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Useful Fictions

An experimental platform for creative co-production of artwork by artist-scientist teams

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Abstract

Useful Fictions began as a two-year collaboration between artists, designers, and scientists from the University of California, Davis, USA, and the Chaire Arts et Sciences of the École polytechnique and École nationale supérieure des Arts Décoratifs, France. In 2019, gathering a coalition of artists, designers, humanists, and graduate students to work with globally acclaimed climate scientists in their labs, the project culminated as a week-long multidisciplinary symposium at École polytechnique and a temporary public art project titled *The Speed of Light (SOL) Expedition*, which took place in Montmartre, Paris, France. The goal of the collaboration was to design and implement an experimental platform suitable for bringing artists and scientists together to exchange shared concerns of critical ecological and societal importance. The vehicle that carried the discourse forward was the creative co-production of artwork by the artist-scientist teams. In pursuit of shared inquiries, the teams worked side-by-side with an attitude toward embracing the complexity of the problem and modeling radical openness to research in which tools, laboratories, and studio work are shared between the team members.

The project's framework emphasized examining the *pars pro toto* correlation between measurements and their interpretations. With a focus on examining the context and expanding concepts of ecological thinking through creative means, this project invites the rethinking of a human-centered narrative that dominates and defines contemporary cultural consciousness. We ask: "What controls the manufacturing of our systems of belief? What stories do we tell ourselves? Can we imagine differently?"

At this roundtable, *Useful Fictions* lead collaborators join as panelists to discuss lab activities and outcomes. The panel examines and discusses how these creative and critical approaches to the shared inquiry inform contemporary debates surrounding values and new directions of art and science collaborations. The roundtable is also an opportunity to extend an open invitation for an external critique of the work.

Keywords

useful fictions, art-science, collaboration, transdisciplinary, climate science, complex problem, human-centered narrative, laboratories, ecological thinking, belief, future

Introduction

Useful Fictions began as a two-year collaboration between artists, designers, and scientists from the University of California, Davis, USA, and the Chaire Arts et Sciences of the École polytechnique & École nationale supérieure des Arts Décoratifs, France. The project culminated in a week-long multidisciplinary symposium from Monday, Sept. 9, 2019, to Friday, Sept. 13, 2019, gathering a coalition of artists, designers, humanists, and graduate students to work with globally acclaimed climate scientists in their laboratories at École polytechnique. Accompanying the symposium, we also mounted a temporary public art project titled *The Speed of Light (SOL) Expedition* that took place in Montmartre, Paris, engaging the public over the course of two days from Saturday, Sept. 14, 2019, to Sunday, Sept. 15, 2019.



Figure 1. Climate scientist explaining the purpose of a detector at SIRT, France's national atmospheric research on climate and the environment. ©Useful Fictions

Useful Fictions Symposium

The goal of the collaboration was to design and implement an experimental platform suitable for bringing artists and scientists together to exchange shared concerns of critical ecological and societal importance. The vehicle that carried the discourse forward was the creative co-production of artwork by the artist-scientist teams. In pursuit of shared inquiries, the teams worked side-by-side with an attitude toward embracing the complexity of the problem and modeling radical openness to research in which tools, laboratories, and studio work are shared between the team members.

The project's framework emphasized examining the *pars pro toto* correlation between measurements and their interpretations. For example, the concept of a meter, the speed of light, and a photographic record all inform our understanding of the world with the assumption that they establish a truth that we can believe. However, measurements are often based on traces or indications of what is being investigated rather than the thing itself. They are often proxies or indices, representative substitutes, or indicators deemed able to represent the original subject of investigation. As such, measurements are fragile and prone to manipulation and misinterpretation. Thus, the context for the measurement is critical, but context is only sometimes known, disclosed, or disclosed adequately. Adding to this complexity is that tools used to make measurements are almost as malleable as measurements themselves. From working with scientists, our project examines the idea of measurements and tools used in science as it relates to climate change in the Anthropocene, where the *pars pro toto* correlation between measurements and their interpretations has been increasingly exploited and politicized in the pursuit of varying human agendas. With an emphasis on examining the context and expanding concepts of ecological thinking through creative means, this project invites the rethinking of a human-centered narrative that dominates and defines contemporary cultural consciousness. We ask: "What controls the manufacturing of our systems of belief? What stories do we tell ourselves? Can we imagine differently?"

Useful Fictions' lead collaborators will join as panelists at this roundtable to discuss their lab activities and outcomes. They will include research quests, intellectual activities, conversations, artifacts of creative processes, and manifestations consisting of sketches, photographs, videos, computer codes, writings, ordinary and 3D printed objects, installations, and sound recordings. The panel will examine and discuss how these creative and critical approaches to the shared inquiry can inform contemporary debates surrounding values and new directions of art and science

collaborations. The roundtable is also an open invitation for an external critique of the work.

Collaborative labs include: Lab 1, CLIMATE MEASUREMENTS, at the Site Instrumental de Recherche par Télédétection Atmosphérique (SIRTA) Observatory, Institut Pierre Simon Laplace (IPSL); Lab 2, A MICROCLIMATE OF ONE, at the Laboratoire d'hydrodynamique (LadHyX); Lab 3, 4D ADDITIVE MANUFACTURING: From Print to Animation, at the Laboratoire des Solides Irradiés (LSI); Lab 4, DATA MATERIA, at the X-Fab prototyping space; and, Lab 5, MAKING, ENGAGEMENT, AND REFLEXIVITY is a migratory group.

Abstracts from collaborators who led the labs

1. **CLIMATE MEASUREMENTS** took place at SIRTA, France's national atmospheric research on climate and the environment (see Figure 1). Climate scientists at the lab study and track dust particles. The creative project produced is titled Stardust. The project imagined an ancient curiosity cabinet containing ancient atmospheric science tools, visualizations of dust studies on Earth of terrestrial and extraterrestrial origins, and a dust invasion poster describing the invasion of the U.S. in 2023 by foreign nations. The project's result is a light-hearted installation created humorously and poetically with music and singing.



Figure 2. Synthetic Schlieren photography. ©Useful Fictions

2. **MICROCLIMATE OF ONE** is a collaboration between researchers in contemporary art and physics. This lab created a participatory art installation in which synthetic Schlieren photography is used to produce real-time photographic portraits of

participants through visualizations of the invisible atmospheric plumes produced by the heat flux and convection of the human body (see Figure 2). The word "one" in MICROCLIMATE OF ONE is intentionally ambiguous. In inventing a process for capturing heat flux and convection of the human body, the project invokes the concept of "one person" and the heat we cannot see.

3. **4D ADDITIVE MANUFACTURING: FROM PRINT TO ANIMATION** took place at the Laboratoire des Solides Irradiés (LSI). Bringing the dynamics of life into inanimate objects is the new realm of additive manufacturing. This novel mindset is also called "4D printing" and uses advanced materials that respond to the influence of external stimuli or energies to program the actions of a printed object. This workshop fabricated, used, and experimented with magneto-responsive soft polymers to mimic the behavior of nature (Figure 3). 2D planar structures of magnetic-responsive soft polymers were used to exploit origami and kirigami folding and unfolding processes. Throughout the workshop, participants speculated on possible near-future applications of 4D printing using this special material: what real-life environmental changes could be used to animate the 4D object, and how might it physically react in response?

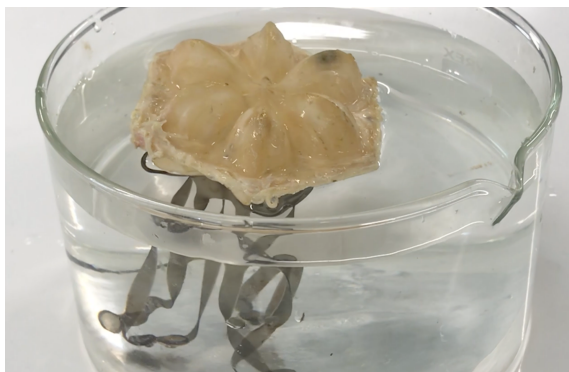


Figure 3. Magneto-responsive soft polymers mimic the behavior of nature. ©Useful Fictions

4. **DATA MATERIA** took place at the X-Fab prototyping space. This workshop invited participants to consider data as an abstract representation of our relationship to larger truths embodying the capacity

for infinite possibilities of reification. The lab created and designed new narratives, fictions, and utopias/dystopias based on climate science data and other sources. Together, the collaborators imagined and materialized the creative manifestations of data occupying indoor and outdoor physical spaces. These projects invite the rethinking of measurements in their relationship to the story we construct.

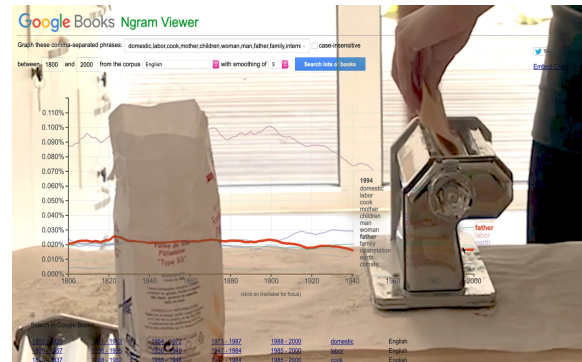


Figure 4. Google Ngram is used to explore the relationship between domestic labor and climate from the year 1800 to 2000. Fresh pasta is made on-site and used as material for storytelling. ©Useful Fictions

5. **MAKING, ENGAGEMENT, AND REFLEXIVITY** is a humanities lab concerned with knowledge production. The team observed the conditions of interactions between artists and scientists and offered critiques. As a migratory group, the lab proposed alternative but useful fictional constructs and instruments that negotiate between a construct's epistemic, methodological, and technical questions. Scientific "truth" is constructed in an iterative negotiation between epistemic, methodological, and technical questions. Constructs – like 'temperature' as Hasok Chang (2007) argued – are invented with instruments that allow different concepts to be measured. Science is, in this sense, an arbitrary measure to assess "real" conditions. What other possible constructs and instruments have been or are being overseen in the histories of science and hence deprived of their own validity? What narratives and forms of knowledge are disavowed in the authoritative face of the Scientific Method? In this group, we invite experts, researchers, and storytellers of non-mainstream and fictional histories of science or

vernacular knowledge, including queer and feminist theories, who are interested in integrating other groups and pointing into unforeseen avenues of inquiry or proposing alternative but useful, fictional constructs and instruments.

The Speed of Light (SOL) Expedition

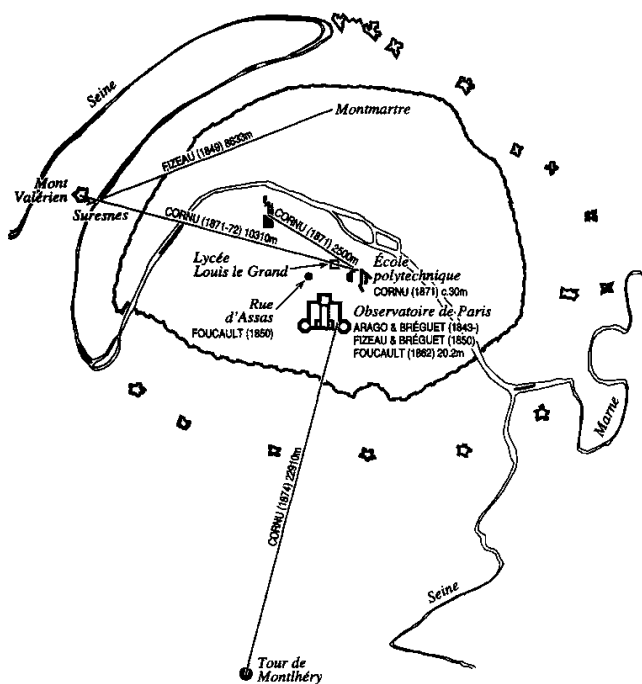


Figure 5. Light beams over Paris: a logarithmically-distorted map of the sites of the various mid-19th century speed-of-light experiments, including Fizeau's 1849 experiment.¹

The Speed of Light (SOL) Expedition is a temporary public art project. It began as an invitation to view the original 1849 experimental device used by Fizeau to measure the speed of light. The device - on display at the Mus'X - Le Musée de l'École Polytechnique in France - was part of a wave of technical and perceptual breakthroughs that gave birth to Einstein's theory of relativity, a chain reaction of paradigm shifts in art and in science that define the modern world. Harnessing the momentum of this historic wave of collective genius, *the SOL Expedition* invites the public to travel the same eight kilometers of distance between Mont-Valérien in Suresnes and Montmartre, defined by Fizeau in his 1849 Speed of Light experiment in Paris (Figure 5). The project brings together artists, designers, scientists, and the

¹ Reprinted from *Vistas in Astronomy*, Vol. 36, 1993, William Tobin, *Toothed wheels and rotating mirrors: Parisian astronomy and mid-nineteenth century experimental measurements of the*

public to produce work individually and collectively to stimulate inquiry and create exchanges as cultural production that inspires agency. The project invites cultural and arts institutions as collaborators to respond to this challenge by conducting research, producing artwork, and designing interventions for public participation. As a first response to SOL, Galerie HUS and the "Chambre d'embarquement" in Montmartre, Paris, responded to the call to participate with a proposal by the economist and researcher Laurent Derobert and the artistic association "Effets désirables." The program offered a public participatory performance entitled *Speed of Shadows Expedition*; the delivery of the programming was timed precisely with three twilight stages: the civil, nautical, and astronomical Twilight.

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