

FORESTS OF ANTENNAS,

OCEANS OF WAVES

Susanna
Hertrich

Un/apparent sensory perception

Jonathon
Keats

Disorientations
of a
more-than-human
sensory
apparatus

1–9 October
14:00–20:00

Liebig12

Liebigstraße 12
10247 Berlin

Biomimicry is the science of applying nature-inspired designs in human engineering and invention to solve human problems. It was used to create the first flying machine, inspired by eagles and owls – this paved the way for technologies like jets and planes. It was also used in the invention of Velcro, which works in much the same way as the hooks on burrs when they stick to animal fur. The principle has served humans well, but rarely benefits the organisms whose innovation we appropriate. As we become more aware of our environment and its progressive degradation by humans themselves, it is of urgent importance to look at and assess our approach from other perspectives. To compensate for the advantages humans benefit from by applying nature-inspired designs, Jonathon Keats has founded the Reciprocal Biomimicry Initiative, a programme dedicated to systematically adapting human technologies to benefit other organisms.

**Jonathon
Keats**

The exhibition at Liebig12 showcases a selection of plans and models for representative innovations responding to the fact that migratory flyways of birds and insects such as butterflies have evolved over eons, oriented to correspond with their biological needs. However their flyway maps are rapidly losing relevance as ecosystems are altered by human-induced climate change; research on species ranging from mallards to cranes has shown that long-established breeding grounds are increasingly inadequate. Equally devastating, radio signals and light pollution are increasingly disorienting, interfering with their innate wayfinding techniques. To ensure that birds and butterflies arrive at the right place at the right time, modern flocks require on-the-fly guidance directed by advance reconnaissance. They use Earth's magnetic field to guide their flight paths, but it is relatively weak and easily overridden by other sources of magnetism at close proximity. Research has shown that magnets can affect birds' internal compasses.

Ground Support Planning Grid

Experimental Prototype · 2015–22

Gallery visitors are invited to plan a future avian navigational support system for Planet Earth. A world map is finely milled into half-inch plywood, holding towers with magnets that can be reconfigured and rotated to design a global air traffic control system. The towers can be pivoted to guide flocks based on up-to-date ground data. This table serves as a platform for experimenting with magnetic fields based on the positioning of miniature magnetized air traffic control towers.

Guidance Drone for Birds

Conceptual Model · 2022

Suspended from the ceiling, a prototype of an electromagnetic guidance drone shows the potential for navigation on the fly: Helmholtz coils mounted to the fuselage of a drone cancel out the planet's natural geomagnetism. An electromagnet generates an alternate north-south orientation for birds to follow.

Air Traffic Control Towers for Birds

Map of Berlin · 2022

Large cities on migratory flyways may imperil birds. Light and electromagnetic pollution can be disorienting, and urbanization may deprive them of habitat for roosting. By electromagnetically manipulating compass directions, air traffic control towers can steer birds around cities or even entire regions. This satellite map of Berlin highlights where urbanization is most pronounced by showing where artificial light is most concentrated. The superimposed compasses show potential alterations to the geomagnetic field that will reorient flyways around human developments.

Handheld Butterfly Assistance Magnets

Giveaways for individual butterfly guidance · 2022

Encouraging people to take personal responsibility, lending a hand to species in need, handheld magnets are given away. Each iron magnet can be used to guide an individual butterfly.

Avian Detour Signage

Conceptual Signage System · 2022

Outside the gallery space on the streets of Berlin, the sidewalks show marks where air traffic towers might be placed based on radio wave intensities during the day and light pollution at night. The Avian Detour Signage System featuring a compass rose indicates how they should bend Earth's magnetic field. The system is designed to actively involve citizens in anticipating a future interspecies smart city. Walking the city measuring radio waves (using a simple handheld RF detector) during the day and making observations of light pollution at night, people are invited to contribute to mapping perils to birds and thus how a future placement of avian air traffic control towers in Berlin could be planned.

Susanna Hertrich

With the discovery and utilisation of electromagnetic signals for wireless communication technologies, it became obvious how limited human sensory perception is with regard to the broad spectrum of electromagnetic waves. Outside the frequencies of light visible to the human eye, the worlds of signals beyond this part of the spectrum remain hidden for our sensory apparatus. In order to better understand the existence of those ranges of the spectrum that are not perceptible to us and how they function, the concept of the »aether« has long been used as an aid: in the natural sciences it was theorised as a hypothetical substance and carrier medium for the propagation of electromagnetic waves, whereas on a philosophical and spiritual level it was understood as a »fifth element« – a massless, unchanging, eternal celestial substance that complements the four earthly elements. The aether thus represents a kind of mediating concept between technology, science and spiritualism and the historical relationships between these concepts, all of which have dealt in dif-

ferent ways with the limited capabilities of human sensory perception of electromagnetism.

The exhibition at Liebig12 presents a selection of works that Susanna Hertrich has developed within her artistic exploration of the possibilities and limitations of human sensory perception in relation to electromagnetic signals. The artist finds inspiration for her speculative and aesthetically conceived works in cybernetic system theories, which draw analogies between machine systems and modes of action of living organisms and social organisations. At the centre of her reflections here is the extreme subjectivity of individual perception, conditioned by our bodies and by the evolution of specifically oriented sensory organs as our human »hardware«. In addition, the aesthetics of antennas serves as a starting point for her to speculate on the functionalities of antennas linked to the mathematical language of their shapes as connecting elements to higher spheres.

Apparent Sensory Perception

Lightbox · 2018

Giving inspiration to the exhibition's title, the neon sign lightbox creating the connection between the exhibition and the space outside the gallery makes reference to William Gibson's first science-fiction short story »Fragments of a Hologram Rose«. It is a story about a man who relies on sense-recordings of other people (»apparent sensory perceptions« or ASPs, where sensory-impressions are projected directly into a person's brain) to generate dreams and thus be able to sleep in a dark, polluted city. Quoting this science fiction story, the artwork addresses research and technological developments related to sensory substitution; how imperceptible stimuli can be translated for humans to become sensible; and ultimately the question of how to take account for the subjectivity of an individual person's perceptions.

The Fifth Element

Sculpture · 2021

This sculpture is an extrapolated version of the fifth geometric form from the series of sacred geometries represented in the five Platonic solids – the dodecahedron –, a skeleton of brass rods held together by steel connectors wrapped with metal foil.

Summoning the Spirits of the Higher Airs

Chalk drawing · 2020

A seemingly occult drawing with chalk on the exhibition floor that takes up elements from »Genealogy of Aether« and symbols from »warchalking«.

»Warchalking is the drawing of symbols in public places to advertise an open Wi-Fi network. Inspired by hobo symbols, the warchalking marks were conceived by a group of friends in June 2002 and publicised by Matt Jones who designed the set of icons and produced a downloadable document containing them. The word is formed by analogy to wardriving, the practice of driving around an area in a car to detect open Wi-Fi nodes. That term in turn is based on wardialing, the practice of dialing many phone numbers hoping to find a modem.«

Source: www.en.wikipedia.org/wiki/Warchalking

Genealogy of Aether

Printed wallpaper · 2022

For this exhibition produced as a large scale wallpaper, this chart brings together the different meanings, developments and fields of thought within which the concept of »aether« was theorised and developed in physics, philosophy and spiritualism.

Antennae

Sculpture · 2017

»Antennae« is the first in a (planned) series of sculptural objects based on the geometric structures of fractal antennas found in networked devices. This sculpture extrapolates these hidden structures, hinting at the notion that antennas are the anchors that connect us to the heavens and so link »aether« with the earthly world.

Radiant plates

Series of sculptures · 2022

A series of sculptural objects commissioned and conceived for this exhibition. The plates refer to the shapes of geometric structures of ultra-wide band (UWB) antennas, a radio technology that can be used with a very low energy level for short-range, high-bandwidth communications over a large portion of the radio spectrum – labelled the »next big thing« in near field communication by the industry.

18 Hz

Sound installation · 2018

A voice reads an excerpt from a text written by Karl Ernst von Baer. In this text, von Baer reflects on how very subjective human perception and thus our access to the world really is – also because of how humans perceive time. He speculates on how a different sense of time would affect human perception of the world and confronts these ideas with the more mechanical understanding and assumption that our worldview is constituted by a specific amount of sensory impressions per time unit: at the »human frequency« of 18 Hertz, or 18 images per second.

Un/apparent sensory perception. Disorientations of a more-than-human sensory apparatus

Light and radio waves can be disorienting for birds and insects like butterflies, especially in cities. Also some other species, such as the elephant-nosed fish, have sensory organs sensitive to electric and electromagnetic fields, making them capable of electrolocation.

Using the animal kingdom as well as mythologies of electromagnetic phenomena as a starting points of reflection and speculation, the final exhibition of the event series *Forests of Antennas*, *Oceans of Waves* focuses on the artistic examination of both human and non-human sensory perception of electromagnetic radiation. The works presented in the exhibition use speculative approaches and thought experiments as starting points for their exploration of sensory relationships with anthropogenic signal-based invisible environments: To ensure that birds and butterflies arrive at

the right place at the right time, and don't get lost along the way, Jonathon Keats designs technologies to provide flocks and swarms with on-the-fly guidance directed by advance reconnaissance. Inspired by ideas of cybernetic systems theory, Susanna Hertrich explores the both mythologies and limits of human sensory perception through the notions of the ether and aesthetics of antennas as gateways to higher spheres.

The exhibition invites visitors to reflect on potentials and limits of bodily and sensory perception, and about how non-anthropogenic technological environments could look like.

On **6 October** at 18:00 at the Galiläa-Kirche, Rigaer Straße 9/10, both artists will present their work and approaches and engage in conversation with the audience.

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FORESTS OF ANTENNAS, OCEANS OF WAVES

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