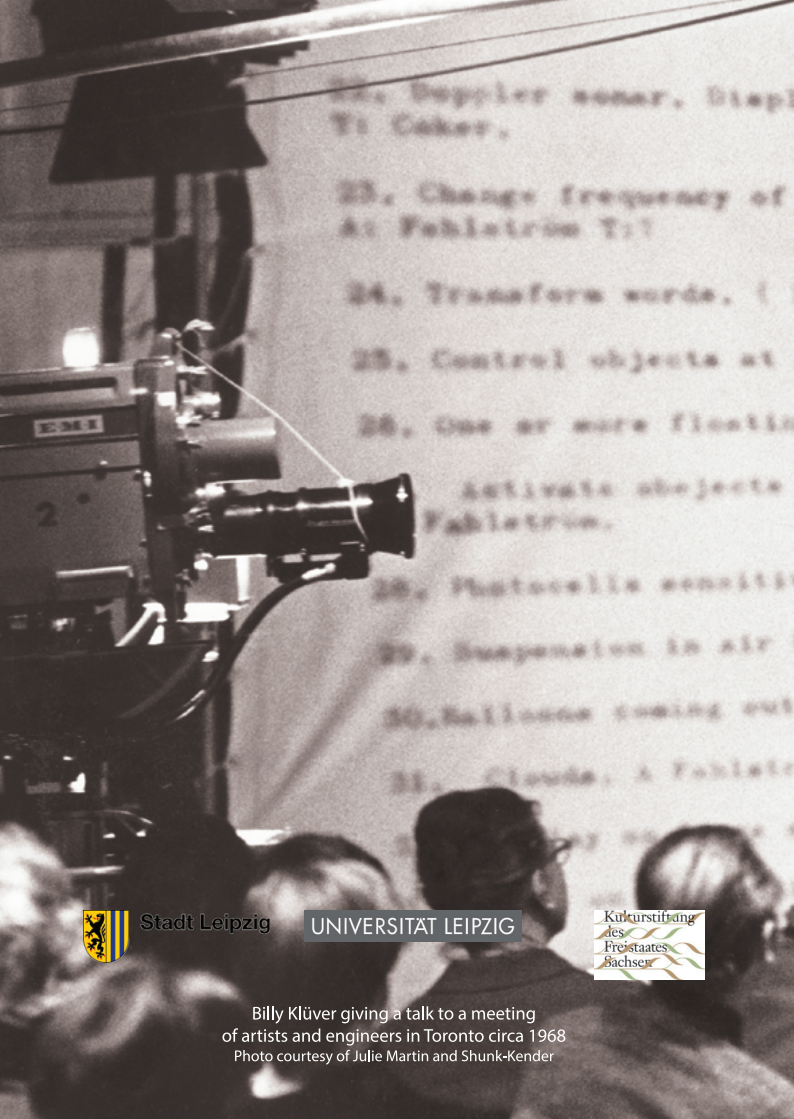

Stadt Leipzig

UNIVERSITÄT LEIPZIG

Kulturstiftung des Freistaates Sachsen

Billy Klüver giving a talk to a meeting
of artists and engineers in Toronto circa 1968
Photo courtesy of Julie Martin and Shunk-Kender