

## Abstracts & Short Biographies

Panel

### **Other Subjectivities. Redefining Intelligence, Agency and Sentience**

Rahma Khazam (Philosophy, Art Theory, Paris)

#### **When the Sardine Can Look Back...**

Art may appear to be about objects, that is, paintings, sculptures, installations, but in reality, it is very much a human or viewer-centred activity: the art object is presented to viewers in exhibitions and interpreted by them from their point of view. Indeed, contemporary art's very functioning is based on the premise that the viewer's interpretation is key. In this paper, I want to look at how art can be envisaged not in terms of reflecting human agency and subjectivity but as a means of gaining access to nonhuman subjectivities. More broadly, I will show that not just artists but also philosophers and theorists are increasingly exploring the question of how to grasp and define agency, sentience and subjectivity nonanthropocentrically, that is, by applying these terms to plants, animals or machines.

*Dr. Rahma Khazam studied philosophy and art history and received her Ph.D. in aesthetics and art theory from the Sorbonne. Her research interests include image theory, sound art and the relations between speculative realism and art. She has published essays in exhibition catalogues, specialized journals and edited volumes and contributed articles to contemporary art magazines such as Frieze and Springerin. She is a member of AICA (International Association of Art Critics), NECS (European Network for Cinema and Media Studies) and EAM (European Network for Avant-Garde and Modernism Studies) and is currently participating in a research project on art and nonhuman agency at ENSAD, Paris, titled 'Behavioural Objects'.*

Desiree Förster (Media Ecology, Institute of Arts and Media, University of Potsdam)

#### **Environments of Shared Concern**

In this presentation, Desiree will show how a new aesthetic of the human/environment relation arises in architectural design, that extends the human responsiveness to environmental stimuli and potentially gives rise to novel concerns. Spaces that resolve around symbiotic relationships between human and nonhuman entities such as algae or fungus, allow for the experience of structural congruencies on biological levels and of mutual dynamic dependencies in respective metabolic pathways. Designing spaces for more-than-human encounters can then allow for the renegotiation of self-other boundaries and distinctions and for the development of more appropriate ways of life that account for the embedded and embodied materialities that are co-constructed through the engaging entities.

*Desiree Förster is a PhD student at the Institute for Arts and Media, University of Potsdam, Germany. She graduated in Philosophy, Literature (BA) and Media-Culture-Analysis (MA). Her research interest lies in embodiment and how new artistic and design practices shape affective atmospheres. She presented at several international conferences, and participated in the New Materialism Training School "Research Genealogies and Material Practices" at Tate Modern, London 2016. Desiree holds the Emergent Scholar Award 2017 of the New Directions in the Humanities Research Network. As an independent curator, she also organizes events at the intersection of art and theory in Berlin.*

Maja Smrekar (Artist, Ljubljana)  
**The Wolf-human-dog Continuum**

In *The Wolf-human-dog Continuum* lecture, Smrekar is going to present the opus of four K-9\_topology projects (2013-2017). They stand for a transcendence of the dichotomy human:dog into its hybrid shape. The work uses the co-evolution between a human and a dog as a matrix to ask the following question: What defines humans as a superior species in the ecologically ruined, over populated and economically compromised world? Her work presents transdisciplinarity by applying different mediums, formats and contents as cross sections in creating a dialogue between humanistic and natural sciences. That way in the K-9\_topology series she connects her past in a context that reflects on a memory of the post-human future. Here, the dog-human "werewolf" exists as a reminiscence of an extinct culture of man; a conclusion suggesting that it is our animality which makes us the most human.

*Maja Smrekar was born 1978 in Slovenia. She graduated at the Sculpture Department of Fine Art and Design Academy in collaboration with the Academy of Theatre, Radio, Film and Television in Ljubljana, Slovenia, and holds Master of Arts in New Media. She has been involved in dog behaviour studies and canine sports training for the last five years. In her work she has been dwelling on two main topics: the parallel evolution within a relationship wolf – human – dog, and the Sixth big species extinction on Earth. She has been awarded for her work at the Cynetart festival 2012 by the European Centre for Arts Hellerau (Dresden/Germany), Honorary mention at the Ars Electronica festival 2013 (Linz/Austria), as well as the Golden Bird Award 2013 – the national award for special achievements at the field of visual art (Ljubljana/Slovenia). She is the winner of the Prix Ars Electronica - Golden Nica 2017 in Hybrid Art. <http://majasmrekar.org/>*

Panel

**Fungal perspectives. From the Viewpoint of a Mushroom**

Saša Spačal (Artist, Ljubljana)

**Mycohuman Relationships.**

**Fungi as Interspecies Connectors, Companion Species and Human Symbionts.**

Mycohuman relationships are entangled with mycorrhizal extensions that transgress both fungi and humans as species and form an extensive rhizomatic network, so vast that transcends several planes of existence: material, immaterial, organic, technological, social and planetary. Symbiotic bonds are made with mycorrhizal technology on this planet of interspecies love. Humans re-learn with their bodies immersed into planetary interconnected system observing and feeling the fresh pulse of intra-action. Multidimensional immersion dissolves the boundaries of the individual, dispersing social identity. What is exposed is a multitude of human microbiome, a soup performing human bodies in the time-space of here-and-now. With fungi, archaea and bacteria of microbiome human being is in becoming with the environment, becoming the environment through a biofeedback looping protocol. Ecological cycle in the network is known. Will humans learn the ethics of intra-acting?

*Saša Spačal is a post-media artist working at the intersection of living systems research, contemporary and sound art. Her work focuses on a post-human environment, in which humans exist and function as one of the elements in an ecosystem, and not as its sovereign. In this, the Cartesian system is abandoned and the fact accepted that the sphere of technology has expanded not only from hardware to software, but also to wetware, whence the logic of hybrid mechanical, digital, and organic functioning originates. Spačal has been featured at venues such as Ars Electronica, Prix Cube, Onassis Cultural Center Athens, National Art Museum of China, Pixelache, Cynetart, Device\_art, Eastern Bloc Gallery, Museum of Contemporary Art of Vojvodina, Kapelica Gallery and elsewhere. Spačal's solo exhibition Symbiome - Economy of Symbiosis was held at Museum of Contemporary Art Metelkova. For her work she has received an Honorary Mention at the Ars Electronica Prix 2015, and was nominated for the Prix Cube 2016. [www.agapea.si](http://www.agapea.si)*

Mirjan Švagelj (Microbiologist, Aceis Bio, Ljubljana)

### **Mushrooms as Teachers. Mushrooms in Human Societies**

Mushrooms are inconspicuous organisms belonging to the “hidden kingdom”, often regarded as undesirable or even terrifying, but they have many roles in human lives and nature at large. With their extreme morphological and biochemical variability they are true masters of colonisation and adaptation. Their roles can loosely be grouped into several roles they play: as edible species, toxic species, medicinal species, symbionts, decomposers, pathogens and as scientific or model species and even as co-authors of artistic works. Mushrooms as a group are phylogenetically not close to one another and to be a mushroom is very anthropocentric since mushrooms are all fungi, which produce fruiting bodies perceptible to the naked eye. This talk will focus on the roles mushrooms play in human societies and how science is uncovering their mysterious ways.

*Dr. Mirjan Švagelj obtained a PhD in biomedicine from the Faculty of Medicine of the University of Ljubljana. As a scientist, he works in research and development in the field of applied biochemistry and biotechnology. As an artist, he works at the intersection of biotechnology, microbiology and intermedia art. He has exhibited his work at numerous venues and festivals, such as Ars Electronica, Cynetart, The Chinese National Museum of Art, Device\_art, Art Laboratory Berlin, Prix Cube Exhibition, the Kapelica Gallery, Kiblix Festival, Onassis Cultural Centre Athens and Museum of Contemporary Art Metelkova +MSUM. For his work he received an Honorary Mention at the Ars Electronica Prix 2015, and was nominated for the Prix Cube 2016.*

Vera Meyer (Institute of Biotechnology, Departm. Applied and Molecular Microbiology, Technical University Berlin)

### **Fungal Biotechnology – What We Do with Fungi (and What Fungi Do With Us)**

The current epoch of the Anthropocene is a new geological epoch of the earth’s lithosphere due to human activities in the last few centuries. Synthetic biology provides a new dimension to the Anthropocene. In the not too distant future, this could take us to an age, where the limits of our capabilities to (re)design biological systems are only limited by our imagination and ethical values. Synthetic biology will revolutionize medicine, food and feed production and offers sustainable solutions for the transition from a petroleum-based to a bio-based economy. Our focus is to pioneer genetic tools for the fungus *Aspergillus niger*, a cell factory with which the biotech industry has long-standing experience as a host for citric acid and protein production. In my talk, I will present our recent approaches, which aim to genetically trim *A. niger* to become a cell factory for new-to-nature drugs.

*Vera Meyer studied biotechnology at the Sofia University (Bulgaria) and the TUB (Berlin University of Technology, Germany). After obtaining a PhD degree (2001) and habilitation (2008) at the TUB, she worked as Assistant Professor at Leiden University (2008-2011). She has been visiting scientist at the Imperial College London (2003) and at Leiden University (2005-2006). In 2011, she became Full Professor of Applied and Molecular Microbiology at the TUB. Vera Meyer is interested to decode nature’s genetic principles underlying growth and metabolism of fungal microorganisms. By bridging the gap between systems and synthetic biology, she together with her team develops new fungal cell factories for the sustainable production of pharmaceuticals and enzymes.*

Panel

## **Plant Intelligence**

Špela Petrič (Artist, Scientist, Amsterdam/ Ljubljana)

### **Vegetal Otherness, Intimately**

My artistic research looks at vegetal life as the unchallenged frontier of estrangement, revealing the limits of human empathy as well as its anthropocentric underpinnings. Plants are, in their omnipresence, utterly foreign complexity and lack of identification elements allowing anthropomorphism, ideal subjects of study in an attempt to re-examine relations with the Other. The field of plant neurobiology has tried to uncover mechanisms of plant function by likening the physiology of plants to animal systems in order to raise awareness of the intricate, highly adapted life of plants; however, the plants' cryptic chemically-based conversations, their biological inter-species networks, their centennial lifespans and non-centralized operation make them the benevolent aliens living among us. How can one draw together the world of human beings and that of plants, while resisting the temptation to sacrifice the specificity of either perspective and respecting the foreignness of vegetal life? The contribution lays out three performative projects – *Skotopoiesis*, *Phytoteratology* and *Strange Encounters* – through which I explore radical and novel modes of human-plant intercognition, which, while discovering the vegetal, delineate our own borders to be overcome.

*Špela Petrič, BSc, MA, PhD, is a Slovenian new media artist and former scientific researcher currently based between Ljubljana, SI and Amsterdam, NL. Her practice is a multi-species collaborative endeavor, a deviant composite of natural sciences, wet media and performance. She tries to envision artistic experiments that enact strange relationalities in hopes of enriching our adjacent possible. Much of her recent work has focused on plant life. Festivals and exhibitions: Abandon Normal Devices (UK), TodaysArt (NL), Zone2Source (NL), Venice Biennial of Architecture (IT), Touch Me Festival (CRO), Pixelpoint (IT), European Conference on Artificial Life (IT), Playaround (TW), Harvard (ZDA), Ars Electronica (AT), National Center for Biological Sciences (IN), HAIP (SI), Galleries de la Reine (BE). [www.spelapetric.org](http://www.spelapetric.org)*

Joana Bergmann (Institute of Biology, Free University Berlin)

### **Hand in Hand. Root Morphological Traits and Their Mediation by Arbuscular Mycorrhizal Fungi**

The environmental pressures that shape the evolution of a species root morphology are numerous. Roots have to take up nutrients and water by simultaneously blocking root feeding and colonizing soil biota. Depending on the ecological niche of a species, roots differ in their execution of this balancing act. Ecologists try to quantify these different strategies by measuring root morphological traits. The majority of land plants form mycorrhizal symbioses with soil fungi. Those plant-fungal interactions are mutualistic - meaning that both partners profit from the symbiosis. With their fine hyphal networks the fungi take up nutrients and water from the soil and transport it to the plant roots in exchange for carbon, which the plant photosynthesizes. Additionally, they can protect the roots from pathogens. The plants fitness and the morphology of roots therefore varies in response to mycorrhizal colonization while the mycorrhizal fungi themselves are nonviable without a living root.

*Joana Bergmann, born in Berlin in 1984, studied Biology at the Free University Berlin and finished her diploma on flower morphology and hybridization in a subandean plant genus in 2009. She has been fascinated for very long with the morphology of plants - with their clear structure and symmetry as well as their flexibility in handling the challenges of their environment. In the following years she worked on diatom algae in the Botanical Garden and Botanical Museum Berlin. Since 2012 she researches as a soil ecologist at Free University Berlin, studying root morphological traits and plant-soil interactions affecting biodiversity in European grassland communities and ecosystems. Her doctoral thesis submitted recently is titled "Root traits and their effect in plant-soil interactions".*

**Keynote**

Monika Bakke (Institute of Philosophy, Adam Mickiewicz University Poznan)

**The Force of Radical Openness: Multispecies Alliances Beyond the Biological**

When the biological opens onto the mineral, and the planetary onto the cosmic, there arises a need not only to recalibrate the scales used to measure space and time, but also to focus on the forces that precede forms. One such force is metabolism, which operates as functions, cycles, and systems that enable the flux and transformation of matter. It infinitely generates novel forms of organization within and with the environment. Acknowledging that multispecies alliances are formed among both organic and nonorganic species by the forces of biological and mineral evolutions requires us to reconsider the questions of belonging and identity. The living/nonliving divide then appears to be no more than a convenience and a convention, because matter, both on earth and elsewhere, is self-assembling and evolving.

*Dr. Monika Bakke is Associate Professor in the Philosophy Department at the Adam Mickiewicz University, Poznań, Poland. She writes on contemporary art and aesthetics with a particular interest in posthumanist, transspecies and gender perspectives. She is the author of *Bio-transfigurations: Art and Aesthetics of Posthumanism* (2010, in Polish) and *Open Body* (2000, in Polish) co-author of *Pleroma: Art in Search of Fullness* (1998), and editor of *Australian Aboriginal Aesthetics* (2004, in Polish), *Going Aerial: Air, Art, Architecture* (2006) and *The Life of Air: Dwelling, Communicating, Manipulating* (2011). From 2001 till 2017 she was working as an editor of a Polish cultural journal *Czas Kultury* [Time of Culture].*

Panel

**Microbial Agency. Proposing Micro-subjectivity**

Ingeborg Reichle (Media Studies, University of Applied Arts Vienna)

**Biome and Biomatter**

Artists have responded to non-human agency in the age of cutting edge research in multi-directional ways. In my contribution I want to critically analyse a current artistic position referring to biomes as distinct biological communities and particularly to human microbiomes, which can be regarded as a the collection of bacteria, viruses, and other microorganisms that are present on a human body. My presentation will focus the art project FIFTY PERCENT HUMAN by the Austrian artist Sonja Bäuml (Gerrit Rietveld Academy Amsterdam), which is in search for a critical language, which is carefully balancing our imagination about human-microbe interaction and the great diversity of the human body's ecosystem, mainly by using artistic, fictional and philosophical research tools.

*Prof. Dr. Ingeborg Reichle is the chair of the Department of Media Theory and the head of the new BA study programme „Cross-Disciplinary Strategies: Applied Studies in Art, Science, Philosophy, and Global Challenges“ at the University of Applied Arts Vienna. Before joining the faculty of the Department of Media Theory as full professor in 2016, she was FONTE professor at Humboldt University Berlin. In Vienna her primary area of research and teaching is the encounter of the fine arts with the post-digital and new technologies like biotechnology and synthetic biology. In 2004 she gained her Ph.D. from the Humboldt University Berlin with the dissertation about „Age of Technoscience: Genetic Engineering, Robotics, and Artificial Life in Contemporary Art“, published 2005 in German and 2009 in English, both with Springer publishers, Vienna/New York, at Humboldt University Berlin she also gained her habilitation in 2013. Ingeborg Reichle is a member of the College Art Association (CAA), the International Association for Aesthetics (IAA), and the International Association of Bioethics (IAB).*

Regine Hengge (Institute of Biology, Microbiology, Humboldt University Berlin)

### **Biofilms – Invisible Cities of Microbes from the Petri Dish to the Human Body**

Although bacteria are invisibly tiny single-cellular creatures, they represent the largest biomass on earth and manage to colonize nearly any site, including the human body. As the human microbiota, they contribute to keeping us healthy and happy. Based on our intimate relationship with them, we have learned to use them for food production and in biotechnology. On the other hand, some bacteria are nasty pathogens that cause infections that remained deadly to us before we discovered antibiotics, i.e. chemical weapons that bacteria themselves use against each other in their fight for food. While we have always envisioned bacteria swimming around as single cells, recent research has shown that they prefer to live in large communities termed 'biofilms'. The bacterial inhabitants of these 'cities of microbes' communicate and cooperate to produce an extracellular matrix of biopolymers. This matrix not only confers protection, but allows bacterial biofilms to behave like tissues, i.e. to fold and buckle up into striking morphological patterns that even become visible to the naked human eye. By performing rapid morphogenetic movements based on an intricate inner structure, these biofilms are a prime example of 'active matter'.

*Regine Hengge studied biology and obtained her doctorate at the Universität Konstanz. After carrying out post-doctoral research at Princeton University (NJ, USA), she completed her Habilitation in Microbiology & Molecular Genetics at the Universität Konstanz. As a Full Professor she headed the microbiology unit of the Freie Universität Berlin from 1998-2013, and since 2013 has been in a similar position at the Humboldt-Universität zu Berlin. Her scientific research deals with signal transduction mechanisms and regulatory networks in bacterial biofilm formation and stress responses. Following her interdisciplinary interests, she is a member of the Excellence Cluster ImageKnowledgeGestaltung and also pursues a longterm Science&Theatre project in collaboration with the English Theatre Berlin. Among other awards, she received the Gottfried Wilhelm Leibniz Prize from the DFG, the Landesforschungspreis Baden-Württemberg and an ERC Advanced Investigator Grant. She is an elected member of several national and international academies including the Leopoldina, BBAW and EMBO. <http://mikrobiologie.hu-berlin.de/hengge>*

Anna Dumitriu (Artist, Brighton)

### **Make Do and Mend**

Anna Dumitriu will discuss her project "Make Do and Mend" which references the 75th anniversary of the first use of penicillin in a human patient in 1941 and takes the form of an altered war-time women's suit marked with the British Board of Trade's utility logo CC41, which stands for 'Controlled Commodity 1941'. The holes and stains in the suit have been patched with silk stained with pink colonies of *E. coli* bacteria, grown on dye-containing agar. The genomes of these bacteria have been edited using a technique called CRISPR, to remove an ampicillin antibiotic resistance gene and scarlessly patch the break using homologous recombination with a fragment of DNA encoding the WWII slogan "Make Do and Mend". Ampicillin is part of the penicillin group of antibiotics so with this artistic genomic edit, Dumitriu and Goldberg have used today's technology to return the organism to its pre-antibiotic era state, reflecting on how we might in future control and protect such biotechnological advances.

*Anna Dumitriu (UK) (1969) is a British artist whose work fuses craft, sculpture and Bio Art to explore our relationship to the microbial world, medicine and technology. She is affiliated to the Modernising Medical Microbiology Project at the University of Oxford (UK), the Department of Computer Science at The University of Hertfordshire (UK), Brighton and Sussex Medical School (UK), and Waag Society (Netherlands). She is the artist partner and on the EU Horizon 2020 funded FET support action FEAT: Future Emerging Art and Technology and has been working with the MRG-Grammar research project to explore gene regulation and CRISPR. She currently has a major solo exhibition at the Museum of the History of Science, Oxford, UK. [www.normalflora.co.uk](http://www.normalflora.co.uk)*

Panel

**Human as Nonhuman. Microbiome and Holobiome**

François-Joseph Lapointe (Artist, Microbiologist, Biological Sciences, University of Montreal)

**Performative Microbiome Experiments**

We inhabit the microbial world. Microbes live on us, around us, and inside of us. Every single orifice of our bodies is populated by millions of microbes. We eat microbes, digest microbes, and defecate microbes. Whereas the human genome defines what we are as a species, the human microbiome now redefines the concept of self. As a scientist, I study the microbiome to detect novel types of interactions among bacterial communities. As a performance artist, I use my body as a canvas, tracking the evolution of my microbiome self. What if I become vegetarian? What if I travel to a different country? What if I practice celibacy for a month? Those are the kinds of artistic endeavours that can be directly translated into scientific data. In this talk, I will present my latest experimental performances with the microbiome as a way of questioning the aesthetics of the self.

*François-Joseph Lapointe is an arts scientist from Montréal (Canada) with a PhD in evolutionary biology (1992) and a PhD in dance and performance studies (2012). As a scientist, he has published over 100 papers ranging from molecular systematics and population genetics to phylogenomics and metagenomics. As an artist, he applies biotechnology as a means of dance composition, and has created the field of choreogenetics. For his most recent project, he is currently sequencing his microbiome (and that of his wife) to produce metagenomic self-portraits (microbiome selfies). His work has been exhibited in Canada, France, Germany, Denmark, Australia and the USA.*

Tarsh Bates (Artist, SymbioticA, The University of Western Australia, Perth)

**On Being a Microbioartist: Making art in a microbiology laboratory**

I explore the physical, emotional and political relationships between humans and *Candida albicans* (an opportunistic fungal pathogen of humans). These relationships span immunology and ecology, sexuality (both human and microbial) and evolutionary biology, public health and body discipline, institutional frameworks and kinship. I examine the biopolitical implications of the recent revolution in our understanding of the human body as being at least half non-human. In addition to the challenges of working with pathogens, the rapid simplification of genetic engineering technologies and increasing commodification of human microbes raises complex questions about whether these organisms have ethical standing: are they living or merely machines? This presentation asks the audience to consider the perspective of the microbe, of the pathogen, as a creature that is more-than-human, through a series of artworks developed in a microbiological laboratory.

*Tarsh Bates is an artist/researcher/educator interested in how knowledge and experience form and transfer through the relationships between bodies, environment and culture. She completed a Master of Science (Biological Arts) in 2012 and has worked variously as a pizza delivery driver, a fruit and vegetable stacker, a toilet paper packer, a researcher in compost science and waste management, a honeybee ejaculator, an art gallery invigilator, a raspberry picker, a lecturer/tutor in art/science, art history, gender & technology, posthumanism, counter realism and popular culture, an editor, a bookkeeper, a car detailer, and a life drawing model. She is currently a candidate for a PhD (Biological Arts) at SymbioticA UWA where her research is concerned the aesthetics of interspecies relationships and the human as a multispecies ecology. She is particularly enamoured with *Candida albicans*. <https://tarshbates.com/>*

Regine Rapp (Art Theory, Curatorial Research, Art Laboratory Berlin)

**Nonhuman Subjectivities. Artistic Strategies towards a Multispecies Performativity**

There are different moments in current artistic processes that leave behind the humanist idea of the solo artistic genius and explore complex collaborations across disciplines and more provocatively across species and kingdoms. What does it mean when nonhuman agents perform in a 21<sup>st</sup> century artwork? While not proposing the nonhuman as artist, certainly the performative process of art production can be a vehicle for the nonhuman agent as well as multispecies entanglements. A short overview of the dynamic aesthetic field of making-kin shows various artistic methods, embracing the *matter* as such, a direct *material engagement with the world* (Barad). A new artistic paradigm proves to have overcome the nature/culture divide by implementing worldly terrains for multispecies encounter, intra-action and performativity in a postanthropocentric era.

*Regine Rapp is an art historian and curator. Her research focuses on 20th and 21st century art, installation, image text theory, and art & science collaborations. As an Assistant Professor at Burg Giebichenstein Kunsthochschule Halle she taught Art History. As co-founder of Art Laboratory Berlin (2006), she has researched and curated numerous exhibitions, seminars and conferences (Time and Technology, Synaesthesia, [macro]/[micro] biologies) and has presented research ideas internationally. Together with Christian de Lutz she developed the international interdisciplinary conference "Synaesthesia. Discussing a Phenomenon in the Arts, Humanities and (Neuro-) Science" in 2013. Her publication "[macro]biologies & [micro]biologies. Art and the Biological Sublime in the 21st Century" was released in 2015. Currently she is elaborating the theoretical concept of Nonhuman Subjectivities and Nonhuman Agents.*

Panel

**Endosymbiosis and Sympoiesis**

Rachel Mayeri (Artist, Media Studies, Harvey Mudd College, Los Angeles)

**Orfeo Nel Canale Alimentare**

*Orfeo Nel Canale Alimentare* (Orpheus in the Alimentary Canal) is an animated opera about the digestive tract (finished in October 2017, 9:30 min. of length, Italian/ with subtitles). It was commissioned by Imagine Science Films and is part of a compilation of ten films on the theme of chimeras. In the film, Orpheus attempts to rescue Eurydice from a bout of indigestion by crossing the river of her inner-under world. But in the alimentary canal there are no heroes, only the multitudes. The river, which runs through us, the alimentary canal, is suggestive as a boundary object between the self and other, the internal and the external, the human and the nonhuman environment. The film explores the dissolution of individuality through the realization that our bodies are teeming with nonhuman life. Musically and narratively, in this ecological opera, individual heroes are superseded by the chorus, who represents a symbiotic view of life.

*Rachel Mayeri is an LA-based artist working at the intersection of art and science. Her videos, installations, and writing projects explore topics ranging from the history of special effects to the human animal. The multi-year project "Primate Cinema" investigates the boundary between human and non-human primates in a series of video experiments. This work has shown at Sundance, Berlinale, Ars Electronica, and dOCUMENTA (13). Recent commissions include the environmental art project "Critters Speak" about the Gulf of Mexico ecosystem seven years after Deepwater Horizon, with Brandon Ballengée, funded by National Academy of Sciences Keck Futures Institute; the animated opera "Orfeo Nel Canale Alimentare" about the digestive tract, supported by Imagine Science Films, and "The Jollies" an animated documentary about the primatologist Alison Jolly. As professor of media studies at Harvey Mudd College, she teaches courses in Animal Media Studies, Art & Science, and Stories from the Anthropocene. <http://rachelmayeri.com/>*



Heather Barnett (Artist, Researcher, Central St. Martins, London)

**Many-Headed: Co-creation across Scales and Species**

The slime mould *Physarum polycephalum* is a well-established model organism within the fields of biology, physics and computing. It is also increasingly employed within art and design disciplines, pedagogic practices and public engagement activities as a vehicle for exploring questions of intelligence and agency. As both an artist and an educator Heather Barnett has been exploring the organism's emergent and adaptive properties and, since 2009, has developed a range of studies, methods and practices employing the slime mould as artistic medium, educational model and social metaphor. The intention of the work is to draw connections between complex systems in biological, technological and social contexts; to create emergent participatory platforms for self-organisation and co-creation; and to develop interdisciplinary methods of creative and critical inquiry. Here, Barnett will explore the notion of 'polycephalism' (many-headedness) in both slime mould and human terms.

*Heather Barnett is an artist and educator with an international reputation for innovative interdisciplinary work involving scientists, artists, participants and organisms. Working with imaging technologies and biological behaviours, projects include microbial portraiture, cellular wallpapers, performing cuttlefish and an on going 'collaboration' with the intelligent slime mould, Physarum polycephalum. Heather has exhibited widely in art galleries, science museums and public spaces, including the Victoria & Albert Museum, Science Museum, Wellcome Collection (London), and the New Institute (Rotterdam), and Observatory (New York). She is Lecturer on the MA Art and Science at Central Saint Martins, University of the Arts London, chairs London LASER in association with Leonardo/ISAST, and is a Higher Education Academy National Teaching Fellow. <http://heatherbarnett.co.uk/>*

Daniel Lammel (Institute of Biology, Free University Berlin)

**Endosymbiosis and the "love story" between plants and microorganisms**

It has been 50 years since Lynn Margulis proposed the endosymbiont hypothesis. She brought light upon the origin of organelles in eukaryotic cells, proposing that mitochondria and plastids evolved from symbiosis with bacteria. Molecular biology analyses have brought more evidence supporting that, even if no experiments have definitely proved it. However, it is well known in science that several plants form endosymbiosis with bacteria and fungi. Per definition: *Endosymbiosis*, noun, symbiosis in which one of the symbiotic organisms lives inside the other; and *love*, noun, 1. a strong feeling of affection; 2. a great interest and pleasure in something. 3. feel deep affection or sexual love for. This talk will play about how some bacteria and fungi interact with plants to form endosymbiosis, and how complex, specific, beautiful and important for life on earth it is.

*Daniel Renato Lammel, Agronomic Engineer, Ph.D. In his Master's thesis he worked with the diversity of bacteria called rhizobia that form endosymbiosis with leguminous plants (family Fabaceae). During his PhD he worked with environmental microbiology and molecular biology related with the biogeochemical cycles. Coincidentally he was neighbour of L. Margulis in Amherst, Massachusetts. Currently, he is a post-doctoral research fellow at Free University Berlin, working with arbuscular mycorrhizal fungi, that forms obligatory endosymbiosis with plants.*

Laura Benítez Valero (Institute of Philosophy, Autonomous University of Barcelona)

**Biosophy and Mutagenesis. Towards an Alien Sym\_poiesis**

The use of *Biosophy* and the return to Spinoza's contributions is to seek an alternative to avoid ideal-materialisms. What we could name as *ontological immanence* is an essentially anti-hierarchical proposal, in terms of Deleuze, because all being, *étant*, exercises as much being, *être*, as there is in it. *A becoming of beings in being*. This subversive potential, *all beings are the same, se valent, all being(s)\_thing(s) of being, être, are the same in their difference*, is connected not only to some (com)post\_human discourses but also to symbiogenesis. Lynn Margulis remarked "physical

contact is a non-negotiable requisite for many differing kinds of life" (1998), so as long as we are very much part of *Nature* we are entangled by a symbiotic toxic interdependence. The *potentia* of some biohacking and artistic proposals working *with\_in* non-human agents relies in anti-individualistic perspectives. Then, *could we think on sym\_poiesis as a material discourse phenomena, materialising in intra-action with other material discourses apparatuses? An alien mutagenesis?*

*Laura Benítez Valero earned a PhD in Philosophy from the Autonomous University of Barcelona (UAB) with a thesis on the relationship between artistic practises and biotechnology (January 2014). She is an external collaborator of the teaching team for Aesthetics and Art theory at the Department of Philosophy of the UAB. She has worked as coordinator at the Institute of Humanities of Barcelona/CCCB and as a teacher on the Master's degree in Research in Arts and Design at EINA. She has been guest researcher at the Ars Electronica Centre, and researcher at the MACBA's documentation centre. She has participated in cycles as a reader, teacher and guest researcher at different international institutions. She is currently collaborating on different research projects, academic and autonomous alike. Her current research focuses on processes of bio-resistance, bio-civil disobedience and nonhuman agents.*

Panel

### **Nonhuman Agents. A Report**

Through workshops and lectures, seven international artists, six of whom live in Berlin, invited the public to think about the non-human by means of selected artistic, performative and scientific methods. Mushrooms, mosses, lichens and bacterial processes, as well as Berlin wetlands, play a central role. Workshop participants explored symbiotic bacterial and yeast communities or viewed urban space through the nonhuman perspectives of the intelligent single-cell organism *Physarum polycephalum* and GPS tracking.

Here the results of the four workshops and one lecture are presented to the conference public.

<http://www.artlaboratory-berlin.org/html/eng-events-archive.htm>

#### Alanna Lynch (Artist, Berlin)

*Alanna Lynch works with organisms, textiles, research and performance, drawing on a varied background in biology, psychology and activism. Her work explores feelings of fear and disgust and the politics of affect. She holds degrees in Fine Art, Psychology and Library and Information studies. She has exhibited and performed internationally. Recent awards include the Goldrausch Künstlerinnen-projekt Scholarship (2016). She has taught at Kunsthochschule Weißensee and is a member of the collective Smell Lab. [www.alannalynch.com](http://www.alannalynch.com)*

#### Margherita Pevere (Artist, Berlin)

*Deeply fascinated by biological processes, Margherita Pevere is a visual artist and researcher investigating decay and transformation of human and non-human matter. Her practice features a unique combination of organic and technological materials: she grows bacterial cultures, manipulates paper and photographic film, collects organic relics, captures ephemeral lights with digital video and plans to store a digitized collection of memories on bacterial genome. Pevere received a Masters at the Berlin University of the Arts and is now a PhD candidate in Artistic Research at Aalto University in Helsinki (FIN). She is member of the Finnish Bioart Society. Most recent exhibitions include the Article Biennial – i/o lab, Stavanger (NO) and State Festival, Berlin.*

[margheritapevere.com](http://margheritapevere.com)

Theresa Schubert (Artist, Berlin)

*The Berlin-based artist Theresa Schubert researches the interface of art, biology and technology. She studied media art at the Bauhaus-University, Weimar. In her artistic practice, she combines variable media with works that manifest themselves aesthetically in audiovisual installations, photographs or works on paper. Her work treats phenomena of nature not only as inspiration but as material and critical process.*

[www.theresaschubert.com](http://www.theresaschubert.com)

Sarah Hermanutz (Artist, Berlin)

*Sarah Hermanutz is a visual artist working at the intersections of performance, technology, and ecology. Her sculptures, installations, and performance experiments are preoccupied with wetlands, amphibious creatures, and the mysteries of social cognition. She frequently collaborates with dancers, musicians, and audiences to explore the complex and often unspoken social assumptions between the minds and bodies of audiences, performers, and 'props' (both human and nonhuman). Her artistic research takes place in Berlin at Lacuna Lab, an art and technology collective she co-founded in 2015, and in the media arts department of Bauhaus University Weimar. Her performances and projects have been presented across Europe, the USA, and Canada.*

<http://sarahhermanutz.com/>

Heather Barnett (see above – in panel “Endosymbiosis and Sympoiesis”)Plan b (Sophia New & Daniel Belasco Rogers) (Artists, Berlin)

*plan b is the artist duo Sophia New and Daniel Belasco Rogers. Since 2003 (Daniel) and 2007 (Sophia), plan b have recorded and stored every daily movement using GPS technology. Results of this are presented in festivals, galleries and at <http://planbperformance.net>. In their performance work, they explore topics such as the dynamics of conversation, singing, confessions and cycling. They also work in the fields of installation, new media, fine art and give workshops. Since the establishment of plan b in 2002, they have developed more than 25 projects, which have been and are to be seen in over 27 cities worldwide.*

Panel

**Nonhuman Perspectives under Threat**Mary Maggic (Artist, Vienna)**From Molecular Colonization to Molecular Collaborations**

Our world is an alien landscape filled with toxicities. Thanks to capitalist forces such as petrochemical, agricultural, and pharmaceutical industries, endocrine disrupting molecules mutate our bodies and bodies of non-human species, and at the same time “queer” our socio-cultural constructions of what is “normal” and what is “natural.” All-pervasive and inescapable, are we able to reposition our stance on molecular “disruption” and formulate new narratives for being-of-this-world? Therefore it urges us to consider the micro-performativity of hormonal substances as an agential power of not only molecular colonization but of molecular collaboration.

*Mary Maggic is an artist and biohacker working at the intersection of biotechnology and cultural discourse. Their work spans documentary filmmaking, DIY science, and public intervention. Maggic's most recent projects *Open Source Estrogen* and *Estrofem! Lab* generate DIY protocols for the extraction and detection of estrogen hormone from bodies and environments, demonstrating its micro-performativity and potential for mutagenesis, i.e. gender-hacking. They have a BSA in Biological Sciences and Art from Carnegie Mellon University and a Masters in Media Arts and Sciences from MIT Media Lab, and have exhibited at the HKW for Transmediale and the OK Center for Ars Electronica. More Maggic can be found at <http://maggic.ooo>*

David Sepkoski (Max Planck Institute for the History of Science, Berlin)  
**Are We Experiencing a ‘Sixth Extinction’ and Does It Matter?**

The idea that we are currently experiencing a ‘Sixth Mass Extinction’ developed during the late 1980s and early 1990s in the context of heightened awareness of global biodiversity loss. The term ‘Sixth Extinction’ is an explicit reference to the five major mass extinctions of the geological past, and reflects the important influence that paleontology – the study of life’s past – has had on estimates and predictions about the present and future of life on earth. However, while it has become an effective rhetorical tool, the term ‘Sixth Extinction’ also raises problems. On an empirical level, it is debatable whether comparisons of data and scale between past and present extinctions are valid – a concern raised by paleontologists themselves. And from an ethical and philosophical perspective, the analogy between the agency of humans and major geological events of the past flirts with an anthropocentrism that has often characterized the discourse around the ‘Anthropocene.’

*David Sepkoski is a Senior Research Scholar at the Max Planck Institute for the History of Science in Berlin. He has written widely on the history of paleontology and biology, data and information practices in natural history, and the environmental sciences. His current book, Catastrophic Thinking: Extinction and the Value of Diversity is a history of the relationship between scientific theories and cultural anxieties about extinction, and will be published by the University of Chicago Press. His next project is a history of cultural responses to the sciences of ‘deep time’ from the Enlightenment to the Anthropocene.*

Panel

**Beyond the Animal as Machine. Ethology in the Age of Technoscience**

Birgit Schneider (Media Ecology, Institute of Arts and Media, University of Potsdam)  
**Through the Eye of an Animal. Uexküll’s Perceptual Worlds in 360°?**

The zoologist Jakob von Uexküll conceptualized the German term “Umwelt” to describe the way different types of animals such as birds, marine fish or snakes are perceiving their surroundings. He was guided by the Neo-Kantian idea that the organs of perception shape the ways how the world is perceived. By adapting the concept to all forms of animals he consequently ended up with the idea of manifold “Umwelten” (in plural), because each animal is equipped with different organs adapted to the environment. In my talk I am guided by the observation that today Uexküll’ian ideas are taken up by means of new media technologies: interactive programming, virtual-reality-helmets, go-pro-cameras and 360 degree videos try to get beyond the human cave of perception and allow animal world experiences. In my talk I will introduce and problematize some current examples in between science, animal protection and art that are telling in respect to how people think that animals perceive the world but also about their own (media) tunnels of perception. This leads to the question if, in fact, the current ways that connect to animal perception tell more about the disconnectedness from other species than about animal perception.

*Birgit Schneider holds a PHD in cultural studies and is currently professor for media ecology at Potsdam University, Institute for Arts and Media, European media studies. She studied art history and media studies, philosophy, and media art at the Karlsruhe University of Arts and Design, Goldsmiths College, London, and the Humboldt University of Berlin. Her research focus are technical and scientific images with a strong focus on questions of mediality, media aesthetics, codes, diagrams and textility from 17th century till the present. Her current research focuses on the visual communication of climate since 1800 and a genealogy of climate change visualization in between science, aesthetics and politics.*

Robertina Šebjanič (Artist, Ljubljana)

### **Sound of Troubled Worlds = Songs for Serenity**

--- *"There are still songs to sing beyond mankind" by Paul Celan*

Improved living conditions in a technologically advanced world enables us to live significantly longer than in the past centuries. But the question is how this coexistence and relationship is going to be shaped in the future. The work *Aurelia 1+Hz / proto viva generator* (2014) addresses the coexistence of human animals and machines in this "new normal" situation. The most substantial aims of the audiovisual performance *Aurelia 1+Hz / proto viva sonification* (2015) are to explore the phenomena of interspecies communication, sonification of the environment and the underwater acoustic/ bioacoustics. The project *Aquatocene / subaquatic quest for serenity* (2016) reflects about the immersion into the underwater acoustic environment and the sound and noise pollution produced there by human presence. The project explores the relationship between sound, nature and society and the human impact on the (under)water habitat as well as the establishment and maintenance of safe audio environments for animals that live in the oceans and seas.

*Robertina Šebjanič (SI) works in the intersection of art, technology and science. Her work encompasses immersive installations, av performances, workshops that tackle philosophical questions of our society to the understanding of living systems and their interaction with the environment. Her ideas and concepts are often developed in collaboration with others, through interdisciplinary integration. She is a member of Hackteria Network and Theremidi Orchestra. She was awarded an Honorary Mention @Prix Ars Electronica 2016, nomination for STARTS2016 and nomination for the White Aphroid award. She is part of SHAPE2017 platform. Robertina is internationally exhibited artist. She performed / presented / exhibited at solo and group exhibitions as well as in gallery's, biennials, triennials and festivals: Ars electronica\_Linz, Kosmica\_Mexico City, Le Cube\_Paris, Art Laboratory Berlin, Piksel\_Bergen, Device art\_Zagreb & Eastern Bloc\_Montreal, Eyebeam\_New York, PORTIZMIR#3\_Izmir, Kiblix festival\_Maribor, Gallery Kapelica\_Ljubljana. She studied at the Academy of Fine Arts and Design (SI), Famul Stuart School of Applied Arts (SI) and the Valand School of Fine Arts (SE).*

<http://robertina.net/>

Vivian Xu (Artist, designer, Shanghai)

### **The Silkworm Project**

The Silkworm Project explores the possibilities of designing a series of hybrid bio machines that are capable of generating self-organized silk structures. The silk machines utilize a closed feedback loop system between the organic and the artificial, where the biological and the computational form an ecosystem that demonstrates automated production that is autonomous in its nature. Researching in the history of computation and its entanglement with the technological development of the loom, the artist explores a critical and artistic intersection between the organization of silk and the organization of information. This comparison between old and new technologies, between one of the world's oldest materials – silk – and its newest medium – data – brings up new questions of production and computation in the present day. The artist tackles this question through a series of machines that addresses 2D and 3D printing.

*Vivian Xu is an artist and researcher from Beijing, currently based in Shanghai. Her work explores the boundaries between bio and electronic media in creating new forms of machine logic, life and sensory systems. She has shown and lectured at various institutions in China, the US, and Australia, including the National Art Museum of China, the Chronus Art Center, New York Science Museum, and Symbiotica. Her work has also been published and featured in the Unreasonable mini documentary series, Creator's Project China, Vice China, and Elle USA. She is co-founder of Shanghai-based cross-disciplinary design lab Dogma Lab. She was Research Fellow at the Interactive Media Arts Program at New York University, Shanghai, and researcher and committee member at Genspace, a community bio lab in Brooklyn, New York. She received her MFA in Design + Technology from Parsons the New School for Design in New York. [www.vivianxuprojects.com](http://www.vivianxuprojects.com)*

**Moderators (if not mentioned above as speakers):****Christian de Lutz (Curator, Artist, Art Laboratory Berlin)**

*Christian de Lutz is a curator and visual artist, originally from New York. Co-founder and co-director of Art Laboratory Berlin (ALB), he has curated over 40 exhibitions, including the series Time and Technology, Synaesthesia, and [macro]biologies & [micro]biologies. His curatorial work focuses on the interface of art, science and technology in the 21st century, especially BioArt, DIY Science and facilitating collaborations between artists and scientists. He has published numerous articles in journals and books. A recent publication [macro]biologies & [micro]biologies. Art and the Biological Sublime in the 21st Century reflects theoretically on ALB's 2013-15 program.*

**Marta de Menezes (Artist, Cultivamos Cultura, Lisbon )**

*Marta de Menezes is a Portuguese artist (b. Lisbon, 1975) with a degree in Fine Arts by the University in Lisbon, a MSt in History of Art and Visual Culture by the University of Oxford, and a PhD candidate at the University of Leiden. She has been exploring the intersection between Art and Biology, working in research laboratories demonstrating that new biological technologies can be used as new art medium. In 1999 de Menezes created her first biological artwork (Nature?) by modifying the wing patterns of live butterflies. Since then, she has used diverse biological techniques including functional MRI of the brain to create portraits where the mind can be visualised (Functional Portraits, 2002); fluorescent DNA probes to create micro-sculptures in human cell nuclei (nucleArt, 2002); sculptures made of proteins (Proteic Portrait, 2002-2007), DNA (Innercloud, 2003; The Family, 2004) or incorporating live neurons (Tree of Knowledge, 2005) or bacteria (Decon, 2007). Her work has been presented internationally in exhibitions, articles and lectures. She is currently the artistic director of Ectopia, an experimental art laboratory/ Lisbon, and Director of Cultivamos Cultura/ South of Portugal.*

**Eliot Morrison (Biochemist, Free University Berlin)**

*Eliot Morrison is a protein biochemist at the Free University in Berlin. His research focuses on the role lipid modifications play in the function of T cell activation and signaling, with a particular focus on the enzymes responsible for regulating lipid modifications like palmitoylation. Originally from the San Francisco Bay Area, he has lived and worked in Berlin since 2012. Before studying biochemistry, he trained in classical 2-D animation and illustration, and still seeks to emphasize the importance of narrative and aesthetics in science, not only in the context of scientific communication, but also in the way scientists use visualization to represent and model complex phenomena, and how that process dictates the course of scientific inquiry.*

**Florence Razoux (Neurobiologist, Berlin)**

*Florence Razoux is a neurobiologist with a PhD in biomedical engineering from the ETH Zurich (CH) that rewarded her pioneer work in developing pharmacological magnetic resonance imaging methods in mice. She deepened her expertise in neuroimaging and brain physiology during her postdoctoral training at the UCSD (USA) and MDC Berlin (DE). Her scientific work on preclinical models of psychiatric disorders has been published in renowned biomedical journals. In parallel to her scientific career, Razoux is exploring a creative research landscape at the intersection between neurosciences, technology, design and art. Her work was presented in London (Burnout, 2015) and most recently at the Haus der Kulturen der Welt in Berlin (Gray Matters, 2017). She is currently working on the Non-human Agents series at Art Laboratory Berlin.*

**Pablo Rojas (Biotechnologist, Science Curator, Berlin)**

*Pablo studied art photography before switching to biotechnology at USFQ in his home country, Ecuador. He holds a MSc degree from University College Dublin and a PhD from Charité – Universitätsmedizin Berlin. His scientific career has been complemented with business and innovation training from NovaUCD Ireland and the School of Design Thinking in Potsdam. Pablo is science and research curator at STATE Festival for Open Science, Art and Society; and programme coordinator of the TUBS Science Marketing GmbH team that developed the STEM-oriented Technical University Berlin Summer & Winter University. He worked on medical diagnostics for several institutions in Europe and North America, developing and improving microbiology molecular tests for infectious diseases. He currently mentors at the Startupbootcamp for Digital Health; helps local research institutions communicate their findings; and collaborates with local artists, musicians and designers.*