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ARTISTS AND SCIENTISTS in dialog



Image: The Substitute, 2019. Alexandra Daisy Ginsberg



Image: ETH Zurich

Do you want better Nature? Visions of future biology from art and science

We have new tools at hand to design nature in ways that were thought impossible only decades ago. But what does it mean to *better* nature? How can we re-think our relationship with nature in the Anthropocene when we realize how dependent we are on nature, and how limited our understanding of the complexity of life is? For some, the 21st century is the century of ecology, for others it is the century of the life sciences and biotechnology. This LASER Zurich evening will bring these two perspectives into conversation.

Beat Christen, a synthetic biologist at ETH Zurich, has developed computer-algorithms to build genomes anew. He will describe how computers will aid us in designing artificial organisms, and also discuss the challenges and purposes for which this technology should be used, and how potential for abuse can be prevented.

The renowned artist Alexandra Daisy Ginsberg engages with the interplay of design and nature and asks through her work what it means to better nature.

Moderated by Christoph Kueffer, Hochschule Rapperswil / ETH Zurich and Juanita Schläpfer, Zurich-Basel Plant Science Center, we invite you to join us for an inspirational evening.

LASER ZURICH is part of the series – The Leonardo Art, Science, Evening Rendezvous (LASER) Connected to *Leonardo: The Journal of Art and Science*, MIT Press.

Time: Thursday 19th March 2020, 18:00 – 20:30

The talk is free but please register, and indicate if you would like the Lebanese supper afterwards (CHF 5.- donation), [Register here](#)

Venue: ETH Zürich,
Main Building, Semper Aula HG G60
Rämistrasse 101
8092 Zürich

Alexandra Daisy Ginsberg (UK)

<https://www.daisyginsberg.com/>

Dr. Alexandra Daisy Ginsberg is an artist examining our fraught relationships with nature and technology. Through artworks, writing, and curatorial projects, Daisy's work explores subjects as diverse as artificial intelligence, exobiology, synthetic biology, conservation, biodiversity, and evolution, as she investigates the human impulse to "better" the world. But what does better mean? Who is it better for? And who gets to decide? Ginsberg will address these questions through discussion of some of her recent artworks, including resurrecting the smell of extinct flowers (now on view at the Natural History Museum Bern). As humanity slowly acknowledges the impact of our progress on the natural world, and the need to make a damaged nature better, we have to ask: what does better mean?

Biography

Dr Alexandra Daisy Ginsberg has spent over ten years experimentally engaging with the field of synthetic biology, developing new roles for artists and designers. She is lead author of *Synthetic Aesthetics: Investigating Synthetic Biology's Designs on Nature* (MIT Press, 2014), and in 2017 completed *Better*, her PhD by practice, at London's Royal College of Art (RCA), interrogating how powerful dreams of "better" futures shape the things that get designed. She read architecture at the University of Cambridge, was a visiting scholar at Harvard University, and received her MA in Design Interactions from the RCA.

Daisy won the World Technology Award for design in 2011, the London Design Medal for Emerging Talent in 2012, and the Dezeen Changemaker Award 2019. Her work has twice been nominated for Designs of the Year (2011, 2015), with Designing for the Sixth Extinction described as “romantic, dangerous... and everything else that inspires us to change and question the world”. Daisy exhibits internationally, including at MoMA New York, the Museum of Contemporary Art, Tokyo, the National Museum of China, the Centre Pompidou, and the Royal Academy, and her work is in museum and private collections.

Recent works:

- [THE SUBSTITUTE](#), a northern white rhino digitally brought back to life.
- [MACHINE AUGURIES](#), a dawn chorus built using machine learning.
- [THE WILDING OF MARS](#), a simulation of colonizing Mars only with plants, not humans.
- [RESURRECTING THE SUBLIME](#), experiencing the smell of flowers made extinct by humans, at Natural History Museum, Bern

Beat Christen (CH)

<https://imsb.ethz.ch/research/christen.html>

Professor Beat Christen's research group at ETH Zürich covers a broad range of activities in the area of systems biology and synthetic biology. In his LASER talk, he will describe how computational algorithms paired with chemical DNA synthesis enables digital manufacturing of biological systems up to the size of entire microbial genomes. He will present insights related to the design, building and testing of a computer-generated bacterial genome and discuss how, in the near future, algorithms will enable production of novel, useful life-forms. Christen will discuss possible future applications of synthetic genomes for industrial purposes and health benefits. He will also talk about the need for profound discussions in society about the challenges and purposes for which this technology can be used and, at the same time, about how potential for abuse can be prevented.

Biography

Beat Christen studied Molecular Biology and earned his PhD at the Biocenter, University of Basel. As a Postdoctoral Fellow and Research Associate, he worked together with Lucy Shapiro at Stanford University where he invented novel high-throughput strategies that enable quantitative investigation and deciphering of large-scale networks in prokaryotes. Among these strategies are high-content fluorescence microscopy screening approaches, a systems genetics strategy to map essential genetic features with base-pair accuracy on the chromosome, and a methodology to profile transcription factor networks on global scale.

In 2019, with his brother Matthias Christen, he developed a range of technologies that greatly simplifies the chemical manufacturing of large DNA molecules containing many hundreds of genes. With this method, they built the first genome of a bacterium entirely designed by a computer algorithm.

In 2013, Beat Christen joined the Institute of Molecular Systems Biology as an Assistant Professor at the Department of Biology, ETH Zürich.

Encoding new abilities into DNA: <https://www.youtube.com/watch?v=Jg2xvgHuLO8>
Research paper: <https://www.pnas.org/content/116/16/8070>

About Leonardo/ISAST

Leonardo/The International Society for the Arts, Sciences and Technology (Leonardo/ISAST) is a nonprofit organization that serves the global network of distinguished scholars, artists, scientists, researchers and thinkers through our programs focused on interdisciplinary work, creative output and innovation. From its beginnings, Leonardo/ISAST has served as the virtual

community for purposes of networking, resource-sharing, best practices, research and events in Art/Science/Technology. The organization is well known for the publication of Leonardo Magazine, MIT Press.

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