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SYMPOSIUM

Fluid Visualisation and Sound Matters: Bridging Art, Science, and Visualisation

July 6, 2017

14:00-14:15
Welcome
Gerald Bast
Rector, University of Applied Arts Vienna

14:15–14:30
Fluid Visualisation and Sound Matters
Ingeborg Reichle
Department of Media Theory, University of Applied Arts Vienna

14:30–15:00
From Liquid to Solid and Back
Reiner Maria Matysik
Department of Design, University of Art and Design, Halle (Saale)

15:00–15:30
The Sea Around Us
Pinar Yoldas
*Penny W. Stamps School of Art and Design,
University of Michigan, Ann Arbor*

15:30–16:00
Aquatocene — Subaquatic Quest for Serenity
Robertina Šebjanič
Artist, Ljubljana

16:00–16:15 *Coffee Break*

16:15–16:45
Life in Plankton: Study Methods and Diversity
Thomas Schwaha
Department of Integrative Zoology, University of Vienna

16:45–17:15
From Images to Models: Using 3D Imaging Techniques for Generating Accurate Models of Microscopic Animals
Stephan Handschuh
VetCore Facility for Research, University of Veterinary Medicine Vienna

17:15–17:45
NOISE AQUARIUM Visualisation
Martina Fröschl and Alfred Vendl
Department of Digital Art, University of Applied Arts Vienna and Department of Digital Art (Science Visualization Lab), University of Applied Arts Vienna

17:45–18:00 *Coffee Break*

18:00–19:00 Keynote
Minding the Macro-Micro BioMe
Victoria Vesna
Director, UCLA Art Sci Center, Department of Design Media Arts, University of California, Los Angeles, and Visiting Professor at the universities of Tsukuba and Linz

Venue:

Angewandte Innovation Lab (AIL),
University of Applied Arts Vienna
Franz-Josefs-Kai 3, 1010 Vienna

Project Noise Aquarium (Victoria Vesna, Alfred Vendl, Martina Fröschl, et al): Plankton and noise pollution visible through scientific imaging techniques and 3D Visualization (2016). Photo/ Image: By courtesy of Martina Fröschl.

Fluid Visualisation and Sound Matters: Bridging Art, Science, and Visualisation

University of Applied Arts Vienna

Symposium on July 6, 2017

Concept

The symposium will bring together artists, scientists, and experts working in the field of scientific visualisation and visual effects to develop a cross-disciplinary understanding of how art and science contribute to raising awareness of the current massive ecological crisis of marine ecologies and identify a suitable epistemological framing for this global challenge. Overfishing, pollution, acidification, and rising temperatures due to climate change are the main factors that have been putting tremendous stress on marine ecologies for decades. The oceans cover up to 70% of the Earth's surface, 97% of the world's water is saltwater, 2% is fresh water in the form of ice, and the remaining 1% is drinking water.

With plastics and plasticisers as well as noise pollution in the oceans, we now have relatively new, emerging phenomena that defy the regulatory definitions of pollution. Accurate definitions are lacking also because modern waste, like plastic pollution, is fundamentally different from its predecessors. The sciences involved in tracking, analysing, and understanding the ecological crisis of marine ecologies face severe epistemological problems, because the methods used hitherto are failing: The emerging phenomena are both novel and occurring on an unprecedented global scale. The entire extent to which plastics and plasticisers are floating in the oceans and seas is not visible to the naked eye because a great deal floats below the surface in the form of microparticles. Plastics are not biodegradable, but they are gradually broken down into smaller and smaller particles in the ocean through wave action and intense irradiation from sunlight. Marine organisms confuse these microplastics with plankton; this means that plastics (and the toxins they contain) are increasingly entering the food chain, irretrievably and irreversibly. Around 70 % of plastic waste deposited in the oceans sinks to the sea floor, but in 1997 scientists observed for the first time that an enormous amount of tiny plastic particles were collecting on the surface of the water in the vortexes of ocean currents, also known as gyres. The discovery of the so-called Great Pacific Garbage Patch made it clear that millions of tons of plastic garbage are drifting in the oceans. Since the discovery of high concentrations of microplastics in other gyres as well, it can no longer be denied that a new ecosystem has emerged in which artificial and natural aspects are inseparably connected.

The symposium will provide a spectrum of artists' responses to the current transformation of our oceans at the dawning of the *Plasticene age,* where our oceans are turned into a *plastisphere,* a human-made system in which the natural and the artificial are no longer distinguishable and speculative biologies evolve. Collaborative projects will be presented that identify unnatural noise in the oceans as a further environmental issue, especially the effect of noise on microscopic organisms such as plankton, for example. *Noise Aquarium* — a project which seeks to raise attention about the current loss of marine biodiversity introduces a collection of accurate 3D models as a resource for scientific and artistic research. Another artistic project *Aquatocene — Subaquatic Quest for Serenity* will present the efforts to make recordings using hydrophones in different locations around the globe. Underwater noise has an impact on a great number of marine life forms, which depend on the sub-aquatic sonic environment to survive. Despite the availability of popular aquatic sounds, there is hardly any awareness that the underwater soundscape is as rich as the one heard by terrestrial creatures above water.

The symposium presents aesthetically powerful art projects that seek to reach out to and inform a global audience about plastic pollution and noise pollution in the oceans and will demonstrate how current modes of scientific visualisation are able to address underestimated (and invisible) effects on our marine ecologies, with the aim to foster positive changes in consumer habits. The symposium will also launch an exchange between the University of Applied Arts Vienna's Department of Media Theory and the Science Visualization Lab of the Department of Digital Art and Faculty of Design at the University of Art and

Design, Halle (Saale), Germany (Burg Giebichenstein Kunsthochschule Halle), which will also involve the Department of Design Media Arts, University of California, Los Angeles, USA, the University of Art and Design Linz, Austria, the University of Vienna, and the University of Veterinary Medicine Vienna.

Speakers

Prof. Ingeborg Reichle, PhD
Department of Media Theory, University of Applied Arts Vienna, Austria

Prof. Reiner Maria Matysik
Departement of Design, University of Art and Design (Burg Giebichenstein) Halle (Saale), Germany

Dr. Pinar Yoldas
Penny W. Stamps School of Art and Design, University of Michigan, Ann Arbor, USA

Robertina Šebjanic, artist
Ljubljana, Slovenia

Dr. Thomas Schwaha
Department of Integrative Zoology, University of Vienna, Austria

Stephan Handschuh, MSc
VetCore Facility for Research, University of Veterinary Medicine Vienna, Austria

Martina Fröschl, MSc
Department of Digital Art, University of Applied Arts Vienna, Austria

Prof. Alfred Vendl, PhD
Department of Digital Art (Science Visualization Lab), University of Applied Arts Vienna, Austria

Prof. Victoria Vesna, PhD
Director, UCLA Art Sci Center, Department of Design Media Arts, University of California, Los Angeles, USA and Visiting Professor at the universities of Tsukuba, Japan, and Linz, Austria

Biographical Notes

Ingeborg Reichle, Ph. D., is a media and cultural theorist writing on contemporary art, new technologies, and new media with a focus on biotechnology and artificial life. She is chair of the Department of Media Theory, University of Applied Arts, Vienna. In 2004 she received her Ph.D. from the Humboldt University Berlin with her dissertation *Art in the Age of Technoscience: Genetic Engineering, Robotics, and Artificial Life in Contemporary Art,* published 2005 in German and 2009 in English by Springer publishers, Vienna and New York. She is co-editor of seven books, the most recent being IMAGE MATCH. *Visueller Transfer, "Imagescapes" und Intervisualität in globalen Bildkulturen* (Fink, Munich 2012). She completed her *habilitation* thesis in 2013 titled *Bilderwissen – Wissensbilder: Zur Gegenwart der Epistemologie der Bilder* at the Humboldt University Berlin, where she was FONTE professor from 2014. In 2010 she curated the Bio art exhibition *jenseits des menschen – beyond humans* at the Berlin Museum of Medical History at the Charite in the context of the conference *Leben 3.0 und die Zukunft der Evolution* held at the Berlin-Brandenburg Academy of Sciences and Humanities in Berlin. Since 2000 she has been a guest lecturer and guest professor at various international institutions, including the School of Visual Arts (SVA), New York; the Department of Biology, Massachusetts Institute of Technology (MIT), Boston; the Life-Science Lab, German Cancer Research Center, Heidelberg; Timbusu College, National University of Singapore; and the National Autonomous University of Mexico (UNAM), Mexico City.

Reiner Maria Matysik is a Berlin-based artist and a professor of three-dimensional design at the University of Art and Design in Halle (Burg Giebichenstein), Germany. He studied fine arts at the Hochschule für bildende Künste Braunschweig and at the Ateliers Arnhem. He works in manifold ways with concepts for future landscapes and organisms, such as post-evolutionary life forms. Through the specific adoption of object, in-

stallation, and video he developed a dynamic scenario of future landscapes and organisms. In this way he creates an area of conflict between promise and failure in a potential future. Both the visual implementation and their linguistic form can be recognised here as the essential artistic strategies which he uses as his own interface between the worlds of scientific research and pseudo-scientific fiction. In 2004 he directed the artistic development project *Institute of Biological Sculpture* at the Hochschule für bildende Künste Braunschweig. He was a lecturer at the Institute of Visual Arts, Faculty of Architecture, Technical University Braunschweig, and from 2008 to 2009 visiting professor of sculpture at the Fachhochschule Kunst Arnstadt. He has exhibited his artworks at institutions such as the Gerhard-Marcks-Haus, Bremen; Centre Pasquart, Biel, Switzerland; Neue Gesellschaft für bildende Kunst, Berlin; Projektraum deutscher Künstlerbund, laboratoria moskau; Museum Koenig, Bonn; Georg Kolbe Museum and Kunstlerhaus Bethanien, Berlin; Staatliche Kunsthalle Baden-Baden; Fondación Cesar Manrique, Lanzarote; Kunstverein Hannover; Martin-Gropius-Bau, Berlin; Kunsthalle Bern, Switzerland. He is the recipient of grants from the Studienstiftung des deutschen Volkes, Kunstfonds e.V., DAAD, KfW Bank, Stiftung NORD/LB Öffentliche, and the Senate of Berlin.

Pinar Yoldas, Ph.D., is a cross-disciplinary designer/artist/researcher currently based in Ann Arbor, Michigan. Her work develops within biological sciences and digital technologies through architectural installations, kinetic sculpture, sound, video and drawing with a focus on post-humanism, eco-nihilism, anthropocene and feminist technoscience. She holds a Ph.D. from Duke University where she was affiliated with the Duke Institute of Brain Sciences and Media Arts and Sciences. She holds a Bachelor of Architecture from the Middle East Technical University, a Master of Arts from Bilgi University, a Master of Science from Istanbul Technical University, and a Master of Fine Arts from the University of California, Los Angeles, where she worked at the Art|Sci Center and the UCLA Game lab. Her book *An Ecosystem of Excess* was published by ArgoBooks in 2014. Pinar Yoldas was a 2015 John Simon Guggenheim Fellow in the Fine Arts and a 2016 FEAT Future Emerging Arts and Technologies Award recipient. Her solo shows include *The Warm, the Cool and the Cat* at Roda Sten Konsthall (2016), Polyteknikum Museum Moscow (2015), *An Ecosystem of Excess,* Ernst Schering Project Space Berlin, among many others. Her group shows include *ThingWorld*, NAMOC National Art Museum of Beijing (2014); Transmediale Festival, Berlin (2014), ExoEvolution at ZKM (2015), 14th Istanbul Biennial (2015), Taiwan National Museum of Fine Arts (2016). Pinar Yoldas' residencies include the MacDowell Colony, UCross Foundation, VCCA, National Evolutionary Synthesis Center, Duke University, Quartier21 Künstlerstudio-Programm, Transmediale Villém Flusser research residency at Berlin University of the Arts. She has been an invited speaker at SAIC, Haus der Kulturen der Welt, Northwestern University, University of Applied Arts Vienna, University of Arizona, Reed College, University of Buffalo, BacNet15, Penn State, and UCLA among many others.

Robertina Šebjanic is an artist based in Ljubljana, Slovenia, who works at the cross-roads of art, technology, and science. For several years now her art and research focus is oriented towards projects developed in the fields of living systems (Bioart), AV performances, noise/sound art, installations, and interactive ambient-responsive immersive environments. The context for her ideas and concepts is often realized in collaboration with other authors (artists, scientists, humanists, makers, hackers…), and through interdisciplinary and informal integration in her work. She studied at the Academy of Fine Arts and Design and the Famul Stuart School of Applied Arts in Ljubljana as well as at the Valand School of Fine Arts in Gothenburg, Sweden. She is a member of the Theremidi orchestra and the Hackteria Network and in 2013 was on the organising team and a participant of HackteriaLab Bangalore. In 2014 she participated at HacteriaLab Yogyakarta. In 2012 she organised *Interactivos?'12 Ljubljana: Obsolete Technologies of the Future at* LJUDMILA digital media lab in Ljubljana, where from 2008 to 2012 she was active as programme manager. From January 2013 to July 2014 she worked as a mission and programme developer at KSEVT – Cultural Centre of European Space Technologies. In 2016 she was an art and science research resident at Station biologique de Roscoff – Roscoff Marine Station, organized by PING and curated by Ewen Chardronnet. In 2016 her project *Aurelia 1+Hz / proto viva sonification* received an Honorary Mention at the Ars Electronica 2016 Interactive Art+, her project *Time Displacement — Chemobrionic Garden* received a STARTS Prize 2016 nomination, and the project *Aquatocene: Subaquatic Quest for Serenity* was nominated for the White Aphroid Award.

Thomas Schwaha, Ph.D., is a zoologist at the Department of Integrative Zoology, University of Vienna, with a particular focus on animal morphology and evolution as well as on imaging techniques. He studied biology at the University of Vienna focusing on zoology where he obtained his PhD with a dissertation on soft-body morphological aspects of bryozoans, tiny colonial invertebrates. Since 2011 he holds a post-doc position at the Department of Integrative Zoology where he is responsible for all microscopes and imaging facilities of the department and teaches undergraduate and graduate students as well continuing his research, primarily on bryozoan morphology. With his strong background in imaging, he also focuses on new developments in this technology and supports other researchers with new approaches towards research issues. Along with his broad teaching experience, this has allowed him to gain detailed knowledge of the morphology of various animal phyla, for example, arthropods, mollusks, and annelids.

Stephan Handschuh is a biologist with a technical focus on microscopic imaging and 3D visualization at VetCore Facility for Research, University of Veterinary Medicine Vienna. He has a broad biological background in diverse fields such as evolutionary biology, comparative and functional morphology, microscopic anatomy, developmental biology, and theoretical biology. He obtained his Magister (MSc) in biology at the University of Vienna in 2007. After a fellowship at the KLI Altenberg he became a staff scientist at the imaging facility of the University of Veterinary Medicine Vienna in 2012. There he has a strong technical focus on quantitative microscopic x-ray imaging and 3D data visualization and analysis. Since 2010 he is also a member of the Science Visualization group of the University of Applied Arts Vienna, where he works on creating scientifically meaningful 3D models of microscopic animal samples.

Martina Fröschl is a digital artist and focuses on computer-generated imagery (CGI). She is currently working as a researcher at the University of Applied Arts Vienna in the Science Visualization Lab Angewandte group. She studied media technique and media design and graduated with a Masters thesis on how CGI relates to the generated factual reality of documentary and mockumentary films. Ever since, the depiction of realities and biological phenomena has driven her creations. She has worked on various documentary and fiction productions for TV and cinema as a visual effects and CGI artist. To name just a few: *Mount Saint Helens* (Directors: J.D. Hissen, H. Leger, Production: Interspot 2010), *The Little Gypsy Witch* (Director: T. Žaja, Production: Formula Film 2011), *Limits of Light* (Director: Alfred Vendl, Production: AV-Dokumenta 2011), *Planet You* (Directors: M. Meszaros, A. Vendl, Production: Terra Mater 2012), *Meteor Menace* (Director: Ivo Filatsch, Production: Terra Mater 2012), The *Little Knight Trenk* (Director: Anthony Power, Production: Blue Eyes Fiction 2015). She has presented at various conferences and workshops including *Science Visualization in TV and Film for Better Understanding of Science,* Bangkok 2010; FMX Conference, Stuttgart 2013; Mite Colloquium, Graz 2013; Blender Conference, Amsterdam 2016; LASER UCLA, Los Angeles 2016; CAx Berlin, 2017. With a large group of volunteers, she has organized since 2008 the SIGGRAPH Chapter Vienna's conference PIXELvienna: Annual Conference on Computer Graphics & Animation, and she was editor-in-chief of CGmag Austria. Her recent work is based on scientific images like μCT, MRI, SEM, and light microscopy in collaboration with imaging experts and biologists. The computer animation workflows of the interdisciplinary project *Noise Aquarium* are further developments of her intense commitment to science visualization incorporating scientific imaging. Related processes are described in M. Fröschl et al., Computer-Generated Images of Microscopic Soil Organisms for Documentary Films, Soil Organisms 86 (2) 2014.

Alfred Vendl, Ph.D., was a professor at the University of Applied Arts Vienna from 1981 to 2014 and until 2014 he was the head of the Institute of Art and Technology and an associate professor at the Technical University Vienna. In 2016 he became the director of the Science Visualization Lab at the Department of Digital Art, University of Applied Arts Vienna. He studied materials science at the Technical University of Vienna, where he gained his PhD. He was a research scientist at Imperial College, University of London, U.K.; University of Freiburg im Breisgau, Germany; University of California San Diego, La Jolla, USA; and the Max Planck Institute for Metals Research, Stuttgart, Germany. He is the author of around 80 scientific publications in materials science, archaeometry, and art technology. Work in film and television: he trained as a camera operator in Vienna, and since 1968 has worked as a free-lance cameraman. Since 1970 he has worked for ORF (Austrian Television) variously as a cameraman, writer, director, producer, and host of science talk shows. He has been the writer, director, and/or producer of more than 200 prime time documentaries for ORF,

ARD, ZDF, WDR, BR, ARTE, BBC, Discovery, Smithsonian, WNET, etc. He is the recipient of many international TV awards, including the Emmy Award of the American National Academy of Television Arts and Sciences in 2008 for Nature Tech.

Victoria Vesna, Ph.D., is an artist and professor at the UCLA Department of Design Media Arts and Director of the Art|Sci Center at the School of the Arts (North campus) and California NanoSystems Institute (CNSI) (South campus). Although she was trained early on as a painter (Faculty of Fine arts, University of Belgrade, 1984), her curious mind took her on an exploratory path that resulted in work that can be defined as experimental creative research which resides in between disciplines and technologies. With her installations she investigates how communication technologies affect collective behaviour and how perceptions of identity shift in relation to scientific innovation (PhD, CAiiA_STAR, University of Wales, 2000). Her work involves long-term collaborations with composers, nano-scientists, neuroscientists, and evolutionary biologists and she brings this experience to students. Victoria has exhibited her work in 20+ solo exhibitions, 70+ group shows, has published 20+ papers and given 100+ invited talks in the last decade. She is the North American editor of AI & Society journal (Springer Verlag, UK) and in 2007 published an edited volume, *Database Aesthetics: Art in the Age of Information Overflow* (Minnesota Press) followed by another in 2011 Context Providers: Conditions of Meaning in Media Arts (co-edited with Christiane Paul and Margot Lovejoy), Intellect Ltd, 2011. Currently she is working on a series, Art Science & Technology, based on her online lecture class.

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Project Noise Aquarium (Victoria Vesna, Alfred Vendl, Martina Froschl, et al.): Plankton and noise pollution visible through scientific imaging techniques and 3D visualization (2016).