SYNAPSE 15

INTERSECTIONS

OF ART AND SCIENCE

Emily Davis Gallery

Myers School of Art, The University of Akron

uakron.edu/art/galleries/edg

Synapse • Art Science

Learn more about the Synapse projects, lectures, and event schedule online

synapseartscience.com

*This exhibition is made possible with the generous support of the **John S. and James L. Knight Foundation**, **GAR Foundation**, **Akron Community Foundation**, **Myers School of Art Residency**, and numerous private donors. We are grateful for our partnership with FRONT International 2022.*

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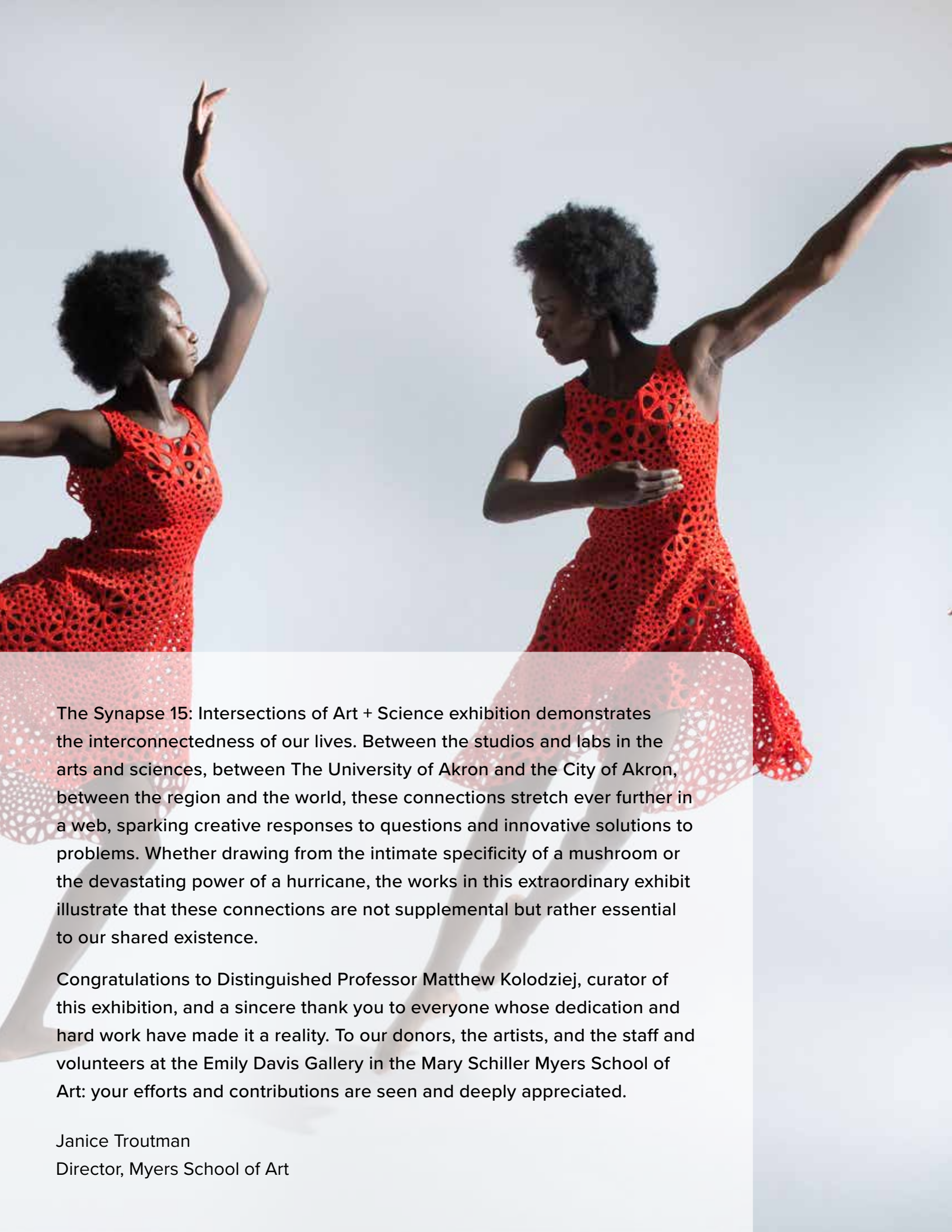
The Synapse Art and Science Series at The University of Akron probes ideas, images, and mutual interests to connect the art and science disciplines. Akron's place in the Cuyahoga Valley and its legacy as a city of invention and making are highlighted in the exhibition. Synapse focuses on artists and designers, as well as science and engineering collaborators who explore the natural world. The artists on view in Emily Davis Gallery choose to consider issues as challenging as the COVID-19 pandemic, climate change, and sustainability and as fundamental as abstraction, mechanics, material processes, and the perception of a viewer.

Artists choose materials and processes to convey meaning and to apply specific qualities to their work. They look to 3.8 billion years of nature's strategies and design to influence what to select and how to construct their work. While their approaches range from the metaphorical and abstract to applied solutions, each responds and learns from the natural world to inform their efforts to invent and communicate who we are in this moment.

Now, and for the past 15 years, the goal of Synapse is to develop conversations between artists, designers, scientists, engineers, business, and colleagues in social sciences and humanities to encourage innovation and community engagement. This process is often characterized as messy, full of differing viewpoints and the unknown. It is precisely this unknown melded with curiosity that makes it interesting and worthwhile. This exhibition features collaborative teams across many media and interests that embrace this challenging space where risk and failure are balanced with points of insight and a drive to make change happen.

In keeping with the spirit of connections that Synapse fosters, the works on display are loosely organized around themes such as time, data, material, and environment. Consider how your own interests and questions are viewed through the lens of another discipline. How could these points of view inform and develop your own thinking, actions, and making?



The Synapse 15: Intersections of Art + Science exhibition demonstrates the interconnectedness of our lives. Between the studios and labs in the arts and sciences, between The University of Akron and the City of Akron, between the region and the world, these connections stretch ever further in a web, sparking creative responses to questions and innovative solutions to problems. Whether drawing from the intimate specificity of a mushroom or the devastating power of a hurricane, the works in this extraordinary exhibit illustrate that these connections are not supplemental but rather essential to our shared existence.

Congratulations to Distinguished Professor Matthew Kolodziej, curator of this exhibition, and a sincere thank you to everyone whose dedication and hard work have made it a reality. To our donors, the artists, and the staff and volunteers at the Emily Davis Gallery in the Mary Schiller Myers School of Art: your efforts and contributions are seen and deeply appreciated.

Janice Troutman
Director, Myers School of Art

NATHALIE MIEBACH

SYNAPSE

HISTORY AND MISSION

Synapse develops new educational strategies, research initiatives, community engagement, and economic development. Synapse sparks interactions and insights among artists and scientists, campus and community, faculty, and students, practicing professionals, and the simply curious. We are grateful for their pursuit of the unknown and a better world.

Open to all university disciplines and the public, Synapse events take the form of residencies, internships, collaborative projects, lectures, workshops, performances, publications, panel discussions, and exhibitions. Synapse is a forum for entrepreneurship exploring enlightened collaborations and developing mutual understanding across disciplines on diverse topics ranging from artificial intelligence and evolution to psychology, physics, the environment, and life on this planet.

Projects take place both at The University of Akron and within the surrounding community as a means for developing community and new audiences for the arts. Collaborative partners include the Biomimicry Research and Innovation Center at The University of Akron, Bierce Library, UA Honors College, Cummings Center for the History of Psychology at UA, Akron Zoological Park, Akron Art Museum, Martin Center for Field Studies and Environmental Education, Cleveland Clinic Art Collection, Sculpture Center Cleveland, Kent State University, Cleveland State University, Museum of Contemporary Art Cleveland, Curated Storefront, Great Lakes Biomimicry, and FRONT International.

We are grateful to the many artists and designers who have participated these past 15 years

Alice Aycock
Philip Beesley
Janine Benyus
BeTA_S
Diane Davis-Sikora
Rui Liu
Linda Ohrn-McDaniel
Brian Bress
Alan Butler
Diana Cooper
Steve DiBenedetto
Mark Dion
Jason Ferguson
Peter Galison
Adam Gopnik
Eric Gjerde
Ann Hamilton
Matthew Kenyon
Eve Laramee
Stacy Levy
Charles Lindsay
Ilaria Mazzoleni
Nathalie Miebach
Carrie Moyer
John Newman
Ken Rinaldo
Nervous System
Jessica Rosenkrantz
Jesse Louis-Rosenberg
Adelaide Paul
Judy Pfaff
Duke Riley
Alexis Rockman
John Roloff
Jenny Sabin
Simon Schleicher
Michelle Segre
Buzz Spector
Jennifer Steinkamp
Rachel Sussman
Fred Tomaselli
Marius Watz
Terry Winters
Anouk Wipprecht
Tom Wiscombe
Wong Kit Yi

Founded in 2007, the Synapse series would not have been possible without the generosity of Rosalie Steiner. Rosalie's deep devotion to the environment, the arts, and social justice made her the ideal supporter of the Synapse vision. It is in her honor that we wish to dedicate this exhibition.

The intersection of art and science is one with which I have always had a fascination. As a biologist who spent years researching arachnids and their environments—which meant plenty of time around spider webs—I recognize that science can be breathtakingly beautiful, and that art can reveal much about the scientific world around us.

I am gratified that The University of Akron's Myers School of Art is examining this topic in a new exhibition. In our role as a public urban research university, UA seeks to share with our community an exploration of the arts and sciences, and the convergence point between the two spaces.

Gary Miller
President, The University of Akron


SYNAPSE 15

INTERSECTIONS
OF ART AND SCIENCE

Wong Kit Yi

Mark Dion

John Roloff

Stacy Levy

Judy Pfaff

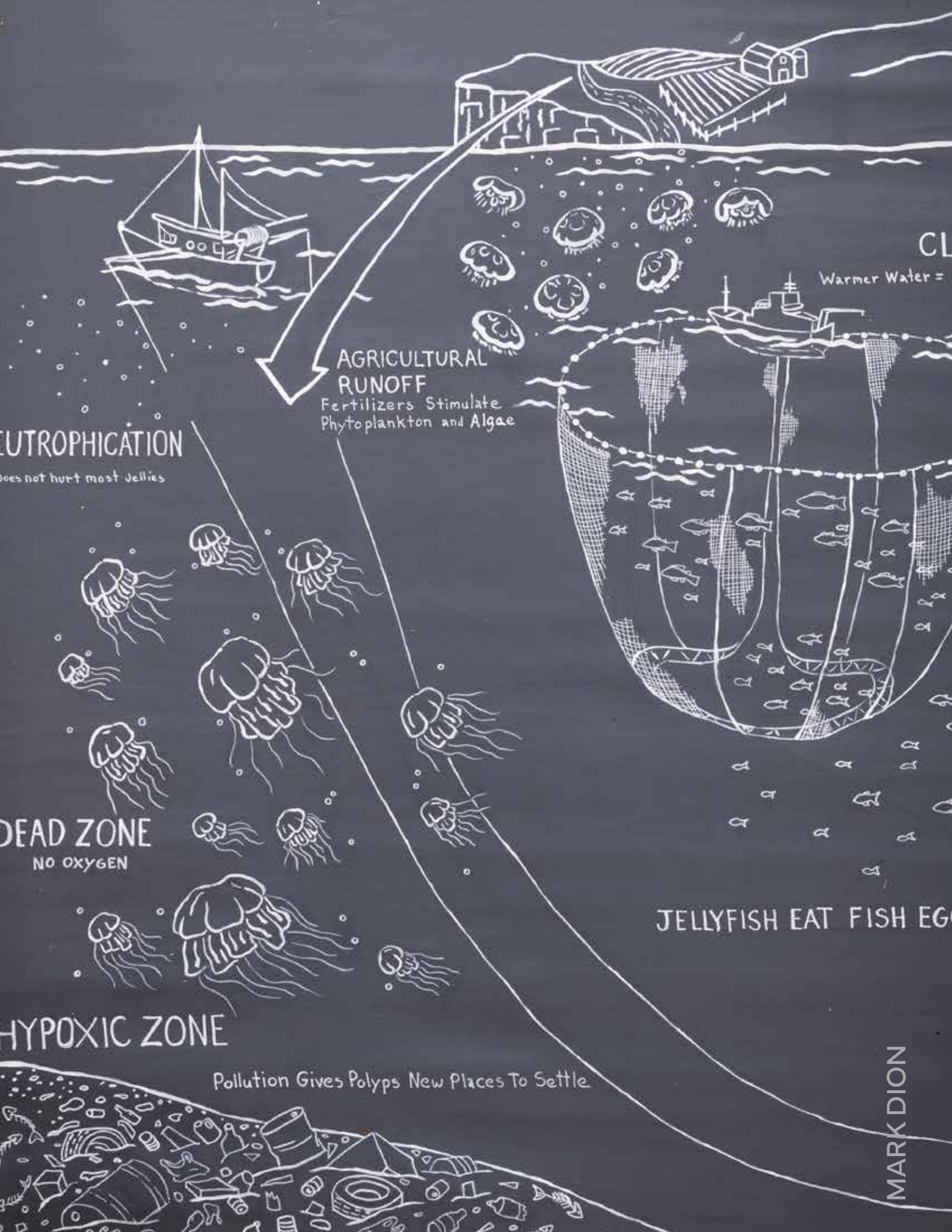
BeTA_S:
Diane Davis-Sikora, Rui Liu
and Linda Ohrn-McDaniel

Terry Winters

Nathalie Miebach

Jenny Sabin

Nervous System:
Jessica Rosenkrantz and
Jessie Louis-Rosenberg


AGRICULTURAL
RUNOFF
Fertilizers Stimulate
Phytoplankton and Algae
EUTROPHICATION
oes not hurt most Jellies
DEAD ZONE
NO OXYGEN
HYPOXIC ZONE
Pollution Gives Polyps New Places To Settle
Warmer Water =
JELLYFISH EAT FISH EG
MARK DION

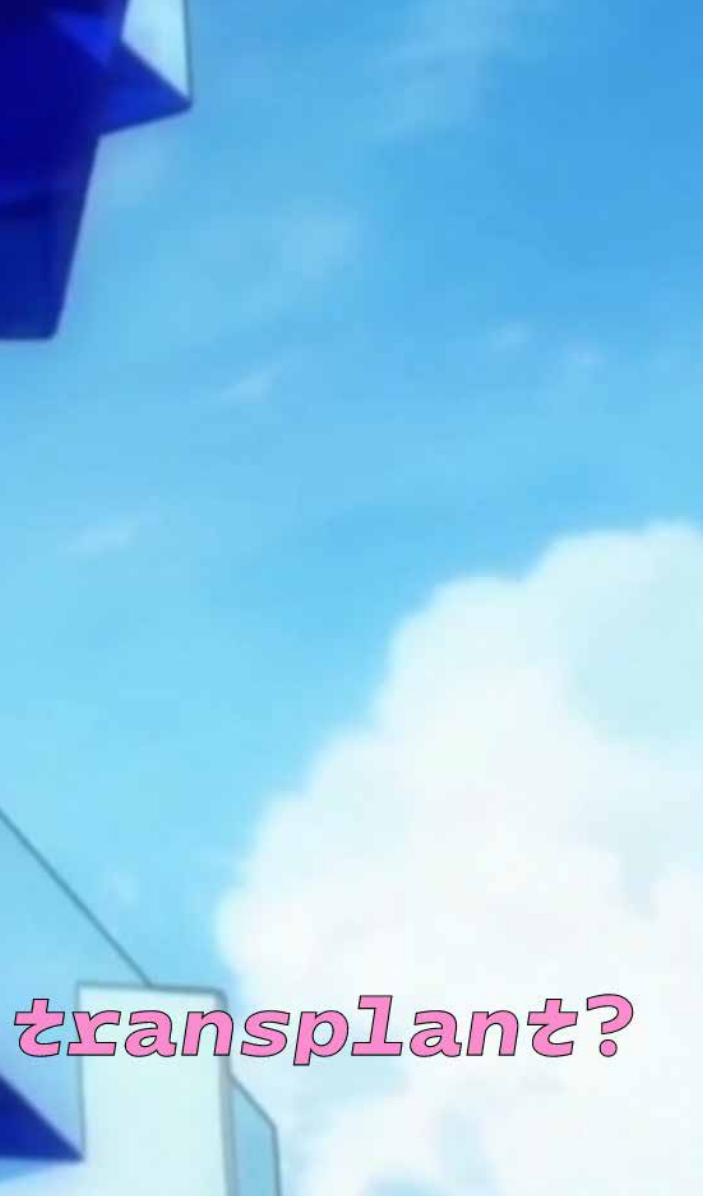
Shape Enlightened Questions

Looking back on the collaborations of the past 15 years, the Synapse Art and Science series leverages the resources of The University of Akron as a collage of many pathways for engaging the world. Since 2007, thousands of students, faculty, and the public have benefited from this forum where nationally and internationally known artists and designers share uniquely personal insights into the creative process through lectures, student critiques, and discussions with scientists in laboratories. Witnessing how this process unfolds through conversation, research, material exploration, and reflection is vital for producing graduates who are flexible thinkers, team oriented, and problem solvers.

WONG KIT YI

Can you talk about the process and influences in your current project?

After researching in Akron and Cleveland, I was immensely inspired by the world's first voice box transplantation that was carried out at Cleveland Clinic in 1998. My latest karaoke lecture performance *Inner Voice Transplant* (2022) covers a range of topics including reanimating a dead person's voice to the elusive nature of the inner voice; pilgrimages made in sickness; ancient temple priests interpreting dreams millennia in advance of Sigmund Freud; the homesickness of Jiang Shi—the Chinese hopping zombie; evoking a powerful spell that has been used since the Middle Ages; and methods for using the "inner wind" from our lungs to perform political magic.



Wong Kit Yi (黃潔宜)

INNER VOICE TRANSPLANT, 2022
Karaoke lecture performance
HD video with sound

One theme the exhibit explores is how working across disciplines presents differing views to a given issue. Wong Kit Yi conducted research at the Cummings Center for the History of Psychology, the founder's home for Alcoholics Anonymous, the Cleveland Clinic and had meetings with biologists studying energy storage in fish and new materials based on spider webs; these visits inspired storytelling about the boundaries between facts and fictions. In the installation there are Chinese mystical prayers meant to give voice to the unheard and silenced, a comment on political control of creative thought. As you watch the video, it becomes clear that knowledge and understanding have, over time, been exchanged and championed by individuals and groups in many forms. Scientific inquiry has shifted, and the beliefs we have left behind still define our present. The strength of our human experience is measured in what is heard, searching the unknown, and by our willingness to stand up against misinformation and suppression. Part sci-fi, part documentary, and part karaoke machine, the work challenges us to consider how we are part of the myths we consume and active partners in the knowledge we pursue.


THE PROBLEM WITH JELLYFISH
CO2
CLIMATE CHANGE
AGRICULTURAL RUNOFF
URBAN RUNOFF
EUTROPHICATION
OVERFISHING
FLOATING PLASTICS
DEAD ZONE
JELLYFISH EAT FISH EGGS
HYPOXIC ZONE
TRAWLING
BROKEN HABITATS FOSTER POLYPS
Oceans

Seeing artists connect and exchange ideas with subject-matter experts and regional partners provides students of all disciplines with strategies for opening ways of critical thinking and making. Mark Dion presents real-world problems such as climate change and overfishing as places where ecosystems and human actions intersect. In his work, often characterized as contemporary curiosity cabinets or fictional research outposts, Dion is an advocate of the artist's role as a disruptor. He finds things at flea markets or at the edges of rivers and oceans. Artifacts that are forgotten or left in fragments for us to find are presented in a laboratory setting to confuse what is present inquiry and what is outdated thought. *Lecture—The Trouble with Jellyfish* outlines the real-world problems of overfishing and how the environment reacts. Dion functions as an explorer, a collector, and sometimes an actor taking on the character of scientist or naturalist. He invites the audience to be an active participant in that narrative and to find connections, from the elementary school lesson and consumer culture to the professional researcher, as a way to reveal the stories and problems of the natural world. Dion's lifelong commitment to the environment and how we understand it, care for it, and unfortunately destroy and control it are fuel for how he examines the limits of assumptions and rules.

Mark Dion

LECTURE—THE TROUBLE WITH JELLYFISH, 2018
Mixed media installation

Wong Kit Yi (黃潔宜)

As a FRONT International artist, Wong's work relates to both the science and art themes of Synapse as well as FRONT's themes of transformation and healing. Wong Kit Yi lives and works between New York and Hong Kong. Exploring biological answers to metaphysical questions, she deals with odd scientific findings and the dysfunctional relationship between what is considered science and pseudoscience. Wong also investigates the contractual relationship, working with such ideas as patron collaboration through the 99-year leases for her artworks. Her interests are always subject to change.

Her most recent works have been included in projects organized by Public Art Fund (New York, 2020); TANK Museum (Shanghai, 2020); Para Site (Hong Kong, 2019); Surplus Space (Wuhan, 2018); the Latvian Centre for Contemporary Art (Riga, 2017). Reviews of her work have appeared in such publications as the New York Times, Art in America, Contemporary Art Daily, E-flux conversations, Art Review, ART news, ArtAsiaPacific, and Art Newspaper. She was selected for the Chinati Foundation Artist in Residence program (Marfa, 2021). Receiving an MFA from Yale University, she has been teaching university courses about performance, video art and new media. She is the co-chair of LASER (Leonardo Art Science Evening Rendezvous) Hong Kong.

—Wong Kit Yi

wongkityi.com

Mark Dion

In 2014, Mark Dion visited the Myers School of Art to meet with students, tour biology labs and lecture at the Akron Art Museum.

Mark Dion's work examines the ways in which dominant ideologies and public institutions shape our understanding of history, knowledge, and the natural world. The job of the artist, he says, is to go against the grain of dominant culture, to challenge perception and convention. Appropriating archaeological, field ecology and other scientific methods of collecting, ordering, and exhibiting objects, Dion creates works that question the distinctions between 'objective' ('rational') scientific methods and 'subjective' ('irrational') influences. By locating the roots of environmental politics and public policy in the construction of knowledge about nature, Mark Dion questions the objectivity and authoritative role of the scientific voice in contemporary society, tracking how pseudo-science, social agendas and ideology creep into public discourse and knowledge production.

tanyabonakdargallery.com/artists/34-mark-dion/

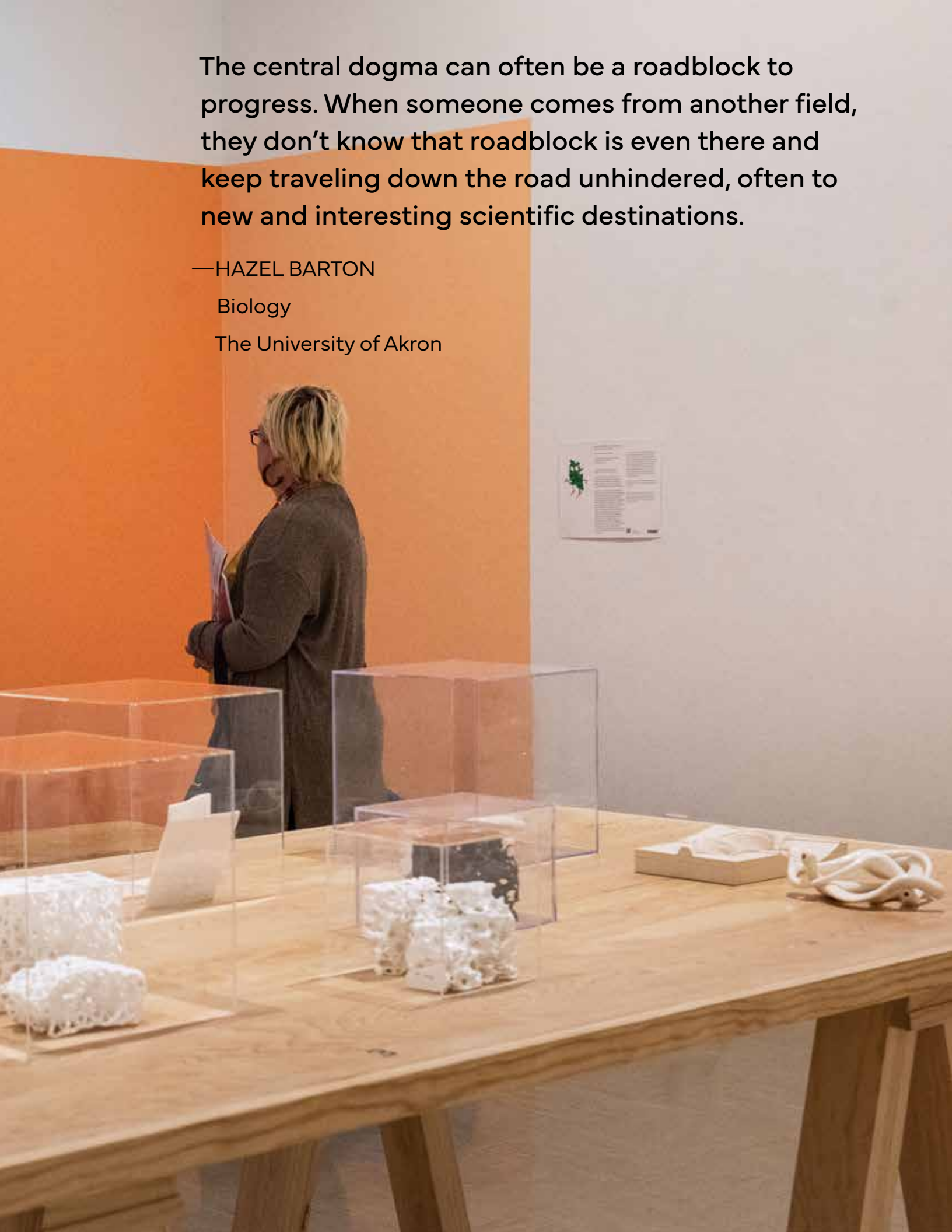

and strolled into Tim's room.

The central dogma can often be a roadblock to progress. When someone comes from another field, they don't know that roadblock is even there and keep traveling down the road unhindered, often to new and interesting scientific destinations.

—HAZEL BARTON

Biology

The University of Akron



Learning Placemaking Skills

This show is a reflection of the unique setting of The University of Akron as an institution situated in a landscape with a history of industry, invention, and place making. An important part of making any collaborative project or program work is to consider What are the resources of this place? and What is this place about? Synapse has always been about bringing new ideas to Northeast Ohio while being mindful of engaging what is on the minds of the audiences in this location.

STACY LEVY

Two artists in the show, John Roloff and Stacy Levy, present projects that engage this local geography and environment. Roloff's piece, *Landscape Projection: Third State*, playfully represents both the history of scientific thought and the history of the earth. In this work, a wig seems to float in a matrix of stones against a backdrop of large-scale panoramic photographs of wetlands. The wig was inspired by Gottfried Leibniz, a polymath and co-inventor of calculus and the author of the *Monadology*. He symbolizes the tension between dynamicist and organic thought as opposed to progenitors of a more mechanized world view, such as Newton and Descartes. In this installation, the person is removed and and the wig symbolizes both the scientist and an organic landscape with stones acting as clouds. The stones, limestone and sandstone, represent geologic time upwards of 358 million years ago. The photographic landscapes provide a picture of the present-day living landscape above the surface. The three elements of individual, geology, and organic environment are melded together in an architecture where all things are considered alive in different states of being.

John Roloff

LANDSCAPE PROJECTION: THIRD STATE, 2022
photographic components, 1988
High strength gypsum, stainless steel, glass fiber, acrylic medium;
B&W photo, ultra-white paint

JOHN ROLOFF

Stacy Levy's career has been formed by community engagement and the importance of water as a life-giving material. Each of her projects examines how to visualize the water below the surface of our urban environments. In so doing, Levy brings awareness to our connections with the environment and how to be good stewards. Her recent project in Cuyahoga Falls, Ohio, collaborated with the community to make chalk drawings of river flow on the pavement in the city. For the Emily Davis Gallery exhibition, Levy's contribution, *Cuyahoga Falls Project*, uses the river water and vials to create a cascade that mimics the descent of water in the area. The Cuyahoga River is historically significant as a pathway for trade and navigation. The river burning multiple times between 1968–69 sparked national attention and support of the environmental movement. Envisioning renewal and revealing what lies beneath our feet, Levy used her visits to prepare a site proposal to excavate areas of an urban parking lot and design plantings that reflect the river pathways through the landscape.

Stacy Levy

CUYAHOGA FALLS PROJECT, 2022
400 glass vials and caps, river water, steel wire

STACY LEVY

Where did your fascination with water come from, and at what point did you realize it would be a medium for your creative work?

When I was little, I grew up near a city park. And I used to play in a creek that smelled really different after a rainstorm. And it was years later that I realized that the creek I used to play in was a sewage outfall drainage channel and not really a “natural” creek at all. And I think that got me interested in the different kinds of water that cross the land. So, I wanted to investigate these different types of urban waters and bring them into view.

You work on both permanent and temporary projects. What have you learned about time in relation to your work?

I try to show change in many of my projects, and I work to have my projects collaborate directly with nature as nature changes over time. And nature is quite slow. And depending on the natural process, these projects can take a long time to show natural changes. But many pieces need repeated visits to see change. I guess what I am really thinking a lot about is how the project can embody an action: the art is more like a verb than a noun. This can happen I short and longer based projects. But the action of the piece, and the interaction of the art with nature is very important to me.

You work with engineers and biologists. Can you talk about that collaborative process, and can you describe a project where the artwork informed the scientific inquiries?

I am not sure I’ve ever changed scientific practice. However, I have visualized scientific understanding in a new way. I believe this can help scientists understand that their world needs to be re-visioned—so that people outside of of science can understand what scientists are quite intimate with.

You work with communities. Has the process of community engagement influenced the short or long-term environmental concerns of that community?

I think awareness is the first step to actionable change. And so my job as an artist is to create awareness.

Can you talk about visualizing the invisible and why that is so important to affecting change?

Most people have no idea how the world works, and even I am fairly confused by its various systems, so it's essential to take a deeper look at those systems and get to know what nature is really doing. And I hope that I can be part of starting that understanding

Stacy Levy

TIDE FLOWERS, 2022

marine vinyl, steel, polycarbonate plastic, foam

John Roloff

John Roloff first visited Akron in 2010 for a design charette with faculty in biology, engineering, landscape architecture, political science, and art around the subject of water. For this exhibition, Roloff created a site-specific work using sandstone and limestone from Ohio that evokes a sense of time and human presence within this geography.

For the past 50 years, my work has been fundamentally about ecology in an expanded frame. My understanding of land, sea and atmosphere engages interrelated cycles of natural and man-made materials and processes. This world view was developed through the practice of ceramics, installations and conceptual proposals that evolved concepts of site-alchemical material/historical transformations as a symbiotic merging of physical matter and living systems across geologic time - a condition of global metabolism. My practice embraces an integration of ecology, ontology, self-organizing systems, energy flow and aesthetics with expanded ceramics as protagonist engaging narratives seeking to transcend the “living/non-living” dichotomy.

—John Roloff

johnroloff.com

Stacy Levy

Visiting the University in 2021, Stacy Levy was an artist in residence in Cuyahoga Falls working with the community to consider the river and natural resources of Northeast Ohio. During her visit to Akron, Levy worked with students on a chalk drawing that covered the entire parking lot to reveal the materiality of water as a life-giving element.

People often think that nature ends where the city begins. My projects are designed to allow a site within the built environment to tell its ecological story to the people that inhabit it. As a sculptor, my interest in the natural world rests both in art and science. I use art as a vehicle for translating the patterns and processes of the natural world. My research requires partnerships with scientists, fluid dynamic engineers, and geologists. Interested in watersheds, tides, growth, and erosion, I make projects that show how nature functions in an urban setting. Making large-scale public installations in rivers, streets, parking lots, airports, and nature centers, I frequently work as part of a collaborative team seamlessly merging sculpture into the architecture, the topography, and the storm water requirements of the location. My work employs materials from surveying, landscape, and construction industries to highlight existing forms and reveal natural processes that would otherwise be out of site. To build these visual metaphors, I mesh the clarity of diagrams, the beauty of natural forms, and the visceral sensations of the place. My practice is motivated by imaging what is too small to be seen, too invisible to be considered or too vast to be understood.

—Stacy Levy

stacylevy.com

JUDY PFAFF

Think Abstractly

Abstraction involves developing modes of communication that are not literal, but rather reflect or create a new reality. Juxtaposing imagery or information from multiple sources in the same space suggests new meanings. Connecting things or ideas that appear similar but have very different uses or connotations sparks memory and imagination. Distilling or combining information into a framework of essential parts can deliver clarity to complex feelings, ideas, and challenges. Abstraction in this exhibition is practiced on the one hand by human intuition, material exploration, and critical thinking, and on the other hand by the environment or data dictating the form of the work. Abstraction involves making the invisible visible—be it time, social interaction, scientific data, the materiality of the world around us, or feelings and thoughts.

Judy Pfaff is an alchemist and a pioneer in installation art. Using building materials and domestic objects, Pfaff uses a DIY sensibility to transform consumer goods into cosmologies and environments that immerse us. Her work often involves engaging entire buildings as an arena for her experiments. Pfaff brings subject matter and new life into formalist abstraction, including issues of gender, chaos theory, mysticism, and how everyday consumer products define our culture. Her work simultaneously conforms and rebels against the spaces she works in. The work is responsive to the limits and possibilities of material and architecture. Rather than focusing and closure, Pfaff's work reveals and depends on multiple languages vying for attention. Risk and failure are championed as a way of revealing that meaning is elusive, but not ambiguous. The work in the exhibition features forms that appear to be lifted from the depths of the ocean or an uncharted galaxy. At first appearing otherworldly, closer inspection shows them to be made of the industrial materials of our modern and pop-culture lives.

Judy Pfaff

RHUBARB FOOL, 2020
PRINCE, 2021
DEEP SEA FISHING, 2021
MUD DAUBER, 2021
SEA JELLIES, 2021

JUDY PFAFF

Excerpt from a recent article in Sculpture magazine by Leah Triplett Harrington illuminates Pfaff's work and process:

Judy Pfaff's current installation of wall-hung works [...] is aptly titled "opsins," after the tiny proteins that calibrate color within the eye's light-sensitive retinas. Key elements in phototaxis, circadian rhythms, and other responses related to light sensitivity, opsins, which appear as curls and cords under the microscope, are found in the plant and animal worlds as well as the human. At first glance, the title seems to refer to Pfaff's signature amalgams of twines and strips, but a second, closer look reveals a conceptual influence. Though filled with Pfaff's typical energy, "opsins" is infused with a glowing vibrancy and color unusual for her frenetic forms. The exhibition hinges on gradations across light, color, and darkness, making it one of Pfaff's most joyful bodies of work to date.

While color, light, and glass have long been formal and material elements in Pfaff's work, light bulbs have only just started appearing alongside her characteristic syntheses of melted plastic, expanded foam, paper lanterns, wire, wood, and steel. *Fish Story* (2021) combines such familiar materials and introduces two light bulbs that bring everything together and cause the work to coalesce. On one side, a horizontal light shaft balances spindles of purple and magenta with orange strips of plastic. On the other side, a concentration of melted clear plastics glows in cast light. A loose twist of blue illumination dangles toward the floor, while cut swathes of rainbow-colored paper lanterns stretch and tangle across the wall. In between, caverns—formed as the materials pull away from each other and their supports—imbue the work with a sense of discovery. All color, texture, and mystery, Fish Story resembles a massive coral reef and recalls *Deepwater* (1980), one of Pfaff's earliest installations.

For the full article on Pfaff, visit https://sculpturemagazine.art/judy-pfaff-3/.

BeTA_S

DIANE DAVIS-SIKORA
RUI LIU
LINDA OHRN-MCDANIEL

Student Team Members
Riley Anderson, Vahid Koliyaee, Maxwell Neuman, Gabriela Gonzales Allende Oluwatobi Karim, Sohrab Azizollahi, Maame Amoah, Haley DeRose, Fred Wolfe

Diane Davis-Sikora, Rui Liu, and Linda Ohrn-McDaniel are the lead investigators of BeTA_S. An architect, engineer, and fabric designer respectively, they are driven to find flexible and multifunctional approaches to real world challenges using their combined knowledge and teamwork. Their challenge was to consider issues of combining qualities of resilience, permeability, and modular design into structures for addressing deployable farming and food scarcity. Based on the structure of spinal columns and principals of tensegrity, the modular design of the BeTA_S canopy allows the system to expand in size as needed. The textile covering, made of a hydrophobic recycled plastic yarn, works well as a water-resistant substrate for growing. The team made weighing the real, but often hidden, factors of survival, sustainability, use, structural integrity, and social interactions necessary design goals.

BETA_S | DIANE DAVIS-SIKORA

Can you explain Biotensegrity and how the scientific principles of the human body inform the process of developing the BeTA_S project?

Biotensegrity is the structural principle that underlies biomechanical motion within the body. Its logics are based on the structural principles of “tensegrity” (a term coined by Kenneth Snelson, a protégé of Buckminster Fuller) which is a self-stabilized structural system comprised of discontinuous floating rigid elements that are held in structural equilibrium using a continuous network of high-tension cabling system. Biotensegrity is the adoption of tensegrity logics in biological systems (i.e., structural anatomy and biomechanics).

BeTA_S Canopy is the second project by our team that explores the use of biotensegrity concepts as an interior space making system. The project’s predecessor, the BeTA Pavilion, drew direct inspiration from the anatomy of the human spine and structural flexibilities of its biomechanical/biotensegrity system. In the BeTA Pavilion we leveraged the flexural dynamics of the structural system. That installation described a hyperbolic paraboloid geometry consisting of 54 floating bend fiberglass rods linked by custom computationally knit textiles (creating a continuous tensioning chain). The BeTA pavilion was structurally stable, yet it also responded to human touch with vibrational motion, akin to the movement of the human spine.

The BeTA_S Canopy is based on these same biotensegrity logics. However, here, we are exploring ways to use this structural concept to create a surface and spatial enclosure. The surface consists of 7 CNC knit textile bands (1'-6" x 18'-0" each) with integrated pockets designed to hold a linear array of tetrahedron modules in place at their vertices. Each tetrahedron module is formed from precut fiberglass rods with custom 3D printed connectors. The pockets located at the edges of the knit textile bands includes an integrated elastic loop that is used to connect each textile strips to its adjoining neighbor by looping. The canopy is designed as a double layer system (3 inner and 4 outer rows), with each looping connection stabilizing the vertex of 3 distinct tetrahedrons. When all vertices are looped together, the system creates a stable, yet structurally soft surface with slight vibrational movement when touched. Paralleling biotensegrity systems, the BeTA_S Canopy is composed of a collection of discontinuous floating elements held in tension by a continuous tensioning network.

Biotensegrity is the structural principle that underlies biomechanical motion within the body. BeTA_S translates biotensegrity concepts into a surface space-making system.

A) Biotensegrity Model ©Tom Flemons B) BeTA_S Double Layered Assembly
C) Sample Surface Geometries.

Riverfront

The surface consists of 7 CNC knit textile bands (1'-6" x 18'-0" each) with integrated pockets designed to hold a linear array of tetrahedron modules in place at their vertices.

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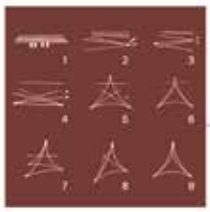
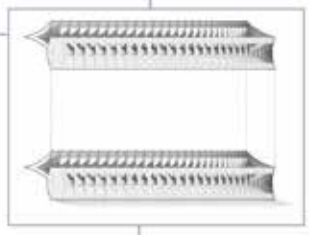
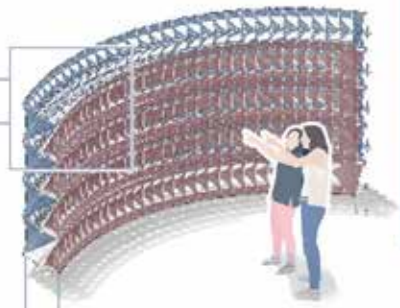
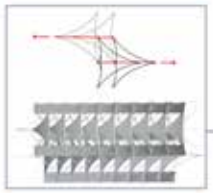
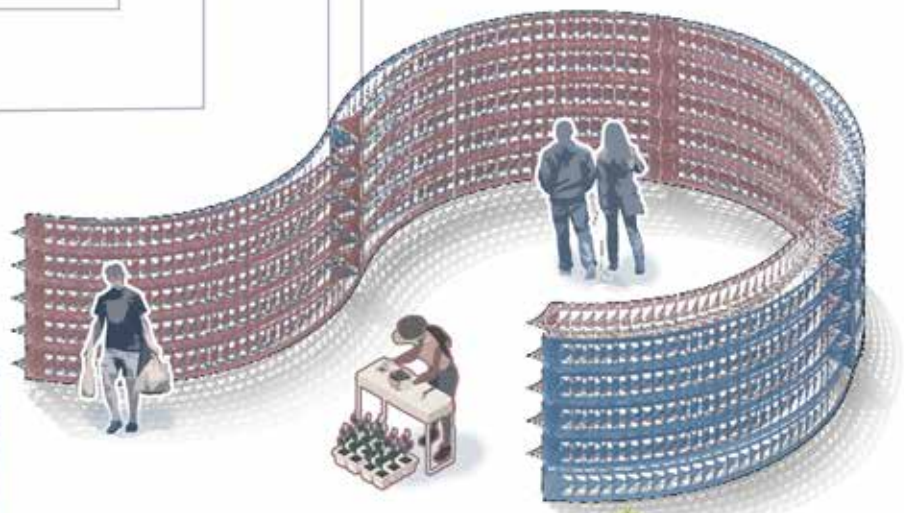


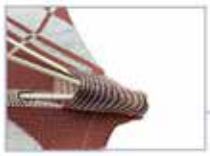


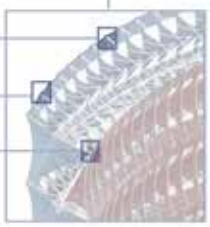


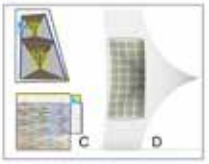


Inspired by biotensegrity logics, BeTA_S is composed of a collection of discontinuous tetrahedrons held in compression by a continuous tensioned network.









CNC knit textile pattern developed using hydrophobic

Woven monofilament farming trays (C) are designed with an open waffle weave sett to provide roots with access to light, air and water. Trays are developed with integrated irrigation tubes and secured within a farming pocket. (D)

West Side Arts District

Aeroponic systems are energy efficient, and offer 65-90% less water consumption than other soilless farming methods.

Crop types are organized along irrigation pathways carrying their required nutrient solutions.

The suspension of roots in air provides maximum access to oxygen. Aeroponics are a high yield, pesticide free, and promote rapid plant growth.

BeTA_S

Can you describe some of the collaborative processes of working with engineers, architects, and fashion designers?

The BeTA_S and its predecessor BeTA pavilion are collaborative projects with KSU colleagues Dr. Rui Liu (Associate Professor in the Architecture Program at CAED) and Linda Ohrn-McDaniel (Professor in the School of Fashion). Our process is collaborative; we're together in studio working through problems by physically making and mocking things up. The process is iterative with a lot of prototyping at full scale. We are constantly testing/questioning material performances and exploring different options/variable in real-time together. Sharing ideas from our different areas of expertise, design, engineering, and fashion, creates a rich and creative dialogue and debate. We ask a lot of questions. The process is as much about shared ideation and conversations as it is about collective making/creating. We've also involved graduate and undergraduate architecture and fashion design students in the project during different stages of the process.

The project is designed to address farming and human challenges. Can you describe some of those visions?

The project first began with the desire to develop a deployable urban farming strategy for large volume structures in response to urban vacancy and food insecurity. We are interested in exploring aeroponic, soilless systems for indoor applications and looking for a material system that supporting this concept. The biotensegrity logics explored in the BeTA Pavilion and BeTA_S Canopy are developed from a singular tetrahedron module which is a piece of a more complex modular system that we investigated in these earlier farming studies.

However, through the process of developing BeTA and BeTA_S we have become interested in exploring the dynamics of this structural system further and testing more integrated farming wall networks. BeTA_S Canopy is a lightweight, deployable system; and its formal flexibility enabls it to change its geometry and adapt to a variety of diverse conditions. Additionally, its modularity allows the system to expand in size as needed. The textile in BeTA_S Canopy is also hydrophobic and is knit with yarn made from recycled plastic bottles. This material works well as a water-resistant substrate for a farming structure.

Judy Pfaff

Judy Pfaff met with students, exhibited work and lectured at the Akron Art Museum in 2015.

Hung tightly, with each work flowing into the next, these individual wall pieces become symbiotic, just as we are to the plants and animals of our planet. It would be too easy, however, to read simple negative implications of the manmade in works such as Bjork (2021), with its folds of silvery exhaust pipe caught in waves of baby-blue melted plastic. Form and material are fully reconciled here, as if the artificial and biological have learned to coexist. This is emphasized in Tree Frog (2021), installed at eye level, with a face of lime-green, foregrounding swells, and stalactites of greens and blues. A central, slender drip of light green reaches down, while slight, delicate strands sway to the floor from either side, like Day-Glo vines creeping off a tree. A close look reveals a wisp dotted as if with dew drops, an intimate detail within a maximalism that plays with the dalliance between proximity and perception. This play is the drama of “opsins,” with its webbed tension between light and dark, natural and unnatural, seen and unseen.

—Leah Tripplett-Harrington

(text credit: Sculpture Magazine)

judypfaffstudio.com

BeTA_S

Diane Davis-Sikora
Rui Liu
Linda Ohrn-McDaniel

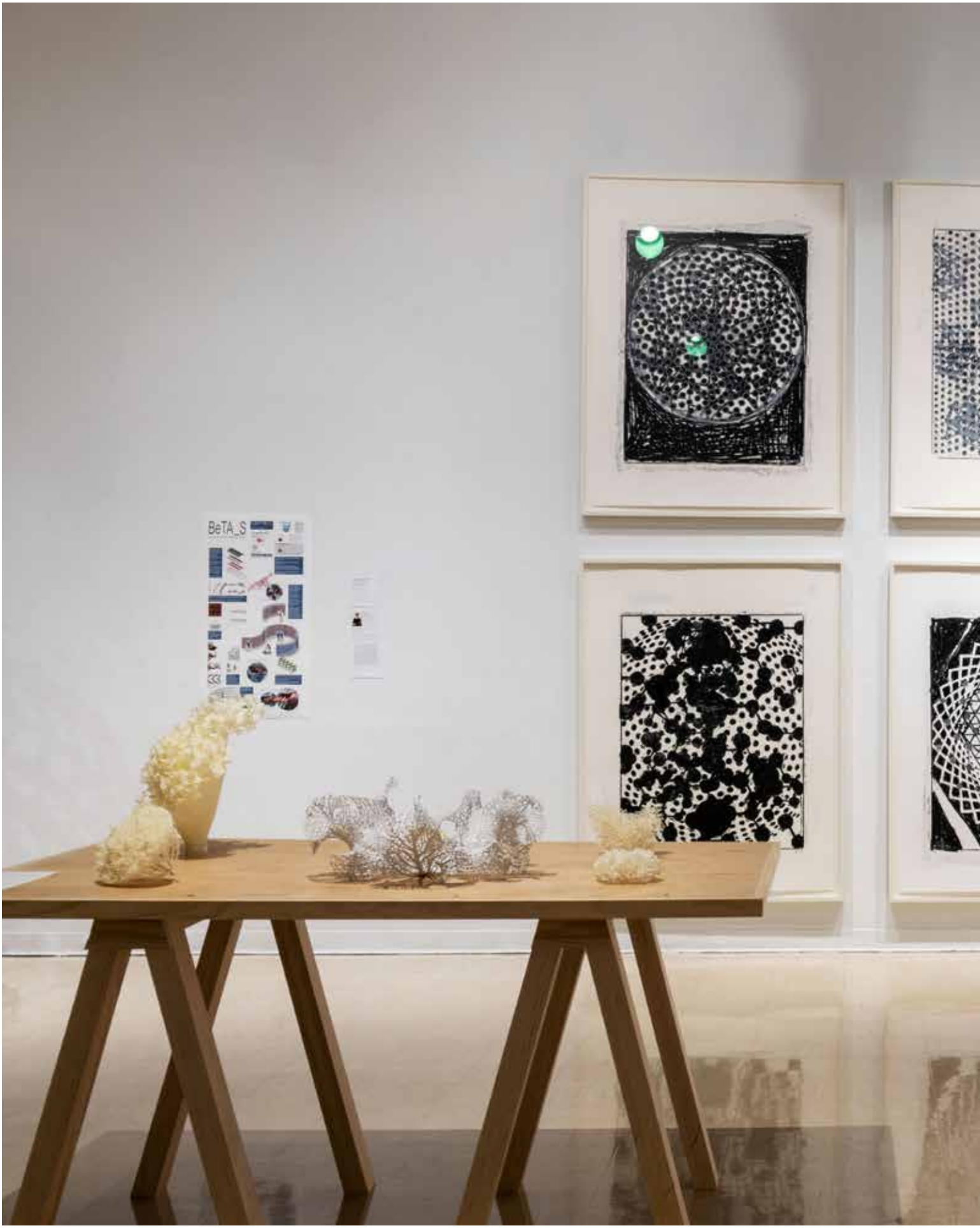
Student Team Members
Riley Anderson, Vahid Koliyaee, Maxwell Neuman, Gabriela Gonzales Allende Oluwatobi Karim, Sohrab Azizollahi, Maame Amoah, Haley DeRose, Fred Wolfe

The Beta_S team developed the featured work specifically for the Synapse 15 exhibition working across disciplines of architecture, engineering, and fashion design. This collaborative group focuses on the inseparable relationship between architecture and structure as defined by the interaction between form and force. The proposed ecological “green” wall incorporates aeroponic (soilless) gardening system within a modular bending active structure. Inspired by the biomechanical organizational principles of the spinal column the project builds from a single regular tetrahedron module.

dianedavissikora.com

kent.edu/caed/profile/rui-liu-phd-pe

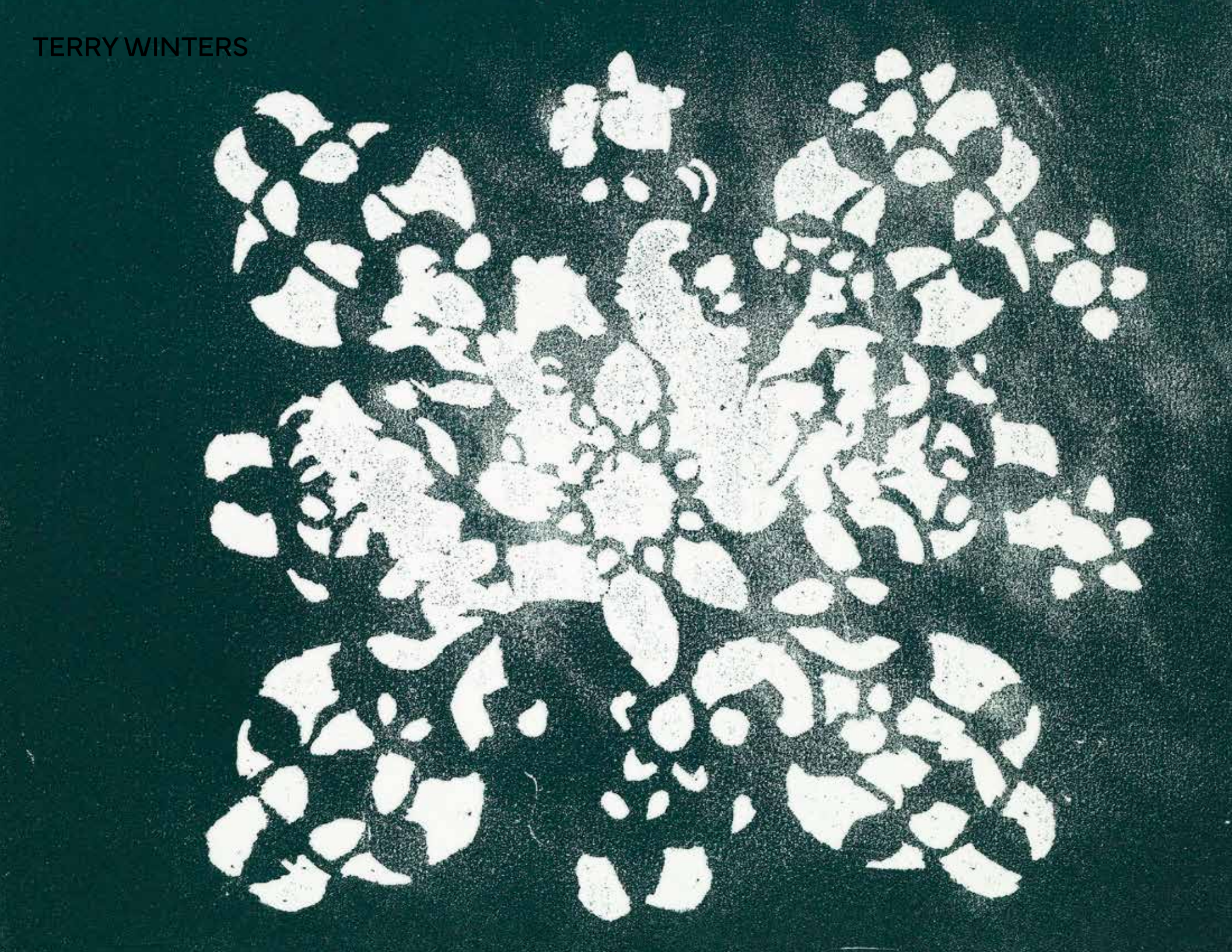
kent.edu/fashion/linda-ohrn-mcdaniel


BeTA_S

Visualizing Data and Information

Recently, the world was able to view images brought back by the James Webb telescope, which looks at the beginnings of the universe and into galaxies that are beyond our horizons. Terry Winters works at that intersection of what we sense and what we see. While the work appears contemporary and fixed using resources of graphs and charts of analytical systems, the materiality of the work using relief printing and layers suggests deep time and change. Inspired by tantric, scientific, or musical notations, Winters is in pursuit of visualizing the world around us that is real to us but invisible, through a mixture of invention, testing, and play. The *Pollen* prints suggest the temporary qualities of dust and atoms while the *Atmospheres* present a taxonomy of different layers intertwined. Multiple languages and perceptions of information layered on top of one another refuse to harmonize. Winters is showing the life that happens when things don't match up.

TERRY WINTERS

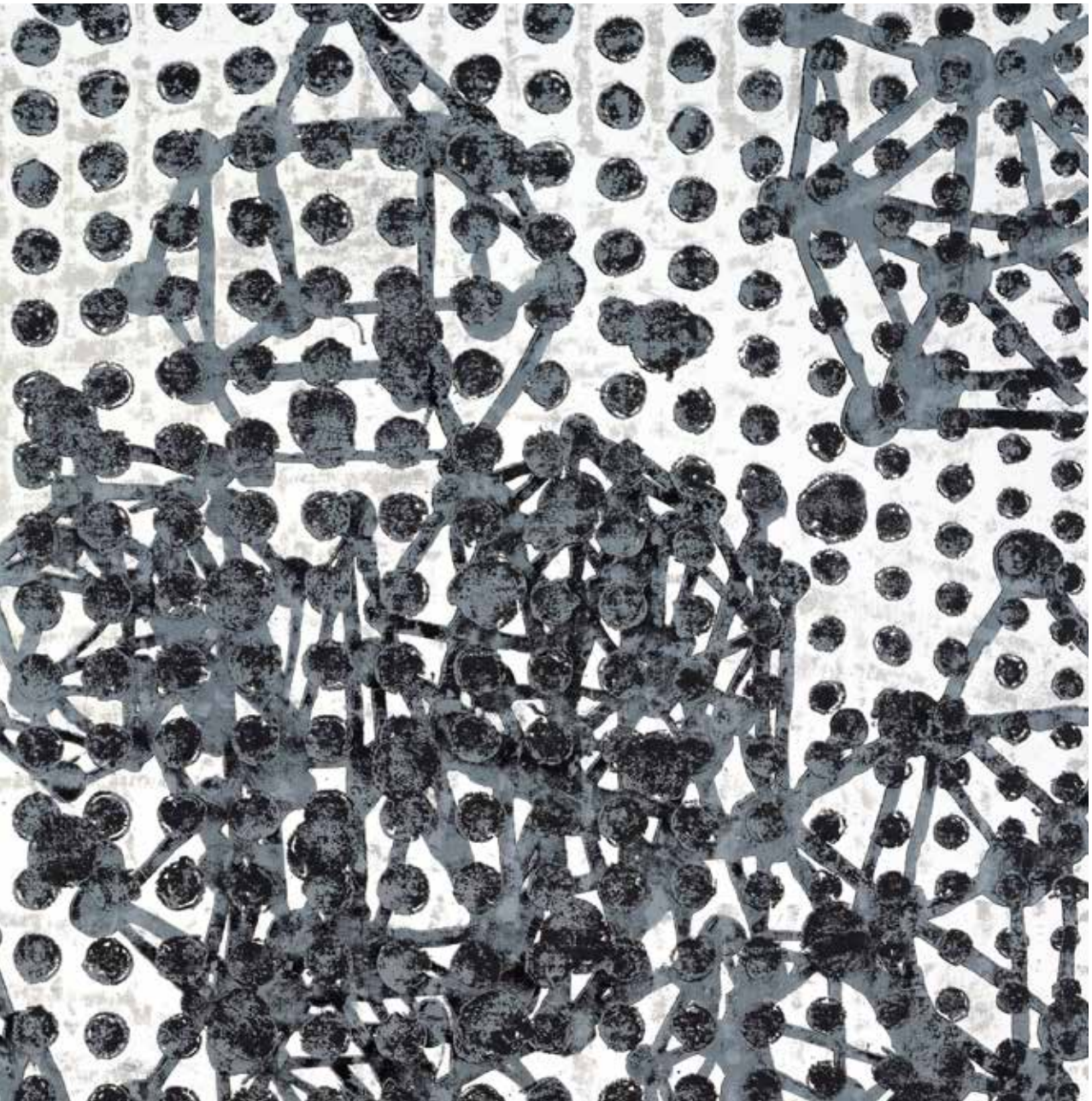


Working together at the interface between sciences, engineering, and design, we will find solutions for creating a sustainable future for all of us.

—ALI DHINOJWALA

Polymer Science and Polymer Engineering,

The University of Akron



Terry Winters

ATMOSPHERES 7, 2014
ATMOSPHERES 11, 2014
screenprints on Lanaquarelle paper

Nathalie Miebach is keenly aware of the implications of material and data in making her work. Data, whether of weather, COVID, or social media, are measured and coded to produce the template for elaborate woven structures. The sculptures are part map and part human story. The work records the longitude and latitude of a shipwreck or the fluctuation in COVID surges interlaced with the personal stories of individuals and specific events. Upon first glance, colors, textures, and objects suggest a carnival or playful arena of hope, but these mask the fact that each element is part of a system of threads that collectively signify tragedies as they unfold over space and time. Miebach's work takes an abstract approach to helping to understand and reconcile trauma on both personal and societal planes.

Nathalie Miebach

BLINDNESS OF SEEING PATTERNS, 2021
paper, wood, weather and COVID-19 data
THREE CRANES FOR JANE, 2015
paper, wood, data
CHUTES AND LADDERS, 2015
paper, wood, data
HALLOWEEN GRACE, 2015
wood, paper, data

Nathalie Miebach

HALLOWEEN GRACE, 2015
wood, paper, data
GHOSTLY CREW OF THE ANDREA GAIL, 2011
colored pen on paper

Terry Winters

In 2012, Terry Winters met with students and faculty in art and science departments followed by a lecture at the Akron Art Museum on abstraction.

I've tried to set parameters within which invention can take place. Drawing is the first step. A search engine for new information, or images. The finished drawings then function as data to feed into the paintings and prints. A dimensional shift takes place through changes of media, color, proportion, and support. The work is put under a kind of pressure—stresses which hopefully reveal new subjects, possible meanings. Not so much 'scientific principles or rules' but a curiosity about technical images. And how those images can function as found objects. Or, as an expanded view of nature—the seemingly objective presentation of facts. I'm trying to engineer the paintings to the point where there is a likeness. A sense of life, that these abstract images are somehow 'real'.

—Terry Winters

terrywinters.org

Nathalie Miebach

Nathalie Miebach's met with students in sculpture and painting at the Myers School of Art in 2016 when her work was featured in an exhibition at the Akron Art Museum.

The Blindness of Seeing Patterns is loaded with weather and Covid-19 data, from both the local level of my own community to global from the Summer of 2021. Just as a reminder, that was the summer that begin with lots of optimism as vaccines finally became available to some (not all) countries in the world. The mood in August began to shift as it became apparent that the Delta variant was still killing and sickening plenty of people despite the availability of the vaccine. The piece essentially speaks about this summer and that transition in mood. On one hand, the piece is almost like an infographic, in that it is essentially only data that is building it. On the other hand, I am giving you no key or legend to actually be able to decode any of it. With that opacity, I'm making a comment of how despite the daily tsunami of Covid-19 data, the disease has remained a strangely elusive, intangible, yet shared human experience. I chose a colorful, bright palette, because despite all the death and heartache during the pandemic, I kept noticing this human instinct towards optimism. Even when things looked really bleak, so many of us tried to get through it by holding onto something to look forward to.

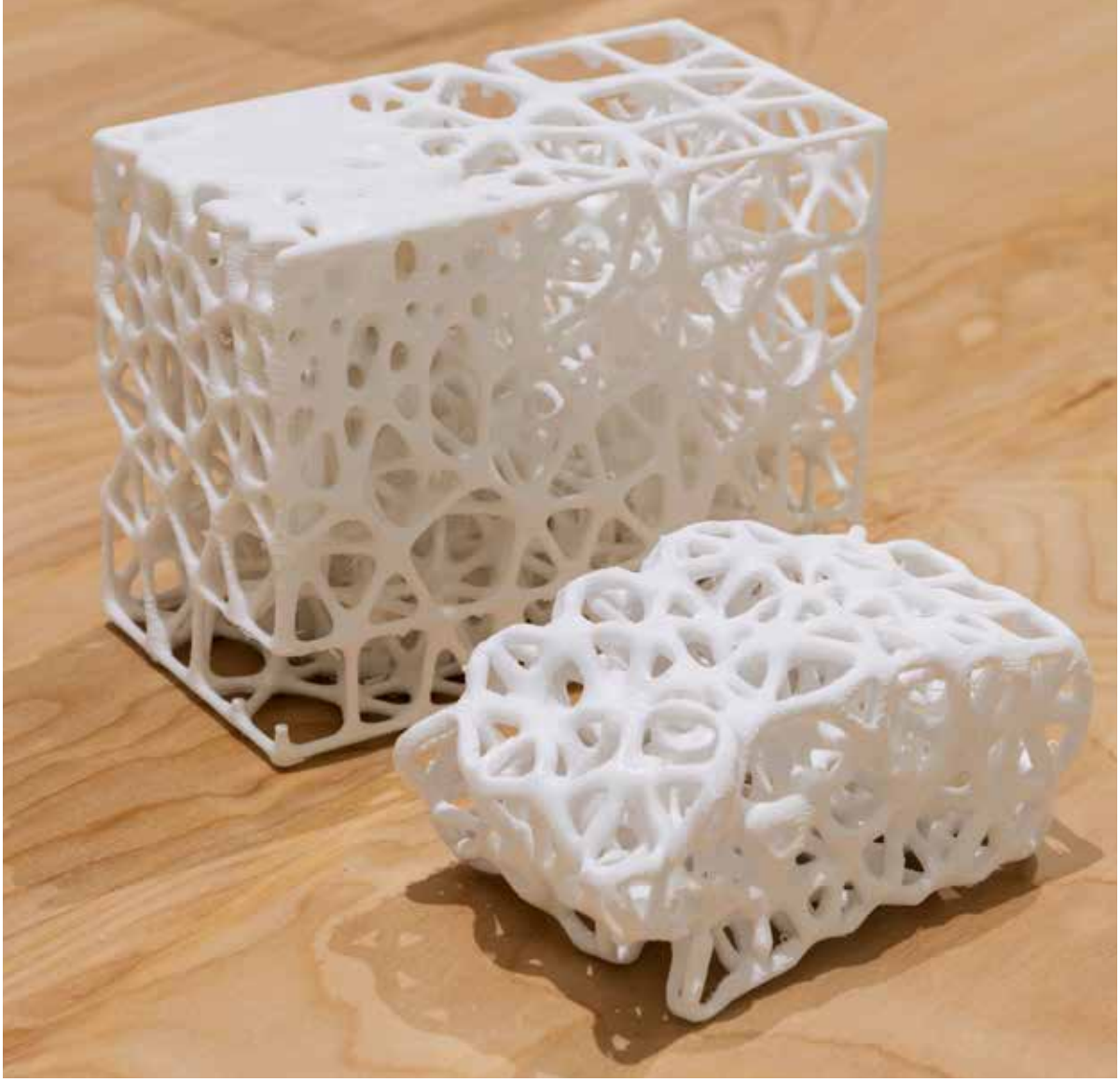
—Nathalie Miebach

nathaliemiebach.com

Explore Relationships Between Form and Function

Historically, art and design inspired by the natural world have looked at form as the model for construction and description. The work in this exhibit takes a modern approach by exploring functionality within the natural world, from the micro to the macro, as a means for thinking, visualizing, and making. For students, public, and professionals alike, this is a touchpoint to consider how analysis of observed behaviors can be inspiration for material and graphic production.

JENNY SABIN



Biomimicry allows students of all ages to be awed by nature and be inspired to think creatively about problem solving, stewardship, and sustainability.

—LARA ROKETENETZ
Biology
The University of Akron

Jenny Sabin

POLYBRICK 2.0, 2018–2022
3D printed ceramic; 3D printed prototypes

Can a building be a responsive environmental system adapting to the density of bodies and changes in heat and light? Could architecture be designed to function as a series of membranes and cells or how blood flows through the body? These are some of the questions that Jenny Sabin asks in both her professional studio practice and in her teaching at Cornell University's Sabin Lab. One of the Sabin Lab projects, Poly-Brick, is an exploration of how biological patterns of growth and function, distilled into mathematical algorithms, can be combined with modern 3D printing techniques in ceramics and other materials. These projects take a transdisciplinary approach, working at the intersections of architecture and science with researchers in areas of biology, robotics, computer science, mathematics, material science, physics, fiber science, and engineering. In these studios, new materials and tools are designed, prototypes are built and tested, and new applications and responsive systems are envisioned.

I think interdisciplinary work for me supports divergent thinking, and ironically expands the capacity for convergence in problem solving in research.

—PETER NIEWIAROWSKI

Biology

The University of Akron

Nervous System is a collaborative design studio that champions the design of forms based on how living systems function. Their products—including jewelry, dresses, and architectural elements—take their forms from running 3D printers on programs based on biological principals and patterns. Nervous System considers this work to be a kind of digital gardening; instead of growing plants, they cultivate algorithms. They developed a set of mechanisms that allow them to control, manipulate, and sculpt the growing process. These act as a set of material and environmental conditions that they can vary through space and time to produce finely differentiated structures. The Kinematics dress, made of over 2000 pieces, was printed as a single unit including flexible joints that allow fluid movement. These innovations in fashion have the potential to shape applications in other contexts, such as modular and flexible structures where location and resources are challenges.

Nervous System

HYPHAE 3D 1, 2014
3D printed nylon

Within the context of a university, it is vital to provide forums for students to value what isn't literal. Students often share a fear of failure, of not having the right answer. Inherent to Synapse's approach is valuing risk and contrasting viewpoints as means of developing insight and innovation. The artists in this exhibition demonstrate both the effectiveness of teamwork and the value of showing where systems break down or don't mesh. In an ecosystem, this place where two environments meet is called an ecotone, such as where a grassland meets a forest. It in these zones that there is an abundance of life.

NERVOUS SYSTEM

Synapse champions abstract thinking and visualizing patterns, sensations, thoughts, and feelings as part of our world and consciousness. The basis of entrepreneurial thinking is when metaphorical and abstract thoughts relate to or address applied real-world issues, experiences, and subjects. Synapse has actively partnered with the community to bring the university beyond its borders. Within the university, Synapse has generated resources that connect people who have separate expertise but mutual interests. When students and professionals meet each other in the context of ideas across disciplines, it forms a new audience for both groups and brings that energy to the larger community. Through the exchange of visits to labs and studios and conversations, whether at the university or in the public sphere, Synapse is connecting individual passions to a universal curiosity of the unknown and the need to address issues of contemporary life.

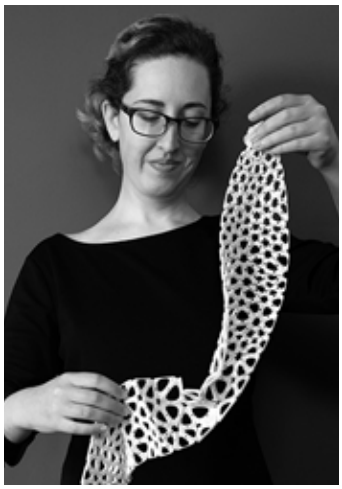
Jenny Sabin

In 2013, Jenny Sabin's visit included research discussions with students and faculty at the University of Akron Biomimicry Research and Innovation Center.

A generative reference for my work is the biological extracellular matrix (ECM), a dynamic protein network that physically and chemically couples the exterior environment of cells with their interior. In 2005, my now long-time collaborator and co-founder of the Sabin+Jones LabStudio, Dr. Peter Lloyd Jones, introduced me to the ECM. Jones, a cell and molecular biologist by training with expertise in matrix biology, showed me the inner workings of context-driven cellular form and morphology, which I quickly understood to be a powerful ecological model for systemic thinking in design. As I learned from Jones and his PhD students, half of the secret to life resides outside of the cell. This protein-rich, dynamic extracellular matrix environment, also known as ground substance, acts upon DNA or code to steer form through a multitude of parameters and feedback mechanisms. This matrix environment is a cell-derived woven protein network that contacts most cells within the body. Importantly, as I came to learn from my collaboration with the Jones laboratory, this environment changes dynamically throughout its development and through compromised conditions generated by disease, including lung pathologies, pulmonary hypertension, and breast cancer. In the LabStudio, we were specifically interested in models that show how these alterations feed back into control cell and tissue behavior at the level of code and beyond, in multiple dimensions, including time.

—Jenny Sabin

jennysabin.com



Nervous System

Jessica Rosenkrantz and Jessie Louis-Rosenberg

Jessica Rosenkrantz and Jesse Louis-Rosenberg lectured and visited science labs and art studios in 2018.

Jessica Rosenkrantz, creative director, and Jesse Louis-Rosenberg, chief science officer, work collaboratively to create using a novel process that employs computer simulation to generate designs and digital fabrication to realize products. Drawing inspiration from natural phenomena, they write computer programs based on processes and patterns found in nature and use those programs to create unique and affordable art, jewelry, and housewares. To evolve such forms, they systematically engage in generative processes. Instead of designing a specific form, they craft a system whose result is a myriad of distinct creations. These systems are interactive, responding both to changes in specific variables and to physical inputs. Nervous System has pioneered the application of new technologies in design, including generative systems, 3D printing, and webGL. Nervous System releases online design applications that enable customers to co-create products to make design more accessible. These tools allow for endless design variation and customization.

n-e-r-v-o-u-s.com


THE
LAST
RIDE

Acknowledgments

Arnold Tunstall, Director, University Galleries, thank you for your creative mindset and tireless work to make these visions happen.

A big thank you to Rachael Reynolds for managing the many people and parts of a very complex exhibition.

Rhye Pirie, from the exhibition branding to the design of this catalogue you have expertly made the artist's work come alive for our community.

Madison McSweeney, your video contribution to the exhibition welcomed and engaged the audience.

PJ Hargraves, your fabrication skills and quick work have made the exhibition shine.

Dale Dong, your fabulous photo documentation will allow us to share images with people into the future.

Thank you to Chris Martin and Aaron Flowers for your support in printing graphics and images to tell the stories.

Thank you to McKenzie Beynon, Madison McSweeney, Diana Rice, Isabelle Nutt, and Alexia Avdelas for your assistance with installation.

Janice Troutman, Director of the Myers School of Art, for your advocacy for these kinds of cross-disciplinary opportunities for students.
uakron.edu/art/

Appreciation to Dave Flynn for your mentorship and guidance on design.

Lauren Folk, your expert editing and help with budgets was invaluable.

Lisa Craig and Melissa Olson, thank you for getting the press and word out about the exhibit and series.

Thanks to Professor Kate Budd for table design.

Thank you to National Lime and Stone company in Akron for materials related to John Roloff's work.

The partnership with FRONT International: Cleveland Triennial for Contemporary Art has broadened the audience for the Synapse 15 exhibition. Artist Wong Kit Yi is a featured FRONT 2022 Artist. We are grateful for the generous spirit and collaboration of Prem Krishnamurthy, FRONT artistic director, and Annie Wischmeyer, curator.

Synapse's goal is to develop relationships with community organizations. The loan of the *Pollen* prints by artist Terry Winters from the Cleveland Clinic's art collection is an indication of that continued creative and idea-driven partnership.

Synapse has brought in dozens of internationally known artists across every discipline to lecture, work with students, and share insights with the Myers School of Art and the Northeast Ohio community. It is because of the support of my colleagues across disciplines of architecture, graphic design, photography, ceramics, painting, printmaking, metals, sculpture, art education, new media, and art history that this has been possible.

Colleagues in the sciences and engineering disciplines have shared the Synapse vision and have welcomed hundreds of students into their labs over the years. Synapse is a piece of the larger ecosystem of research and innovation that is the Biomimicry Research and Innovation Center at The University of Akron. In particular, I wish to thank Ali Dhinojwala, Peter Niewiarowski, Chris Miller, Petra Gruber, Frank Loth, Hazel Barton, Henry Astley, Hunter King, Randy Mitchell, Todd Blackledge, Lara Roketenetz, and Richard Londraville.
uakron.edu/bric/

The generous support of the John S. and James L. Knight Foundation, GAR Foundation, Akron Community Foundation, the Myers School of Art Residency Committee, and numerous private donors committed to innovation in the arts and community building have made this project possible.

Finally, I want to thank the participating artists, designers, and collaborators for your curiosity and determination to look beyond the horizon. We are grateful for your friendship and vision.

—Matthew Kolodziej
Curator and Director of the Synapse Art and Science Series
Distinguished Professor of Art at Myers School of Art, The University of Akron

Exhibition Checklist

BeTA_S
DIANE DAVIS-SIKORA, RUI LIU, LINDA OHRN-MCDANIEL

BeTA_S Canopy, 2022
CNC knit fabric with recycled polyester yarn and white solid fiberglass rods
Acknowledgments
College of Architecture and Environmental Design, School of Fashion TechSyleLAB, and CAED FabLAB at Kent State University; REPREVE recycled fiber; and InnovaKnits textile manufacturing.
Student Team Members
Riley Anderson, Vahid Koliyaee, Maxwell Neuman, Gabriela Gonzales Allende, Oluwatobi Karim, Sohrab Azizollahi, Maame Amoah, Haley DeRose, Fred Wolfe
view this work on page viii, 32, 34

MARK DION

Lecture—The Trouble with Jellyfish, 2018
mixed media installation
Courtesy of the artist
view this work on page xii, 4

STACY LEVY

A single strand from the Bushkill Curtain Buskin Curtain, Bushkill Creek, Easton, Pennsylvania, 2011
seven hundred and fifty painted buoys, steel cable, hardware
Project for Art of Urban Environments Festival
view this work on page 11

Single Petal from Tide Flowers
Tide Flowers, Hudson River Piers 26 and 25, New York, New York, 2006 and Domino Park on the East River, Brooklyn, New York, 2022
marine vinyl, steel, polycarbonate plastic, foam
Hudson River installation commissioned by the Hudson River Park Trust; East River installation curated by Sue Spaid and commissioned by Eco Artspace with support from Domino Park.
view this work on page 11, 20

Cuyahoga Falls Project, 2022
400 glass vials and caps, river water, steel wire
Project funded by the National Endowment for the Arts and the City of Cuyahoga Falls. Additional partners include Arts Now, Collide, Curated Storefront, Cuyahoga Falls Chamber of Commerce, and Downtown Cuyahoga Falls Partnership.
view this work on 11, 16

WONG KIT YI

Inner Voice Transplant, 2022
karaoke lecture performance; HD video with sound
Courtesy of the artist
view this work on page 2

NATHALIE MIEBACH

Blindness of Seeing Patterns, 2021
paper, wood, weather, and COVID-19 data
view this work on page vi

Chutes and Ladders, 2015
wood, paper, data
view this work on page 46, 62

Comfort Zones II, 2022
paper, string, data

view this work on page 62

Ghostly Crew of the Andrea Gail, 2011
colored pen on paper

view this work on page 49

Halloween Grace, 2015
fiber rush, wood, paper, data

view this work on page 47, 48

Three Cranes for Jane, 2015
rope, wood, paper, data

view this work on page 46, 62

Works courtesy of the artist

NERVOUS SYSTEM

FLORESCENCE ORNATA 2, 2014
nylon 3D printed by Selective Laser Sintering

HYPHAE CRISPATA 1, 2014
nylon 3D printed by Selective Laser Sintering

HYPHAE 3D 1, 2014
nylon 3D printed by Selected Laser Sintering

view this work on page 56, 59

HYPHAE 3D 2, 2014
nylon 3D printed by Selective Laser Sintering

view this work on page 59

FLORESCENCE CRISPATA 1, 2014
nylon 3D printed by Selective Laser Sintering

FLORESCENCE ORNATA 1, 2014
nylon 3D printed by Selective Laser Sintering

KINEMATICS DRESS 6, 2015
nylon 3D printed by Selective Laser Sintering

view this work on page ix, 58

JUDY PFAFF

Prince, 2021
melted plastic, acrylic, paper lantern, steel hardware

view this work on page 28

Rhubarb Fool, 2020
pigmented expanded foam, melted plastic, string lights

view this work on page 28

Deep Sea Fishing, 2021
melted plastic, pigmented expanded foam, electric lighting

view this work on page 28, 31

Mud Dauber, 2021
melted plastic, pigmented expanded foam, paper lantern, red wire, steel hardware

view this work on page 28

Sea Jellies, 2021
melted plastic, acrylic, paper lantern, steel hardware

view this work on page 28, 30

Works courtesy of the artist

JOHN ROLOFF

Landscape Projection: Third State, 2022
(photographic components 1988)
high strength gypsum, stainless steel, glass fiber, acrylic medium; B&W photo, ultra-white paint
Courtesy of the artist; stones courtesy of National Lime and Stone Corporation

view this work on page 12, 14, 63

JENNY E. SABIN

PolyBrick 1.0, 2014-2015
3D printed high fire ceramic stoneware
A Project by Sabin Design Lab, Cornell University; Research Associates: Martin Miller & Nick Cassab

view this work on page 8

PolyMorph, 2013
high fire slip cast ceramic components
A Project by Jenny Sabin Studio, Featured in the 9th ArchiLab, FRAC Centre, Orléans, France; Design and Production Team: Martin Miller, Jillian Blackwell, Jin Tack Lim, Liangjie Wu, Lynda Brody

view this work on page 9, 55

PolyTile 2.0, 2020-2021
3D printed porcelain and DNA Hydrogel
A Project by Sabin Design Lab, Cornell University; Research Associates: Viola Zhang & David Rosenwasser

JENNY E. SABIN & CHRISTOPHER HERNANDEZ

PolyBrick 2.0, 2018 – 2022
3D printed ceramic; 3D printed prototypes
A Project by Sabin Design Lab, Cornell University; Research Associates: Eda Begum Birol, Colby Johnson, Ege Sekkin, Yaseen Islam, David Moy, Cameron Nelson, Yao Lu

view this work on page 9, 54

TERRY WINTERS

Atmospheres 4, 7, 8, 9, 11, 12, 2014
screenprints on Lanaquarelle paper
Courtesy of the artist

view these works on page ix, 45

Pollen, 2011
3 from suite of 9 prints
relief, embossment
Collection of Cleveland Clinic

view Pollen 7 on page 43

JULY 15–
SEPTEMBER 30
2022

EMILY DAVIS GALLERY

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