The Future in the Stars
European Astroculture and Extraterrestrial Life
in the 20th Century
Emmy Noether Research Group
Friedrich-Meinecke-Institut
Freie Universität Berlin

Sounds of Space

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– Abstracts –

Tatjana Böhme-Mehner

Outer Space and Space Travel in Pierre Schaeffer's "La Coquille à planètes"

The term "concrete music" had not yet been coined when, in 1944, Pierre Schaeffer crowned his research with the "composition" of the radio play *La Coquille à planètes*, telling on one hand the narrative of a journey in space and on the other elaborating the technological possibilities of sound manipulation. Both from a socio-historic and from an aesthetic perspective the composition of *La Coquille à planètes* marks the point at which Schaeffer reached the highest level of concreteness to move at the same moment to a concept of extreme abstractness. Analyzing the radio play from a technological and from a content-oriented perspective I show why it appeared at this particular point, taking into account the historical situation in France in the middle of the 1940s and the development of Schaeffer and his "Studio d'Essay" in the preceding years. Thus, the paper deals with the representations of space as a vanishing point within the discussion of radiophonic art as well as with spaces as a representation of the enquiring mind of the time.

Tim Boon

Music for Spaces – Music for Space

This presentation grows out of the Science Museum's July 2009 live performances of Brian Eno's *Apollo*, held to mark the 40th anniversary of the moon landings. I focus on two sides of a pun: on instrumental music in the sense of music with a function both within a film and within museum spaces; and on instrumental music in the sense of music without words. For the film, the music serves to help the viewer to experience NASA Apollo footage in different ways: from the mystery and danger of space, to the 'endless frontier' depicted by the Country-Music inflections of pedal steel guitar. In the Science Museum, the performances of this originally electronic score served to make a site-specific event that could suggest complex cultural narratives about historical and technological change. *Apollo* depicts space by developing the sonic language of place previously heard on Eno's *On Land* (1982), notably the 'organic' drone textures produced by slowing recordings and elaborate studio manipulations. I compare this with a longer tradition of representation of space using various kinds of electronic drones; another distinguished example being Eduard Artemiev's score for Tarkovsky's 1982 *Solaris*, realized using the Russian ANS synthesizer. In concluding, I show how this example might integrate with a new philosophy and practice of music in museums more broadly.

Klara Anna Capova
Listening to the Sounds of Silence

The paper introduces a piece of research that is devoted to the sociocultural aspects of scientific search for extraterrestrial life. Drawing from anthropology of science as a rather new field within mainstream anthropology, the paper focuses on activities of the SETI Institute, here conceptualized as 'listening'. 'Listening' constitutes the ways of our understanding the universe by introducing novel acoustic experience of the audible outerspace. Since 'listening' is not the only strategy that employs sound in the search of the Other, the search for extraterrestrial intelligence is introduced in context with the radio messages to the stars, 'messaging'. The paper focuses on search for Other life as a sonic experience and introduce 'listening' and 'messaging' as a technoscientific practices alternative to standard visual scientific rhetoric. It also includes the actual soundmarks collected during ethnographic fieldwork and offers insight into the current concepts of other life as theorized and reproduced by the scientific community and popular culture.

Paweł Frelik
Dark Transmissions: Cosmic Visions in Contemporary Music

Although space does have a sound, in the actual music practice most of that sound is of little value in itself. At the same time, various music genres and practices have long been invested in presenting themselves as the sound of space. In the same way in which famous NASA images of nebulae and spiral galaxies have been visually edited, many artists have used various techniques and approximations to convey to their listeners the sense of what the universe *could* sound like. I concentrate on three distinct genres that have made cosmic imagery central to their identity in the last two decades. These are space ambient, dark ambient, and space black metal. Radically different from each other, each of these music genres has accumulated a repertoire of sonic solutions that imitate and approximate what the artists imagine space sounds like. More importantly, I am interested in how each of these musical interpretations of outer space is both an expression of and a creative factor in a different vision of the universe. Using music as well as textual and paratextual elements, artists working in each of these sonic aesthetics have conceived the universe to be a harmonious place washed in positive energies (space ambient), indifferent and entropic emptiness (dark ambient), and a reflection of human despair and loneliness (space black metal).

Stefan Helmreich
Listening Through Alien Ears to the Voyager Interstellar Record

What kind of message was the Voyager Interstellar Record, launched into space on the Voyager spacecraft in 1977? Much has been written on this topic – from the explanatory primary source by Carl Sagan and others, *Murmurs of Earth: The Voyager Interstellar Record* (1978) to Nelson and Polansky's 1993 second-order analysis published in the *Journal of Applied Communication Research.* This presentation examines the peculiar *Scrambles of Earth* artifact, an audio record that its creators, the *Search for Extraterrestrial Intelligence In Exile* (SETI-X), in 2010 claimed represented an alien 'remix' of the original Voyager Record, which sonic repurposing itself constitutes a kind of third-order commentary on the technics and politics of the original record. Though widely suspected of being a hoax, *Scrambles of Earth* affords a way into thinking of questions to do with imagined alien sensory apparatus and interpretative technology, with how extraterrestrial 'ears' might hear, in ways both

familiar and strange. It also poses information theoretic questions, notably those addressed by Lachmann, Newman and Moore in 2004.

Konstantin Kaminskij

The Voices of the Cosmos: Electronic Synthesis of Special Sound Effects in Soviet vs. American Science Fiction Movies from Sputnik 1 to Apollo 8

It took about thirty years from the invention of film to establish the motion picture as an audible artwork. And it took another thirty years from the introduction of cinematographic (electrified) voices to the "voicing" of electricity. The science fiction genre in particular made electricity acoustically perceptible on the movie screen. In this paper I examine how science fiction plot and acoustic special effects were compositionally related in early socialist (Soviet, East German, Polish and Czech) science fiction movies, where human voices typically communicate with the voice of electricity. Finally, the paper demonstrates how the connection of science fiction plot and acoustic media-semantics overlays the ideological message implied in science fiction movies that intended to prefigure the socialist future in the present of the Cold War era.

Cathleen Lewis

Okudzhava and Scott-Heron: The Social Critique Soundtrack of the Space Race

On the surface, Bulat Shalvovich Okudzhava and Gil Scott-Heron have virtually nothing in common except for the fact that both were poets, specialized in a form of song called "author song." Okudzhava was born in Moscow to a Georgian father and Armenian mother just after the Bolshevik Revolution. After Stalin's death, he began to compose songs and to perform them, accompanying himself on a Russian-tuned guitar. Okudzhava provided a musical social and functional critique of the Soviet system that has become the anthem of late and post-Soviet space culture. Scott-Heron was a Chicago-born baby-boomer son of an American opera singer and Jamaican soccer player, who demonstrated early literary talent. He began his career as a jazz poet, combining his poetry with instrumental jazz in critiques of America's inequities.

The work of these two intersected at the space program. In 1969, Okudzhava's lyrics "Your Honor Lady Luck" were instrumental establishing the cult status of the film *White Sun of the Desert*, most notably among Soviet and Russian cosmonauts. Scott-Heron challenged the conventional acceptance of the Apollo moon program in his 1970 poem-song, "Whitey on the Moon." In it he laid out the irony of a moon landing in the context of the persistent poverty of the US. In 2008 director Aleksei German chose the Okudzhava's poem "Paper Soldier" as title, inspiration and soundtrack for the film on the early human space program. The fact that these poetic critiques, created a world apart, each landed on the targets of human spaceflight is intriguing. In this paper, I analyze the trajectories of these three social critiques and how they map out key cultural differences between the US and USSR during the space race.

Michael Mooradian Lupro

"Just my Job, Five Days a Week:" Soundscapes of Space Labor in Apollo Era Pop Music

This paper interrogates the sonic discourses of space labor in two of the most popular space related musical texts of the Apollo era, David Bowie's "Space Oddity" and Elton John's "Rocketman." Both

songs are woven into the sonic fabric of space travel and are strongly associated in the popular imagination with the human spacefaring future. Sonically, each of these texts imagines and communicates a spacefaring future of extremely uneasy labor relationships. Dominant analyses of the song lyrics elide the agency of the protagonists and assume forces like "ground control" are indeed in control. Shifting the narrative analysis to focus on arrangements, instrumentation, and recording technologies, controls on labor become contestable. Is it possible, for example, that Major Tom is not the passive victim of an equipment failure we are predisposed to expect, but rather an active participant in a costly act of rebellion against the forces of control, ground and otherwise? Since human spacefaring, and the labor that produces it, still exists more in the imagination than in material reality, the representations of contested space in these texts present new challenges and opportunities for the regime of real space labor.

Trevor Pinch

Inner Space and Outer Space: How the Early Electronic Music Synthesizer Took Us There

The experience of the 1960s counterculture was, it turns out, a heavily technologically mediated one. Whether through the technology of drugs or through the technology of music or through various "mind expansion" programs it is increasingly clear that the supposedly anti-technology ethos of the period was at best selectively applied. In this talk I reflect upon one specific music technology – that of the early electronic music synthesizers which became available in the period 1964-1975. I explore the types of sound the early synthesizers made and how these sounds became associated with inner space exploration and outer space exploration. I focus in particular upon the use of the early Moog and Buchla synthesizers but I will also discuss the British EMS synthesizer. Musical examples are culled from the early Pink Floyd, Hawkwind and the Beatles.

Johan Stenström

The Significance of Electronic Music in the Space Opera "Aniara"

In his verse epic *Aniara* (1956) the Swedish poet Harry Martinson depicts the fate of mankind in space in a remote future. In 1959 Karl-Birger Blomdahl wrote an opera based on the epic. *Aniara* is the name of a spaceship which veers off course and continues its never-ending journey in space. One of the features that aroused widespread attention in this opera was the Mima tapes – that is, the taped electronic music and *musique concrète* used to represent the sound sequences emanating from Mima, an anthropomorphic apparatus unconstrained by the limits of time and space. At the close of the 1950s there was as yet no electronic music studio in Sweden. The Swedish Broadcasting Company put a studio and two technicians at Blomdahl's disposal. The means by which the three Mima-tapes were produced seem by today's standards rather poor: a few tape recorders, the archive of sound effects, a number of sinus-tone generators and a control-table. For the creation of the Mima tapes Blomdahl used certain key phrases from Martinson's epic, for instance: "Cosmos and the light year's song." This first part is also named "The Milky Way." The composer wanted to give the impression of the start of a huge engine. Five tone generators were used, engendering a frigid sound rising upwards, ever faster and higher. With the Mima tapes Blomdahl was able to add another narrative or associative dimension to the work. Above all he created affinity between form and content, music and subject matter. In 1959 electronic music was considered a congenial way to tansmit an impression of the sounds of space.

Alexandra Supper

Eerie Whistling and Tribal Cosmic Heartbeats: The Silencing of Craft Skills in the Sonification of Astrophysics

This paper discusses the sonification of astrophysical data as one approach for rendering phenomena from outer space as sound. In sonification, data are transformed into sounds, often (but not necessarily) with the help of digital sound synthesis technologies. Although some precursors exist, systematic scientific and artistic research on sonification began in the early 1990s. The paper focuses on the sonification of astrophysical data and its usage in the public legitimization of astronomical research, especially in the field of asteroseismology, where sonifications of stellar oscillations play a prominent role in science popularization. The discourse about sonification often involves a silencing of craft skills. By definition, the sonifications rely on a number of technological and human interventions in order to turn the data into sound; yet in the public discourse, it is often suggested that the sounds come directly from the phenomena being sonified. This downplaying of the skills and tools that make the sonifications possible in the first place helps to play up the mystique of, for instance, listening to "the music of the stars," and thus contributes to the construction of sublime experiences of science supposedly afforded by sonification.

Axel Volmar

Cosmic Symphonies: Electronic Music Culture, Analog Synthesizers, and the Birth of Superstring Theory in the 1970s

It is well known that electronically generated sounds contributed greatly to the aesthetics of space movies since the 1950s. While these connections have been addressed frequently by historians of culture and media, it also seems to be worth following a different path by investigating whether and how cosmological theories have been shaped by postwar auditory culture and synthesized sounds. In my paper, I trace historical relations between the culture of electronic music and theoretical physics by reconstructing the influences of synthesizers as cultural artifacts on early superstring theory. According to string theory, the universe entirely consists of (very small) fundamental elements called "strings," and all physical particles known today are "synthesized" by the strings by vibrating in different resonance patterns. Of course, superstring theory is based on abstract, high level mathematics, but in order to understand the mathematics, the conception of scientific models have always been crucial for the development of theoretical physics. In this respect, it is interesting to note that both the notion of the "string" as well as the metaphor of the universe acting as a "cosmic synthesizer" resulting in a "cosmic symphony" commonly used to in string theory, date back to the early 1970s – a period in which the auditory culture of western societies was widely influenced by the diffusion of the synthesizer invented by Bob Moog and others only a couple of years earlier. Therefore, superstring theory can be seen as a modern version of the ancient "music of the spheres" or *musica universalis*, conceptualizing the universe in sonic forms. The proposed paper is rooted within the methodological frameworks of science and technology studies (STS), historical epistemology and sound studies. Drawing on historical accounts as well as recollections of some of the protagonists involved, I show that the use of acoustic models and metaphors in early superstring theory were not entirely coincidental but lay in the intersections of the *technological culture* of both physics and popular music.

Eliad Wagner

Crossing Streams: Instant Composition Using the Sound Vocabulary of Science Fiction

Electronic music has always been connected with the unfamiliar, the strange and the unnatural. Perhaps it is the artificial timbres of electric signals, which contribute to this specific quality. Very naturally, electronic music became such an important tool in describing other worlds, especially in early science fiction and fantasy works, that many basic electronic sounds were coined and strongly associated with specific elements in science fiction (the sound of a "laser gun" is an example of that). Since instruments from these times were hard to transport and handle, many composers and musicians had to limit themselves to studio work alone. In recent years, though, a rekindled passion for older technologies has led to the development of instruments, which draw from older designs, but are constructed using modern parts and assembly techniques, leading to a decrease in size, increased mobility and ease to use on stage. I will present an electronic instrument designed in the way described above to create strange and otherworldly sounds drawn from and inspired by the science fiction mindset. I use the instrument to examine contemporary ways of thinking about music (such as instant composition, *musique concrète* and free improvisation) using the particular vocabulary associated with these fields. The presentation is a live demonstration of arranged phrases and articulations that take inspiration from the world of space exploration as portrayed in popular culture, generated and arranged in real time. These will provide a practical demonstration of some of the theoretical topics covered in the conference, especially a current view of the relationship between the idea of space exploration and general thoughts about electronic music work, listening practices and instrument design. I intend to demonstrate how such sound material can be organized into a coherent musical form with value and meaning independent of the original context of the sounds themselves and how applying modern methods of composition to the vocabulary of science fiction influences many aspects of live electronic performance.

James Wierzbicki

The Imagined Sounds of Outer Space

Especially since the dawn of the Space Age in the years immediately following World War II, popular culture has teemed not only with visual representations of outer space but also with their concomitant sounds. To launch a workshop whose objects of discussion include a variety of the very real sounds that emanate from space, this keynote address explores manifestations of 'space' sound that are entirely imagined. Drawing primarily from the rich crop of science fiction films that blossomed world-wide in the 1950s and 1960s but also referring to precedents and consequents, the address deals in turn with sounds connected with signals from outer space, with sounds generated by various sorts of outer-space technology, with sounds that depict the atmospheres and landscapes of distant planets, and with sounds that in one way or another illustrate travel through space. Framing the address will be commentary on 'outer space' sounds that have little to do with science fiction but, rather, exist simply as examples of music. The reasons why filmmakers would engage with the 'sounds of space' seem obvious enough, but why, the address asks, have so many composers working in classical as well as popular genres looked to space for inspiration?