

Listening into microbial sounds for environmental awareness

Ruth Schmidt and Sandry Volny listen into microbial sounds, and through their creative work, offer us a new perspective on our environment, since microbial communication is invisible to us day to day. They joined forces to combine science and art in the Aural Soilsapes Project to bring about our attention to our connection with the natural environment, and to increase awareness about climate change. Ruth Schmidt and Sandra Volny teamed up to talk to us.



Above: Sonja Bäümel, Fifty percent human (Amsterdam), 2016. Courtesy the artist.
Photo - Jean-Sonja Bäümel. © Ruth Schmidt. All rights reserved.

Q & A - Ruth Schmidt & Sandra Volny

[Ruth Schmidt]

How can microbial ecology support climate change research and awareness?

Microbial Ecology is the study of the interactions of microorganisms with each other and their environment. As such, I look at how microbes communicate with each other through smells, or volatiles. A common example I like to give is the sweet, fresh and evocative smell following the first rainfall after a dry spell. This earthy-smelling substance is geosmin, a chemical released into the air by a soil-dwelling bacteria called actinomycetes. Microbes — thanks to the scents they release — can help plants better tolerate these stressful conditions, an important service in a warming climate. My research focuses on understanding how microbes and plants work together, and which microbial scents help crops.

Like our human body, the plant relies on its microbes to maintain their health, growth and protection from environmental stresses. This tight interaction is also called a holobiont, which can be considered a “superorganism” — an organized society that functions as a whole. By understanding the mechanisms underlying this tight interaction, we can then select the microbes that carry the genes for the smells that help plants withstand drought — and feed them to our crops like vitamins so that they can continue to provide us with food in a warmer future.

Please tell us how you merge your microbial studies with collaborative artists, to make ‘microbial music’, and exhibitions?

I started to collaborate with artists a few years ago during a workshop aimed to promote cross-disciplinary approaches by bringing together artists and scientists. It was here where I met Lucas Wiegerink, a composer, and Eva van Ooij, a cello player, with whom we composed a musical piece inspired by microbial communication. We used a scientific article as basis to understand how microbes communicate with each other through electrical signals. This idea was then translated into a musical piece in which the playing instruments symbolize the several sound signals that microbes use to communicate. Another example stems from an

exhibition called 50 percent human by Sonja Bäuml, a bio-artist based in Amsterdam. The project evolved around the central question “How much human are we, if at least half of our body consists of microbial cells?”

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Above: Sandra Volny, Radio Jove, (sound installation), 2015. Courtesy the artist. Photo: Jean-Sébastien Veilleux. © Sandra Volny. All rights reserved.

During the creative process, a multidisciplinary team of artists, scientists, and science historians examined, questioned, and challenged the relationship between the human body and its microbial cohabitants. In particular, the project aimed to see how the concept of the Human Microbiome can be critically challenged and to allow people to reach out to their microbes and explore the potential of their microbial self.

These questions were addressed using scientific tools and the results were translated into three-dimensional space installation in which people could literally meet their microbes.

[Sandra Volny]
What is sound art, and how do you create sound art to communicate concepts in science and climate change?

Sound art is a way to navigate spaces from the physical, the material to the tactile dimension and the imaginary. In my research, I experience aural spaces by listening to them: listening to the background noise and the echo that fill in the places, moving in an attempt to expose what is disappearing.

I create situations in which an individual's awareness of his or her surroundings arises through sound. I don't see my work as a tool to communicate concepts in science. Science inspires me and I am interested in conversing in a creative way with it: creating analogies between science and art, interpreting science and even challenging science with artistic hypothesis.

One of my current projects is about radio astronomy. Working closely with astrophysicists, I am interested in going back in time by listening to the distant creating an experience where the intangible radio waves coming from the universe become tangible.

The sound installation takes shape in a space where hearing becomes of a way of touching at a distance (upcoming in 2019). Listening consciously to our space forces us to renew our relationship with what surrounds us.

There is a beautiful chaos out there and we are surrounded by the multiple. We need to connect to the unseen, the invisible and the almost inaudible in order to weave a new tissue of relation with our environment.



Above: Sandra Volny, *Where does sound go, where does it come from* (video and sound installation gallery Dazibao, Montréal), 2016. Courtesy of the artist. Photo - Richard-Max Tremblay. © Sandra Volny. All rights reserved.

[Ruth Schmidt and Sandra Volny]

Please tell us about what inspired the creation of the Aural Soilscaapes project? What is the key message about climate change that it aims to communicate?

When we first met, we were interested in bridging both our fields of study: the scientific method and its precise measurements with the human experience that art can create. We wanted to move away from a pure scientific focus bringing empathy, resonance, movement to the reflection on climate change. We ask:

“How can we give a voice to the inaudible and invisible microbial life that is so crucial to our ecosystems?”

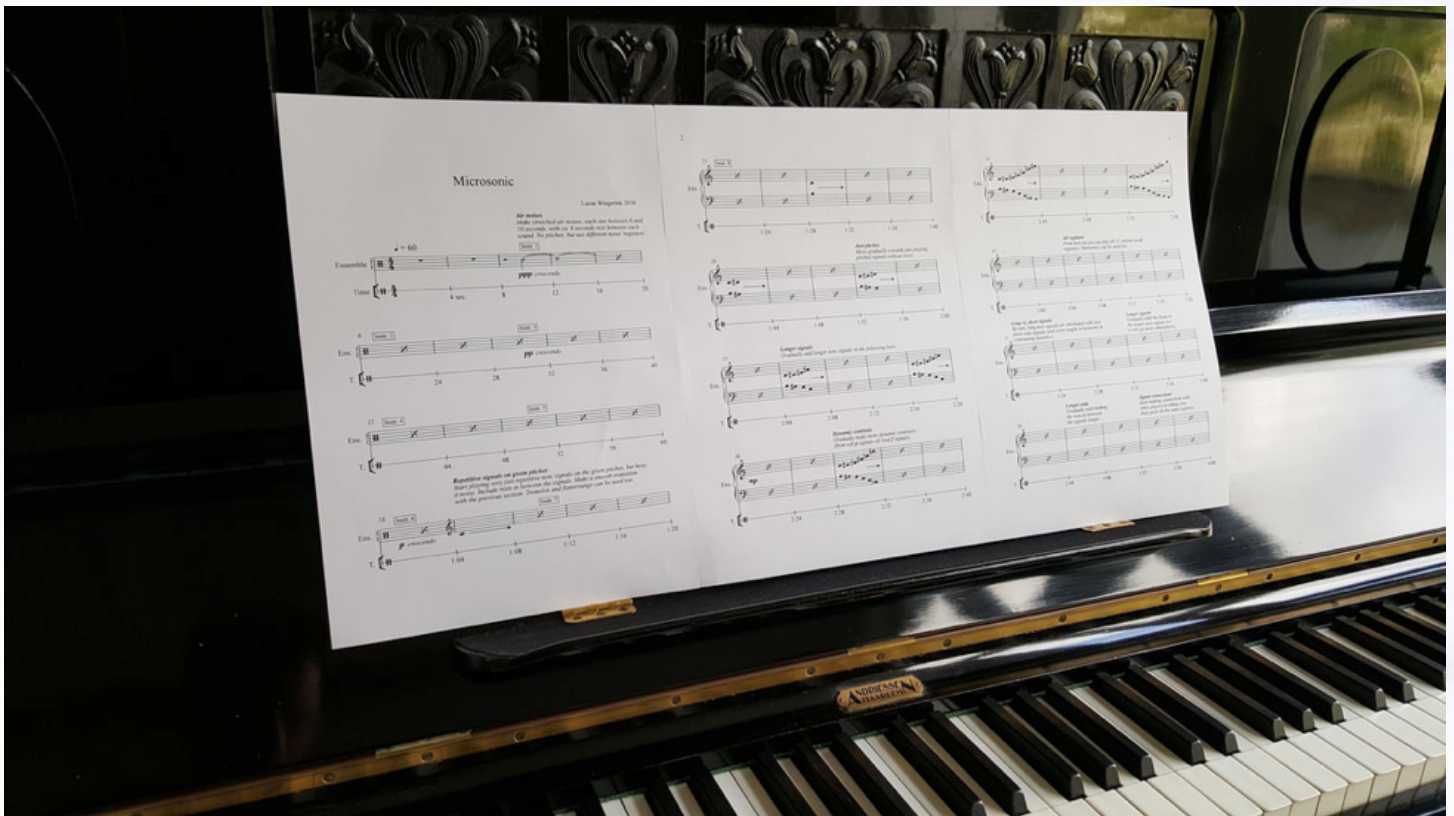
By combining scientific tools with artistic hypothesis, we aim to bridge science and fiction for an expanded awareness.

The living inhabitants of soil, plants and microbes, are capable of producing and perceiving sounds in order to interact with each other, yet at low frequencies and without an identified organ as animals and humans have. Environmental changes have huge impacts on soils, and climate change has been shown to alter interactions among organisms. Sound can be seen as an indicator of healthy ecosystems, which are likely impacted by climate change.

In this project, we want to answer the following question:

“How do sounds from our environment influence us as humans and how do we stand in relationship to other ecosystems and living organism?”

By doing so, we aspire to move away from the anthropocentric view of considering plants and other living organisms as objects, and move towards a holistic view of ecosystems interacting with each other and creating awareness to the interconnectedness of living organisms with the environment.



Above: Ruth Schmidt, Eva van Ooij, Lucas Wiegerink, Microsonic, a musical piece inspired by microbial communication, 2016. Courtesy to the composer. Photo: Lucas Wiegerink. © Ruth Schmidt. All rights reserved.

This project appears to bridge diverse subjects together. How does it combine science and art, as well as sound and climate change?

For the project Aural Soilscapes: creating ecological consciousness to climate change we established a transdisciplinary team of ecologists and a sound artist to create a new approach to create ecological consciousness by conducting sound field experiments and laboratory protocols.

Our team is composed of Dr. Ciara Raudsepp-Hearne, a senior scientist at the Sustainability Science Lab at McGill University and QCBS member, Dr. François-Joseph Lapointe, a tenured professor of biology at Université de Montréal and QCBS member,

Dr Nicolas Bélanger, a professor of environmental sciences at TELUQ, and Ariel Beaudoin-Lambert, a student currently doing a DESS in art, creation and technology at Université de Montréal. With the combination of our expertise, we aim to cross the artificial boundaries separating contemporary arts and sciences establishing a common framework to approach yet unknown terrain, such as our concept of aural soilscapes. We betake ourselves to theoretical and physical places to experience and document the becoming of ecological consciousness.

We specifically aim to merge disciplines to create something new. To us, artscience is not a way to communicate science, but means to create a space that allows to learn, experience and expand by inspiring each other with our different backgrounds.

Final thoughts

With Sandra Volny's sound and space research, and Ruth Schmidt's knowledge in microbial ecology, the team present art installations to increase environmental awareness. Both sharing a background in research, together, they listen into microbial sounds for their art, with the aim to increase our awareness of our connection to the environment, and the importance of climate change.

Bios

Sandra Volny is an artist/ researcher, founder of Sound and Space Research an international research platform based on research groups focusing on sound, space and its resonances with the social and environmental context. She received her Ph.D from La Sorbonne University in Paris (France) and has presented her work internationally in individual and collective exhibitions.

Ruth Lydia Schmidt is a microbial ecologist who is working on finding microbial solutions to combat climate change. She earned her PhD from Wageningen University in the Netherlands and is currently based in Montréal at the INRS-Institut Armand-Frappier Research Centre. She is passionate about bringing arts and science together and about building a more inclusive scientific community. She is a board member of the non-profit organization 500 Women Scientists and works as an instructor at the DIY community lab bricobio.

Links

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