Remote Encounters:

Connecting bodies, collapsing spaces and temporal ubiquity in networked performance

http://remote-encounters.tumblr.com/

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<http://liminalities.net/10-1/synema.pdf>

Synema: Expanses through Connected Environments

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Abstract

The series of Internet based technological developments in recent decades affects and transforms so deeply our practices and perceptions that the very notion of auditorium cannot remain untouched and unscathed. What we discern as a listening space for production and reception of music and for sound propagation in space and in time is now overlapping the specific physical structures and architecture (concert halls, venues, esplanades, etc.) towards enlarged and invisible sensory enveloping forms: internet auditoriums. We have to examine those 'spaces': their architectural filiation with places and rooms, their plasticity for being built, planned, settled and landscaped for listening, their ability to locate and seize listeners and to be explored by sound productions designed to be listened to. That is why the author is opening several assumptions crossing both musical and sound production, spaces and places for audiences, sociotechnical arrangements and interactions, all being perceived as coherent, seamless, and homogeneous (that is producing an 'auditorium'). One example is the Synema project that was premiered as a networked audio-visual performance at the Remote Encounters International Conference on April 2013. This project is part of a series of works that involve what the author considers as an extended music for expanded and expanding auditoriums and the expected development of a music 'by' environment: when music and environment are intermingled, collaborate together, and both oscillate. Thus such as attuned listeners we could explore an idiomatic music and new aesthetic experiences both based on properties of sound propagation in acoustic networked, tuned and connected spaces.

The Synema project is part of a studies series related to the author's practice-based Ph.D. research on Internet Auditoriums[1]. This research is developed from a musical point of view by probing and exploring, as a musician, music composer, and researcher, several hypotheses concerning notions and practices related to interactions between production, composition, and reception of sound and music. The author's interest focuses first on creative and active aspects of audio practices into our societal contexts that embed more and more telematic actions and operations of sound transports, moves, conveyances and transfers. In the author's view, and from observations, analyses, and music works initiated, it would be interesting to explore hidden forms of sound and musical structuring, which, first viewed as impediments, disruptions, interferences, or technical limitations, would open an unlimited musical potential. The sound propagation and the related acoustic effects could act and operate far beyond the physical and material walls of our listening place[2]. That is why the author has opened several assumptions crossing both musical and sound production and 'manufacturing' (music composing, interpreting, playing), reception and perception (the listening), the presence and co-presence in the places and spaces, and practices of technical and social arrangements that allow interconnections between these actions, operations, and members of an audience, all being perceived as coherent, seamless, and homogeneous (that is producing an 'auditorium'). This exploration is growing step by step in the author's research and musical career: the involvement of acoustic properties in music (extended techniques, intonation, microtonality and acoustic interferences, musical acoustics, electroacoustic and electronic combinations), network music performances (distributed performers and listeners, permanent music and temporary listening, listening circuits), internet auditoriums (larger structures of listening space at a planetary level), extended music for expanded and expanding auditoriums[3] (idiomatic music for correlated and 'tuned' spaces and for attuned members of audiences to a homogeneous and co-constituted set, as virtual and intangible as it is, in which they feel to be co-present and to participate 'in space' and 'in time'), the Earth-Mars auditorium (involving an extreme situation of listening and of sound production), intensity-based music (structured by loudness and sound intensity by enhancing embodied and immersive sonic and musical experience), delay-based music (structured by delays between transmission and reception, and between interactions combining synchronisations and desynchronisations), music 'by' the environment (based on and structured by impact and feedback of spaces).

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[1] "Research projects and studies."

[2] Blesser and Salter. *Spaces speak, are you listening? Experiencing aural architecture*. 163-214.

[3] According to Descartes (*Principles of Philosophy*), the notions of extension and of expanse are related to the awareness based on experiences of the sensible and on bodily sensation and corporeality; a contrario the notion of space is related to abstraction. See also: Gallet. *Composer des Étendues*.

To be able to listen to both our surrounding space and remote distant spaces where we are not physically present, without disturbing and altering our hearing and understanding, is a recent situation and phenomenon. Yet this is also an ancient fact: we have never steadily increased our spaces and our perimeters of listening with the help of architectural devices, of various techniques, of means for transporting sound (recordings), and for transmitting it over large distances (telephone)[4]. However, recent techniques have brought new dimensions: a greater simultaneity or sensation of it (despite the distance), the plasticity and ductility of listening perimeters, multiple and simultaneous audiences and transmitters (in distributed places), etc. These developments and breakthroughs change deeply and sustainably what we usually mean by our listening 'space', the listening practices and dispositions, and listening places (where the act of listening is proposed and 'formed'). Thus an auditorium is both:

- an architectural 'structure' where we listen to the space (determined by our action of listening to spaces and the environment);

- and the virtual and ductile listened space through sound production (music, voice, ambient sound) proposed in this location (determined by the properties of space that color and tint the sounds that propagate in space).

In a digital and networked age, the difference can be subtle between what is 'producing' an auditorium and what 'is' an auditorium : listening to the space and the listened space (similarly : visiting the space and the visited space, etc.).

What we discern as an auditorium and a listening space is now overlapping the specific physical structures and architecture (concert halls, venues, etc.) towards enlarged sensory enveloping forms. It appears as a hybridisation of actions and spaces where tactics such as collective-driven, embedding mobility and spaces/places visits, networked and live-feed, and so on each contribute to the everyday experience. These operative processes of asynchronic & synchronic attachments to places, to moments and to the now, are landscaping a 'sensorium' while keeping characteristics of an 'auditorium'. Furthermore they are operators for an 'extended music' and for a music 'by' environment: when music and environment are intermingled, collaborate together, and both oscillate, and when music becomes anti-predicative and inexpressive, and produces space by modulating and interacting with sonic expanses

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[4] "NMSAT – Networked Music & SoundArt Timeline – A panoramic view of practices and techniques related to sound transmission and distance : Archeology, Genealogy, and Sound Anthropology of the Internet Auditoriums and Distance Listening". A bibliographical collection of references (more than 3,000) about sound transmission and transport. And also: Joy and Sinclair, "Networked Music & Soundart Timeline (NMSAT) — A Panoramic View of Practices and Techniques Related to Sound Transmission and Distance Listening," 351-361; Joy, "Networked Music & Soundart Timeline (NMSAT) — Excerpts of Part One: Ancient and Modern History, Anticipatory Literature, and Technical Developments References," 449-490.

and continuities of the properties of the places[5]. The experiencing of a spatial and acoustic space is characterised and assessed by the perception and the feeling of a 'certain' homogeneity and intermediacy, and of a co-presence to 'something' or 'someone': that defines an action of tuning that is radiating and coming to us.

One example is the Synema project that was premiered as a networked audio-visual performance at the Remote Encounters International Conference on April 2013. The intention of this project as a step towards an 'extended auditorium', i.e. by the extension of its perimeter, is to experience transmitted sound and images from distant places that are simultaneously fold together while preserving their own local properties and 'colourations'. Thus sonic expanses and propagations reach us and are mixed with the sounds of our own environment. Because the networked online system on the server is activated by internauts' requests on the Web, Synema (originated from Sync and Cinema) offers multiple individual experiences at the same time (and of course in different places), each output[6] being different and using the same live sources (microphones and webcams). The use of the cinema reference allows better understanding of how in future works could implement an idiomatic music based on properties of sound and acoustic networked spaces (in planetary and inter-planetary dimensions).

> "Tout ce qui bouge sur un écran est du cinéma."
> "Everything that moves on a screen is cinema." (Jean Renoir)

Synema is an online networked application created as part of the nocinema.org project[7]. The Synema process applies generative principles to live video and audio streams selected from all around the globe. Thus the system on the server is generating live cinema by assembling live video feeds and live sound selections from webcams and streaming microphones. Connected and 'retuned' locations and ambiances creating fortuitous synchronicities based on synchronisations and a-synchronisations resulting from the on-the-fly 'montage' by the application on the server. Sound originates from live streaming microphones located in various worldwide locations (for the performance at Cardiff : Germany, France and Columbia), and are maintained by collaborators (Locustream project by Locus Sonus[8]). Streaming video shots are real time fragments of webcam feeds located in various places selec-

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[5] "Ante-Bruit. Composer le Tout-Audible" (Pre-Noise - Composing the All-Audible).

[6] The combination between virtual and physical worlds defines the actions of the 'extranaut', that is another facet of the internaut (who acts online).

[7] "Nocinema."

[8] "Locus Sonus Audio Streaming Project Map – Locustream Soundmap – Live Worldwide Open Microphones 2006-2014 – A Locus Sonus Lab Initiative."

ted by the application. Video fluxes are slightly treated e.g. framing, magnification, addition of panning shots, crossfades to black, etc. in real time and are sometimes combined through superimposition and juxtaposed effects incorporated into the final output 'montage'. Filming skies and horizons becomes an opportunity to create a new kind of cinema using webcams and avoid displaying information related to specific locations or its security concerns. Synema interpenetrates and interlaces local and remote spaces, environments and ambiances: those which are near and in which we are physically present and operate, and those captured, at a distance, brought to us, and that propagate towards us, while becoming, in extension, our now. This interconnection is creating and modifying perimeters and dynamics of our perceptions.

Connecting, inter-connecting and experiencing (inter-)connections of terrestrial spaces is part of our daily life (Internet)[9]. The next question is what will happen with our perception and subsequently with our aesthetic experience when inter-connections with extreme spaces and milieux will be continuously and remotely accessible, because it will be still impossible to be there physically. Extreme spaces are both on Earth (underwater, polar and desert areas, nano-spaces, toxic spaces, far-remote and impenetrable spaces, etc.) and in Outer Space. How will we be able to develop practices and experiences in order to perceive and to experience these sonic spaces and to manufacture specific listening while preserving the ecological balance of them (by avoiding 'terraforming' for adapting these locations for human habitability)? What kind of limited or unlimited aesthetic experience are we ready to live and to be immersed in? Because we continually move, mentally and physically, we need sensorial and intellectual excitations for living, thinking, acting, and operating. In this way and by extending these reflections, the current Synema study is a first exploration concerning the very next opening of a 'Earth/Mars Auditorium' when a microphone is set on the distant planet (ca. 2016-2018)[10] and human missions to Mars (ca. 2025-2030) will be part of our reality. The operation of connecting ambiances and environments between two remote spaces and places as distant as those of Mars and Earth could enable the consideration and amplification of the planetary dimension of our current listening with a new angle. We need to explore and to consider a larger auditorium we're modulating and playing.

This means as a feature of our current and increasingly more telematic spaces we can consider they contain acoustic variations and parameters: when a sound disappears from a space and emerges into another space, near simultaneously or with the perception we have of a direct and live connection. This involves a transparent ar-

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[9] Joy, "Une Époque Circuitée" (A Circuited Era - About an organology of networked art : the Internet as a musical space), 57-76.

[10] "Proposition Mars Microphone 2016 (ISAE Institut Supérieur de l'Aéronautique et de l'Espace)."

chitecture, invisible circuits of sound expanses and consequently of our listening practices. These aspects authorize us to approach emerging conditions of:

1) 'extended music' (or music for sound expanses);

2) sonic 'field spatialisation', the connecting and, consequently, retuning of successive spaces of various natures and acoustics (electronic, telematic, physical) where sound is propagating, and finally;

3) sensorial and aesthetic experiences of sonic tele-propagation beyond the acousmatic listening[11] we already know.

The author wishes to consider singular properties, impacts and outcomes of networked systems such as their immaterial structure and organicity, and their virtual acoustics and spacing aspects for inventing and contributing to an idiomatic cinema and music. The latencies, delays and time effects produce a whole range of lattices of variations and of transformations embedded into individual and collective listening (or, more specifically, of a togetherness by individual experiences) that everyone could consider as patterns and 'idiorrythmic'[12] operations of attention and of aesthetic experience of the everyday.

These promised operations and to a large extent what we are already engaged in, can correspond to what we're expecting of future aspects of music and of music listening with out-of-reach sound: networked music performances are now and have been for a few decades an existing field of music experimentation and of 21ˢᵗ century concerts developments[13] — The best known and much-publicised examples include: Pierre Henry with one of his last creations, Paroxysmes, playing at a distance

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[11] According to Jérôme Peignot ("Quels mots pourraient désigner cette distance qui sépare les sons de leur origine…" (What term could designate the distance that separates these sounds that we heard of their origin?), In "Musique animée", 15 radio programmes by Groupe de musique concrète, 1st programme with Philippe Arthuys, "D'où vient le mot acousmatique" (Where does the word acousmatic?), National radio station, France, 1955; cited in Bayle, *Musique Acousmatique - propositions … … positions*, 51-54; and also: Peignot, "De la musique concrète à l'acousmatique" (From musique concrète to acousmatic music), 116) and to Pierre Schaeffer (Schaeffer, "Expériences Musicales," 2). And also: "Acousmatic: is said of a noise that one hears without seeing what causes it" (Schaeffer, *Traité des Objets Musicaux* (Treatise on Musical Objects), 91-99).

[12] Roland Barthes developed the concept of 'idiorrythmy' to express a possible way of living together, for instance in space, that preserved individual rhythms (withing a group) and a fluctuating balance between them and a communal rhythm. (Barthes, *Comment vivre ensemble. Cours et séminaires au Collège de France, 1976–1977*; and also: Barthes, *How to Live Together: Novelistic Simulations of Some Everyday Spaces*). In addition, Henri Lefebvre, following Gaston Bachelard, defined the issue of rhythmanalysis: it is to study and understand the polyrhythm, being attuned to the world, to explain what is occurring in places. (Lefebvre, *Éléments de rythmanalyse*; and also: Lefebvre, *Rhythmanalysis: Space, time and everyday life*).

for a networked concert in Hobart Tasmania for the Mona Foma Festival (Jan. 2012)[14]; Beethoven's 9th Symphony conducted by Seiji Ozawa and played with simultaneous distributed live groups of singers synchronised on five continents via satellite connexion for the opening ceremony of Nagano Olympics Games in 1998[15]; tele-concerts and performances by the English band FSOL (Future Sound of London) playing from their home to audiences at remote festivals (ISDN live, Transmission 2, The Kitchen, 1994 May 11, and November 4 & 5)[16]; and the most experimental ones include: music works by Pauline Oliveros with distributed musicians and audiences for live concert performances, for outer space[17], and for live Second Life events (the Avatar Metaverse Orchestra[18]); and of course music works by Pedro Rebelo, Max Neuhaus, Bill Fontana, Atau Tanaka, The Hub, Maryanne Amacher, etc.[19]

The development of networked music performances lies not only in the technical achievement and technological challenge of broadband networks to reproduce music (with a hi-fi reflex related to live music performance duplication), but mainly in the development of music designed and conceived for networked systems. Since networked music configurations interlace spaces and involve properties of those ones, our assumption takes into account effects and responses of such a mixed environment, or more precisely of such a combination of environments. Thus a music or a sound work for networked spaces is consequently 'environmental' or a work 'by environment', i.e. a work that collaborates with it and whose elements and conditions is dependant on interactions with and responses from the environment(s), the context, and the (eco)-system(s) that generate it.

In a larger sense these characteristics could imply notions of environmental aesthetics and of ambient aesthetics.

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[13] Renaud and al. "Networked Music Performance: State of the Art."

[14] "Pierre Henry, Paroxysms — World Premiere."

[15] "THE XVIII WINTER GAMES; A Display of Culture and Hope Opens Games."

[16] Kitchen NYC information, The. E-mail message: "Before and After Ambient - An Inaugural Event of Electronic Cafe International, Future Sound of London Live from their studio."

[17] "Echoes from the Moon."

[18] "The Avatar Metaverse Orchestra."

[19] "Introduction à une Histoire de la Télémusique" (Introduction to an History of Networked Music Performance). And also: "NMSAT – Networked Music & SoundArt Timeline – A panoramic view of practices and techniques related to sound transmission and distance : Archeology, Genealogy, and Sound Anthropology of the Internet Auditoriums and Distance Listening".

"[W]e discover in the aesthetic perception of environment the reciprocity, indeed the continuity of forces in our world — those generated by human action and those to which we must respond. [...] Environmental aesthetics, as theory and as experience, can help us achieve a truer sense of the human condition. [...] Person and environment are continuous. [...]."[20] [21]

For his part, Jean-Paul Thibaud notes that an "aesthetics of ambiances [is] concerned with the affective tonality of architectural and urban spaces."[22] And Gernot Böhme develops an aesthetics of 'atmospheres' "as a general theory of perception" and a "study of atmospheres involved in interpersonal connection".[23] This series of studies included those of Thibaud, Böhme and Berleant (among others) gives us the scope and the magnitude of such a chaining of questions related to the reality manufactured by our perception and to our understanding of and reactivity facing the outer world by listening.

In the era of the Internet, digital, and electronic communication networks, these aspects also point out the continuous modifications of our listening perimeters and spaces, of our collective and individual listening and of practices of music composing. Developing such a research in an arts/science context gives the artist a new role: to propose assumptions for a future, like a feint (to be where one do not expect us), while well we're opening problems into the now; actually the future doesn't exist, but the near future does, by collapsing into the present. These investigations into what it's possible or imaginable are directly working on our now.

Concerning the Earth/Mars auditorium hypothesis initiated with the Synema project issued from other network music works the author has produced over the last few years, and the ongoing developments of a 'synscape' project and a kind of 'space-time sensorium' for astronauts along their long trip (6 to 9 months) and visit to Mars (ca. 18 months), our attempt involves issues emerging from the interconnection and correlation of sonic spaces based on spatial and temporal cross-linking and distribution. The intention of the 'synscape' project concerns the proposal of an evolving sound mixing and folding all along the travel(s). For instance: live

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[20] Berleant, *The Aesthetics of Environment*, 4.

[21] "Berleant argues that aesthetic experience begins with the environment (both natural and humanly modified environments) and extends to art." (Brady, "Environmental Aesthetics," 313-21).

[22] "Let us note that the term aesthetic must be understood here in its original meaning of aesthesis, i.e., perception by the senses and not only as judgement of taste or philosophy of beauty." ("The City through the Senses"). After: Augoyard, "Vers une esthétique des ambiances" (Towards an Aesthetics of Ambiances), 17-34.

[23] Böhme, "Acoustic Atmospheres: A Contribution to the Study of Ecological Aesthetics," 15. And also: "The art of the stage set as paradigm for an aesthetics of atmospheres."

streaming microphone captures from both planets, or sound modulations driven by variations of sound ambiances, etc. by twisting slowly from Earth to Mars sounds, and music fabrication systems ('space-time sensorium') between Mars and the Earth. These projects will be developed while taking into account delay times (the one-way communication delay with Earth varies from 4mn to 22mn due to the speed of light), other constraints and extreme conditions inherent to the travel in outer space and the stay on Mars: habitat and habitability[24], acoustic permeability, 'exteroceptive' attention[25], and familiarity, promiscuity and creative motivation, collective-based deprivation and individual contribution, sound perception into the Martian environment (disabilities, needs of sonic distances) and memory of field and aesthetic experiences, etc. They could breach problems of isolation, of clipping and of containment which could cause problems of solipsism for instance,[26] while proposing systems of discontinuous & continuous sensorial excitations for the astronauts, and at the same time, of a space of participation between the two communities of Earth and Mars, and of a space of 'earth-martian' and 'mars-earthling' productions. Our projects create problems more than solve them and problematize issues for the scientific, artistic and social communities.

Our research is more based on actions and operations of synchronicities (synchronisation, de-synchronisation, re-synchronisation) and of 'tuning' (in French: syntonisation) than on descriptions of the chaining of spaces and times such as a factual extension of our listening places. Thus these operations we're already acting into our current and existing ways of listening to music and to everyday and mundane sound environments in ordinary experience and situations, rely on actions of modulations and of listening positions and dispositions face to emerging sonic states and dynamics (and also used in urban planning, architectural acoustics and in most loudness-based music works): filtering (with our bodies and by moving according to sound reflections on surfaces), masking (hidden and emerging sounds because of their simultaneity), cut out effects (transition from an ambience or an atmosphere to another one)[27], amplification (the strengthened sounds for increasing their propagation in comparison to background noise and a sonic ambiance), partial listening (by selecting into seemingly unlimited and unceasing sonic processes and productions)[28], listening by wake (by following specific sonic dynamic appear-

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[24] Schlacht, "Space Habitability."

[25] Sensitivity to stimuli originating outside of the body.

[26] Johnson and Holbrow, "*NASA SP-413 – Space Settlements, A Design Study.*"

[27] Augoyard, Jean-François and Henry Torgue. *À l'écoute de l'environnement. Répertoire interdisciplinaire des effets sonores*. 34-45; and also: Augoyard, Jean-François and Henry Torgue. *Sonic Experience: A Guide to Everyday Sounds*. 29-37.

[28] Comparable to the synecdoche effect. Augoyard, Jean-François and Henry Torgue. *Ibid*. 134-40 (French version). 123-29 (English version).

ances and rythms into an environment), and so on. It is not merely a question of placings and of trajectories of isolated presences and bodies in space and immersed together or lonesome in an environment (visual, sonic, animated, landscape, ambiance, venue, concert hall, at home, with earphones, etc.). It is to listen to more than what we hear. It is continuous and immediate actions of attention, in mobility or mobilised, of lithe, flexible, and absentminded exchanges and weavings with the fields of the sensible and with mobile / immobile reality (the moves, the rythms, and also the oscillations between the 'possible' and the 'real'). This occurs in the followup adaptations into the moving[29] (by sympathy, by intuition, inadvertently and unintentionally, by anticipation, etc.)[30], and in the dynamic constructions by the perception and the interpersonal interactions and those with the outer, when the sounds flow toward us[31]. That modifies actively our own distances and listening reaches with the membranes of what is surrounding us and that thus become ductile and fluctuating. The production of continuities (there is no more separation between us and the outside[32]) is persistent and remanent. That corresponds to aesthetic, experiential situations, creative and participative spatialisation experiences. We're acting into our environments (and interacting with them) and we're engaging at any time and everywhere aesthetics experience[33]. Similarly, we could say that, in perception, we are shaping the world that shapes us. By our moves and our listening we're filtering and modulating and tuning with the sonic environment constituted by sound expanses (that come toward us or that we continuously cross and criss-crossing) even if they are coming from remote or absent sources and brought to us by telematic operations into our own acoustic environment. At the same time we're tuning with other listeners and actors who we perceive the co-presence of in space (togetherness).

Thus into a project embedding extreme conditions such as those of an Earth/Mars auditorium, we have to examine and to investigate with scrutiny what that ensures and preserves continuities and stabilities into our perception and our experience of (inter-)connected and joined remote spaces experienced as seamless spaces. This is related to qualities of ductility and plasticity — like membranes, bio-

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[29] Bergson. *La Pensée et le Mouvant* (The Creative Mind: An Introduction to Metaphysics). 144-76.

[30] Schütz. "Making music together : a study in social relationship."

[31] "The rhythmanalyst will not be obliged to leap from the inside to the outside of the bodies he observes; he should be able to succeed in listening to them together and allying them, by taking his own rhythms as a reference: by integrating the inside to the outside and vice-versa [...]." Lefebvre, *Éléments de rythmanalyse : Introduction à la connaissance des rythmes.* 32-33; and also: Lefebvre, *Rhythmanalysis: Space, time and everyday life.*

[32] Berleant. *The Aesthetics of Environment.* 4.

[33] "There is an aesthetic aspect to our experience of every environment [...]." (Berleant, *The Aesthetics of Environment*, 11).

mes and sensory environmental envelopes — of what remains and is maintained as an 'auditorium'. Another aspect of this larger auditorium (extended to an interplanetary dimension) is to imagine the next Internet and its future, i.e. next developments into electronic communication (telepresence and co-presence) at very large and incommensurable distance. We'll have to prepare an extension of our sensorium by adapting ourselves and our hearing capacities to an 'altered' acoustic environment to which we could access remotely and telematically before directly experiencing it. This contains speculative aspects of architecture (habitat, forms) and of structure (field, systems) by probing and working extreme conditions and situations of the sensible experiences: with two sonic environments as remote as possible involving between two virtual acoustics and internal reciprocal physical ones, and with communication standards and systems: those of today and those anticipated in the near future.

Confronting a new sensible register, we'll have to explore how we could combine it with our existing sonic environment and how we could incorporate it in order to imagine next martian, earth-martian, and mars-earthling sound and music productions, i.e. what we could 'manufacture' sonically and musically, starting from our listening and experiences of these given combined environments. Our perception of environments seems to be indivisible: sounds emerge together. We know how to tune and to interact with our earthling environments: from decoding and analysing the sound signals, to displacing and playing field recordings (like sound 'capsules' we transport and deliver), and to making music in places and spaces, as in 'out in the open' situations. In addition we'll have to understand how to learn, to experience with, and to participate in martian sound environments and in the distance between the two planets. The challenge will be certainly to ask if a terraformation of our listening or if a terraformation (or an 'acoustisation'[34]) of the Mars planet will be necessary (which raises an ecological and ethical point of view). It is dealing too with deficits and disabilities (of synchronisation, continuity, time delay in communication between Earth and Mars) in order to preserve types of 'ecotones'[35] and of ecosystems of and between the two planets, the two communities, and the two environments (to act into an 'auditorium', to make an 'auditorium').

The notion of 'ecotone', transposed in acoustics and sound research fields, relies on two principles: that of continuity (recurrences, structural aspects, organicity) and that of discontinuity (fortuitous events, unexpected saliences, signal losses and cuts), that both operate on our listening (to music or to environments or to background noise). As we have seen, the sense of 'tuning' and of modulation in space and time

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[34] Term and notion coined by the author that means modifying a given acoustic to be audible to human ears. (different from 'sonification').

[35] An ecotone is a transition and contact area between two ecosystems or biomes. This term was created by A. G. Tansley ("The use and abuse of vegetationnal concepts and Terms." 299) and precised by G.L. Clarke (*Elements of Ecology*).

from us as listener(s) is relying on our reaction to and interaction with (and our perceptions of) formal and informal lines or elements into sound environments and a fortiori in music (this is relevant in experimental music, for instance: improvisation music, noise music, generative music, etc.). That joins other in-progress studies the author is leading related to music based on sound intensity (loudness) as an attempt to approach a music constituted by interactions and modulations with, and immersions into the environment — that the author considers as 'extended music' (or music for sonic expanses), unexpressive ones, and that is not based on 'out of sound' decisions and on analytical listening: such as studies on noise and harsh noise music such as the works of David Tudor, Iannis Xenakis, and La Monte Young[36]. Another facet of these studies is relying on music based on sound delay (a live time lag between sound emission and reception) and, in some aspects, on sound decay, that will surely open reflections on the use of duration in music or better to say on music listening duration and music production that does not corresponding to music duration[37]. What appears as a problem with the Earth/Mars auditorium (the incompressible time delay) for verbal communication between interlocutors located on the two respective planets could be a new investigation in music and an extension (into larger dimensions) of what we experience in networked music performance, related to live experience, synchronisations and participation: a music that expands, that folds and unfolds, and that evolves with its environment and space-time contexts. Taking into account network communication defaults and artifacts as properties of a specific acoustic, even if this one is conceived as virtual, could help us to distinguish an idiomatic music (at least initially: delay-based music).

A first step could be that such projects ('synscape', etc.) can be modeled on Earth by taking extreme conditions of the martian environment as analysed today (delay time in communication, characteristics of the Mars acoustics, etc.) and by applying them to music listening and production. Although scientific analysis, simulations and observations (remotely performed with the help of telescopes and of satellites) bring out almost assured and verified conditions of the Martian environment and the travel to Mars, there will always be differences with future direct experiences (as it is the case today with the supposed presence of methane on this planet predicted by the analysis but invalidated by the field probes lead by the

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[36] "Musique à Niveau Sonore Élevé – Musique-Environnement" (Loud Sound & Music Structures Into Environment and Space). And also: "Ante-Bruit. Composer le Tout-Audible" (Pre-Noise - Composing the All-Audible).

[37] To extend the research by Chris Chafe (Network Delay Studies, and Internet Acoustics: series of papers), Pauline Oliveros ("Echoes from the Moon"), Pedro Rebelo ("Netrooms The Long Feedback, a participatory network piece" and "Nethalls"), Atau Tanaka and Kasper T. Toeplitz ("The Global String"; and also: Atau Tanaka and Bert Bongers. "Global String – A Musical Instrument for Hybrid Space"), etc.

rover Curiosity[38]). At the same time, the use of live sound from Mars at the beginning of its present exploration could produce a deceptive impression and a difficulty to compare them to terrestrial sounds : apart from sonic artefacts of wind on the microphone's membrane (fleeting dust devils, storms and tornadoes) and renderings of small distances (because of the specific nature of atmosphere on Mars: attenuation due to viscosity, thermal conductivity, etc.)[39], the sonic aspects that could be used could concern continuous variations of intensities, dynamic appearances, and so on. Unlike the images captured on Mars surface which seem to be familiar to us and which bring the two planets closer, the junction of both sonic environments like two streamed field recordings mixed together can't create at first sight a composite soundscape such as we usually expect it. Thus we can find rich possibilities for exploration and experimentation with sound and music by developing simulations on Earth concerning 1) extreme delays (within transmissions and interactions between operators of a musical action, and thereby to consider a music based on expanses produced by extensions), in addition of studies issued from conditions identified in a manned space mission and relating to 2) the sensorial containment during a long time and the potentials of resolution of it (immersion into a architectured space and the necessity to perceive its properties facilitating sound propagation and localisation, and its status between isolation and permeability between the outer and the inner for a better understanding of our own listening embodiment and situation); 3) the perception deficits into an extreme environment (because of failures of our auditory organs) and the ways to restore an exteroceptive attention and perception (with the help of clues, dynamics, variations, fluxes, ambiant layers, temporalities and durations, distinct events and artefacts, etc.)[40]; and so on.

Finally this also concerns music collaborations with environments beyond today's current practice of field recordings and of phonographies in order to heighten other facets of aesthetic experience with music and listening. That is, to modulate and oscillate with the surroundings and audio streams for having a more sensitive experience without predication, expectation and preferences into a vast sonic space[41] — instead of always being based on 'events' vs 'non-events' distinction and inventory (of what exists in space and in places and bore by a discourse on

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[38] Webster and al., "Low Upper Limit to Methane Abundance on Mars," 355-357.

[39] Bass and Chambers, "Absorption of sound in the martian atmosphere." And also: Williams, "Acoustic environment of the martian surface"; Petculescu and Lueptow, "Atmospheric acoustics of Titan, Mars, Venus, and Earth."

[40] The theme of 'feeling' (Empfinden) in the thought of Erwin Straus (Straus, "The Forms of Spatiality", 3-37); and the critique of 'kosmotheoros' (a specular, overhanging, and geometrical conception of the world: a subject of the world representing the world to himself as an object facing him) by Maurice Merleau-Ponty (Merleau-Ponty, *Le Visible et l'Invisible* (The Visible and the Invisible), 30-31, 106, 149, 276).

space and by representational conception) and on naturalism and realistic perspectives (vs noise, density and saturation). Our perceptions of background noise and sonic scenery are certainly essential comparing sound saliences and figures that we distinguish and separate as 'events' and sonic signals. Actually these perceptions often neglected (in music for instance) help us to better 'sense' the space around us — as if the space was 'musicalised' and continually offered aesthetic experiences (physical, social, situational, contextual, environmental, etc.). We experience the fact to be a part of the environment: how our bodies are immersed into the environment (and blend into the background) and how our systems combine and collaborate with it. Moreover whatever we listen to (music, ambiance, etc.) — or hear, at the level of an auditory experience —, listening requires an experiential 'sense' of space in order to better follow sound 'lines' and sonic expanses, its complexity, sonic organisations, combinations, animation, responses in space and time[42]. The ruggedness of space (present in its responses and animation, and in intensity and density thereof) combined with its ductility (mobile and evolving shapes and forms) and with its capacity to accommodate and to feed fortuitous, incidental and temporary sounds, provides occasions of production of this sense/ation that could be interesting to compare it with (musical) emotion we feel, beyond any effect of expression. Our listening spaces are less places of contemplation than places of participation in, of action and engagement into, and of improvisation with these surroundings: from landscape to soundscape, to taskscape and finally to 'synscape' (as an aesthetic and artistic involvement).

The very notion of 'auditorium' doesn't have to be restricted to the standardisation of music and of listening (that has evolved historically until the architecture of today's concert venues) and must propose a kind of unlimited collaboration, as well as the promise of an 'unlimited' music, between listeners, producers, listeners and producers, and finally between each of them and the environments, contexts and milieux. This new manufacture/fabrication, more porous and which uses circuits, chaining of spaces, etc. while remaining homogeneous and continuous, is based on structures which authorizes us to distinguish them as 'auditoriums' as well. Synema (and 'synscape' along with other on-going or future music projects related to the Earth/Mars auditorium) would serve as a 'clutch' for such auditory and sonic mem-

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[41] "The question of the dissipation of music has to do with how much of the experience of music in that very strong fundamental sense might be dissipated by a number of things" ("An artist of the auditory sounds off on the world of sounds"). Interview of Francisco Lopez by Todd L. Burns, Red Bull Music Academy, Matadero, Madrid, 2011. *The Dissipation of Music* is an in-progress essay by Francisco Lopez. Also: "I believe in expanding and transforming our concept of music through nature (and through 'non-nature') [...]." (Lopez, "Profound Listening and Environmental Sound Matter." 82-87).

[42] Kahle, "Validation d'un modèle objectif de la perception de la qualité acoustique dans un ensemble de salles de concerts et d'opéras" (Validation of an Objective Model of the Perception of Room Acoustical Quality in an Ensemble of Concert Halls and Operas).

branes, and for immaterial and architectonic listening structures and auditoriums based on expanded and relayed acoustics.

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