



SEEING THE UNSEEN SCIENCE AND ART

David Bowen

Hannah Chalew

Catherine Chalmers

Maru García

David S. Goodsell

Lia Halloran

Juniper Harrower

Elizabeth Hénaff

Karey Kessler

Laura Splan

Chaffey  College

WIGNALL MUSEUM *of*
CONTEMPORARY ART

INTRODUCTION

Seeing the Unseen: Science and Art is a group exhibition featuring art that investigates the intersections of the sciences and the arts. The work asks a number of prescient questions including: Why do artists engage with science? Why are scientists interested in visual or creative representations of their work? Are these collaborations creating clarity, or new access points for information in the STEM fields? Are artists expressing and making visible the work of scientists and science? The exhibition further attempts to increase our understanding of how art and science influence each other. Artists engage in new methods of scientific research in their rigorous and awe-inspiring works of art. *Seeing the Unseen* features David Bowen, Hannah Chalew, Catherine Chalmers, Maru García, David S. Goodsell, Lia Halloran, Juniper Harrower, Elizabeth Hénaff, Karey Kessler, and Laura Splan.

Seeing the Unseen: Science and Art is the first of two exhibitions presented during the 23-24 academic year that explore the intersections of the arts and STEM (Science, Technology, Engineering, and Mathematics). Both exhibitions are presented in collaboration with the STEM Academic and Career Community. Curated by Professors Joann Eisberg, Robin Ikeda, Mark Padilla, and Wignall Museum Director and Curator, Rebecca Trawick.

This was printed on the occasion
of the exhibition

Seeing the Unseen: Science and Art
August 21 – November 18, 2023

Wignall Museum of Contemporary Art

5885 Haven Avenue,
Rancho Cucamonga, CA 91737



www.chaffey.edu/wignall

PROGRAMMING

Free and open
to the public

RECEPTION

Seeing the Unseen Reception

TUESDAY, AUGUST 29
4–6PM

Wignall Museum of Contemporary Art

BOOK SIGNING & POP-UP

Forager: Field Notes for Surviving a Family Cult

Author and Professor Michelle Dowd

TUESDAY, AUGUST 29
4–6 PM

Wignall Museum of Contemporary Art

*Book copies will be available for
sale at the event.

FILM SCREENING & DISCUSSION

Kiss the Ground

WEDNESDAY, SEPTEMBER 20
12–2PM
WH-142

LECTURE & WORKSHOP

A Ruler to Measure the Universe

Henrietta Leavitt, Cepheid Stars and
the Magellanic Clouds

MONDAY, SEPTEMBER 25
2:30–5PM
CAA-211

PANEL DISCUSSION

Beyond the Horizon: Navigating the Radical Landscape of AI

WEDNESDAY, SEPTEMBER 27
3–4:30PM

Hybrid event: Attend in person in LI-8
or <https://tinyurl.com/Wignall-Talk-NavigatingAI>

LECTURE

Evolutionary Ecology

Juniper Harrower &
Benjamin Wong Blonder
with Professor Chamberlain

MONDAY, OCTOBER 2
9:30–10:30AM
WH-142

PERFORMANCE

Theatre + Art: The Burlesque Astronomy Play Stage Reading

WEDNESDAY, OCTOBER 4
12:30–3PM

Planetarium

FREE tickets:

[www.tix.com/ticket-sales/
chaffeyboxoffice/5569](http://www.tix.com/ticket-sales/chaffeyboxoffice/5569)

PANEL DISCUSSION

Am I? Unveiling the Illusion of Individuality

TUESDAY, OCTOBER 10
10:30AM–12:30PM
CAA-218

WORKSHOP

Día de los Muertos: Make Your Own Calaveras

WEDNESDAY, OCTOBER 11
12–2PM
CAA-210

WORKSHOP

Shades of Blue: Improvising with Cyanotype

WEDNESDAY, OCTOBER 18
12:30–2:30PM
CAA-210

WORKSHOP

What is SI and How Do I Apply?

WEDNESDAY, OCTOBER 25
12:30–2PM
Online event: via Zoom
<https://tinyurl.com/SI24-InfoSession>

WORKSHOP

Drop-in Zine Making

WEDNESDAY, NOVEMBER 8
12:30–2PM
CAA-210

LECTURE

Hannah Chalew

with Professor MacDonald

WEDNESDAY, NOVEMBER 8
5:30–7:30PM
HS-143

PERFORMANCE

Music + Art

MONDAY, NOVEMBER 13
12:30–2PM
Wignall Museum of Contemporary Art

Please visit our website www.chaffey.edu/wignall for more information
about our programs. All programs are free and open to the public.

Juniper Harrower, "Botanical Entanglements," 2022. Silk, ink, cochineal dye.
42 x 15 inches each. Collaborative research with Benjamin Blonder's UC Berkeley lab.

David Bowen
Hannah Chalew
Catherine Chalmers
Maru García
David S. Goodsell
Lia Halloran
Juniper Harrower
Elizabeth Hénaff
Karey Kessler
Laura Splan

DAVID BOWEN

David Bowen's work, *46°41'58.365" lat. -91°59'49.0128" long. @ 30m.* refers to the source location where the water surface data was collected for this series. An autonomous aerial vehicle hovering 30 meters above Lake Superior captured still images of the water's surface. For this series of five, the vehicle was deployed to the same location on different days and in different weather conditions. The collected images were converted into three-dimensional models using open-source software. The models were then carved with a CNC router into a series of clear acrylic cylinders. This process captured the dynamic movements of the waves and ripples from a specific time and location and suspended this ever-changing water pattern into a static transparent form.

David Bowen is a studio artist and educator whose work has been featured in exhibitions at ZKM, Karlsruhe, Germany; Fundación Telefónica, Madrid, Spain; Eyebeam, New York, NY; Ars Electronica, Linz, Austria; BOZAR, Brussels, Belgium; Science Gallery, Dublin, Ireland; Itau Cultural, São Paulo, Brazil; Laboral Centro de Arte y Creación Industrial, Gijón, Spain; The Israel Museum, Jerusalem, Israel; The Cranbrook Museum of Art, Detroit, MI; Intercommunication Center, Tokyo, Japan; and Centre for Contemporary Culture, Barcelona, Spain. He is currently an Associate Professor of Sculpture and Physical Computing at the University of Minnesota – Twin Cities, Minneapolis, MN.

www.dwbowen.com
[@davidbowenart](https://www.instagram.com/davidbowenart)



David Bowen, *"46°41'58.365" lat. -91°59'49.0128" long. @ 30m."* 2014.
CNC carved acrylic. 6 x 6 x 6 inches each.

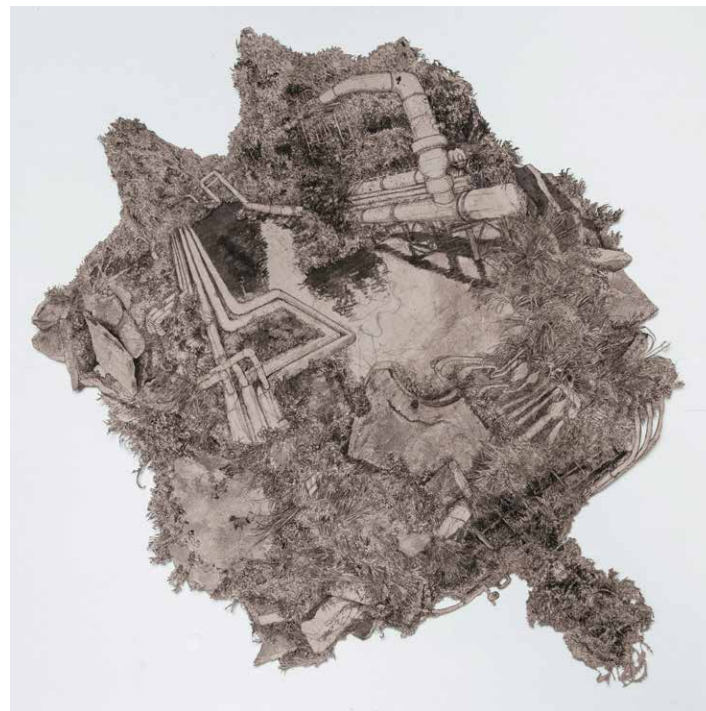
HANNAH CHALEW

Hannah Chalew is an artist, educator, and environmental activist raised and currently working in New Orleans, LA. Her artwork explores what it means to live in a time of global warming with a collective uncertain future, and specifically what that means for those living in Southern Louisiana. Her practice explores the historical legacies that got us here to help imagine new possibilities for a livable future. Since 2018, she has sought to divest her studio practice from fossil fuels as much as possible through the materials she uses (choosing recycled, free, and sustainable materials); by powering her artworks and studio practice with renewable resources like solar power and rain-water harvesting; and by traveling by bike to and from her studio.

Chalew received her BA from Brandeis University, Waltham, MA in 2009, and her MFA from the Cranbrook Academy of Arts, Bloomfield Hills, MI in 2016. Chalew has exhibited widely around the United States. Her work has been featured in *Garden&Gun*, *BOMB*, *Hyperallergic*, *Burnaway*, *Los Angeles Times*, and the *Boston Globe*. Chalew's work is included in two creative atlases by writer and activist Rebecca Solnit: *Unfathomable City: A New Orleans Atlas*, co-authored with Rebecca Snedeker; and *Nonstop Metropolis: A New York City Atlas*, co-authored with Joshua Jelly-Schapiro. In 2021, she received a Monroe Research Fellowship from Tulane University, New Orleans, LA to create ink from fossil fuel pollution in collaboration with fence-line communities in Southern Louisiana. She also received grants to support this project from the Puffin Foundation, Teaneck, NJ; and Platforms Fund, New Orleans, LA. She is the 2022 South Arts Southern Prize winner as well as the South Arts Louisiana State Fellow.

www.hannahchalew.com

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Hannah Chalew, "Solastalgia," 2018. Pen and ink on paper made from trash and abaca. 84 x 84 x 2 inches.



Hannah Chalew, "Study for Structural Trap," 2021. Iron oak gall ink, ink made from shells on paper made from sugarcane combined with shredded disposable plastic waste ("plasticane"). 33 x 25 inches.

CATHERINE CHALMERS

Catherine Chalmers refers to herself as an artist. But, perhaps it is more accurate to say she is part of an art collective. She never works alone. Her colleagues just don't happen to be human. Early on she raised her collaborators in the studio, fed them, and housed them. The dialogue was between her and the cockroach, her and the praying mantis. But, with the Leafcutters project, the exchange is between her and millions of wild ants.

Her work is at the intersection of art, science, and nature. She does extensive research for each long-term multimedia project. Direct engagement with the natural world is central to what she does. Chalmers's work aims to give form to the richness, as well as the brutality and indifference that often characterize our relationship with animals.

She uses the narrative possibilities of the visual arts to bridge the increasing rift between humanity and the ecosystem and to creatively engage with the systems that support life on Earth. Our culture is far richer with the consideration and inclusion of other life forms.

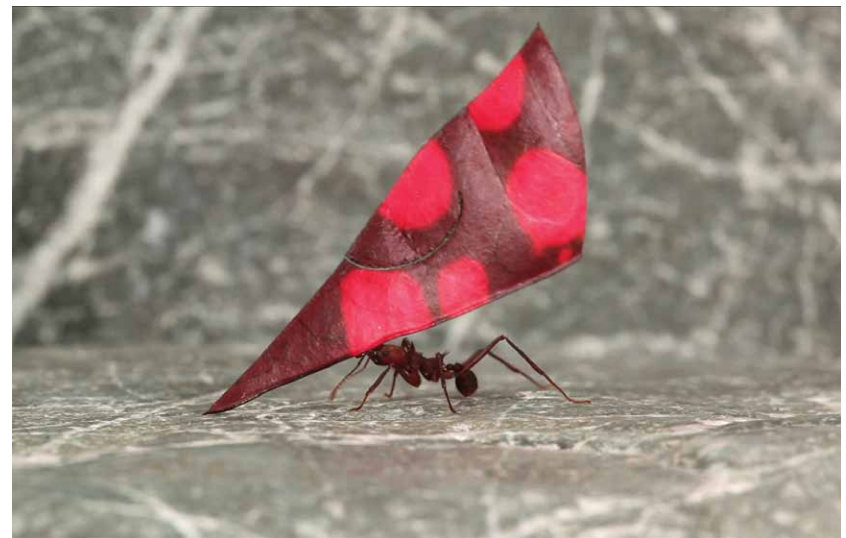
She has worked with a variety of mediums, from engineering to painting, photography, video, sculpture, and drawing, yet her artistic career has been focused on one central issue, how to confront and challenge our anthropocentric point of view. Humanity has been drawing lines in the sand forever, defining what is in and what is out. Maybe now, at the dawn of the Anthropocene, is a good time to reconsider those lines and what lives on the other side.

Chalmers holds a BS in Engineering from Stanford University, Palo Alto, CA, and an MFA in Painting from the Royal College of Art, London, United Kingdom. She has exhibited her artwork around the world, including: MoMA P.S.1, Queens, NY; MASSMoCA, North Adams, MA; The Drawing Center, New York, NY; Kunsthalle Vienna, Austria; and Today Art Museum, Beijing, China. Her work has been featured in the *New York Times*, *The New Yorker*, *Washington Post*, *The Brooklyn Rail*, *Time Out New York*, *ArtNews*, *Artforum*, and on PBS, CNN, NPR, and the BBC. Two books have been published on her work: *Foodchain: Encounters Between Mates, Predators, and Prey* (Aperture, 2000) and *American Cockroach* (Aperture, 2004). Her video *Safari* won Best Experimental Short at SXSW Film Festival in 2008. In 2010, Chalmers received a Guggenheim Fellowship and in 2015 she was awarded a Rauschenberg Residency. From 2016-2018 she was a Fellow at the Center for Art & Environment at the Nevada Museum of Art, Las Vegas, NV. In 2018 she created

the course "Art & Environmental Engagement" and taught it at Stanford University, Palo Alto, CA. Her video *Leafcutters* won Best Environmental Short at the 2018 Natourale Film Festival, Wiesbaden, Germany; in 2019 it won the Gil Omenn Art & Science Award at the Ann Arbor Film Festival, Ann Arbor, MI. She lives in New York, NY.

www.catherinechalmers.com

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Catherine Chalmers, still from "Leafcutters," 2017. Video. 17:26 minutes.

MARU GARCÍA

Maru García is a Mexican, LA-based artist/chemist working across art + science + environment. Her methodology combines laboratory and fieldwork tools from her background in plant chemistry and the pharmaceutical industry. Her use of media includes research, installations, performance, sculpture, and video, usually with the presence of organic matter to help understand the biological processes occurring in complex systems. Her areas of interest are biosystems, multispecies relations, and the capacity of living organisms (including humans) to act as remediators in contaminated sites. Her work highlights the importance of eco-aesthetics, in which relations are proposed as ways of building cultures of regeneration. At the same time, she questions the ways science and technology have influenced humans and more-than-humans within the natural world.

García has participated in conferences, and exhibitions in North America, Europe, and Asia. She was an artist in residence in the National Center of Genetic Resources in Mexico and has received awards from the New York Foundation for the Arts 'Anonymous Was a Woman Environmental Art Grant', the California Environmental Protection Agency (CalEPA) Environmental Justice Grant, the California Arts Council, Los Angeles Sustainability Collaborative, Clifton Webb Scholarship for the Arts, and Fundación Jumex. She collaborated with the Art-Sci Center and Counterforce Lab at University of California, Los Angeles, and was a 2020- 2021 Sci-Art Ambassador for Supercollider. She worked at the Getty Research Institute, Los Angeles, CA in the 2019-2020 Scholar program titled "Art and Ecology" and was a 2021-2022 artist in residence at 18th Street Arts Center, Santa Monica, CA.

Currently, she is a Getty Foundation grant recipient for the exhibition "Sink: Places We Call Home" with Self Help Graphics & Art, Los Angeles, CA to be presented in the Pacific Standard Time Art x Science x LA in 2024. She is an Associate Research Scientist in Mineral Sciences at the Natural History Museum of Los Angeles County, Los Angeles, CA. She is the founder of Biomedica Studio and Prospering backyards. Maru holds an MFA in Design & Media Arts from University of California, Los Angeles, as well as an MS in Biotechnology and a BS in Chemistry both from Tecnológico de Monterrey, México.

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Maru García, "Vacuoles: Bioremediating Cultures," 2019. Installation with video and twenty-nine ceramic pieces containing lead-contaminated soil. Dimensions variable.

DAVID S. GOODSSELL

David S. Goodsell is a scientist and artist who divides his time between research in computational biology and the creation of new materials for science outreach. He currently has a joint appointment at two institutes. As Professor of Computational Biology at the Scripps Research Institute, La Jolla, CA, he is developing methods for modeling the molecular structure and function of entire bacterial cells, HIV, and SARS-CoV-2. As Research Professor at Rutgers University, New Brunswick, NJ, he acts as Scientific Outreach Lead at the RCSB Protein Data Bank, where he is creating educational materials for exploring molecular and cellular structure. This includes the "Molecule of the Month," a popular column for general audiences that presents the molecular mechanisms of fundamental biology, health and disease, and bioenergy.

In his watercolor paintings, he works at a level of biological scale that is largely invisible, making artistic visualization a central tool for intuition and understanding. His illustrations integrate information from many sources, building up a picture of what we might see if we could look into a living cell and view it at the molecular level. As part of this work, he has always enjoyed a vigorous dialog with scientists, helping them interpret their own results and see them in a large context, and updating his own work as sources of information go out of date and are supplanted with new scientific discoveries.

ccsb.scripps.edu/goodsell
[@dsgoodsell](https://twitter.com/dsgoodsell) (Twitter)



David S. Goodsell, "Coronavirus," 2020.
Watercolor on paper. 20 x 20 inches (framed).



David S. Goodsell, "Phage-based COVID-19 Vaccine," 2020.
Watercolor on paper. 20 x 20 inches (framed).

LIA HALLORAN

Lia Halloran began a new body of work titled *Your Body Is a Space That Sees* in 2015. This work consists of a series of large-scale cyanotypes that present the history and discoveries of a group of women known as “Pickering’s Harem,” or later as the “Harvard Computers.” Working at the Harvard Observatory from the late 1800s through the first half of the 20th century, the members of this group made significant strides in the field of astronomy through the use of photographic glass plates, establishing classification systems for the size, brightness, and chemical content of stars. The contributions of these women were highly impactful, yet they have been largely excluded from the common history of astronomy.

The works in the series offer the experience of a female-centric catalog of stellar objects in immersive cyan blue and visually illuminate the curiosity and richness of the night sky through depictions of craters, comets, galaxies, and nebula. Halloran’s cyanotypes are created through a process of painting and printing, beginning with visual cues from the “Computers” research. Translations of stellar objects are painted on semi-transparent film and then placed on top of paper coated with light-sensitive emulsion. The film and paper are then exposed to direct sunlight. This process results in the production of two related works: a cyanotype print of the positive image in equal scale to its matching painted negative, both created without the use of a camera.

For the past fifteen years, Lia Halloran’s practice has been in dialogue with science and nature, and discusses topics such as astrophysics, magnetism and gravity, perception and scale, cabinets of curiosity, taxonomy and classification, the periodic table of elements, and interconnected relativity. Halloran has participated in several interdisciplinary projects and collaborations including curating exhibitions, creating platforms for critical dialogue on contemporary art, and establishing connections between science and art. Most notably she co-authored a forthcoming book with the Nobel Prize-winning theoretical physicist Kip Thorne about the warped side of the universe. Her series *Deep Sky Companion*, which reinterprets the 18th-century French comet hunter Charles Messier’s “Catalogue of Deep Sky Objects” in 110 paintings and their 110 photographic twins, is on permanent display at the Cahill Center for Astronomy and Astrophysics at California Institute of Technology, Pasadena, CA.



Lia Halloran, “*Magellanic Clouds, After Henrietta Swan Leavitt*,” 2016.
Cyanotype on paper from painted negative (edition 1/2). 46 x 76 inches (framed).
Courtesy of the artist and Luis De Jesus Los Angeles.

Halloran lives and works in Los Angeles, CA. She received her MFA from Yale University, New Haven, CT, and BFA from the University of California, Los Angeles. Her work is in the collections of the Solomon R. Guggenheim Museum, New York, NY; Escalette Permanent Collection of Art, Chapman University, Orange, CA; Simons Foundation, New York, NY; Capital Group, Los Angeles, CA; Progressive Art Collection, Mayfield Village, OH; Microsoft Art Collection, Redmond, WA; and Fidelity Investments Corporate Art Collection, Boston, MA, among others.

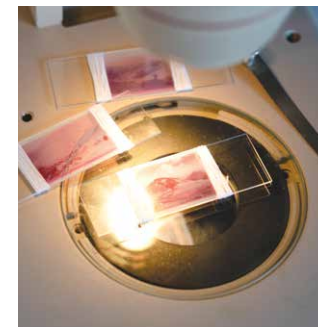
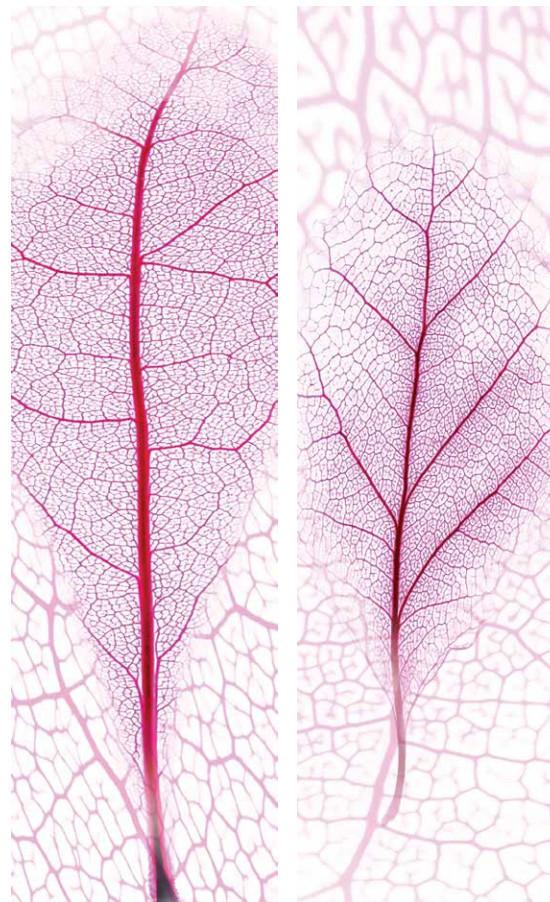
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JUNIPER HARROWER

Dr. Juniper Harrower works at the intersection of ecology and art, specializing in multispecies entanglements under climate change. Through a multimedia art and science research practice, she considers the ways that humans influence ecosystems while seeking solutions that protect at-risk species and promote environmental justice. *Botanical Entanglements* is a multimedia, research-based artwork that illuminates embedded histories in plant form. With this work, Harrower is interested in the localized ecologies of plants in her neighborhood and how we can cultivate a community awareness of plants. She asks, what are the roles that plants play in forming our identities and how do we in turn influence their ways of living? How have colonialism and development impacted these multispecies relationships?

Plants are alchemists that create substance from sunlight, CO₂, and water, sensing and responding to the changing environments around them. As an artist-in-residence with Benjamin Blonder's plant ecology lab at University of California, Berkeley, Harrower studied the patterns of leaf veins within local medicinal plants and the stories those veins share about plant evolution and tradeoffs. Working at the lab, she decayed leaves and stained them with cochineal - an insect dye with complicated colonial histories - to visualize deep plant evolution through leaf vein patterns. The tiny leaves are magnified at a large scale but then blurred at the edges to recover some anonymity back to the plant as we look at each individual leaf. At this expanded size, the silks become portals. The leaves take on the presence of temple guardians, suggesting passageways between time and form. These patterns become circulatory systems, networks, and modes of wayfinding. We are then invited to turn our gaze towards human disruptions and their landscape effects by peering into the settler history of the land that is now the location of Chaffey College, Rancho Cucamonga, CA, rendered in miniature under the microscope. Instead of becoming sharper, the image breaks into dots under magnification, a distortion of these histories. The confusion of scales between small leaves expanded large and large landscapes made small encourages a shifting of focus from human stories to plant lives.

As we stand before the complicated majesty embedded in plant form, and perhaps sense some slippage between science and mysticism, we might seek guidance from our plant kin to better understand the potential for multispecies relationships on a changing planet. We might look to these beings as oracles of planetary secrets, finding ways to both uncover the past but also read the future through the leaves.



Juniper Harrower, "Gazing on the Past," 2023. Microscope slide, ink, Rancho Cucamonga digitally altered historic image, cochineal dye, silk string. 1 x 4 inches. Historic image credit: Paul Hofer, III.

◀ Juniper Harrower, "Botanical Entanglements," 2022. Silk, ink, cochineal dye. 42 x 15 inches each. Collaborative research with Benjamin Blonder's UC Berkeley lab.

Harrower received a Ph.D. in plant ecology from University of California, Santa Cruz, an MFA in art practice from University of California, Berkeley, and a teaching credential focused on education for multicultural classrooms. Her award-winning work has been exhibited nationally and internationally in museums and galleries and her research and artistic products have received wide exposure in popular media such as *National Geographic*, *Kunstforum International*, *KCET Artbound*, *Atlas Obscura*, the associated press, podcasts, music festivals, and conferences. Harrower founded and directed the art+science initiative at University of California, Santa Cruz, has taught art at University of California, Berkeley, and is Assistant Professor of Studio Art at Reed College, Portland, OR. She is a first-generation community college transfer student and believes that community colleges are a critically important resource for education equity.

www.juniperharrower.com @juniperharrower

ELIZABETH HÉNAFF

Dr. Elizabeth Hénaff holds a BS in Computer Science, a Master's in Plant Biology and a Ph.D. in Bioinformatics. She is a computational biologist with an art practice whose research focuses on the ubiquitous and invisible microbial component of our environment. This inquiry has produced a body of work that ranges from scientific articles in peer-reviewed journals to projects with landscape architects, to artworks shown nationally and internationally. Some recent artworks include commissions for the Storefront for Art and Architecture, New York, NY; the Detroit Science Gallery, Detroit, MI; and the Okayama Art Summit, Okayama City, Japan. Using New York City as a living laboratory, her research group at New York University Tandon School of Engineering investigates microbial metrics in urban environments, with a focus on anthropogenic change. Research directions include the engineering of green wall infrastructure, remediation of Superfund sites, and the impact of street-level flooding on urban microbial diversity. She holds an Assistant Professor position at New York University, New York, NY at the NYU Tandon School of Engineering in the Department of Technology, Culture, and Society where she teaches courses in Biodesign.

Molecular biologists have long used paper substrates as a medium to exchange DNA between laboratories: pipetting a few microliters onto filter paper, letting it dry, and mailing it to a far-away collaborator. Gene exchange is also common between microbes, where a single-cell organism can absorb free DNA from its environment, for example, released from another cell upon its death. This project aims to use this paper-based technique to allow exchange between distant microbiomes. Zines are informal, underground publications that have focused on social and political activism, musical genre subcultures, and radical trends. In these three editions of the GENE ZINE, DNA from a given environment has been blotted onto the paper publication, and its human reader is instructed to tear it out and embed it in the soil in need for remediation. Thus, the local microbiome can absorb and adopt functions of the other, whether it be bioremediation from the urban Superfund site the Gowanus Canal, aquatic adaptation from an ancient moat in Japan, or the microbes collected by honeybees. When most scientific instrumentation establishes hierarchies of control, this project aims to create a collaborative relationship with microorganisms as a key to living in the Anthropocene. Indeed, these organisms are the most capable of adapting to our rapidly changing planet and the damage humans have wrought. Borrowing from practices in molecular biology and the tradition of zines as small-scale publications, GENE ZINE is a genomic note from the underground serving the subculture of multispecies collaboration.

elizabeth-henaff.net @ehenaff



Elizabeth Hénaff and Living Interfaces Lab, "GENE ZINE: Holobiont Urbanism," 2023. Risograph print on cardstock. 8.5 x 11 inches (flat).



Elizabeth Hénaff, "GENE ZINE: Gowanus," 2018. Block print on watercolor paper. 8.5 x 11 inches (flat).

KAREY KESSLER

Karey Kessler creates map-paintings that contain ideas about physical places, but also spiritual, internal, and temporal spaces as well. They explore the entangled ways in which our minds, time, and place are deeply interconnected. Using traditional fine art materials such as watercolor, ink, stencils, stamps, and freehand writing Kessler's map paintings tell a story of emotional vulnerability in the face of the urgency of the climate crisis, the humbling expanse of geologic time, and the vastness of the cosmos.

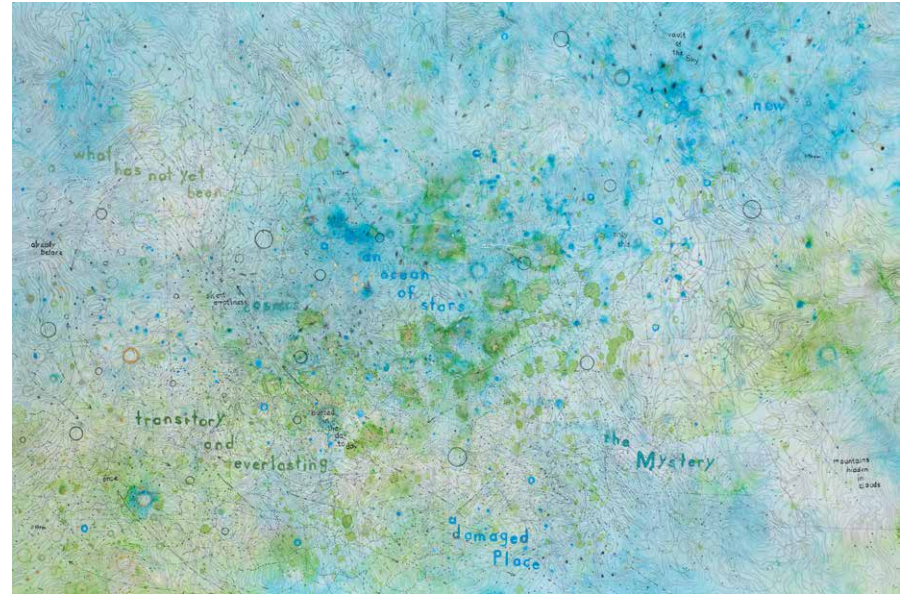
Much of her work explores feelings of "Solastalgia," which means grief or distress for the vanishing wilderness and for environmental destruction. According to many geologists, human activity has become as powerful as a geological force, and it feels like we are wandering without a map to tell us what to do about the environmental changes happening around us. Kessler's maps help guide her, and hopefully others, through the uncertainty of this moment.

Kessler received her BA in Anthropology and Fine Arts from the University of Pennsylvania, Philadelphia, and an MFA from the Pennsylvania Academy of Fine Arts, Philadelphia. Her work can be seen in the flat files of the Pierogi Gallery, New York, NY; and is included in the books: *The Map as Art* by Kitty Harmon (Princeton Architectural Press, 2009), *From Here to There: A Curious Collection From the Hand Drawn Map Association* (Princeton Architectural Press, 2010), *The Embodied Forest* (ecoartspace, 2021), and in *Le Paysage est une traversée* (Editions Parentheses, 2020). Her work was also included in *Orion Magazine* in 2021.

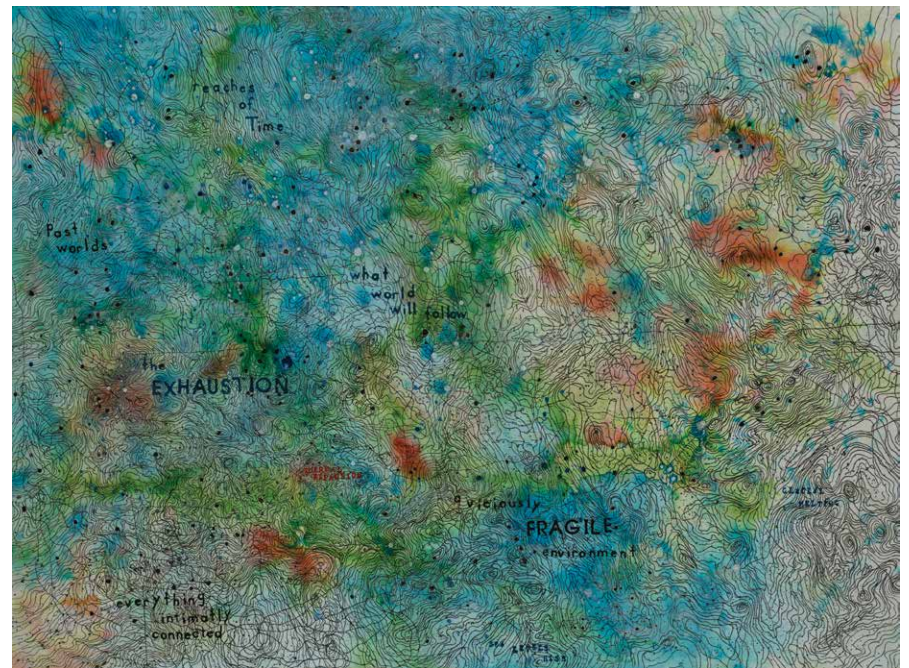
In early 2022, Meta Open Arts commissioned her to create a mural at the Meta Reality Labs in Redmond, WA. In 2020, her work was included in *Time Sensitive* at the Broto: Art-Climate-Science convention, Provincetown, MA. In 2019, she participated in the SciArt Initiative Bridge Residency. Kessler has shown her work widely, including exhibits at the Pennsylvania Academy of Fine Arts Museum, Philadelphia; the Weatherspoon Art Museum, Greensboro, NC; the Katonah Museum of Art, Katonah, NY; and the Bellevue Art Museum, Bellevue, WA.

From 2018-2020, Kessler had a temporary public art piece, *A Path of Wonderment and Connection*, along the new Rainier Valley Greenway in Seattle, WA as part of *Art Interruptions*, and an installation at the Tacoma Tollbooth Gallery in Tacoma, WA. She is currently a member of Shift Gallery in Seattle, WA, and her work can be seen in the online registry of White Columns Gallery, New York, NY.

kareykessler.com @kareykessler



Karey Kessler, "The Mystery," 2022. Watercolor and ink on Hanji paper on panel. 24 x 36 inches.



Karey Kessler, "A Viciously FRAGILE Environment," 2022. Watercolor and ink on Hanji paper on panel. 30 x 40 inches.

LAURA SPLAN

Tangible Variations is a series of woven scientific visualizations generated from computational biology simulations. The weavings, created in collaboration with theoretical biophysicist Adam Lamson, explore the emergence of abstraction and noise in material translations of computational representations of the molecular world. Types of visualizations in the series include Hi-C maps, which visualize molecular interactions at a single point in time, and kymographs, which aggregate interactions over the entire duration of a simulation. The patterns of the woven contact maps show interactions among nucleosomes as the structure of chromatin reconfigures. Chromatin is a complex of DNA, RNA, and protein that is found in the nucleus of eukaryotic cells and is responsible for packaging and organizing the genetic material of a cell. The changing configuration of chromatin over time has important implications for gene expression, epigenetics, disease, and evolution. Simulations of chromatin configurations can be run with biophysical models from which contact map visualizations can be inferred. Contact maps are used by scientists to reveal changing structural features of chromatin such as interactions between DNA wound around the nucleosomes. They can reveal how a genome is organized and show how likely two parts of the genome are to be close to one another. Adam Lamson generates simulated contact maps (representing different points in time or an ensemble average) from his biophysical models. Variations in patterns among the weavings are the result of different spatial positions of nucleosomes in the simulations that are represented with a spectrum of colors known as color maps. The series incorporates the use of different color maps including “cube helix”, designed by Dave Green of the Astrophysics Group at Cavendish Laboratory. The title, “*Tangible Variations*”, was inspired by the term “intangible variation” also known as “developmental noise”, used to explain the role of external causes such as environmental conditions in phenotypic variation that cannot be attributed to genotype.

Laura Splan is a transdisciplinary artist working at the intersections of Science, Technology, and Culture. She creates conceptually layered artworks that explore the sublime complexity of the biological world while unraveling entanglements of natural and built systems. Her work reframes artifacts of the biomedical landscape with embodied interactions and sensory encounters that leverage tactility, light, and sound. Recent exhibitions have included immersive installations, networked devices, participatory sculptures, and intimately scaled objects created with poetically considered materials. Her research-based studio practice and collaborations with scientists culminate in multimedia exhibitions that engage audiences with the critical issues of our time.



Laura Splan (in collaboration with Adam Lamson).

"Tangible Variations (cube helix): 5000," 2022.

"Tangible Variations (cube helix): 5500," 2022.

"Tangible Variations (cube helix): 6000," 2022.

Cotton computerized Jacquard weaving. 54 x 54 inches.

This work was made possible by the Simons Foundation and created in collaboration with Adam Lamson, Science Collaborator and theoretical biophysicist at Flatiron Institute, a division of the Simons Foundation.

Her artworks have been commissioned by the Centers for Disease Control Foundation, Atlanta, GA; and the Bruges Triennial, Bruges, Belgium. Her work has been exhibited at the Museum of Arts & Design, New York, NY; Pioneer Works, New York, NY; and New York Hall of Science, New York, NY. Her work is represented in the collections of the Thoma Art Foundation, Chicago, IL; the Chan Zuckerberg Initiative, Redwood City, CA; and the Berkeley Art Museum, Berkeley, CA. Reviews and articles including her work have appeared in *The New York Times*, *Wired*, *Discover*, *American Craft*, and *Frieze*. She has been featured in profiles and interviews on *Science Friday* and *Voice of America*. Publications featuring her artwork include *The Routledge Companion to Biology in Art & Architecture*, and *Life Eternal* published by The Nobel Prize Museum. Splan's research and residencies have been supported by the Simons Foundation, NEW INC at the New Museum, Jerome Foundation, uCity Science Center, and the Pollock-Krasner Foundation. She lives and works in Brooklyn, NY.

www.laurasplan.com

[@laurasplan](https://www.instagram.com/laurasplan)

CURATORS

JOANN EISBERG fell in love with astronomy when she had the opportunity to study its history and to see how the ideas captured between the covers of science textbooks grew out of the actions of real people exploring nature. She earned her Ph.D. in the History of Astronomy at Harvard University, Cambridge, MA. Currently, she is Professor of Astronomy at Chaffey College, Rancho Cucamonga, CA. She is especially interested in the search for exoplanets and life in the universe, as well as issues of equity and diversity in science, the role of science in modern society, and science teaching and outreach. She has been a Chaffey College Faculty Lecturer of the Year, Co-Editor of a special issue of *New Astronomy Review* entitled *Kepler Exoplanet "Firsts,"* and Administrative Director of the University of Wisconsin System's Women in Science Program. She has observed two total solar eclipses and hopes again in 2024 to stand in the shadow of the Moon.

ROBIN IKEDA earned her BA and MS in Biology at University of California, Riverside. She is an Emeritus Professor of Biology at Chaffey College, Rancho Cucamonga, CA, who spent her 38-year career introducing high school and college students to the wonder of nature and the power of science to guide our understanding of it. Her broad research interests hew towards evolutionary ecology, her field work focuses on species and habitat monitoring, and she continues to support student learning through volunteer work at Chaffey College.

MARK PADILLA started at Chaffey College, Rancho Cucamonga, CA, as a student and worked his way to a Master's and Ph.D. in Particle Physics in 2012 at University of California, Riverside. Mark worked in the industry a bit while teaching part-time at the community college level and fell in love with teaching. He has taught for eleven years and has been full-time for nine years at Chaffey College. Currently, Mark is Coordinator of Astronomy, Physics & Engineering at Chaffey. Mark thoroughly enjoys the educational process and the magic that happens when students understand something they did not understand before.

REBECCA TRAWICK is the Director/Curator at the Wignall Museum of Contemporary Art, a teaching museum located in San Bernardino County on the campus of Chaffey College, Rancho Cucamonga, CA, where she has curated and facilitated exhibitions and public programming since 2002. In addition to the exhibitions she has developed at the Wignall Museum, she has guest-curated exhibitions at the Pelham Art Center, Pelham, NY; Museum of Art & History, Lancaster, CA; and W. Keith & Janet Kellogg University Art Gallery, California State Polytechnic University, Pomona.

OTHER CONTRIBUTORS

We want to give thanks to the following people who provided ideas, concepts, and other expertise to this exhibition in unique and imaginative ways:

Rusul Alansary	Mark Ikeda
Brody Albert	Dave Kary
Benjamin Wong Blonder	Garrett Kenehan
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Angela BurkHerrick	Sheila Malone
Angela Cardinale	Patrick Miller
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Shannon Jessen	Laura Picklesimer
Jim des Lauriers	Lisa Pitts
Jinny Lee	Morgan Rea
Michelle Dowd	David Rentz
Ryan Falcioni	Alan Resnick
Leona Fisher	Hannah Seidler
Sam Gaddie	Andrew K. Thompson
Kimberly George	Louisa Villeneuve
Gwen Gordon	Cindy Walker
Christina Holdiness	Andrew Zwissler
Stanton Hunter	

ASK ART

USING THE MUSEUM TO MAKE CURRICULAR CONNECTIONS

QUESTIONS FOR VIEWING

- If you were the curator of this exhibition, what would you title the exhibition and why?
- Does the theme of “Seeing the Unseen” resonate through the art in the exhibition and your science course? If so, please explain how, using specific details from your course and museum experiences. If not, please explain!
- Science and art are both capable of producing penetrating, piercing, and disruptive insights. And our responses can range from excitement to various forms of discomfort. Did any of the art disrupted, change, or in any way alter your thinking or perspective? Please explain why or why not, using specific details from your museum experiences. If you don’t know, let why be a starting point for discussion, and use specific details from your museum experiences.

- What do artists and scientists do? What are the processes of art and science? What are their similarities? How do they differ?
- What have we gained by compartmentalizing science away from art? What have we lost? What are the risks? Can we explore our knowledge, feelings, and experiences in a more integrated way? If so, how? If not, why not? Please use specific examples from your experience.
- Compare the processes of inquiry, exploration, and discovery of art versus science. Please use specific examples from your museum and course experience. The following excerpts from articles about two of these artists might be helpful.
 - About Chalmers (Hutson 2023): “Perhaps it’s not the ants that rule the rain forest but the fungus.... I’m not a scientist,” Chalmers said. “So I can speculate on these things and just observe and wonder.”
 - About Goodsell (Frumkin, 2020): “When I told Goodsell that I thought his painting of coronavirus was a work of art, he gently reminded me that the illustration is ‘very much tied to science... I always want [the illustrations] to be as accurate as possible, and I want them to help people understand the biological processes that are shown.”

ESSAY PROMPTS

Try to get to know a nearby tree REALLY well. Learn how to identify it. Draw it. Create rubbings using paper and crayons. Smell it, and describe how it feels to your touch. Make detailed notes and drawings of your observations of the tree. Make a map showing where your tree is. Create a poem, an essay, or a work of art inspired by the tree.

- Find a Sci+Art collaborator and exchange “critiques” OR write an essay reflecting on your exploration.
- Explore your thinking around the following questions: Did you draw the objects as you would have for an art class, or for a science class? Would your approach to your drawings, notes, and observations differ for an art, creative writing, or science class? Would these differences in approach (or lack thereof) matter in art, or in science? Would someone else be able to find the tree you studied based on the map you drew? Would that matter in art? Would it matter in science?

Write a well-developed essay in which you compare and contrast two artworks in the exhibition. Analyze key elements such as subject matter, composition, use of color, points of view, themes, etc. Utilize the artist statements in your analysis.



Catherine Chalmers, still from “Leafcutters,” 2017. Video. 17:26 minutes.

ASK ART

USING THE MUSEUM TO MAKE CURRICULAR CONNECTIONS

ACTIVITIES

Sketchbook/Field Notes

- Before entering the exhibition, spend 15-20 minutes just being outside. Focusing as much as possible on nature, try to be aware of all your senses. Write and draw in your field notebook or sketchbook what you see, hear, and touch.
- Your mind will try to reach beyond observing into interpreting, questioning—and daydreaming too. When it does, treat your mind like a cute, mischievous puppy; and bring it back to observing in the here and now. It is common to worry that what you're writing is silly or uninteresting. So long as you are curious, you are totally on track! Keep going.
- After about 20 minutes, reflectively evaluate your notes. Label observations (O); interpretations or attempts at explanation (I), questions (Q), and emotions (E). There is no right or wrong way to explore nature. It is important, though, to be aware of our thoughts and feelings. Because, while observations, questions, and some feelings (especially wonder) can open us to exploration, interpretation or worry can narrow our thinking.
- Now that you've opened yourself to be curious about nature, it's time to explore the work of artists who collaborate with nature and the scientists who study it! Try using the same method of exploration you used with nature. Observe! Write down your observations in your sketchbook or field notebook! Be curious! If questions arise, write them down too! You might find it fun to imagine the artist was standing there and you could ask them about their work: What would you ask?
- Finally, you will notice that information about the artists and their work is posted around the gallery and in the exhibition guide. Lots of folks find that information is helpful for their exploration and understanding.

Inktober events

Inktober events have popped up worldwide. They allow artists of all levels to commit to a 31-day challenge to improve their inking skills and develop positive drawing habits. Commit to one drawing a day, focused on the natural world for a limited amount of time. Or you might try forming digital artwork, sculpture, a piece of music, writing, or something else!

- Some Inktober prompts to get you going may include: Glacier, carbon ring, impact, plankton, acceleration, migration, sugar pine, forestation, water cycle, migration, biological weathering, Baily's Beads, solar system, soil remediation, leaf venation, fungus, ant colony, weather patterns, mapping, molecule, genome, bioremediation, DNA, plant species, lunar eclipse, climate change, forage, gooseberry, waterfall, gravity, fossil fuel, rain harvesting, bird, geologic force, alluvial plain, respiratory droplet, recycle, heatwave. Find more online, or create your own list!

SHARE

- **Create a music playlist** to accompany the exhibition. What would you include and why?
- **Tell a friend**, classmate, instructor, or family member about Seeing the Unseen: Science and Art. Invite them to view the exhibition with you, in person, or online at www.chaffey.edu/wignall.
- **Share your work** of art or field notes on socials:
#seeingtheunseen
#wignallMOCA
#whatsupatthewig
#inktober

ACKNOWLEDGEMENTS

Institutional support for *Seeing the Unseen: Science and Art*, and the Wignall Museum of Contemporary Art is provided by Chaffey College; the Arts, Communication, and Design Academic and Career Community; the STEM Academic and Career Community; the President's Office; and the Chaffey College Foundation.

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Roman Stollenwerk

STUDIO TECHNICIAN AND MUSEUM PREPARATOR VISUAL & PERFORMING ARTS

Andrew Hadle

PRINTING, GRAPHIC & WEB DESIGN

Strategic Communications Office

LAND ACKNOWLEDGMENT

It is our tradition that we acknowledge that Chaffey College is on the ancestral lands of The Kizh and Tongva (Gabrieleño) who remain in the area today. With respect and honor for the lands we gather on and the leaders before us, we would like to take a moment to acknowledge the Gabrieleño-Tongva (GABRIEL-EN-YO TONG-VAH) Peoples, the original stewards of these sacred and unceded homelands. The Tongva people's history, language(s), cultural traditions, and legacy continue to shape this region and we recognize their continuing presence in their homelands.

In the spirit of truth and equity, Chaffey College commits to uplifting the voices of indigenous peoples, and building an inclusive and equitable educational environment, and decolonizing the institution. We also encourage members of the Chaffey College community to learn about the land they reside on and the original caretakers and advocate for culturally responsive action.

MISSION STATEMENT

Chaffey College improves lives and our communities through education with a steadfast commitment to equity and innovation to empower our diverse students who learn and thrive through excellent career, transfer, and workforce education programs that advance economic and social mobility for all.

Installation Images



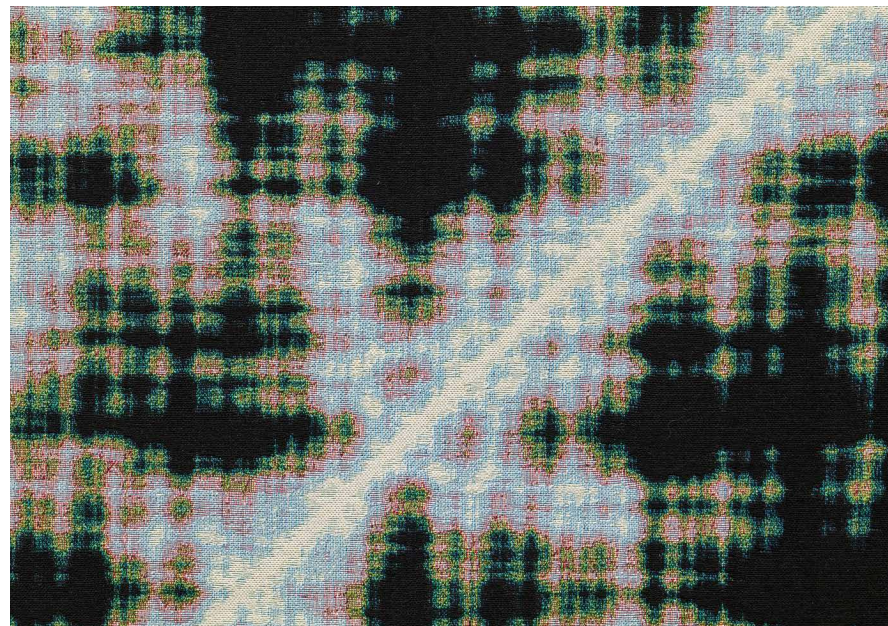
Seeing the Unseen: Science and Art, 2023. Wignall Museum of Contemporary Art at Chaffey College, Rancho Cucamonga, CA.



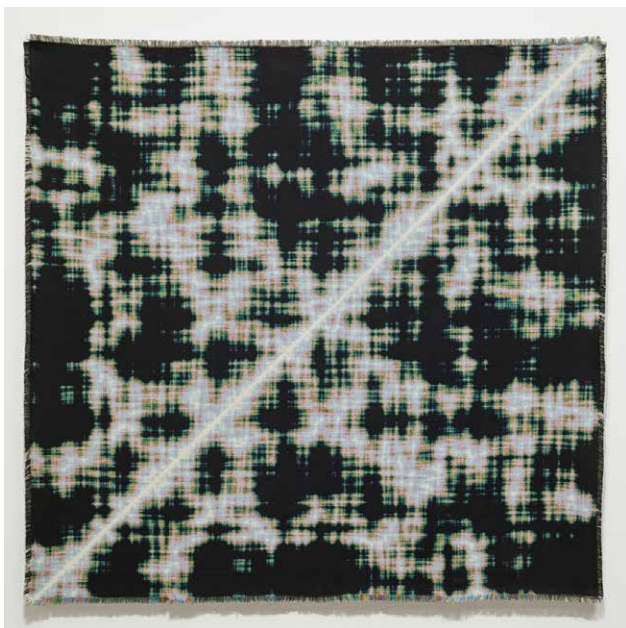
Laura Splan (in collaboration with Adam Lamson), *Tangible Variations, 2022.* Computerized Jacquard cotton weavings. 54 x 54 inches. This work was made possible by the Simons Foundation.



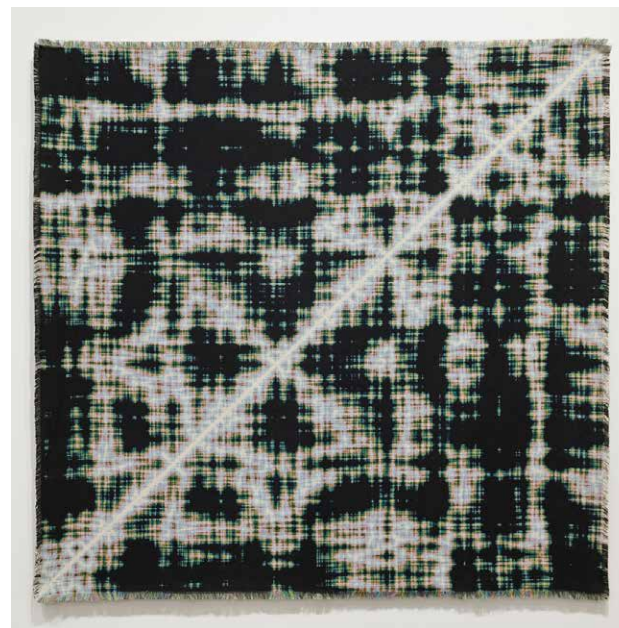
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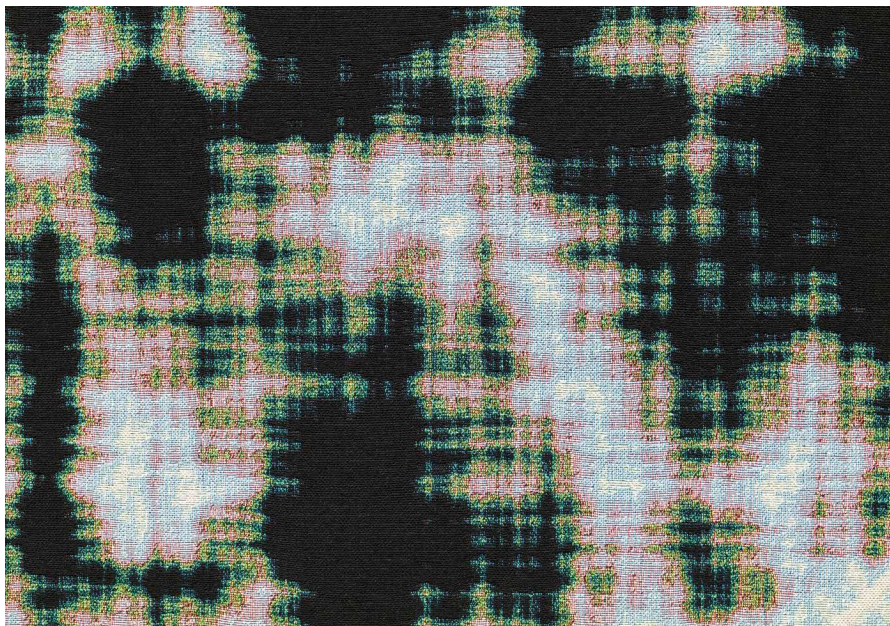
Laura Splan (in collaboration with Adam Lamson), detail of *Tangible Variations (cube helix): 5000*, 2022. Computerized Jacquard cotton weavings. 54 x 54 inches. This work was made possible by the Simons Foundation.



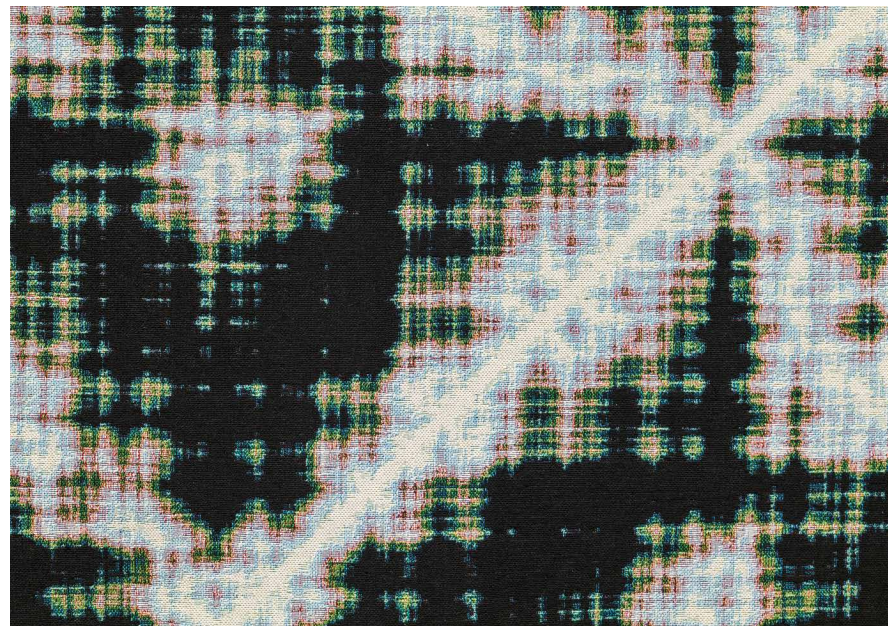
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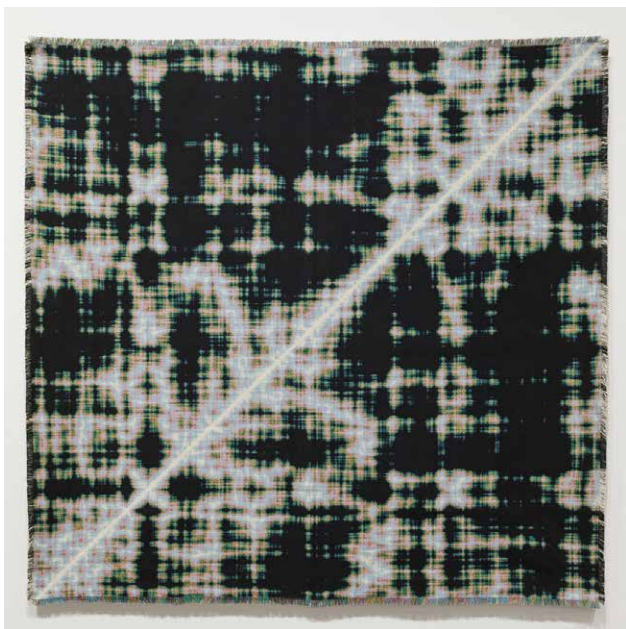
Laura Splan (in collaboration with Adam Lamson), *Tangible Variations (cube helix): 5500*, 2022. Computerized Jacquard cotton weavings. 54 x 54 inches. This work was made possible by the Simons Foundation.



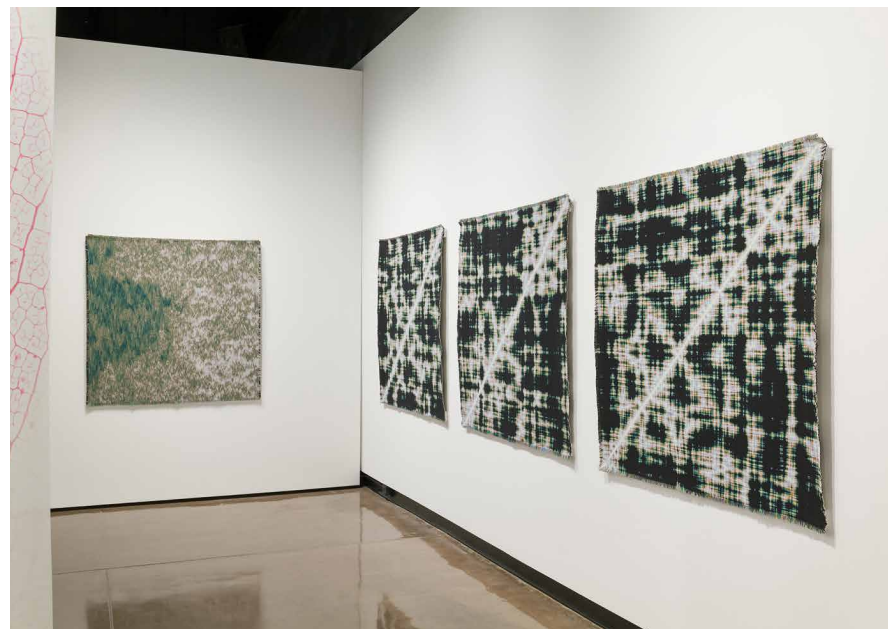
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Laura Splan (in collaboration with Adam Lamson), detail of *Tangible Variations (cube helix): 6000*, 2022. Computerized Jacquard cotton weavings. 54 x 54 inches. This work was made possible by the Simons Foundation.



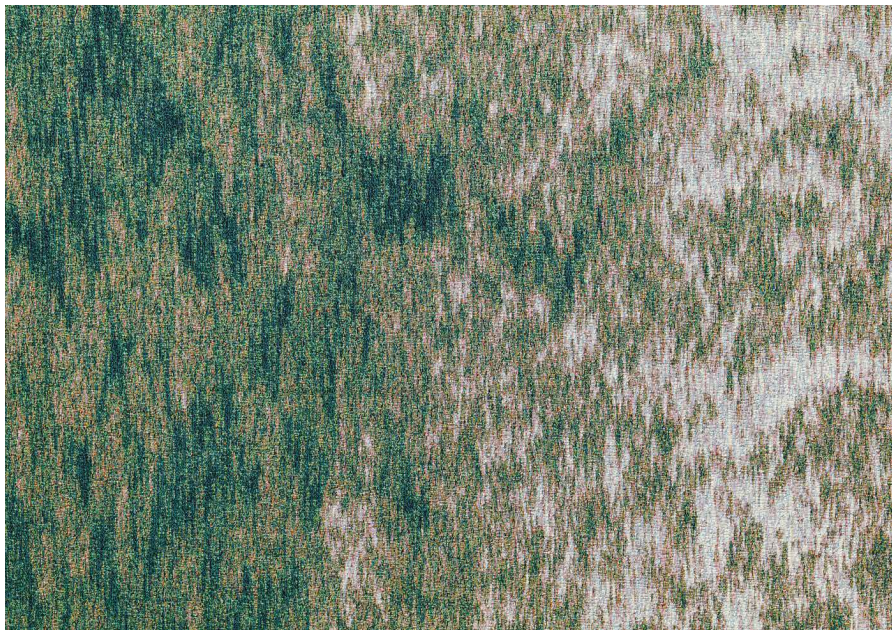
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Laura Splan (in collaboration with Adam Lamson), *Tangible Variations (cube helix): kymograph*, 2022. Computerized Jacquard cotton weavings. 54 x 54 inches. This work was made possible by the Simons Foundation.



Laura Splan (in collaboration with Adam Lamson), detail of *Tangible Variations (cube helix): kymograph*, 2022. Computerized Jacquard cotton weavings. 54 x 54 inches. This work was made possible by the Simons Foundation.



Seeing the Unseen: Science and Art, 2023. Wignall Museum of Contemporary Art at Chaffey College, Rancho Cucamonga, CA. Karey Kessler, 2022. Watercolor and ink on Hanji paper on panel.



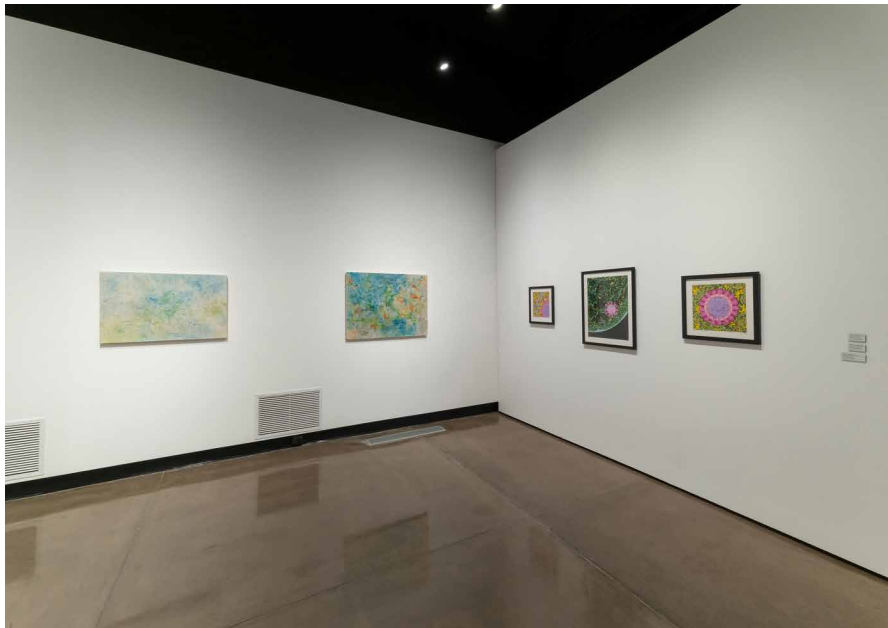
Karey Kessler, *The Mystery*, 2022. Watercolor and ink on Hanji paper on panel. 24 x 36 inches.



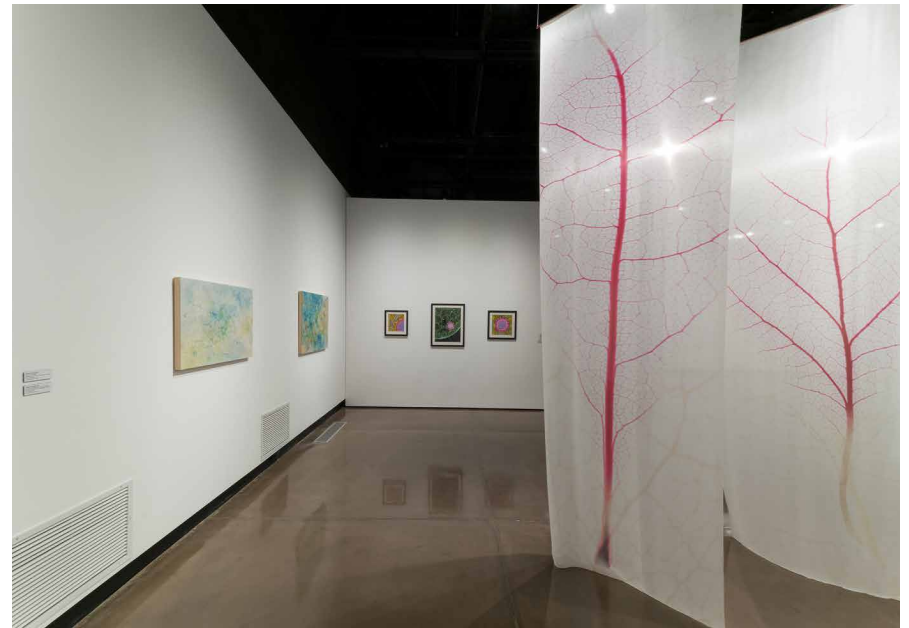
David S. Goodsell, *Coronavirus*, 2020. Watercolor on paper. 20 x 20 inches (framed).



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Juniper Harrower, *Botanical Entanglements*, 2022. Silk, ink, cochineal dye. 42 x 15 inches each. Collaborative research with Benjamin Blonder's UC Berkeley lab.



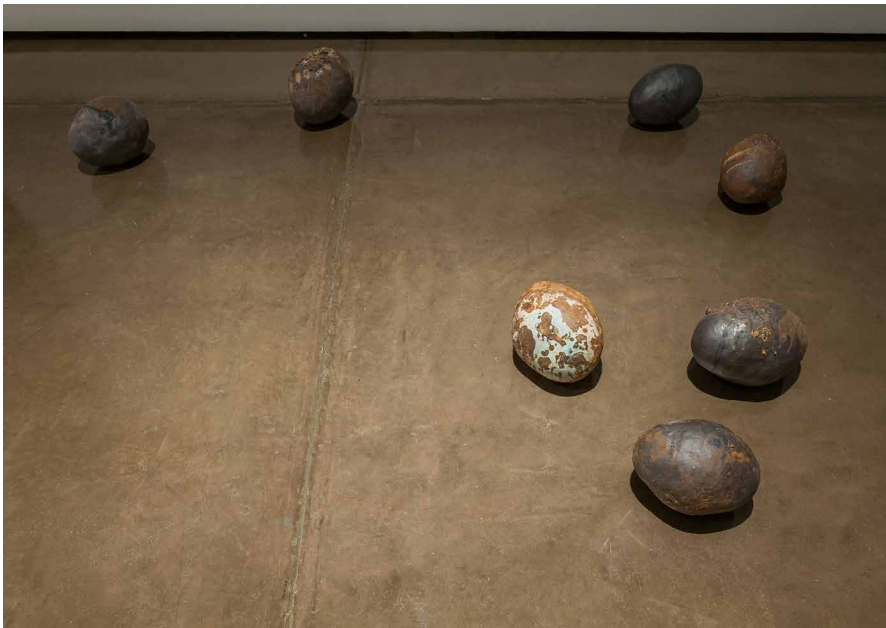
Maru García, *Vacuoles: Bioremediating Cultures*, 2019. Installation with video and twenty-nine ceramic pieces containing lead-contaminated soil. Dimensions variable.



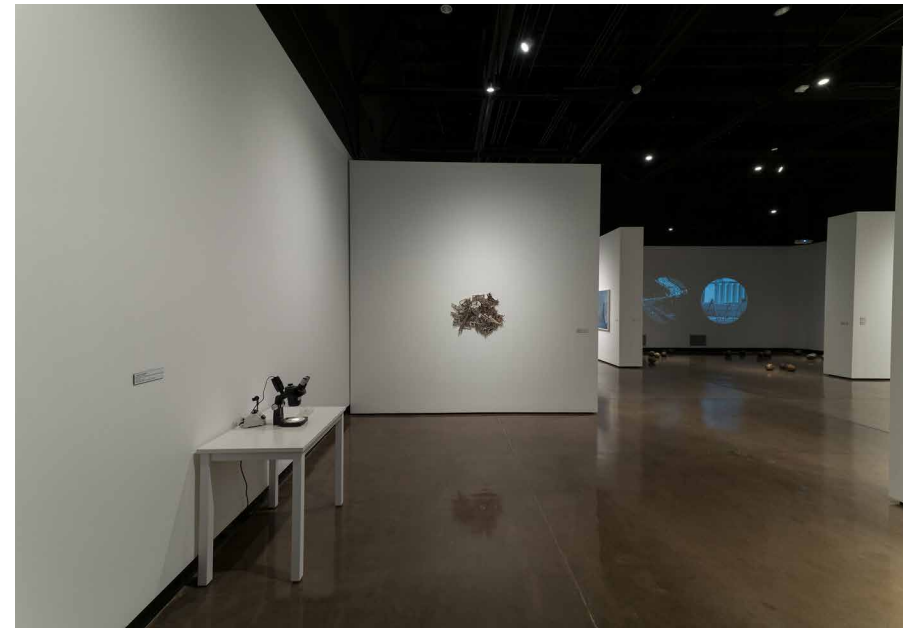
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Seeing the Unseen: Science and Art, 2023. Wignall Museum of Contemporary Art at Chaffey College, Rancho Cucamonga, CA.



Juniper Harrower, *Gazing on the Past*, 2023. Microscope slide, ink, digitally altered historic image of Rancho Cucamonga, cochineal dye, silk string. 1 x 4 inches.



Hannah Chalew, *Study for Structural Trap*, 2021. Iron oak gall ink, ink made from shells on paper made from sugarcane combined with shredded disposable plastic waste ("plasticane"). 33 x 25 inches.



Seeing the Unseen: Science and Art, 2023. Wignall Museum of Contemporary Art at Chaffey College, Rancho Cucamonga, CA.



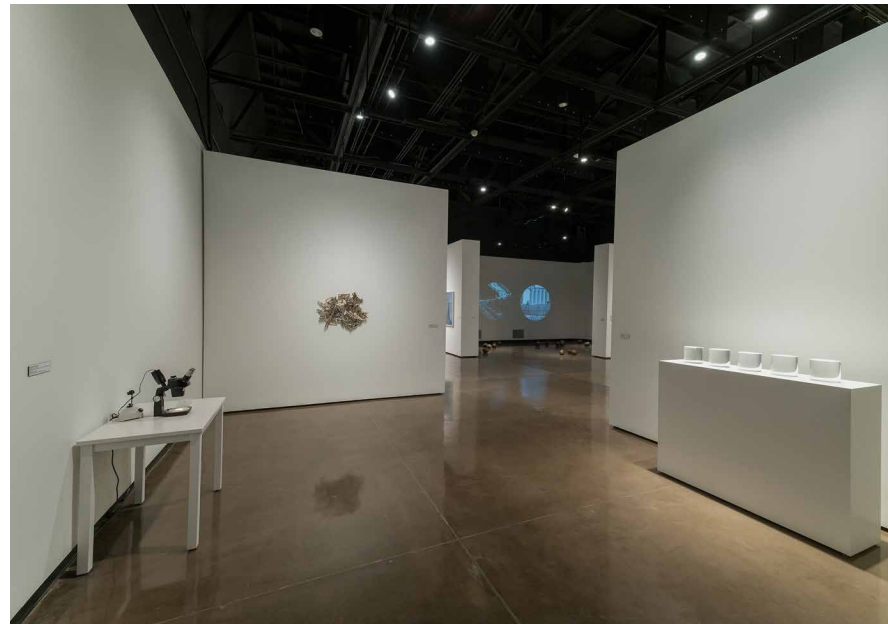
David Bowen, *46°41'58.365" lat. -91°59'49.0128" long. @ 30m.*, 2014. CNC carved acrylic. 6 x 6 x 6 inches each.



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David Bowen, detail of *46°41'58.365" lat. -91°59'49.0128" long. @ 30m.*, 2014.
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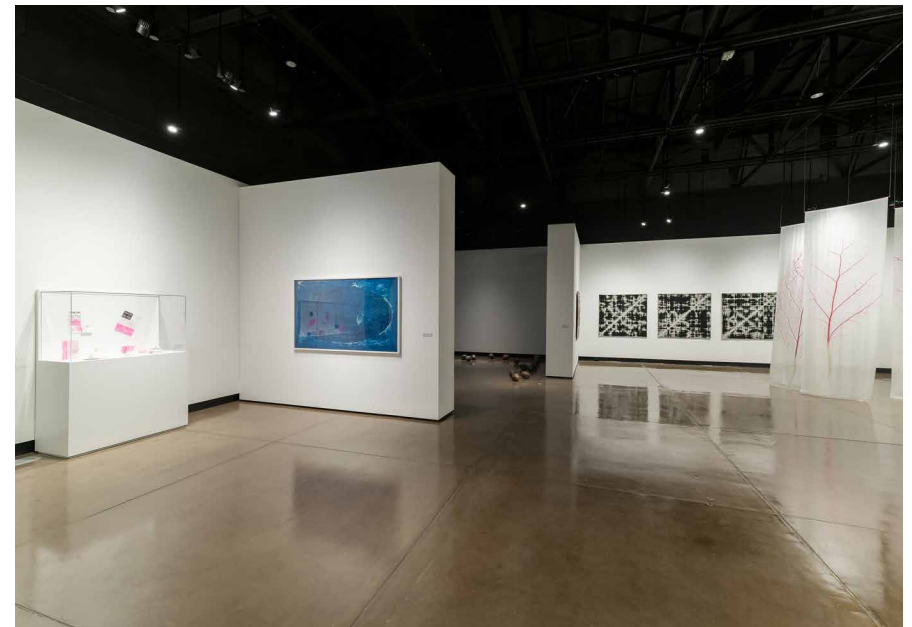
Elizabeth Hénaff and Living Interfaces Lab, *GENE ZINE*, 2018-2023.
8.5 x 11 inches (flat).



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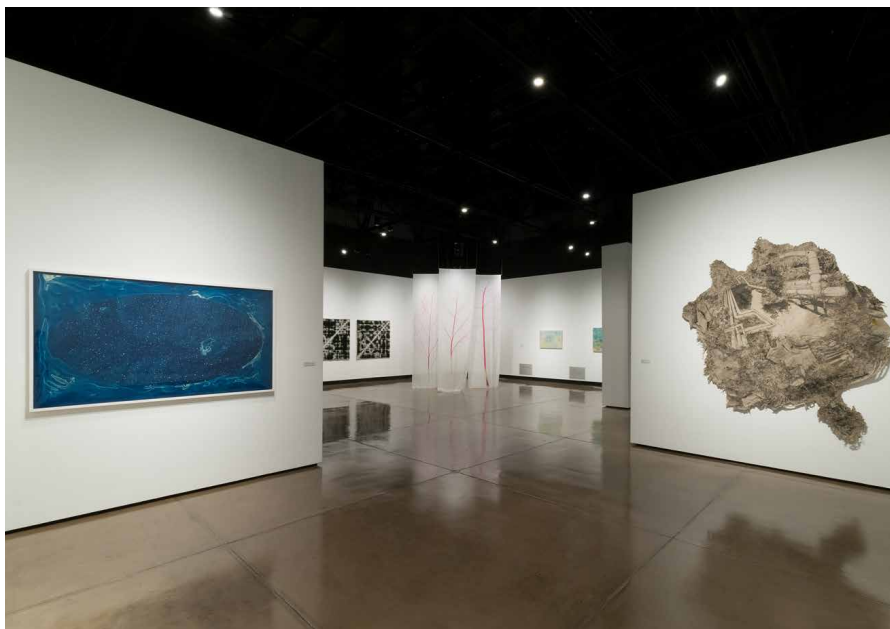
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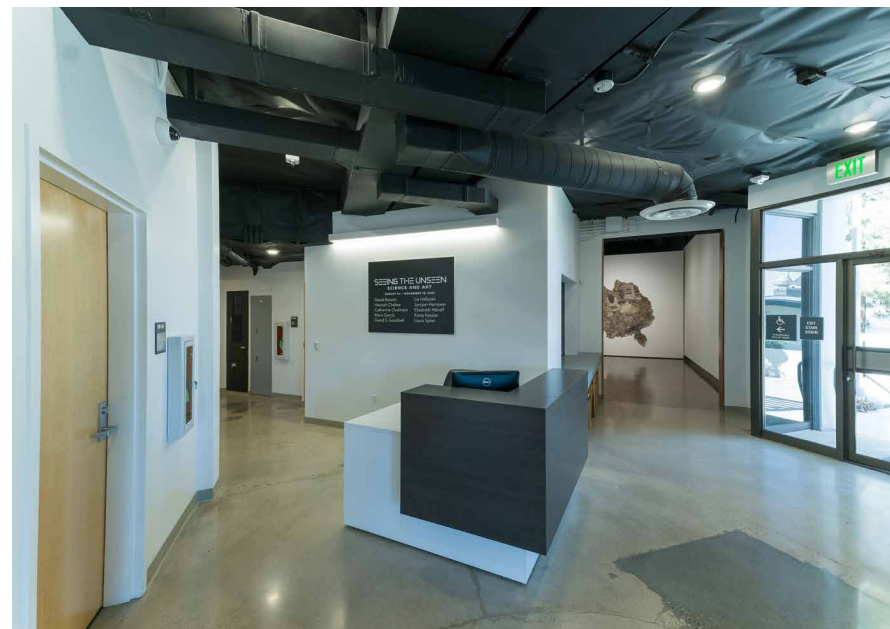
Lia Halloran, *Magellanic Clouds, After Henrietta Swan Leavitt*, 2016. Cyanotype on paper from painted negative (edition 1/2). 46 x 76 inches (framed). Courtesy of the artist and Luis De Jesus Los Angeles.



Hannah Chalew, *Solastalgia*, 2018. Pen and ink on paper made from trash and abaca. 84 x 84 inches.



Seeing the Unseen: Science and Art, 2023. Wignall Museum of Contemporary Art at Chaffey College, Rancho Cucamonga, CA.



Seeing the Unseen: Science and Art, 2023. Wignall Museum of Contemporary Art at Chaffey College, Rancho Cucamonga, CA.



Catherine Chalmers, *Leafcutters*, 2017. Video. 17:26 minutes.



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SEEING THE UNSEEN SCIENCE AND ART

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Chaffey  College

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