

Per-ception

between Nature, Science, Technology, Body and Art

by Dr. Annabelle Görgen-Lammers

Leaving behind a blazing, warming sun and the sound of children's laughter, we enter a great church portal, step into an enigmatic, wired dark. The difference between outside and inside is registered by all senses. Yet this initially does not tell us anything about where we have arrived – have we plunged into the depths of a quiet meditation space or have we soared to find ourselves high up in an exciting room of complex technology? And where are the boundaries of this place, which, while certainly differing from others, feels hard to define in scope and atmosphere? Suddenly the silent dark is interrupted by an impulse of light and sound that quickly disappears into silence. After staying for a longer time, it becomes palpable that we find ourselves in an impressive experimental space of nature-science-art-“per-ception”.

In the here and now of darkness, the most diverse sensations are perceived (as real): bright pinpoints of light glaring in high contrast, only to disappear immediately. They emerge intermittently from small globular sculptures. These rounded bodies are hung inside the space and feature a dark centre on one side, so that each individual sculpture is reminiscent of an eyeball with a pupil. Sometimes pale, sometimes beaming towards the entrance area, they seem to stare at an incalculable multitude of visitors. When several of them are active, the point-like lights connect to form rows; like pearl necklaces, the lights guide our vision upwards, diagonally, sideways. In constant change.

At the same time, in the truest sense of the word extra-ordinary sounds reach us. These emerge from vibrating membranes, speakers at the centre of the sculptures, as and when they emit light. In itself, every sound produced sounds spherical, not graspable in space. The sounds combine into sequences, into penetrating chords, into swelling and receding tones in rhythmically surprising sequences. The intervals are micro-tonal, that is, their intervals are extremely subtle, smaller than the distances between semitones. Again, abruptly, silence. The sensitive interplay of this installation, its exploration and combination of visual and acoustic interstices, is hard to grasp: the glowing colour points create fleeting spatial images accompanied by the constantly changing sounds; the latter generically belong to the former, for in tone colour, pitch and spatial appearance, they are coupled to the colour values and the brightness of the lights as these appear spatially in the installation.

Resonance

In space as much as in our bodies, the colour-light-sound-compositions seem to echo, to generate after-images, reverberation, atmospheres. But before we can get hold of the strange images and sounds, before we can remember them, our perception is already absorbed by the subsequent impulses of light, colour, sound, and therefore of energy – traversing the space. At times the stimuli appear suddenly, at times they quietly announce themselves, like soft bubbles and ripples flowing past. They are in constant movement, transformation, indefatigably new, not graspable, unpredictable – if they follow a plan, then this plan is enigmatic, inscrutable, unprecedented. Our whole body is grasped by the confusing motion of images and sounds in the here and now, as well as by the after-images and echoes alluded

to. It is almost impossible for our senses to be closed off to the multi-channel system of sounds coming from all sides, to the lights appearing at surprising moments, to the ensuing abrupt darkness and silence; in short, to the intense perception of space. Crossing the space, the sounds and lights not only seem to traverse us – it is felt that they actually do so. We become part of this experimental space of nature-science-art and note how parts of our body are made to resonate inside. We “re-sonate” together with the moved, moving sounds, colours, lights, in the sense of the Latin resonare, “re-sound”. In physics and technology, this acoustics-based term refers to the increased co-vibration of a system capable of vibration as and when it is exposed to a temporally changeable influence; resonance develops only when a body's resonant frequency is stimulated by another body's vibration. Translated into human sensibilities, this means that resonance can epitomise a particular way of being in contact with the world. In this respect, resonance can involve elements of affect, of being-touched, of emotion, of a setting-in-motion, of transformation and change.⁴ Resonance is probably one of the very first experiences made in our lives, as children cannot develop without resonance. Yet the experience of resonance is not something we can influence or control. Hence it is a gift

to encounter an installation that integrates strongly and yet indeterminately the sensibility and perception of an audience by means of an intensive spatial “atmosphere”, a thick mesh of stimuli and relations.

Atmosphere

For such an integration of our perception, Harmut Böhme has marked out the term “atmosphere” as that “which is experienced in rooms in the physical presence of human beings and objects.”¹¹ Referring back to the Hermann Schmitz' philosophy of the body, Böhme's definition and reflection considers “atmosphere” as the spatial carrier of mood and as the foundational term of a new aesthetics. Understood as such, the term can also substitute for that which is imposing, for “aura” according to Walter Benjamin's well-known definition from 1935. The latter term served the reflection of what characterises an artwork as such. The explanation of aura as exceeding the artwork itself is concerned with phenomena of distance, an elusiveness that can also be palpable in proximate objects. Let us bring back to mind the fact that, paradoxically, Benjamin derived his explication from his experiences with nature: “What is aura? A strange gossamer of space and time: unique appearance afar, however close it may be. Reposing on a summer's afternoon, to look calmly at a mountain range on the horizon or a branch that casts its shadow over the reposing figure – this means to breathe the aura of these mountains, of this branch.”¹¹¹ As background to the experience of aura, Benjamin describes a certain atmosphere in nature and simultaneously a certain attunement, state of repose, a physically relaxed intuition on the part of the observer. The starting point of Benjamin's conception, then, places at the centre of the experience of aura moments of the natural and corporeal!

It is precisely these moments that also seem central to the composition of Tim Otto Roth's nature-science-art-experiment. We are enveloped by a dense atmosphere which is, on the one hand, indeed imposing. Lying on the floor, many visitors spontaneously expose themselves to the work similarly to

how Benjamin may have lain on his back when developing, “reposing” in nature “on a summer's afternoon”, the cited conception of an artwork's aura. On the other hand, the atmosphere of Tim Otto Roth's installation also exerts an activating effect upon the observer. Quickly you find yourself moving through the light and sound environment, submerging yourself, reappearing, testing various angles for looking and listening. One's curiosity and interest in the exploration and in one's own perception are stirred: from where and how does one's perspective combine the colour points into an image most strongly? And which sculpture emits which tone along with which light? Do the lights' respective colours correlate not only with the sounds' pitch, but also their volume? At which spatial brightness are the sounds woven into the thickest soundscape? And why is it suddenly completely quiet and dark again?

Curiosity

When the primary object of our perception is atmosphere, we are seduced, in the further course of resonating, into reasoning, as one can put it. Against the backdrop of atmosphere, we dissect from a more analytical perspective the forms, colours, processes and technical foundations of the installation. The attention given to the perception of wires, mounts, bracing becomes increasingly differentiated. The atmosphere, as a whole more than the sum of its parts presents itself as constructed, designed, calculated, staged with attention to detail involving a

church space has its history as a site for the invocation of these forces – for instance through prayer or singing – in the hope of receiving answer, that is, of resonance with our hopes for an explanation of the enigmatic character of life and with our desire to connect with them, to enjoy their benevolence. And how does reciprocity work as part of the immersive installation? Does it only affect us, or do we affect it? Are we included in its game? We sense that we can change our perception of the sound by our motion; we can also co-determine the images created for short periods of time by the colour combinations through our respective position. Hence we can autonomously determine our respective individual perception of the whole, of the “composition” that emerges from the colourful micro-tonal “keyboard”, we can “play on”. But can we change by our movement even the individual components, the sounds or the colours? Quickly, a ludic instinct and an illusion of control takes over, the human tendency to believe that certain processes observed for a long time can be consciously prompted. This (unfortunately) is usually not the case, even if the illusion of control remains a strong motivational force in the human.

The conceptual part of the installation betrays that in this respect, too, we are not in full control. AIS³ is short for the three-dimensional “Astroparticle Immersive Synthesizer” and, in its phonetic form [aɪskju:b] simultaneously sounds the name “Ice-Cube” of the largest particle detector in the world.



For [aɪskju:b] the whole St. Elisabeth church was darkened and deep blue filters were mounted to the roof lights. The deliberate reconstruction in the 1990s conserved the historic remnants in the church, which was bombed out in WW2. Für [aɪskju:b] wurde die komplette St. Elisabeth Kirche verdunkelt und die Oberlichter mit tiefblauer Folie verhängt. Der bedachte Wiederaufbau der Kirche nach der Wende, hat die Spuren der Zeit in der im Krieg ausgebombten Kirche erhalten. Image: Jürgen Frank/ Villa Elisabeth.

variety of highly technical elements and processes. The atmosphere itself is the work, it becomes clear. The atmosphere takes effect in and with evident reference to the church space: to the high, plain, rectangular nave of St. Elisabeth, designed in the 1830s by Karl Friedrich Schinkel, in its concrete form still expressive of having burnt down in 1945. The now darkened space was once conceived of for sound, for church songs. Some of them, such as the Gregorian chants which have existed since the eleventh century, already made use of micro-tonalities. The space was constructed for assemblies serving the celebration of a belief in something beyond the visible, in forces that rule over us and traverse us noticeably or imperceptibly. The

The data the researchers have gathered in nature might be described as constituting Tim Otto Roth's motif. The motif is no longer, as in realism, the mountain in nature, nor, as in impressionism, one's perspective on the play of light on the mountain, nor one's presuppositions on the basic rules according to which the mountain may have formed, nor the reflection of basic rules according to which a painting can develop in the contemplation of a mountain, as in Paul Cézanne. Tim Otto Roth is concerned with his own understanding and grasping of initially abstract physical research data and with the simultaneous translation of this data into another “phonetic script”. He is concerned with making it visible to the eye, audible to the ear, palpable when moving. In short, he is concerned

with rendering tangible the latest research in physics by means of the conception of the parameters of an atmosphere that is produced, that affects the body as a whole, the *physis* – what is at issue, here too, is the natural and the corporeal.

that affects the body

Tim Otto Roth's *as a whole, the physis*

concrete form of translating scientific research is based on his long-term artistic research on light (significantly with focus on shadows as giving a premonition of the space of light), on sound (with focus on echo and sound spaces), and on the physical constitution of the recipient (with focus on question of resonance). His research is comprehensive and manifold, at home in the discursive fields of cultural history and art as much as in the practice of the artist and composer. Since 2008, he has intensified his engagement with new scales of sound, tied to physics. His large-scale light and sound pieces developed for public spaces in Europe and the U.S. have received international media prizes such as the German Light Art Award Lux.us and the International Media Art Prize of the ZKM Karlsruhe. The pieces were often developed in cooperation with teams of scientists from leading research institutions around the world.

Re-Search

The list of artists that have explicitly referred to research and science is long. Moreover, art has been understood as a collective, interdisciplinary research practice for a considerable amount of time. An example from nearly 100 years ago might be the surrealists, who established their research office Bureau de recherches surréalistes in 1924. Their aim was to formulate a new attitude to art, which according to André Breton and his followers was in crisis due to the "influence of the dealers", turning into a mere commodity. One of the tasks of art was to be the communal expansion of the imagination to make possible new aesthetic experience: art was envisaged

for the surréalistes

art was envisaged

as a knowledge-producing activity

activity. It was not to take effect in products and styles, but in processes and results. Thus the surrealists tested collective experiments, participation, the joint assembling and collecting of "experimental data" on then-current themes. They were interested in research projects on pathological phenomena of the everyday, puns uttered while sleeping or in a trance, dreams, the conversations of a large audience. The aim was the investigation of a different consciousness by means of the period's latest methods. Today, Tim Otto Roth concerns himself with a physical making-conscious of the most up-to-date physical investigations and insights by means of his period's latest methods, employed poetically.

If the surrealists published their experiments and frequently revolutionary results in journals of which the layout – as in the juxtaposition of text and image – consciously referenced the leading scientific journal in France of the time, *La Nature*, a "Review of the Sciences and their application in arts and industry", then of Tim Otto Roth Martin Kemp observed recently in the English-language scientific journal *Nature*: "A new art is encoding a new science."^{iv}

Indeed, Roth's scientific curiosity seems to form the base for all his creative investigations, a curiosity regarding both the natural sciences and image and art studies, as well as, significantly, the search for (new) linking points between them. In order to translate the most recent physical research into art, he makes use in ever-changing ways of his repertory, his "range": comprising the relations between light colour, micro-tonalities and the visitor's body, all staged in a space.

Concept

The staged translations of scientific data are arbitrary and present themselves, not least, in their quality of being produced, artificial. Tim Otto Roth exposes the concept that forms the backdrop, i.e. his concept, showing it as an individual concept. This becomes clear, for instance, in the phonetic defamiliarisation of the relation to science in the title, or in the emphasized significance of numbers – such as in the stated number of speakers hung in the space, "444", exactly 11% of the overall number of light sensors in IceCube. While on the one hand, this emphasis reinforces the scientific aspiration of the transposition, on the other hand it stands in explicit contrast with the atmosphere to be evoked, and the work's poetic effect.

The conceptual emphasis on the number is reminiscent of Marcel Duchamp. In 1938, for instance, Duchamp allegedly arranged "1200 sacks of coal" to form the ceiling of an exhibition room. At a later point, he had a "1 mile string" run through a gallery room. The human need for *ratio* was satisfied by the precision of the numerical data – a precision at the time actually impossible. Further characteristics of Tim Otto Roth may also be reminiscent of Duchamp, such as the pleasure taken in high precision and perfection. If Man Ray attested in 1938 that Duchamp was "excessively exacting without paying attention to the amount of work that ensued", the piece [aiskju:b] leads us to suspect that some of Roth's assistants may have something similar to report. Above all else, Tim Otto Roth's work follows Duchamp in his questioning of the border lines between art, technology, science.

In his most recent solo show "XX oder der 'Mummelsee in der Pfanne'", Roth rigorously cited Duchamp's observation when visiting an aviation show at the Grand Palais in Paris in 1912. Enthused by perfect industrial form, he is reported to have asked Constantin Brancusi: "Painting has come to an end. Who can do anything better than this propeller. Can you?"^{vi}

The experiments resulting from this attitude such as the Rotoreliefs featuring puns were appropriately exhibited by Duchamp at an inventor's fair.



Impression from the mill and propeller related space at the exhibition "XX oder der 'Mummelsee in der Pfanne'", Municipal Gallery Offenburg 2016. *Mühlen und Propeller im Themenraum der Ausstellung "XX oder der 'Mummelsee in der Pfanne'", Städtische Galerie Offenburg 2016. Image: imachination projects.*

Duchamp's *mise-en-scènes* mentioned above also revolutionised the form of the exhibition: an artist friend called the "1200" sacks of coal hung low above a burning coal furnace "a fantastic metaphor that drew the visitor in whether they liked it or not."^{vii} Hence his contemporaries already noted that Duchamp had created in the lay-out of the exhibition an immersive room of sorts, "fundamentally dealing an incomparable blow to all artistic

or commercial reason". Historically speaking, this was indeed the first case of a public exhibition amounting to a total *mise-en-scène* of the space, and, further, integrating both unchanged and simulated spolia, traces, found items, remains of the everyday, and nature. The use of such elements allowed for the emergence of manifold unprecedented references on the basis of which for the first time a dense atmosphere was staged in the exhibition space, forming the actual work exhibited.^{viii}

In line with the surrealists' research project, this atmosphere was meant to have an entirely confounding effect so as to seduce everyone into their own unconscious.

Transparency

Today's spolia, traces, found items, remains, energy impulses and data from nature form materials for Tim Otto Roth. But while Duchamp consciously sought deception – the sacks of coal were actually filled with paper, the fire in the coal furnace was simulated by a light bulb painted red – Roth aims, as far as possible, for an exact reproduction and translation of scientific findings by means of technical and artistic means. In and by choosing the means for translating physics' investigations into a particular atmosphere, Roth leaves

a mark on our real, physical experience, the parameters that render possible, or do not render possible, resonance. Furthermore, his work leaves a mark on how we store such lived experience in our bodies. Tim Otto Roth makes use of his work and aesthetic to form our perspective, our feelings, our inner conception regarding the research feeding into his work. The atmosphere he creates in doing this remains behind as a corporeal impression, an experience, a "view of the invisible". It will influence our – conscious or unconscious – attitude not only in relation to his artwork, but also in relation to the "motif" addressed, that is, the underlying processes investigated by scientific research. Who, after all, before coming here or in any other way, has ever seen, heard or experienced the neutrino activities penetrating us?

only to physicists, but, in translation, to all of us.

Tim Otto Roth understands how to make use of artistic and visualising techniques for making palpable to the senses complex scientific research such as particle physics and astrophysics, computer science and molecular biology: he considers this an urgent aesthetic challenge for art. Thus he

"view" on the news from outer space

lays open the means and algorithms of his translations, in this case of his "view" on the news from outer space. He presents a range, as it were, renders transparent the rules guiding the decisions made as part of his visual, sonic, spatial translations. This seems important especially in light of the immersive atmosphere and the possibility of provoking strong resonance with the results: even more so in a world in which algorithms used non-transparently increasingly determine our thinking and acting; and even more so in a period in which the difference between and transgressions of outer and inner space are not always sensually tangible, in which it is more and more difficult to notice a transgression of boundaries of the self from the outside, as manifest in the data traces we leave behind. In this sense, as we resonate with AIS³ we experience not (only) processes taking place in space, but (also) ourselves. In our adaptation of the world, we can perceive ourselves afresh.

slightly edited opening speech from August 2018

^{*} translator's note: *disassembling the German word for perception, Wahrnehmung, the author allows us to read it in its separate parts as true-taking, i.e. taking for true/real.*

i Hartmut Rosa: *Resonanz. Eine Soziologie der Weltbeziehung*, Berlin 2018.

ii Gernot Böhme: *Atmosphäre. Essays zur neuen Ästhetik*, Frankfurt a.M. 1995, here p. 251. Böhme's reflections refer back to the elaboration of the concept of atmosphere in Hermann Schmitz' philosophy of the body (*System der Philosophie*, Bonn, 1964ff., Vol 3), which in turn finds a precursor in Ludwig Klage's "Vom kosmogonischen Eros", Bonn 1972.

iii Walter Benjamin: *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit*, in: *ders.: Gesammelte Schriften*, Vol I, 2, Frankfurt a.M. 1974, p. 440.

iv Martin Kemp: *Flashes of cosmic brilliance. Tim Otto Roth's minimalist art installation reflects the complexity of cosmic radiation*. In: *Nature* 458, p. 836 (16 April 2009).

v Man Ray: *Man Ray - Selbstporträt. Eine illustrierte Autobiographie*, Munich 1983, p. 227.

vi Exhibition catalogue: *XX oder der 'Mummelsee in der Pfanne'*. Tim Otto Roth; Städtische Galerie Offenburg, 20.2.–29.5.2016, p. 12.

vii See Marcel Jean, assisted by Arpad Mezei: *La peinture surréaliste*, Paris, 1959, German edition: *Geschichte des Surrealismus*, Cologne 1968, p. 280.

viii See Annabelle Görden: *Exposition internationale du Surréalisme*, Paris 1938: *Bluff und Täuschung – Die Ausstellung als Werk. Einflüsse aus dem 19. Jahrhundert unter dem Aspekt der Kohärenz*, Munich 2008.