Art and Science

Tilt West Journal
Vol. 4 — October 2022

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https://journal.tiltwest.org/vol4/

Tilt West, Denver

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journal.tiltwest.org
ISSN 2767-0198

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tiltwest.org

All inquiries to:
info@tiltwest.org

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Foreword

Welcome to *Art and Science*, the fourth volume of the *Tilt West Journal*. For this edition of Tilt West's annual publication, we achieved our goal of issuing an open call for a commissioned guest curator. Our curatorial team was pleased to select Alana Quinn, who serves as the senior program associate of the Cultural Programs of the National Academy of Sciences in Washington, DC. Alana worked closely with three Tilt West board members–Sharifa Lafon, Joel Swanson, and Brenton Weyi–to identify a compelling roster of artists, researchers, musicians, poets, and filmmakers whose work explores the many varied intersections of art and science.

The curatorial scope of this volume is wide-ranging and explores how different artists use the sciences to inform the ways in which they communicate through artistic practices. Our contributors live and work throughout the western United States, but many are connected to the Denver metro area where Tilt West is based. As always, it remains central to our organization's mission to amplify the rich perspectives and creative talents of our immediate region in conversation with others who may be further afield. We hope this publication sparks your curiosity, deepens your desire for interdisciplinary knowledge, and inspires further engagement and discourse. We invite you to learn more about Tilt West's mission and program on our website: tiltwest.org.

Editors' Note

Artists and scientists alike endeavor to understand the world around us. Although art emphasizes expression and communication, while science tests and proves ideas, both originate in observation and curiosity. As the curators of this fourth volume of the *Tilt West Journal*, we are less concerned with distinctions between the two disciplines than with their shared potential to inform and inspire, to instill a sense of wonder, and to address some of the most pressing social and environmental issues of our time. In this exploration of the *Art and Science* theme, we highlight myriad ways that the arts and humanities intersect with science in both artistic practice and scientific research. In these pages you will find examples of art inspired by scientific ideas, art created through cross-disciplinary collaboration, and art that blurs the boundaries between the two fields.

In contrast to conventionally held conceptions, artistic work and scientific work are actually quite similar. Both scientists and artists make advances through processes that involve experimentation, creativity, problem solving, and rigor. While many of the contributors to this journal identify as artists, they cannot all be so neatly categorized. The work of a data sculptor is featured alongside progenitors of the eco art movement; an artist working with an interdisciplinary network of researchers speaks to the emerging field of ocean memory; and a filmmaker writes about her dual identity as both an artist and a scientist.

Creative practitioners often respond to or critique the world around them, so it is not surprising that many are engaging with scientific themes in their work, especially now, when pressing issues like climate change and the COVID-19 pandemic are at the forefront of our everyday lives. This volume includes responses to the dual crises of drought and wildfire in the Western United States, addressed through both installation art and poetry. Works by a visual artist, an animator, and an Indigenous rapper explore ideas of brokenness and adaptation in relation to climate change. We examine social justice issues raised by human migration, the disproportionate impact of industrial pollution on communities of color, and the dark legacy of the trans-Atlantic slave trade. We feature a visual essay by an artist who has made work by mutating daisies. An Indigenous-led performance group explores our complex connection to nature in our urban environments. A collection of outdated computers and other "dead media" in Boulder, Colorado is brimming with potential for hands-on experimentation, while reducing the impact of e-waste. And in an interview with the directors of an artist residency program at a scientific research field station in California's Sierra Nevada, we invite you, the reader, to consider the potential for similar initiatives in your own region.

Art and science permeate our society. We hope you come away from this issue with an expanded view of their emerging intersections, and we hope you are surprised, delighted, and inspired by the innovative work we have shared.

Alana Quinn, Sharifa Lafon, Joel Swanson, and Brenton Weyi
Art and Science curators and issue editors

Beginning in Medias Res

Erin Espelie

Why does the quaking aspen make sugar not only in its leaves but also in its bark? How do the larvae of darkling beetles biodegrade Styrofoam in their gut? Do red foxes detect magnetic north as they hunt for rodents in deep snow?

Tree, insect, vertebrate.

Populus tremuloides, Tenebrio molitor, Vulpes vulpes.

These are categorical beginnings, ones I have chosen to delve into over the last several years. Each question, each binomial species, has served as an entryway for me into a lens-based study. Discrete answers have been less important than following the elusive aspects of each new question seeping up from the muddy residue of the last. Ending these sets of experiments has entailed distilling results into words, sounds, images.

Still image of aspen bark from Erin Espelie's film *True-Life Adventure II* (2013).

Still image of a Styrofoam landscape from Erin Espelie's film *Tenebrio molitor* (2019).

Are these pursuits born of science or art? Can my efforts be accurately bisected? Should they be? Despite resisting codifications, I find myself regularly forced to issue judgment. Yet science and art, so often placed in false opposition, oscillate around the same impulse: curiosity. Nearly every other worldly pursuit involves endgame motivations such as seeking justice or making money, recording history or assessing humanity, satisfying a hunger or extracting a resource.

Art and science, in my estimation, align more than they differ. Both ask open-ended questions ad infinitum. Both frequently demand new experimental designs and provoke conversations, historical and contemporary, with others in their fields. Their investigators tend to work iteratively in search of new perspectives, triaging an enormous quantity of material deemed inelegant for public display, throughout successive processes. Ultimately, they share a collective abhorrence for reductionism, refusing to be limited by categorical, catchall terms like *the arts* and *the sciences*.

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Over the years I have amassed a collection of quotations from various thinkers who, according to personal passions and collective times, have placed art and science either in alliance or opposition. One of my favorites comes from physician-playwright Anton Chekhov, who personified scientific medicine as his "lawful wife" and the literary arts as his "mistress," writing to a friend that, "[W]hen I get tired of one I spend the night with the other. Though it is irregular, it is less boring this way, and

besides, neither of them loses anything through my infidelity" (Schwartz 2014, 213).

In my early twenties, I clung to this quote as an articulate justification for why I straddled two identities—scientist and artist. The arts were indeed more illicit and seductive than my more stable, socially acceptable, and socially responsible job in the sciences, which I felt obligated and duty-bound to hold. But I agreed with Chekhov that neither entity suffered—in fact they benefited—from the other's presence, together enriching my life.

Later, as I sat and squirmed more squarely within society's definition of an artist, I sought comfort from, among others, author George Eliot, who wrote at the outset of her 1876 novel, *Daniel Deronda:*

> *Men can do nothing without the make-believe of a beginning. Even Science, the strict measurer, is obliged to start with a make-believe unit, and must fix on a point in the stars' unceasing journey when his sidereal clock shall pretend that time is at Nought. His less accurate grandmother Poetry has always been understood to start in the middle; but on reflection it appears that her proceeding is not very different from his; since Science, too, reckons backwards as well as forwards, divides his unit into billions, and with his clock-finger at Nought really sets off in medias res (2002, 1).*

Despite the tired gender split, the idea that Science is a rather oblivious pretender amuses me. The assessment that science cannot escape its own subjectivity—and the trappings of requisite fiction—readily fits my critique of rigid scientific epistemologies. I also admire Eliot's untraditional casting of Poetry as older, wiser, and more assured in her methods—a trusted companion whom we expect to entwine us in tales of enticing confusion.

We all love intrigue—which is why Albert Einstein called mystery "the source of all true art and science" (1931, 5). Mystery awakens our curiosities, which then inspire creativity, the fundamental aspect of expanded exploration. Astronaut Mae Jemison, who also credits creativity as a yoking force, states that the arts and sciences are "manifestations of the same thing . . . avatars of human creativity" (2002). Jemison's

personification is refreshingly open-ended, allowing for a multitude of individual imaginations to fill in the personal identities and infinite aspects of science and art.

Countless others have puzzled over how to reconcile the nuanced differences and similarities in these two fields, from Anna Atkins, Erasmus Darwin, and Leonardo da Vinci to Athanasius Kircher, Maria Sibylla Merian, and C.P. Snow. Recent scholars make this list, too. In a 2022 interview, artist Haroon Mirza offered this about his solar-powered installation, *stone circle,* in the Texas desert:

> *[T]hat's the powerful thing about art: artists being able to propose things that actually provide practical solutions . . . or open up a new awareness [. . .] Sometimes it happens as a very programmed part of the work [. . . but] the majority of the time it comes out of an accidental side effect (Buck 2022).*

Mirza is making the implicit comparison of art to science in both functional and innovative realms. Although I don't fully agree with the validity of that metric—utility cannot always be quantified or identified in advance—I respect its importance for many. Alternately, I know how joyful the serendipity found through unfettered experimentation can be in any field. So I appreciate science writer Natalie Elliot's perspective on how both art and science affect our sense of greater purpose:

> *A lot of great art helps us deal with the tears in the fabric of how we live [. . . so that we can] start to imagine responses to things that science tells us. [. . .] Great artists can give us ways of trying out different stories and ways of envisioning different responses to our existential uncertainty, which I think is always there if we just look around a little bit. And science often helps us see (Bogaev 2021).*

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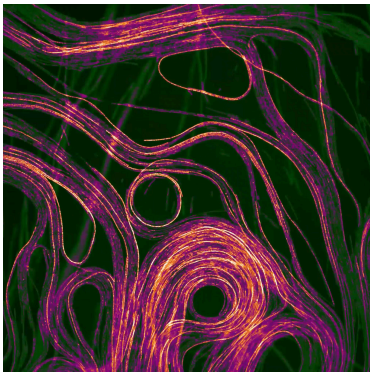
In 2017, I co-founded NEST (Nature, Environment, Science & Technology) Studio for the Arts on the University of Colorado Boulder campus with my colleague Tara Knight. The verb "to nest" is rooted in identifying categories of containment, in the style of taxonomist Carl Linnaeus, maximizing

efficiency while maintaining autonomy. “Nest” is also a noun describing a constructed home. At the very minimum, NEST was meant to be a place for shared observation, in the spirit of scholars Lorraine Daston and Elizabeth Lunbeck who wrote, “Observation has always been a form of knowledge that straddles the boundary between art and science [. . . and it offers] new knowledge in the most unexpected places” (2011, 7-8).

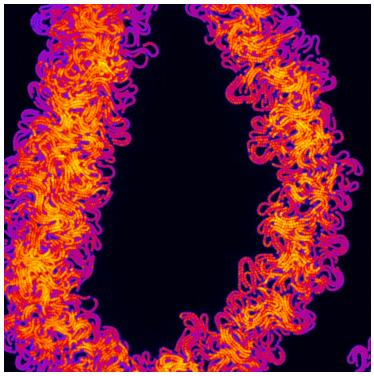
NEST was designed to explore our current uncertainties, to study what might be gained from more collaboration between disparate fields. A 2016 report in the scientific journal *Nature* extolled the benefits of art-science engagements, ranging from breakthroughs in research and the creation of art, to improved communication skills and greater student commitment to their education and campus communities (Eldred 2016, 125-26). Frequently, artists are encouraged to be inspired by scientific research to create their works and, inversely, scientists feel pressure to artfully translate the complexity of their research to the public, typically through data visualizations. NEST Studio for the Arts embraces empiricism within these existing models while encouraging alternate anatomies for addressing complex, integrated understandings of humankind and our environment. By focusing directly on how disciplines interact and how methodologies might be co-created and shared, the students at NEST have found freedom to define their work outside the margins of traditional disciplines.

Over the last 5 years, NEST has supported more than sixty collaborators who have delved into educational traditions, explored ontologies, and gained expertise through broadly defined art-science projects. A ceramicist experimented with a mechanical engineer to create a passive air-filter sculpture; a philosopher collaborated with an ice scientist to create wood-block prints about Baffin Island and rising sea levels; a mycologist and a filmmaker co-directed a film about cell growth; a mathematician partnered with musicians; and so on. We have seen an astonishing array of ways that art and science, working together, can act as catalyst, beacon, icon, and surrogate for a subject, an idea, a cause. They can activate change and sway opinions. The only requirement for results appears to be persistent, creative inquiry in search of ever-shifting perspectives.

I still oscillate—without much predictability in my tempo—between identifying as a scientist or as an artist. One month, my work in a cyanobacteria laboratory takes precedence; in another, a narrative cinematic exploration intercedes. Ultimately, I care little for labeling. Instead, my focus is on choosing where to point my clock-finger next, and then beginning.



Still image of cyanobacteria, filmed by Erin Espelie in collaboration with the Cameron biochemistry lab (2019-present).



Still image of cyanobacteria, filmed by Erin Espelie in collaboration with the Cameron biochemistry lab (2019-present).

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https://youtu.be/ERKEdKBz6fY

Hog Pasture: Survival Piece #1

Newton and Helen Mayer Harrison

YEAR	2012
DIMENSIONS	8 feet x 12 feet x 18 inches
MEDIUM	Earth, fluorescent lights, annual hog pasture mix, seed
CREDIT	Courtesy of Harrison Studio

Helen Mayer Harrison and Newton Harrison played a pivotal role in the foundation of the eco art movement. Often referred to simply as "the Harrisons," Helen and Newton began their practice in the 1970s and created a vast body of work over the five decades they worked together. *Hog Pasture: Survival Piece #1* was exhibited in 2012 at the Geffen Museum in Los Angeles and featured a 120-pound pig named Wilma interacting with a pasture that the artists constructed within the gallery. Soil degradation continues to pose an environmental concern and threat to the global food supply, extending the relevance of the Harrisons' artwork today.

The *Wilma the Pig* video was co-written by the Harrisons and Nada Miljković, who served as the producer and videographer for the project.

ArtSciConverge: An Artist Residency at a Field Station

Jeff Brown
Faerthen Felix

Our guest curator, Alana Quinn, sat down in January 2022 for an extensive interview with Jeff Brown and Faerthen Felix, co-directors of the UC Berkeley Sagehen Creek Field Station ArtSciConverge Artist Residency Program in the Sierra Nevada in Truckee, California. What follows is an excerpted transcript of their discussion. The text has been edited for clarity and brevity.

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Alana Quinn: Jeff and Faerthen, welcome, and thank you for joining me. To start, can you tell us a bit about how the Sagehen Creek Field Station came to exist and what kind of research happens there?

Jeff Brown: In the late 1940s, the California legislature thought it important that the University of California have a wildlife and fisheries program. They appropriated money, and they went to campus and said, "Hey, what do you guys think?" And the people at the university said, "What a great idea!" There were two people there that were key: wildlife biologist Starker

Leopold and Paul “Doc” Needham, who studied benthic macroinvertebrates, the bugs that live in rivers and creeks. Somehow in the time they spent hunting, fishing, and exploring, they found Sagehen Creek, which is located about eight miles north of Truckee. In the winter of 1950-1951, they skied out with some California legislators and representatives of the Forest Service. That was how the Sagehen Creek Field Station began.

Alana: When did you arrive at Sagehen?

Jeff: We got to Sagehen in 2001. During our first summer there, three large forest fires happened around the station. We spent the summer in smoke, and it got us thinking about the value of the place. It's got a long data set, there's data that goes back to the early 1950s, and there aren’t a lot of places on the planet or at least in the United States that have a long-term data set, and–if it's forested in the American West–that haven't burned yet.

In the 19th century, the central Sierras were clear cut. The mills were put in, and the first transcontinental railroad in the United States went through Truckee. Then the forest was allowed to grow, then it was suppressed, cut again, and allowed to grow. People started building homes there, and the US Forest Service began to focus on putting out fires. They’ve done that for a long time. As a result, they started thinning the forest to reduce fuel loads, but they were mostly just taking out all the big, valuable, fire-resistant trees that aren’t a fire problem. A lot of folks were upset about that. So they sued and stopped the forest-related cuts that the US Forest Service had been proposing, at least in the Sierras.

So now we're stuck with what I call the perfect campfire. We've got some bigger trees, we've got the next step down, all the way down to lots and lots of the little stuff. And then we have a thick duff layer. That stuff that falls off the trees turns into dirt over time. We're on the east side of the Sierras, the dry side.

Faerthen Felix: We really need small fires to keep up and help with that nutrient cycling. It depends on low-intensity, regular fire to manage the health of a forest like that.

Jeff: The Washoe tribe would do that when they were there. They would burn the place in the fall when they'd leave. We wanted to figure out what to do for a forest that had been managed successfully for thousands of years by Native Americans but was now out of balance.

We were able to core a lot of these old stumps because they don't decay very fast here. The Comstock-era stumps are still there, and are much older than the trees we have now; we were able to get a fire history from them. We learned that, pre-European arrival, the mean return for fire in Sagehen was about every 2.4 years. It was low-intensity, cooler fire. Post-European arrival, that went up to 24 years and those fires were much larger and much hotter.

You can see how the system had been used to one thing, and then all of a sudden it was thrust into a completely different world. Now that the climate is shifting; we're drying out, warming up, and we're starting to see huge increases in the magnitude and depth from heat that these large fires are having on the ecosystem.

We formed a large collaborative group in an effort to create a forest management plan.

Faerthen: Nobody thought it was going to work, but they were all willing to work together, and we hammered out a prescription that everyone could live with. After all this time and effort, we thought we had won. We were excited. We got loggers and environmentalists to agree. “We're done. This is awesome!” It turns out it wasn't quite that easy.

Alana: This is where the ArtSciConverge artist residency comes in. Can you describe its origins?

Jeff: About five or six years ago, the Nevada Museum of Art in Reno (NMA), which is the only art museum in the world with a permanent Art + Environment Department, came to us and said, “We're looking for a place to put a fifty-year art project on the ground.” They were working with Newton and Helen Harrison, who are big players in the eco art world. They wanted a

place in the Sierras because the theme was climate change and its effect on the Sierra Nevada. And we said, “Great!”

And also around that time, the National Academy of Sciences came out with a report on field stations and marine laboratories and what we should be thinking about to be relevant in the rest of this century. It said we weren’t being effective at moving the results of our science into the broader culture. This report hit us in the gut and made us realize why there's this huge frustration between science and the public.

Faerthen: It resonated with our experience. We were talking to the larger public around Truckee, and we were so excited about this project. This forest fire issue is the biggest socio-environmental issue in these people's lives. And we had come to a place where we could solve this problem if we all worked together, and they all just kind of went, “I don't care.”

Jeff: This report comes out, and the museum has come to us about a project. And that got us thinking differently. When we started talking about the Harrison Studio project, Bill Fox, the director of the Center for Art + Environment at the Nevada Museum of Art said, “Jeff, you've now got world-class artists working at Sagehen. What can we do to grow that program?”

That's when we started the artist residency program at Sagehen, which is pretty unique. We have no money, but we have a great place. We have great issues that we're working on. How do we get artists excited about what we're doing and then willing to engage and use their lens to address the same issues?

Faerthen: There's a tendency for scientists to think that art is simply a tool for illustration of their work. But we made an effort to avoid that. We wanted to invite artists and say, “Here's this place. Here's what we're working on. What can you do?”

Jeff: We worked with the National Science Foundation to fund a workshop about art and science at the NMA in Reno. That was great, because we had a

bunch of artists and scientists there. We had brain researchers, field station people, and the art community.

At the end of the workshop, we launched ArtSciConverge, to connect the two disciplines. The artists wanted to work with scientists but didn't really know how. When we talked to scientists, they'd often say, "I'd love to work with an artist. They can draw a picture of my bird." Well, that's an illustration; art is a pretty broad area.

Alana: What kind of responses have scientists and the visiting public had to the artwork?

Jeff: We had some frustrations when we were talking about Helen and Newton Harrison's project with people. It was obscure, and some people responded that they didn't really think it was art. The Harrisons set up a series of five test plots at varying elevations moving up the watershed. The project was designed to test various plant species' ability to control erosion, preserve water quality, and limit the spread of catastrophic fire in a changing climate.

Faerthen: It looked like a "common garden" science project. The art emerged later in gallery exhibits and mapping projects that they would do and in the poetry that Helen would write. But at the time it didn't really look like art. People were confused by it.

Alana: Can you describe one or two other projects that elicited strong responses?

Faerthen: There is a contest every year sponsored by Socrates Sculpture Park and the Architecture League of New York. Artists and architects design a folly, and if their design is selected, they get to build and exhibit it for a year in Socrates Sculpture Park in New York City. There was one entry by the design practice stpmj that didn't win, but it went viral, and it was beautiful. It was called the *Invisible Barn*.

It looked like an abstraction of one of our cabins, but it was mirrored on its surface. And it had holes that passed all the way through it. You would look

at it and it would reflect the forest at you, and you could see the forest through it.

A view of *Invisible Barn*, 2015, by the New York and Seoul-based design practice stpmj. Photo credit: Faerthen Felix.

What it did for us was remarkable. Even before we built it, when we announced it, suddenly there was this big discussion that went on. All of these issues came out that people were worried about, like: “You're putting a mirror in the forest, aren't birds going to slam into it?”

The interesting part to me was that birds hit windows all the time, and people don't worry about it or comment on it. We've had buildings at Sagehen since the 1950s, and they have windows, and sometimes birds hit them. We have roads and structures in the forest, and nobody ever questions it or asks, “Why are we doing this? Is there a better way?” But because the *Invisible Barn* is art, it made people think differently and ask questions that we should be asking about everything we do. It was a powerful lens for focusing thought. It got people's attention. So, that was a fantastic project. (And, for the record, we researched and used material that birds can see, unlike window glass.)

Jeff: Once we built it, it became the draw for everybody that would go through Sagehen. Sagehen is a busy place. When groups were there, they would always take their photos around the *Invisible Barn*. They were naturally attracted to it. It was wonderful.

Faerthen: Fire is a compelling thing, and some artists and scientists expressed a desire to engage more closely with our prescribed burns at Sagehen. In the past, the Forest Service wanted the public nowhere near their fires. There's way too much liability. They can't juggle all these people coming and going. So that was never a possibility.

Jeff: We asked the Forest Service, “What would a scientist or artist need to do to be able to engage with an active fire?” And they said that they would need to have red card training, the same basic level of training that any of their wildland firefighters have. So we did a red card training for artists and scientists. The Forest Service actually did the field training for us. It was great because it created a connection and lowered that wall a little bit.

Faerthen: One of our artists-in-residence, Julie Weitz, did an interesting project. She has this character called the Golem that's based in Jewish traditional stories. Her Golem became a wildland firefighter, and her project is currently on exhibit at the Contemporary Jewish Museum in San Francisco, which is awesome.

Anywhere you go in the world, there are fire festivals. There's this wonderful relationship that people have to fire that's positive, dynamic, and rewarding. And yet, you look at the fire culture of the Western United States, and it's horrible. It's all about catastrophe, fear, and devastation. We need to change that, and the only people who are going to change that are artists. Scientists can't change culture.

Alana: What do you think is the power of integrating art and science?

Faerthen: We’ve talked a lot about the power of art to shift culture and to change society. But the other aspect of the artist residency program, the thing that we think that the arts can bring to science, is a deeper and more

profound level of discovery. Artists and scientists are both trained pattern detectors, but they come at it from very different perspectives.

Human perception is not a matter of faithfully recording what is out there. It's a filtering process. People from different backgrounds with different expectations and experiences are going to see things very differently. When you have an artist and a scientist working together, or when you have them working in the same space, I think that you can actually get to deeper, more profound levels of discovery. That's an important aspect of our artist residency program, too.

Jeff: One thing we've heard from artists is that they want to be engaged at the beginning when people are starting to formulate the questions, versus coming in after the science side has already decided what the question is. We would love to connect with scientists who are willing to stretch a bit and connect with an artist to start a series of conversations that then leads to question development, and then let them move through their processes with regular interactions and see what happens.

Faerthen: It's been fun to see what artists come up with. We've had people working in all kinds of media, and we've had installation art. We've had performance artists. We've had projection art.

Jeff: One thing that has been powerful for Sagehen is our relationship with the Nevada Museum of Art. They've introduced us to people. And they archive the art process for Sagehen. All the artists that are doing work at Sagehen that are interested, their process will be archived at the Nevada Museum of Art. It's kind of in perpetuity. With that relationship, the world changed for us.

Alana: If an artist wants to get involved, how do they do that? What advice would you give artists who are considering applying?

Jeff: It's not a formal process. We don't have the resources to send out an RFP and evaluate a bunch of applications. If you're interested in what's going on, let us know. If you were to connect with sagehen@berkeley.edu, we can talk about things and then figure out if there's a fit for either side.

We’ve retired from running the station, but we're still managing the art program. The new lead, Ash, is very supportive and wants to see it continue.

Alana: This has been a great conversation. Is there anything else you'd like to add?

Jeff: I know that Tilt West is based in Colorado. Colorado has a number of well-established field stations. They also have a strong art presence. I think it would be interesting if the art world could reach out to a couple of these field stations and try to form some new partnerships there.

The Party Crashers of Paradise

Indigo Moor

Paradise was lost. The largest fire in the history of California swept the town, taking nearly one hundred lives and destroying 18,000 homes. How do you encapsulate the multitudes of a preventable tragedy? Indigo Moor's poem evokes the chaos, mourning, and dark humor of catastrophe.

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We bum-rushed the stage,
this gig in Butte County.
A hundred flaming fan dancers open
for us, take the town like fire-
fruit dropped in hell. A blackout
curtain tossed over the sun.

The drummer goes High Hat
on some propane tanks.
Shit got real. Crowd squeal-
tone deaf. Nothing croons

like charred pines. Or
An arpeggio of screeching hawks.

A microbus humps a Mercedes
behind a burning bush.
It's Paradise. These things happen.

We advertise crippled deer
chewing singed hooves.
A scorched tabby in a birdbath.
Knotted oaks and pine cones
Erupting like roman candles.

Our crooner scats embers
like rainbows over the middle school,
through the blind eye
of the monkey bars.

First, Burrowing Owls
bake into tender bites. Then
a grandmother. Roasted manna
hails down, picking the locks
on a child's lungs
until the wailing of fire engines
finds its twin, before lurching
to a dead crescendo.

After 17 days, we've torched
EVERYTHING.

Except the Starbucks.
We own our sacred altars,
Our angry gods of WiFi.

The Fire Marshall shuts us down.
There's a blood cry
in the curtain calls.

The whole damn town was screaming.

Something like an encore.

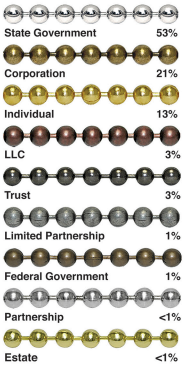
California Water Rights

Adrien Segal

YEAR	2017
DIMENSIONS	34 x 16 x 32 feet (10.3 x 4.8 x 9.7 meters)
MEDIUM	Aluminum, ball chain
CREDIT	Courtesy of the artist. Photo by Mario Gallucci.

California Water Rights, a monumental installation by interdisciplinary artist Adrien Segal, offers a visual representation of water allocation data that provokes questions about environmental sustainability and social inequality. This suspended, immersive sculpture spans three stories in an atrium above two diagonal stairways. Strands of color-coded ball chain are draped above and around the stairways, hung from a meandering river, which mimics the flow of people moving through the space. The 1,072 strands represent the 1,072 largest permitted water users in California. The length of each strand corresponds to the amount of water allocated to each entity, and the colors of the ball chain indicate the types of entities (governmental, corporate, individual, etc.). Each ball represents one acre-foot of water, or just under 326,000 gallons.

As the viewer moves through space and explores Segal's work, this complex information is brought into the realm of bodily experience, imparting an intuitive understanding of the immense amount of water that is used in California. The installation engages viewers with experiential knowledge about how we as a society choose to manage and commodify water, a shared and highly precious resource.


State Government 53%
Corporation 21%
Individual 13%
LLC 3%
Trust 3%
Limited Partnership 1%
Federal Government 1%
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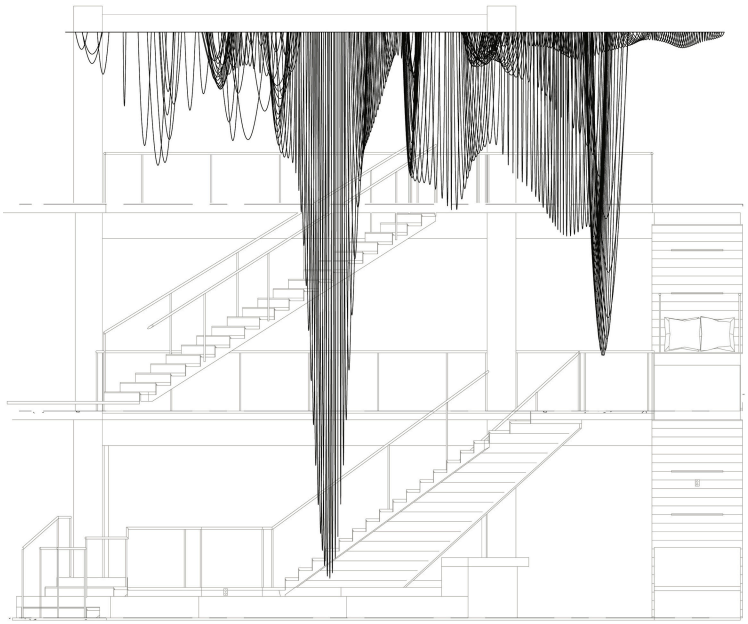
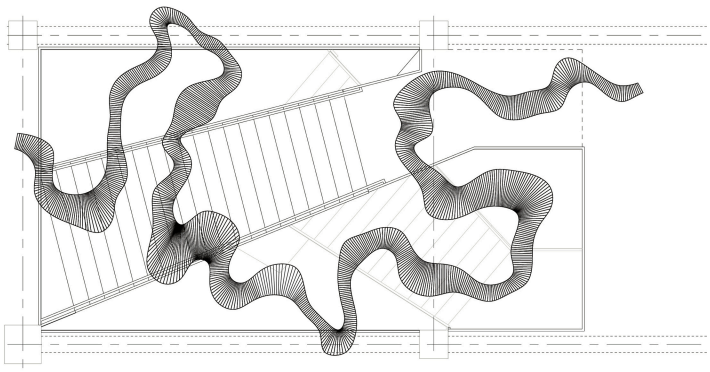




California Water Rights is a permanent installation at a digital lab in San Francisco. Art consultant for the project: Heidi McBride & Co. Data source: California State Water Resources Control Board (SWRCB).

We Claim the Deep: Art & Ocean Memory

Kathie Foley-Meyer

If I try hard enough, I can still remember the taste of the cinnamon candies my father carried around in his briefcase and the slight chemical tang in the smell of his laboratory. His work was associated with the chemical processes of a precursor to what we now call magnetic resonance imaging, or the MRI. I was born when my father was completing a PhD in chemistry at Michigan State University, and his dissertation involved a process that would allow us to see inside objects and, eventually, human beings. His work is on my mind as I complete my PhD in visual studies at UC Irvine, with research and an art practice intimately intertwined with the sciences. My dissertation project is an exploration of art that references the ocean memory of the millions of African lives lost to the sea during the course of the trans-Atlantic slave trade.

Just prior to my pursuit of a PhD, I became obsessed with the afterlives of the human cargo consigned to the ocean during the Middle Passage, and I completed a work titled *Twelve Voyages*, inspired by research I had conducted with the Trans-Atlantic Slave Trade Database. This database is an evolving archive; from its contents one can contemplate the lives of the more than twelve million Africans shipped across the Atlantic between 1514

and 1866 and the estimated two million who did not survive the journey. In his 1999 volume of poetry *Black Salt*, Édouard Glissant writes of the ocean as a territory of "glittering death" from which transformational, abyssal beginnings are possible (98). He also marks it as a zone of collective cultural memory for people of African and Caribbean descent. Christina Sharpe, professor of English literature and Black studies at York University notes in her book, *In the Wake: On Blackness and Being*, "the atoms of those people who were thrown overboard are out there in the ocean even today" (2016, 40). She utilizes the term *residence time*, which is the amount of time it takes for the ocean to completely consume something, and she explains that the human body, composed largely of water and salt, could have a potential residence time of 260 million years (2016, 41). I create art with the knowledge that my ancestors still abide in residence time within the depths of the Atlantic, and I am charged with illuminating their presence. As an artist, I want the freedom to make work about any subject, including those unrelated to my ethnic or cultural background, but one of the pleasures of a PhD is that it can allow for the pursuit of knowledge in a field related to a particular aspect of one's identity.

Part of my dissertation research has focused on the work of American artists Ellen Gallagher and Lorna Simpson. Gallagher's creative practice has centered on sea life and Blackness since her early years in Providence, Rhode Island, and her ongoing *Watery Ecstatic* series continues that tradition. In her 1997 work *Drexciya*, Gallagher presents her version of an undersea territory of superhuman Black beings spawned by the bodies of pregnant African women thrown overboard during the Middle Passage. The oil, ink, and gesso painting on canvas features the population of *Drexciya* as tiny heads of Black women with flip hairstyles and protruding tongues. Without bodies, their existence is powered only by their brains. The later works in *Watery Ecstatic* are oil, watercolor, and cut paper on paper, depicting a fantasy blend of sea creatures and floating women's heads trailing long sheaves of white hair.

Lorna Simpson's work explores similar themes. Her "Everrrything" exhibition, on view at Hauser & Wirth in Los Angeles in 2021, featured large, mixed-media canvases of land and seascapes, including huge rock

cliffs partially composed of photographic images of Black women. In one work they appear as wig-style photographs (an image type also used by Gallagher), which, along with columns of text, appear to be part of a gigantic blue wave rising in front of a brown land mass. In another, a superimposed photograph depicts calmer waters with a rising land mass and columns of text referencing womanhood, where words such as “Queen” and “Eve” are visible. Photographic strips of Black women’s faces blend into the rocklike structure, while another Black woman sits atop the land mass, gazing out across the water as if in vigil for a ship depositing more Black bodies into residence time. The phenomenon of women waiting by the sea for men to return is a common motif in drama and literature, but this woman is waiting for something else: for the end of voyages of human cargo, for the recognition of Black lives lost, and for the emergence of abyssal beginnings that are centuries old.

The artwork of Jason DeCaires Taylor, another focus of my research, is an evocative blend of art and science. The British sculptor is best known for his underwater *Museo Atlantico*, an installation series composed of marine-compatible, pH-neutral, and non-toxic cement intended as a countermeasure to the effects of climate change. Taylor’s installations become hosts for colonies of coral and other sea creatures over time. When his piece *Vicissitudes*, depicting a circle of twenty-six life-sized figures of boys and girls holding hands, was installed in Grenada, some perceived the work to be an homage to the Middle Passage because the boy figures appeared to be of African descent. This was not the artist’s original intent, but the interpretation nonetheless speaks to the desire for commemoration of lives lost to the slave trade.

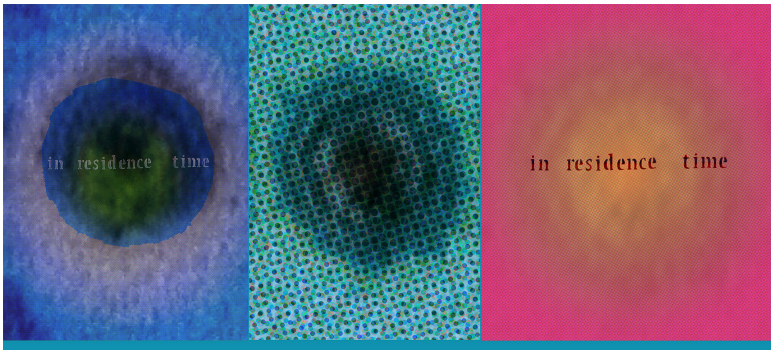
My artistic and research journey has led me to the Ocean Memory Project (OM), an art and science collaborative that considers how environmental change may be recorded “in physical and chemical traits within the dynamic structure of the ocean itself” (Ocean Memory Project, n.d.). If the ocean does have memory, then it must include the residence-time presence of the bodies deposited during the slave trade. As I write this article, I am also working on two grant-funded collaborations with my OM colleagues; one, entitled *Descent & Transformation*, is a multimedia experience of the human

body in the ocean depths, and the other, *Old School*, is a mixed-media project on climate change that incorporates 3D printing, weaving, cassette recordings, and a pop-up book.

As Sharpe writes, "Human blood is salty, and sodium [. . .] has a residence time of 260 million years" (2016, 41). As the ocean recycles up to ninety-five percent of deposited tissues, the residence-time presence of my ancestors in the ocean will, in a sense, outlive me. From the moment when they were jettisoned into the sea, my ancestors became subject to what Calvin Warren, in *The Psychic Hold of Slavery: Legacies in American Expressive Culture*, calls *black time*: "a temporality outside of physical time; it is time that fractures into an infinite array of absurdities, paradoxes, and contradictions (Colbert et al. 2016, 56). He goes on to explain, "The temporal vectors of past, present and future are inadequate to capture the event, and the event fractures these vectors as we attempt to squeeze the event into them" (Colbert et al. 2016, 59). Warren labels slavery an "event horizon" that "structures western thought itself," and he suggests that, without it, western society would not have established the basic elements of modernity (Colbert et al. 2016, 56).

As I consider the implications of the residence-time presence of my ancestors, I am also inspired by the methodology of scientific discovery. In 2018, a new type of viral DNA was discovered in Woods Hole, Massachusetts. Dubbed *Autolykiviridae* by researchers at the Albert Einstein College of Medicine and the Massachusetts Institute of Technology, the name refers to Autolykos, a character in Greek mythology noted for his trickster tendencies and elusiveness. As Dr. Kathryn Kauffman, one of the researchers, noted, "When we're studying viruses anywhere, [. . .] the methods that we use change what we find. We become blind to them if we keep on using certain methods" (Unpublished interview with author, September 30, 2021). Similarly, modification of the processes of art-making can intrinsically alter the final product, resulting in a revelatory outcome. *Autolykiviridae* struck me as a perfect parallel to my ancestors in the ocean: alive in some diffuse form of alternative existence, consumed by the animals and microbes of the ocean, remaining unseen for centuries, then revealed through a new way of seeing. Grainy enlargements of images of

Autolykiviridae from the study became my inspiration for a series of photographic prints evoking existence in residence time.



At Woods Hole II, 2019, inkjet print, 11 x 25 inches. Courtesy of the artist.

As I incorporate oceanography into my art practice and look for methods of elucidating the presence of my ancestors, I feel that I am following in my father's footsteps in creative experimentation. My father's work led to technology that allows us to see inside ourselves, and I view the creative and scientific exploration of ocean memory and my commitment to understanding humanity through the prism of Blackness as working in a similar vein. I remain intrigued by the concept of Black bodies in residence time and will continue to explore the temporality and territoriality of Blackness via this lens. The interplay between art and science may finally compel western nations to come to terms with this incalculable loss of human life.

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Wondering in the Woods

Radio Healer

Radio Healer is a Xicanx and Native American-led collective founded in Phoenix, Arizona, whose membership currently includes Edgar Cardenas, Raven Kemp, Cristóbal Martínez, and Meredith Martínez. These artist-hackers invent electronic tools which they use along with traditional indigenous tools to perform reimagined indigenous ceremonies. Through their installations–immersive environments comprising moving images, tools, regalia, performance, and sound–the collective presents visual and sonic metaphors that defamiliarize the ordinary. Radio Healer's goal is to disrupt perception and provoke audiences to critically consider the complex cultural systems that shape our notions of reality.

The following essay by Radio Healer reflects on their video artwork, Wondering in the Woods. This artwork was originally presented at Convening II of Intersections 2021 and was commissioned by the National Academy of Sciences and Pacific Standard Time 2024, an initiative of the Getty Foundation in Los Angeles. It was subsequently presented online at Southern Exposure, a nonprofit art gallery in San Francisco, at the start of 2022. A three-minute excerpt of the thirty-minute video appears below.

https://youtu.be/L-zemXz3e8s

> *Cruising and descending, a drone cannot think of love, uncertainty, and broken heartedness, but we see the signs of change through its lens. We see the earth shifting through this prosthetic. It is clear that we are part of this force of change, and confused. Perhaps we will reflect with greater frequency and across a larger swath of bandwidth.*

Wondering in the Woods combines drone footage of Eliza Howell Park in Detroit, Michigan; footage of noise instruments built and performed by our members; a sound score; and a sequence of narrated micro-stories, simple in shape and structure, which reference a larger, more complicated story of environmental ideation and land use. In the sound score, we use our instruments to fill in frequency gaps that exist in field recordings of the forested urban park, evoking the complexities of the built environment in relation to its ecological context.

The urban park or preserve is a psychological technology analogous to a shoe. It is made of nature, partly, just as a shoe is made of materials derived from nature, partly, and the city wears it as a cushion against its own hardness. An excellent shoe–sturdy, bouncy, and well-maintained–protects the foot from concrete for a time, but it's never long before the sole degrades, grime tarnishes the finish, and an interior microbial community begins to produce a deeply-embedded reek. One may clean, patch, and

resole a shoe, but most only do this when the stink becomes too bad or the concrete too hard to ignore. In this analogy, the value of a park or preserve lies in its functional relationship to the urban spaces around it. The park is an assembly of natural signifiers invoking Western constructs. As long as the park is well-maintained, it serves its function of easing the mind and offering a set of conditions in which the non-human world appears simultaneously domesticated and wild.

This is only a metaphor, a proposition with an incomplete shape that foregrounds certain aspects while causing others to recede in prominence. According to George Lakoff and Mark Johnson (1980, 10-13) in *Metaphors We Live By*, all metaphors do this. So do stories. For example, one can engage with a story of cleaning trash from the ecosystem of an urban park and easily ignore the larger system of garbage trucks, landfills, industrial runoff, offshore dumping, and other components of global waste mitigation. For another example, one can satirize the romantic appeal of a park while neglecting to disclose that one also loves parks. The shoe metaphor centers the experience of an urban population whose orientation to the park revolves around leisure, while pulling focus away from those who choose or are forced by the economic conditions of the city to use the park as a home. For them, the woods may not be an emotional refuge, but a site of danger and watchfulness. The shoe metaphor also excludes non-human populations who call the park home and fails to address ways in which their health might be measured. A different metaphor would fill these gaps while creating new ones.

Wondering in the Woods offers the proposition that no single metaphor can fully encapsulate the dynamic of humanity acting as a geologic force or resolve the condition of believing in multiple contradictory, competing ways of existing in relation to complex and evolving ecosystems. But the process of analogical thinking–of using metaphors as vehicles for communication and understanding–is important. Metaphor can help us navigate the anxieties inherent to environmental change because it offers a way to imagine the unknown through comparative analysis with the known. It allows us to reach toward something from where we're standing now. Stories offer this same potential. They provide opportunities for curiosity, reflection, and empathy

by suggesting alternative, adjacent ways of understanding, anchored to historical and present realities. Stories help us process our relationship to place, the changes we observe in the spaces we occupy, and the behaviors we take on in response to those changes. The micro-stories we present in *Wondering in the Woods* are little blisters of ideas and experience. Strung together, they reveal tensions and contradictions. We may not find easy answers when it comes to our relationship to our environment, but we work through the good and the bad regardless of the improbability of clarity and coherence.

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When They Came Home

Ann Futterman Collier
Kim Hahn
Jane Lilly Benale

YEAR	2017
DIMENSIONS	37 x 29 inches (rug), 52 x 25 x 18 inches (wearable art)
MEDIUM	Wool, cotton, and silk
CREDIT	Images courtesy of the artists. Photos by Tom Alexander Photography.

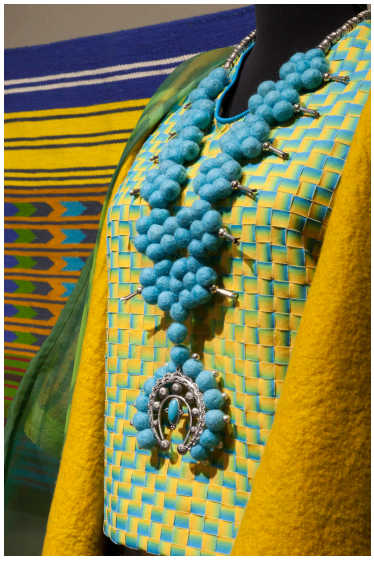
When They Came Home is a project initiated by fiber artists Ann Collier and Kim Hahn in 2017 in collaboration with the Navajo weaver Jane Lilly Benale. Jane's son Malcolm Benally, a Navajo author, served as an essential consultant throughout the artists' process. The rug and wearable artwork that comprise the finished piece give symbolic form to the devastating impact of uranium contamination on the Navajo community, with a focus on the burden for Navajo women.

From 1944 to 1986, nearly 30 million tons of uranium ore were extracted from the land of the Navajo Nation in northeastern Arizona, Utah, and New Mexico. Many Navajo men took jobs as mine workers during this period. The community was not informed of the long-term health risks of uranium contamination, which can cause lung cancer, bone cancer, and kidney failure. The miners unwittingly carried toxic dust on their clothing back to their homes, where it accumulated, exposing the entire community to

elevated levels of radiation. Traditionally it has been the job of Navajo women to keep the home safe, but the uranium dust from these Cold War era mines became an ever-present danger, poisoning their homes, their land, and their drinking water. The impact of the radiation continues to affect the Navajo people today. Jane, a Navajo matriarch, has experienced the trauma of uranium toxicity in her own family.

At the start of this project, in consultation with Malcolm, Ann began by dyeing wool in colors that are associated with important elements of Navajo life, such as green pastures, blue sky, and yellow daylight and corn pollen. Wool was selected as a medium because of the significance of sheep in Navajo daily life and ceremonies. From this wool, Jane created her interpretive rug, weaving a prayer for the Earth and a prayer for the stories of uranium contamination to be told.

Inspired by Jane's rug, Kim digitized and modified the pattern and printed it on silk organza fabric. Ann used the silk organza to make nuno felt yardage, and from this fabric Kim constructed a skirt and cape, modeled after both contemporary and traditional Navajo garments. Kim then created a second digital textile print that was hand woven into fabric for a blouse. Together she and Ann designed the organza shroud, with the intense green color representing uranium pollution spilling onto the body. Lastly, Ann made felted wool balls and used beading techniques to produce an interpretive squash blossom necklace. At various stages in the project, Malcolm contributed his creative perspective on how best to portray and honor Navajo culture.



When They Came Home was featured in the 2021 exhibition *Exposure: Native Art and Political Ecology* at the IAIA Museum of Contemporary Native Arts in Santa Fe, New Mexico. That installation is pictured here.

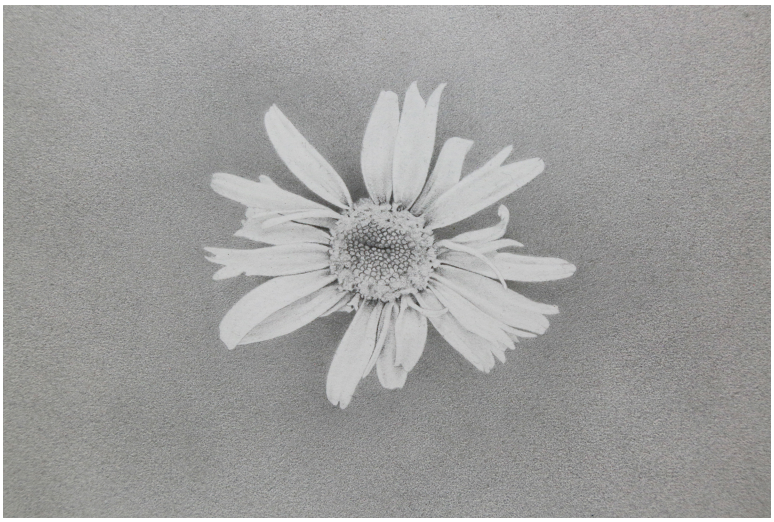
Pushing Daisies

Megan Gafford

If we want to know the truth, we must try to break our ideas. This was Karl Popper's (1959) philosophy of science, and I think it wise because it feels arduous to doubt ideas that we love. Wanting something to be true can make it tough to realize when we're wrong. As Mary Shelley (1818, 16) wrote, "Nothing contributes so much to tranquilize the mind as a steady purpose–a point on which the soul may fix its intellectual eye."

Upon falling in love with the idea of learning truth through science, I started making art about science, and then with it. A physicist helped me dose daisy seeds with radiation to mutate them like flowers found near the 2011 Fukushima meltdown. Those blossoms were elongated like caterpillars. The misshapen daisies reminded me of Lyndon Johnson's infamous 1964 campaign ad depicting a little girl counting daisy petals until a nuclear explosion engulfed the television screen. The cartoonish and childlike daisy is a potent symbol of innocence or–in the case of mutant daisies–innocence corrupted.

I wanted to use these associations to make art that would evoke the tension between pursuing knowledge and curiosity killing the cat. This was how I tried to slaughter my sacred cow. To uphold Popper's principle, I knew that I should wonder about the blind nature of science; although science opens our eyes to how the world works, it is also an amoral tool with indiscriminate applications. Just as someone can use a hammer to build or to bludgeon, science can be used for wonder or for weapons. Because I hold curiosity sacred, I needed to explore whether it could be taken too far.

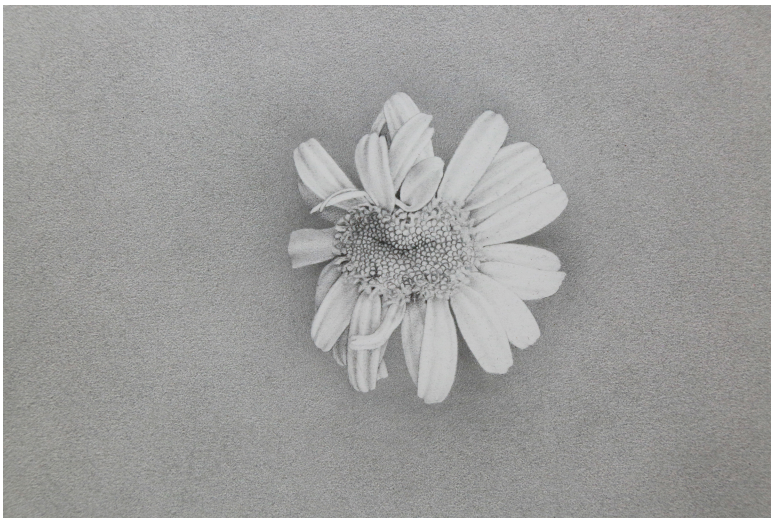


I felt elated when the first strange blossoms emerged from my irradiated seeds. Some were subtle–misshapen petals here and there, a slightly

squished center–but others were extraordinary. I preserved them in resin sculptures that were supposed to elicit contradictory emotions, like pleasure tinged with apprehension. The beautiful flowers were meant to attract; the knowledge of what I had done to them was meant to unsettle.

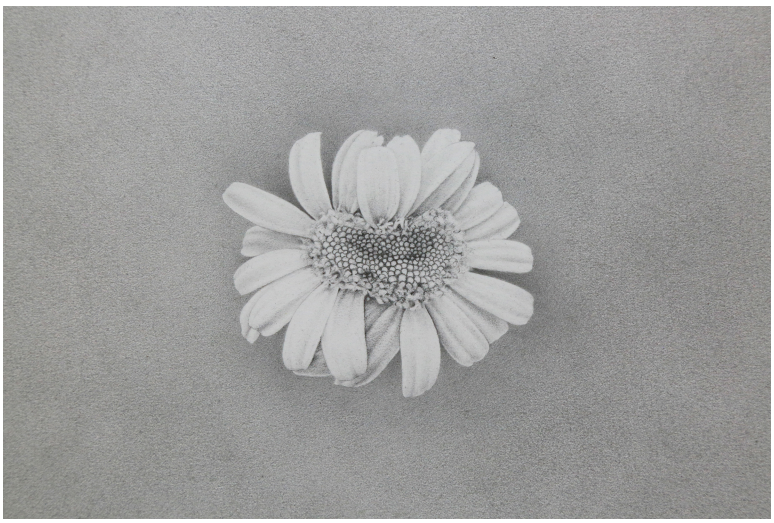
In this way, I wanted to continue the Romantic tradition of grasping at the sublime: experiences that inspire awe and angst in equal measure. But whereas the Romantics rejected science in their paintings of natural splendor, I tried to locate the sublime in human ingenuity. Laboratories can be luscious landscapes, too.

My use of scientific processes has sometimes led people to ask how my work is art, rather than science. Tellingly, scientists have never considered me one of their own; only artists have asked me this. The question has annoyed me. If a urinal could become art in 1917, then why not a mutant daisy a century later? My short answer has been, “Because I aim at beauty.”



Sometimes it seems like art and science are rivals. Manhattan Project physicist Richard Feynman (1981) once described this argument he had with an artist:

He would hold up a flower and say, "Look how beautiful it is," and I would agree. And he says, "You see, I as an artist can see how beautiful this is, but you as a scientist take this all apart and it becomes a dull thing." And I think that he's kind of nutty . . . I see much more about the flower than he sees. I can imagine the cells in there, the complicated actions inside, which also have a beauty. I mean, it's not just beauty at this dimension of one centimeter, there's also beauty at smaller dimensions: the inner structure, also the processes. The fact that the colors of the flower evolved in order to attract insects to pollinate it is interesting. It means that insects can see the color. It adds a question: does this aesthetic sense also exist in lower forms? Why is it aesthetic? All kinds of interesting questions, which the science, knowledge, only adds *to the excitement, mystery, and awe of a flower. It only adds. I don't understand how it subtracts.*



If renowned scientists bristle at artists who think they have a deeper relationship with beauty, then perhaps I have given the wrong answer to that annoying question about my work. Sometimes I've elaborated: "Because I'm not trying to solve the puzzle." I've never wanted my art to become propaganda for my position on, say, the safety of nuclear power or the wisdom of mutually assured destruction. Instead, my clarion call has been

Rebecca Solnit's description of the division of labor between artists and scientists: "[Scientists] transform the unknown into the known, haul it in like fishermen; artists get you out into that dark sea." If scientists clarify, then I have tried to linger within the mystery.

This, too, has probably been the wrong answer. Rather than stimulate curiosity, my art has too often operated as a Rorschach test. A typical example: people who fear nuclear power have viewed my daisies as a case-in-point and assume I also consider it a reckless technology (although I disagree). I don't know that I have ever opened up closed minds or roused admiration for nuance. Lofty ideals like "linger within the mystery" are stillborn if the artwork is simply vague.

Maybe the most honest explanation has been, "Molding nature to my will feels exhilarating." Perhaps in exploring themes of mad scientists and Promethean figures, I became one myself. I have never cared that some of my peers consider me a Dr. Frankenstein, though. Why let something as pedestrian as reputation sully the search for the sublime? But I have grown bored with my approach, because it risks becoming formulaic: Disquieting Science + Beauty = Art.

Moreover, this kind of art has taught me what it can about scientific amorality. Curiosity can become a consuming passion like lust, aching for catharsis. Especially when getting results is uncertain at the outset, emotion can dominate the struggle to discover what is possible. Indulging this hot pursuit has given me a visceral understanding of the temptations the devil uses to strike a Faustian bargain, and taking the deal has helped me plumb the human condition. Having completed this lesson, I must now try to break my new ideas.

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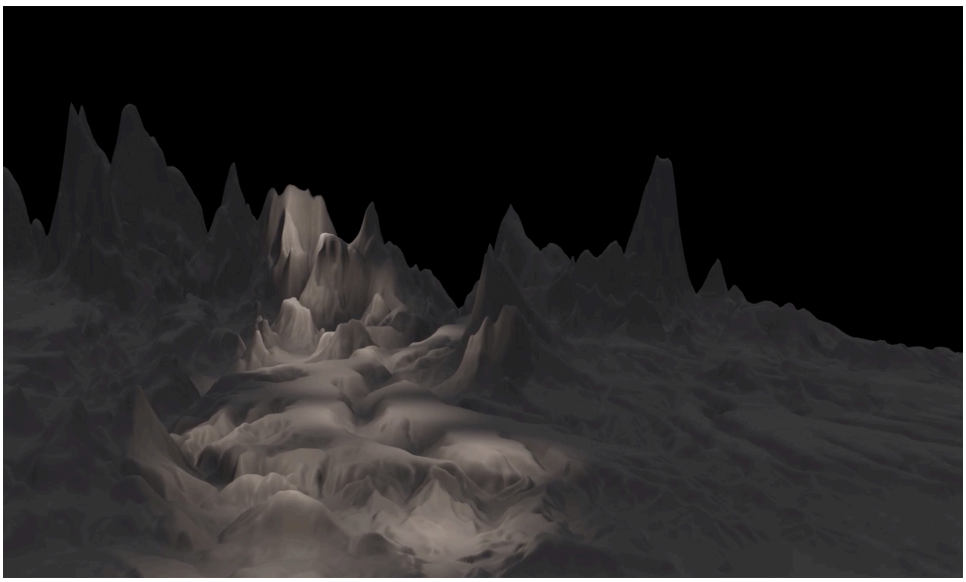

https://youtu.be/xLWFsuon7AM

Land

Cherish Marquez

YEAR	2021
MEDIUM	3D-rendered animation
DURATION	00:02:00
CREDIT	Copyright Cherish Marquez

They looked at me as they dug into the earth … They hit the rocks beneath the surface … I could feel the ground move beneath me … It shook once and then stopped … and then there was nothing left."

Cherish Marquez's *Land* is inspired by the Chihuahuan desert where she grew up. The desert sustains spiritual connection through its evolutionary processes, guided by memories of the ancestors who have walked its dirt for generations. Most think it void of life or treat it as a dumping ground, but it is home to a wide range of organisms who thrive within the sand. Desert plants evolve and adapt to survive within their ever-changing climate, and, as temperatures rise due to global warming, they are becoming even more resilient. Three adaptive strategies are the secret to their success: succulence, drought tolerance, and drought avoidance. Each of these strategies means survival in harsh terrain. These plants are the ultimate survivors. Their resiliency, their history, and their evolution inspired this animation, which speaks in the voice of the land itself.

The Media Archaeology Lab as Anti-Museum and Art Method

Livy Onalee Snyder

An Apple IIc in the Media Archeology Lab. Photo credit: Diane Bolluck.

Housed in the Media Archaeology Lab (MAL) in Boulder, Colorado is a collection of media— supposedly obsolete items which we have thrown

away, forgotten, or labeled as irrelevant. The Macintosh 128K, IBM Personal Computer, Apple Lisa, and Canon Cat V777 Work Processor are displayed among other hardware. Computer manuals, keyboards, and bins of floppy disks line the shelves. Contrary to what one might think, however, this nostalgic tech is not simply collecting dust. Since 2009, MAL has promoted experimental, hands-on approaches for viewers, researchers, students, and artists to make connections between media objects and their social impacts.

Dr. Lori Emerson, an associate professor at the University of Colorado Boulder, originally founded the collection to study and preserve digital literature from the 1980s. Emerson was specifically interested in a series of digital kinetic poems created by bpNichol, including a piece called *First Screening* (1984). This computer poem combined concrete poetry with then-new tech: the Apple IIe, a mass-produced microcomputer. While it is still possible to view emulations of works like *First Screening*, it is more difficult to conduct close readings of them simply because these emulations lack aspects which are intrinsic to their original computer platforms. As the famous media theorist Marshall McLuhan said, *the medium is the message*.[1] By using the original media with which *First Screening* was written, Emerson was able to analyze its surface effects and consider its social and material aspects as well (2019, 179).

Emerson's project eventually grew beyond the scope of preserving digital literature and collecting small computer operating systems. Currently, MAL's collection consists of everything from typewriters, video games, user manuals, and phones to more unfamiliar objects like lie detectors, a "love tester," Scientology e-meters, and a golf ball finder.[2] Most recently, the Lab has been hard at work reconstructing an old French videotex service. Preserving hardware and software from the past is integral to MAL's purpose; at the same time, and of equal importance, is the promotion of new experimental research that changes the way we view mainstream technology.

The Lab's mission is to "demonstrate alternative paths in the history of technology and empower visitors to imagine an alternative present and

future" (Media Archaeology Lab 2022). MAL's interest lies not in displaying media behind glass or as a tidy chronological progression, but rather in encouraging viewers to explore and interpret media themselves by physically turning on, playing, and tinkering with devices—a decision that positions MAL as an anti-museum of sorts. While some museums incorporate interactives as part of their exhibits, they generally adopt a no-touch policy, especially regarding collections of objects. MAL grounds itself in hands-on exploration of the actual devices in its collection—not replicas or models—so visitors can discover important themes, structures, and links in the history of this technology that would normally be overshadowed by more obvious and controlled narratives.

One such approach interprets the history of technology as nonlinear, a methodology currently in favor with many scholars in the field of media archaeology. From Emerson's perspective, "we can understand a waxing and waning of devices more in terms of a phylogenetic tree whereby devices change over time, split into separate branches, hybridize, or are terminated" (Emerson 2019, 181). For instance, the Sony Walkman was a hybridized Sony Pressman, a recording cassette device originally created for use by journalists. The only difference between the two devices is that one had a microphone, and the other had a pair of headphones. This small example illustrates that technology is not "old" or "new" but, rather, an ongoing assemblage of pieces and parts. Media termed "obsolete" are usually rendered less functional as a result of changes in social and economic variables that shift throughout time, but this does not mean they have no value.

Emerson is not alone in this perspective. Other media archaeologists, such as Jussi Parikka, believe that to embrace media archaeology as a method is to implicitly adopt a nonlinear way of understanding temporality. In other words, we should not think about time as flowing in one direction only, where one device simply supersedes another. Parikka characterizes media archaeological practices as "good at forcing us to think about time as pleated," which recognizes devices outside of an "earlier-later" construct (2012, 144-146). This perspective stands in direct contrast to short-term use values of media promoted by capitalist industries today. Adopting a

nonlinear way of understanding temporality or an alternative history allows us to rethink myths of progress and, as Parikka writes, "teleological assumptions concerning evolution of media culture that underpin the more mainstream ways of seeing how media technology is part of our lives" (2012, 144).

MAL hosts several artist and scholar residencies dedicated to unfolding, rethinking, and imagining the future of media. These projects bring together individuals from around the globe, in both the sciences and humanities, to work with MAL's collection. Emerson believes, "It's great to have a firm grasp of how stuff works, but its historical impact isn't just technical . . . inviting artists and scholars that nod to (or in some cases really tackle straight on) the importance of that more ephemeral stuff gives us an entry into those more complex conversations" (Unpublished interview; Lori Emerson and libi striegl, February 1, 2022). One scholar tackling the complex topic of alternative histories is artist-resident, researcher, and current MAL manager Dr. libi striegl.[3] Striegl's artistic and research practice draws upon myriad technologies from various eras, then playfully mixes and matches their intended uses. For example, her artwork *Reflections Within the Transitioning Grid* uses traditionally-made imagery—calligraphy and printmaking—with technologically-generated applications like 3D printing.

During striegl's residency, she produced the report "Alternative Taxonomies," which considers re-categorizing MAL's collection to unearth new anarchival interactions with media artifacts. Striegl writes, "In order to think differently about the relationship we have with technologies, an attempt must be made to change the order of thinking" (striegl 2022). Heavily influenced by Jorge Borges' essay "The Analytical Language of John Wilkins," striegl creates systems of categorization that allow visitors to find new, unexpected paths as they move through MAL's constellation of media. Rather than categorize objects by function and temporal location (the Lab's current system), striegl proposes three different taxonomies of organization—economic, sensory, and emotional—thus encouraging visitors to think of how we might assign meaning in non-traditional ways. Striegl's work illustrates how technological solutions can challenge and rethink power relations through categorization.

MAL proactively invests in alternative media histories, approaches, and technologies that have been cast aside, neglected, or repressed in order to combat teleological assumptions about myths of progress. This type of research also has practical applicability to a modern-day environmental problem: electronic waste, also known as e-waste, is a rising concern as hundreds of functional devices are discarded every day. While control of this global issue seems out of our hands, media archaeology as an art method can make a small difference. Jussi Parikka studies artists like Garnet Hertz, Paul DeMarinis, Berni Lubell, and Zoe Beloff, as well as artist-run projects like the Dead Media Project, that focus on reusing e-waste for community and artistic purposes. A well-known example of this type of recycling is circuit bending, an electronic method initiated by the DIY scene. For these artists, media obsolescence and reuse are central to their practice. As demonstrated by striegl and other artist-residents at MAL who engage with media archaeology, it is possible to explore creative solutions to social and environmental issues such as growing e-waste.

MAL's interdisciplinary makeup is anything but traditional: it is a lab and an anti-museum. Its scholars study artistic media and media theories. The projects it inspires sit between media archaeology and technological nostalgia. It is an archive and a functional space for cross-disciplinary and experimental research, teaching, and creative practice. The flexibility of this space and the method of collective experimentation it promotes can inform current debates around the uses of technology by expanding our definitions of media's value across artistic and scientific disciplines.

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FOOTNOTES:

1. Essentially, McLuhan said this to show that the forms and methods—the media—used to communicate information have a significant impact on the messages they deliver.
2. These were some of the more interesting pieces in the collection as described in an interview with Emerson and striegl.
3. libi striegl prefers using lower case letters in her name. You can find more about her work on her website: libirose.com

Migraciones

SWEAT

YEAR	2018
DIMENSIONS	Variable
MEDIUM	Digital video game comprising Unity3D executable file listening for OpenTSPS interpretation of a surveillance camera signal. Housed on a Mac mini (late 2014) running Mac OS 10.11.6, El Capitan. The surveillance camera is an ELP 180° FOV USB cam in a custom 3D-printed housing.
DURATION	Variable
CREDIT	Copyright SWEAT

Migraciones is an interactive display created by SWEAT (South West Ensemble for Art & Technology), a collaboration between Rafael Fajardo, Esteban Fajardo, and Chris GauthierDickey. The work offers a poetic meditation on migration and the environment. Conceived as a game, the installation establishes a playful dialogue with gallery visitors who affect the system through their presence. When people are absent from the space in front of the screen, animated monarch butterflies alight on the bough of a mesquite tree. As a person approaches the screen, the butterflies respond by flying away and do not return until the space is empty again.

Set in a Texas landscape in a time prior to human habitation of the land, *Migraciones* not only illustrates the impact of humans on the ecosystems in which we live, but also serves as a potent metaphor for human migration. Monarch butterflies, which migrate north from Mexico to sites in the United

States and Canada, have dwindled in recent decades, with populations declining more than 80% since the 1990s as a result of pesticides, climate change, and development. Beyond the project's dire ecological implications, *Migraciones* also includes a political dimension, as the movement of the butterflies corresponds to the movement of people from South and Central America to the United States. While one migration is generally celebrated, the other has been met with fervent resistance and weaponized for political gain.

https://youtu.be/aBblx5J41K4

It Will Not Be The Same, But It Might Be Beautiful

Nina Elder

YEAR	2020
MEDIUM	3-channel video
DURATION	00:30:00
CREDIT	Courtesy of the artist

It Will Not Be The Same, But It Might Be Beautiful is a multimedia investigation of change by artist Nina Elder, whose work actively bridges experimental fields and ways of knowing. Integrating science, art, and emotional knowledge, the project explores objects that have been exhausted by use and transformed by time. By focusing on what remains, even after environmental demise, *It Will Not Be The Same, But It Might Be Beautiful* creates a contemplative space for grappling with the fractious sensation of social, political, and environmental upheaval.

Excerpts from the larger project, the video and drawing featured here revolve around puzzle stones, which are rocks that have been shattered by extreme shifts in temperature caused, in this instance, by rapidly retreating glaciers in Alaska. In the video, a collaboration with cinematographer Michael Conti, the artist asked people to pick up naturally shattered stones and attempt to piece them back together. For the participants, a broad group of Alaskans, the process of touching these otherwise ordinary stones with

intention and care generated a mix of emotions: hope, creativity, anxiety, diligence, and absurdity.

Elder's drawing depicts a single shattered stone that has been unsuccessfully reassembled. It is one of a series of drawings that function as portraits of puzzle stones, depicting the nuance and character of each stone's breaking. To make the drawings, Elder rubs large paper with glacial silt to create a velvety, luminous background and uses wildfire charcoal and industrial pulp mill waste as her mark-making media. These nearly-photorealistic drawings are evidence of the artist's contemplative and rigorous observation. By documenting human interactions with these stones, she explores a personal space within climate change and illuminates the poetry of things that are fractured and fundamentally changed.

Broken

Xiuhtezcatl

The youth make us hopeful – the power, the passion, the energy, the vision, the drive. They can see a changed world, in ways that sometimes older generations are too skeptical to even attempt.

Youth like Xiuhtezcatl. He is a veteran – an odd thing to say about someone in their early twenties, but still a veteran – on the radar for his desire to change the world for more than a decade now. He wants you to believe that the world can be changed.

Broken is a reminder to you, to his peers, to all of us, that there is still time.

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https://youtu.be/LKUZJjxm9Vs

To break free was never my choice
Walked broken streets
Expectations overpowered my voice
I pray my greatness won't die with me
I'm praying my greatness won't die with me
And I'm losing myself

I feel like I've got something to prove to myself
Too long fulfilling expectations, got my truth overwhelmed
Scales broken, the world is ending, and you're choosing your wealth

While the walls fall and the world burns
Seas rise, and the clock turns
And the earth fighting back with hurricanes
And the earthquakes and the pouring rain
This is for every life lost
For the legacy of Standing Rock
For the sacred land that we desecrate
The trauma my people still carry today
For the suicide of our youth
Who still suffer from being colonized
Watched the bombs drop and the bullets fly
We steady ignoring the Earth's cry
Passed too many tipping points
And it's not enough, running out of time

And the walls fall

How could you be a witness to the end and not act?
Can't you see the world is broken?
Every person on the planet part of something bigger than us
We have all been chosen
As the generation of humanity that determines
What kind of world will we pass down to our children?
I'm uncertain
How will you look your child in the eyes and tell them
Their future wasn't worth fighting for?
Could've done more but didn't listen
Didn't wake up, didn't speak up
Didn't fight back when there was still time
Everything we love is what we must protect in the final moments
While there's still time

And there is still time

I believe

There is still time

The 11th hour man we living in
Drowning in the sea of hopelessness
I've carried this weight my entire life, and it's too much
Feel like giving in
We standing still at a precipice
I believe that our legacy will be more than this
The apathy is so poisonous, and it's killin' us
Diversity is resilient
Can't let our differences divide us
Gotta recognize that the change we want in the world has to start inside us
We have a lot to heal from
The world needs to change
Fight for what we love, start healing the world's hate
Build beauty from the ashes after the world breaks
It's in the hands of the youth now
We leading the way

We leading the way

You see, we're born and we die, I'm done trying to escape it
I learned from my momma that this life is what you make it
If happiness is a choice, it's up to you to choose it
If my power is in my voice, then I'm bound to learn to use it
Breakdowns lead to breakthroughs
Move through the challenges, flow where the current takes you
I'm grateful to be young and this passionate
In my heart, part of me has always been an activist
That's why I wrote this record, so you could understand
Music made me believe in the person I am
No masks, no acting, no gimmicks
This is what it looks like to live life with no limits
This art is my resistance
I like my revolution with rhythm

A melody and a breakbeat, so people will listen
This is for every broken soul that's felt like giving up
I pray this music and these words can play a part to lift you up
A people's champion, show the people all that they can be
This journey's always been 'bout so much more than being happy

Yes I'm broken, the world is, too, that's how it is
But things have to fall apart to be reborn as more than this
I believe that the world can be more than what it is
I believe all the loss we've felt will teach us how to give
I look back at our ancestors and how they used to live
In balance with the planet, man, that's how we've got to live
With love being the compass that guides the way
Leads us home
I believe the brighter days are on their way
We've gotta hope
With love being the compass that guides the way
And leads us home
I believe the brighter days are on their way
We've gotta hope

I believe

There is still

Time

Contributors

Jane Lilly Benale

Jane Lilly Benale (she/her), a Navajo woman and an accomplished weaver, dedicated her life to the home and the loom. She was born in a hogan in 1930 in White Ruins, Arizona and lived until her death in July 2022 atop the Black Mesa region of the Colorado Plateau in northeastern Arizona. At the age of eighteen, Jane was already a master weaver. Every spring, she would shear sheep and goats, then clean the wool and mohair to spin into yarn. She would gather juniper berries, yucca plants, cactus prickly pears, and the roots of plants to make dye for the yarn. At the time of her passing, Jane was a ninety-three year old matriarch. Due to her failing eyesight, she wove her last storm pattern rug at the age of ninety-one. In the final years of her life, she continued her teachings by telling stories, talking about the importance of water, sheep, the land, the home, and the Navajo language. She always reminded people of the sacred space and time that a weaving and a loom hold. Never finish a rug when it rains. Never give food to people through a loom. And always pray before you begin weaving.

Jeff Brown

Jeff Brown (he/him) likes to say that he holds a BS in BS (business services) from the University of Maryland University College. Over the course of his career, he has worked as a fireman, a professional triathlete, an entrepreneur, a diplomat, a ski guide, an avalanche forecaster, and a whitewater river guide. Jeff is the former director of the UC Berkeley

Central Sierra Field Research Stations. He was a resident at the Sagehen Creek Field Station from 2001 until he retired in 2020. He now serves as the volunteer co-director of the Sagehen Art Program. In 2012, Jeff launched the Sagehen Forest Project, a collaborative community effort to address the risk of wildfire, involving ecologists, state and federal government agencies, the timber industry, environmental groups, interested NGOs, wildlife biologists, and concerned citizens. The group created a successful plan to restore forest health to the 9,000 acre Sagehen watershed, and the strategies have spread. Jeff now spends his retirement rowing a wooden whitewater dory, ski-mountaineering, and riding bikes in the western United States and France.

Ann Futterman Collier

Ann Futterman Collier (she/her) holds a PhD in clinical and health psychology from UCLA and has worked in the area of community-based participatory research for over twenty-five years. She is currently a senior researcher at Southcentral Foundation in Anchorage, Alaska, and she previously served as an associate professor in the Department of Psychological Sciences at Northern Arizona University. Ann has extensive expertise conducting health research and program development with tribal communities and refugees throughout the Southwest, the Pacific Rim, and Alaska. She is also a fiber artist, passionate about social practice and community engagement. Her work has received several regional and national awards, including the 2018 Most Significant Artistic/Creative Work Award from the Office of the Vice President for Research at Northern Arizona University; a Viola Award for Innovation in the Arts from the Flagstaff Arts Council in Arizona; an Innovative Design Scholarship from the International Textiles Apparel Association (ITAA); and an Excellence in Fibers Award from *Fiber Art Now* magazine. Find out more about Ann's artwork, research, and writing at facebook.com/Dr-Ann-D-Futterman-Collier-142051725910399/.

Nina Elder

Nina Elder (she/her, they/them) is an artist and researcher whose projects reveal humanity's dependence on and interruption of the natural world. With a focus on changing cultures and ecologies, Nina advocates for collaboration and fosters relationships between institutions, artists, scientists, and diverse communities. Her work includes drawings,

performance, pedagogy, critical writing, community-based projects, and public art. She has had solo exhibitions across the country, including recent shows at SITE Santa Fe and Indianapolis Contemporary. Her artwork has been featured in *Art in America* and *VICE Magazine*, as well as on PBS; and her writing has been published in *American Scientist* and *Edge Effects Journal*. Nina is an affiliate artist of the National Performance Network. She has recently held research positions with the Center for Art + Environment at the Nevada Museum of Art, the Anchorage Museum, and the Art and Ecology Program at the University of New Mexico. You can view more of her work on her website, ninaelder.com.

Erin Espelie

Erin Espelie (she/her) is a filmmaker and writer whose poetic nonfiction films have shown at the New York Film Festival, the San Francisco Museum of Modern Art, Rotterdam International Film Festival, Edinburgh International Film Festival, and Whitechapel Gallery in London, among others. She is co-director of NEST (Nature, Environment, Science, & Technology) Studio for the Arts at the University of Colorado Boulder, where she is also an associate professor in the Department of Cinema Studies & Moving Image Arts and the Department of Critical Media Practices. Erin holds degrees in molecular and cell biology from Cornell University and experimental and documentary arts from Duke University. She has served as editor-in-chief of *Natural History* magazine since 2014. You can view examples of her cinematic work at erinespelie.com.

Faerthen Felix

Faerthen Felix (she/her) spent her early career as a whitewater river guide, an avalanche forecaster, a ski patroller, and a mountain bike and ski guide. She also served brief stints as a videographer and a restauranteur, and she spent one weird season as an aerial spotter for a brine shrimp fishery on the Great Salt Lake. In 2001, Faerthen joined the UC Berkeley - Sagehen Creek Field Station as assistant manager. She retired from her full-time position with Sagehen in 2020 after nineteen years but continues to serve as volunteer co-director of the Sagehen Art Program. She also co-manages the Sagehen Herbarium and Collections Program. In her retirement,

Faerthen divides her time between mountains and rivers, bikes and boats, and the western United States and France.

Kathie Foley-Meyer

Kathie Foley-Meyer (she/her) is an artist, an arts consultant, and a PhD candidate in visual studies at UC Irvine. Her work is inspired by the history of the African diaspora and explores themes of interconnectedness, memory, visibility, and transparency. Two of her mixed media works, *In the Wake: With the Bones of Our Ancestors* and *Privilege Grid No. 3* were recently added to the collection of the National Academy of Sciences. An avid arts advocate, Kathie has served on the board of LACE (Los Angeles Contemporary Exhibitions); she was part of the artist selection and advisory committees for Metro Art for the Expo Metrorail Line; and she has served on grant panels for the LA County Arts Commission. She is also the host and producer of *Outside:Inside Radio*, a podcast created by the Prison Arts Collective at San Diego State University, which highlights the creative work of justice-impacted and formerly incarcerated individuals. You may explore Kathie's artwork on her website, kf-m.com.

Megan Gafford

Megan Gafford received her BFA from the University of New Orleans in 2011 and an MFA in painting and drawing from the University of Colorado at Boulder in 2016. In her studio practice, she repurposes unsettling scientific tools like radiation and cybernetics as art materials, to create work that commingles eeriness and elegance. Megan has shown her work with galleries and museums throughout the United States, including exhibitions with SITE Gallery Houston, David B. Smith Gallery in Denver, the Boulder Museum of Contemporary Art, and the Backyard Ballroom in New Orleans. Her essays have been published by *Quillette, Arc Digital,* and *Areo Magazine*. Currently based in Denver, Megan teaches painting and drawing at the University of Colorado at Denver. You can learn more about her work at megangafford.com.

Kim Hahn

Kim Hahn (she/her) is a full professor in the School of Fashion at Kent State University where she teaches both fashion design and fashion merchandising. She holds an undergraduate degree from Yonsei University in Seoul, Korea, and she earned both her MA in fashion design

and her PhD in fashion merchandising from the University of Nebraska-Lincoln. Her research and creative work is influenced by cultural factors as well as current industry trends. Kim has created more than forty wearable artworks over the past decade, and her innovative designs have been included in numerous juried, invitational, and solo exhibitions. She has received several design awards from the International Textiles Apparel Association (ITAA), including the Sandra Hutton Award for Excellence in Fiber Arts; the Creative and Innovative Employment of Technique(s) Award; an Innovative Design Scholarship; and the Cotton Incorporated Innovations in Cotton Design Award. Kim has also received an Excellence in Fibers Award from *Fiber Art Now* magazine. In 2018, her scholarship and teaching was recognized by Kent State University with a President's Faculty Excellence Award.

Newton and Helen Mayer Harrison

Newton and Helen Mayer Harrison (he/him and she/her) are widely regarded as leading pioneers of the eco art movement. They worked as a team from 1970 until Helen's death at age ninety in 2018, and then Newton continued their work until his passing shortly before the release of this volume in 2022. Over the years, the Harrisons collaborated with biologists, ecologists, architects, urban planners, and other artists to uncover ideas and design strategies to support biodiversity and community development. Their concept of art embraced a breathtaking range of disciplines. The Harrisons' projects focused on watershed restoration, agriculture and forestry issues, urban renewal, and urban ecologies, and their practice often involved serving as historians, diplomats, ecologists, investigators, emissaries, and art activists. The Harrisons' visionary approach to their work expanded dialogue around previously unexplored issues, leading to practical solutions and implementations and–on occasion–changes in government policy. They also exhibited extensively with museums and galleries throughout the United States and internationally, including events such as documenta 8, the Venice Biennale, and the Bienal de São Paulo. Find out more about their ground-breaking work at theharrisonstudio.net.

Cherish Marquez

Cherish Marquez (she/her, they/them) is a Latina and Queer-identifying artist. She spent her childhood in Sierra Blanca, Texas and the early part

of her adult life in Las Cruces, New Mexico. Currently, she lives and works in Denver. Cherish holds a BA in fine arts and creative writing from the New Mexico State University and an MFA in emergent digital practices from the University of Denver. She builds complex imaginary worlds through animations and game design. Her work explores environmental justice, mysticism, mental health, queer identities, generational trauma, and healing. Cherish's practice is heavily informed by speculative futurism, which combines cultural practices of healing (Curanderismo) with new technologies to alleviate the earth's trauma (mining, nuclear power, etc.). Discover more examples of her artwork on her website, cherishmarquez.com.

Indigo Moor

Indigo Moor (he/him) is the poet laureate emeritus of Sacramento, California. His fourth book, *Everybody's Jonesin' for Something*, took second place in the Backwaters Prize competition sponsored by the University of Nebraska Press and was published in 2021. *Jonesin'* is a multi-genre work consisting of poetry, short fiction, memoir pieces, and stage plays. Indigo's previous award-winning books include *Tap-Root, Through the Stonecutter's Window*, and *In the Room of Thirsts & Hungers*. Indigo is part of the visiting faculty for Dominican University of California, teaching poetry and short fiction in the MFA program. He is the former poetry editor for *Bookends Review Literary Journal* and sits on advisory boards for the Sacramento Poetry Center and the Modesto Stanislaus Poetry Center. A ten-year veteran of the US Navy and a twice-decorated Gulf War veteran, Indigo now divides his time between writing, teaching, and working as an integrated circuit layout designer for computer companies.

Radio Healer

Edgar Cardenas (he/him) is an artist-scientist based in Detroit, Michigan. He holds a PhD in sustainability from Arizona State University and first became involved with Radio Healer in 2015 during his time in Arizona. In his 2019 book, *Between Two Pines*, Edgar outlines how an informed, engaged, and integrative art-science practice is essential if we are to address the complex sustainability challenges we face today. Through his interdisciplinary artwork, Edgar investigates the tangled sociocultural, ecological, political, and economic forces that shape human/

environment relationships. His work emphasizes the need for communion with everyday ecologies to illuminate what is obvious but often overlooked: we are not separate from our environments or from one another. Edgar is currently finalizing his second book, *Meanwhile in Detroit*, exploring his relationship to wildness in the city. He is also an associate director for the Toolbox Dialogue Initiative Center, a consulting and research group at Michigan State University which facilitates collaborative capacity building with interdisciplinary teams and organizations.

Raven Deshalecoweney Kemp (he/him) is a Native American artist based in Phoenix, Arizona. A member of the Navajo Nation, as well as the Muscogee-Creek, Choctaw, and Euchee tribal nations of Oklahoma, Raven was raised in a family of artists with strong ties to the local Native community. His studio practice includes painting, printmaking, computer programming, and sound art. Over time, Raven has had opportunities to collaborate with Native and nonprofit organizations such as the Muscogee-Creek Nation, Native American Connections, the Phoenix Indian Center, Pueblo Grande Museum, and the Heard Museum. One of his most significant collaborations has been his ongoing involvement with Radio Healer, which he joined in 2012. Through his work with the collective, Raven has built indigenous electronic instruments, performed experimental music and sound, and served as a storyteller. He uses his creative expression to advance indigenous cyberpunk and science fiction.

Cristóbal Martínez (he/him) is Mestizo of the Genizaro, Pueblo, Manito, and Chicano people of Northern New Mexico. He holds a PhD in rhetoric, composition, and linguistics from Arizona State University and is currently chair of the Department of Art and Technology at the San Francisco Art Institute. In 2003 Cristóbal co-founded Radio Healer; in 2009 he joined the art collective Postcommodity; and in 2018 he co-created the experimental electronic music duet Red Culebra. Cristóbal has dedicated his career to interdisciplinary collaboration, and he remains a prolific artist in all of these groups. Along with his partners in Postcommodity, he has exhibited work in the 18th Biennale of Sydney, the 2017 Whitney Biennial, documenta 14, and the Carnegie International, 57th Edition. The collective was awarded the Fine Prize at the Carnegie International, 57th Edition, and they have also received an Art of Change fellowship from the Ford Foundation. In 2021-22, in collaboration with

Wapatah: Centre for Indigenous Visual Knowledge at OCAD University, Postcommodity presented *Time Holds All the Answers*–a major museum exhibition with a comprehensive monograph–at Remai Modern in Saskatoon.

Meredith Martinez (she/her) is a fiction writer based in Phoenix, Arizona. She earned her MFA in creative writing from the MFA Program for Writers at Warren Wilson College. Her work focuses on intersections between socio-cultural and environmental forms of violence and explores the ways in which one finds meaning in one's life and relationships in the context of climate-related instability, loss, and grief. Meredith is currently working on her first novel, *Vulture*, a near-future story of intergenerational friendship which extends realities of unchecked development, ecosystem destruction, water shortages, heat-related illness, and other vulnerabilities related to securing food, medicine, and shelter in the Sonoran Desert. Her writing has appeared in *Contrary Magazine*, the *New Orleans Review*, and Dzanc Books' *Best of the Web* anthology, among other publications, and she served as an editor for the 2016 inaugural volume of *Everything Change: An Anthology of Climate Fiction*, produced by the Imagination and Climate Futures Initiative at Arizona State University. Meredith has been a member of Radio Healer since 2007.

Adrien Segal

Adrien Segal (she/her) is an artist based in Oakland, California. Drawing from landscape, science, history, and perception, her interdisciplinary work bridges the gap between scientific rationality and the emotional nature of human experience. A pioneer of data physicalization, Adrien has exhibited her art internationally since 2007, including shows with Ballroom Marfa, the Peabody Essex Museum, and the Southern Alberta Art Gallery. Her work is held in the permanent collections of the City of Homer, Alaska and the National Academy of Sciences in Washington, DC. She has participated in residencies across the United States, Canada, and Europe, and her artwork has been featured in publications including *Making Data*, *American Craft*, and *Data Flow 2*. Adrien holds a BFA from the California College of the Arts, where she currently teaches art and design. In 2022 Adrien was the US-UK Fulbright Scholar with the Duncan of Jordanstone College of Art and Design at the University of Dundee in Scotland. Visit adriensegal.com to explore more of her work.

Livy Onalee Snyder

Livy Onalee Snyder (she/her) holds a BA in art history and a BFA in painting and drawing from the University of Colorado Denver and an MA in humanities specializing in art history from the University of Chicago. Her research focuses on modern and contemporary art, media archaeology, metal music studies, role-playing games, and queer studies. Livy's passion for art has translated into successful internships with the Museum of Contemporary Art Denver, the Denver Art Museum, the Peggy Guggenheim Collection in Venice, and Black Cube Nomadic Museum. She has written articles for *Denver Art Review: Inquiry and Analysis (DARIA)*, *Sixty Inches from Center*, and *Chat About*. She has also interviewed artists for the Visual Resource Center in Chicago and for Black Cube's blog. Livy currently works for punctum books–an independent, scholar-led publisher based in California–as a library associate, editing books. In addition, she serves on the board of Denver Digerati, curating reels for Supernova Digital Animation Festival. You can find links to more of her writing at livyonalee.com.

SWEAT

Esteban Fajardo (he/him) is a Los Angeles-based game designer whose work spans both commercial and art applications. He architects meaningful relationships between players and space, whether that space is a digitally constructed fantasy or a brick and mortar gallery. Esteban received a "Ones to Watch" award from BAFTA Games for his design work with Team OK on the abstract dueling game *Chambara*, which was released on Playstation 4 and PC in 2016. Since then he has explored various technologies such as VR with Skydance Interactive and custom game engines with Evening Star Studios. Esteban applies these experiences to his artistic collaborations with SWEAT, building responsive game systems that viewers often "play" without realizing that they have been drawn into a game. In his spare time, Esteban writes about game design for his website, estebanfajardo.com. Raised in Denver, he returns to the mountains every chance he gets.

Rafael Fajardo (he/him) is an artist, designer, researcher, and educator. Born in Colombia, he migrated with his parents to the United States in 1968 and grew up in San Antonio, Texas. Rafael earned his BA and BFA from the University of Texas at Austin and an MFA from the Rhode Island

School of Design. He is currently an associate professor of emergent digital practices at the University of Denver, where he is also core faculty for the LatinX Center and serves as a founding member on the board of advisors for IRISE, the Interdisciplinary Research Institute for the Study of (in)Equality. In 2004, *i-D Magazine* named Rafael among the top fifty designers in the United States. Through his work with SWEAT, Rafael has been creating boundary-blurring videogames as an art form since 2000. SWEAT's earliest games, *Crosser* and *La Migra*, were recently featured in *ReVisión*, a 2022 exhibition at the Denver Art Museum. Rafael has also collaborated with artists Adán De La Garza and Justin Ankenbauer under the moniker of Dizzy Spell to curate a series of pop-up artist game arcades. Learn more about his work at rafaelfajardo.com and sudor.org.

Chris GauthierDickey (he/him) is a computer science researcher with expertise in games, visual programming languages, and computer science pedagogy. He traces his roots to Laredo, Texas, where he grew up near the border of Mexico. He has collaborated with SWEAT on *Migraciones* as well as on the rewriting of their earliest games, *Crosser* and *La Migra*. Chris holds a BS and a PhD from the University of Oregon. He currently serves as chair of the Department of Computer Science at the University of Denver, where he has been a faculty member for over sixteen years. As chair, he is working with his department to develop a computer science curriculum which offers students a strong foundation in ethics, diversity, equity, inclusivity, and justice.

Xiuhtezcatl

Xiuhtezcatl (he/him) is a musician, activist, model, and entrepreneur who pushes the envelope of what hip hop can look and sound like. His message and depth transcend his youth, yet his music is packed with hard-hitting grit. His thought-provoking lyrics are anchored by his Mexica roots on his father's side and by the passion for environmental justice work he inherited from his mother. Xiuhtezcatl served as youth director of Earth Guardians, a worldwide environmental organization, until 2019. Bilingual and skilled with code switching, he incorporates Spanish and English interchangeably into his music, which explores culture, legacy, identity, and his struggles as a young Indigenous man growing up as a minority in mainstream America. Xiuhtezcatl has performed and collaborated with artists such as Raury, WILLOW, and Jaden. He is one third of the

emerging hip hop group Voice Runners, along with Los Angeles-based artist Tru and producer Jaiia Cerff. In 2020 the trio dropped a series of singles that culminated with the self-titled *Voice Runners* album. Xiuhtezcatl's most recent album, *XI:XI*, was released in December 2021.

About

Tilt West is a Denver-based nonprofit dedicated to stimulating inclusive community exchange about art, ideas, and culture. We believe critical discourse is vital to the health of an arts ecosystem. We are committed to supporting artists, writers, thinkers, and all cultural workers who make Colorado an interesting and inspiring place.

For every issue of the *Tilt West Journal*, we commission a range of cultural practitioners to respond to a central topic. In addition to our publishing activities, Tilt West regularly hosts roundtable discussions across the Denver metro area and beyond. Tilt West maintains an open invitation list for all our roundtables; sign up at tiltwest.org/join-us. Roundtable prompt materials can be found at tiltwest.org. We post the audio recordings of our roundtables on Soundcloud, and we commission written responses to these conversations for our Medium channel.

Tilt West's activities are supported by a talented group of volunteers culled from the region's growing arts and culture sector. We thank board members past and present for their contributions: Olivia Abtahi, Tya Anthony, Manuel Aragon, Mindy Bray, Ruth Bruno, Maria Buszek, Jaime Carrejo, Whitney Carter, Ilan Gutin, Sarah McKenzie, Bianca Mikahn, Sharifa Lafon, Kate Nicholson, Gretchen Schaefer, Geoffrey Shamos, Marty Spellerberg, Brandi Stanley, Joel Swanson, Autumn Thomas, Derrick Velasquez, Tricia Waddell, Sarah Wambold, and Brenton Weyi.

This issue was built on Quire, a multiformat digital publishing framework developed by the Getty. In this volume of the *Tilt West Journal*, the main text of the book is set in Tinos; the titles are set in Open Sans Condensed; and the headings, author names, and navigation are set in Open Sans. All three typefaces are designed by Steve Matteson, a typeface designer based in Louisville, Colorado.

Cover art: SWEAT, Migraciones, *2018. Digital video game. Courtesy of the artist.*

Acknowledgments

This *Art and Science* volume of the *Tilt West Journal* was funded primarily through a grant by the University of Colorado Office of Diversity, Equity, and Inclusion. We are honored to have their support, as it affirms our publication's central commitment to amplifying the diverse voices and perspectives of the creative community in our region and beyond.

Additional support for the journal and Tilt West's roundtable programming is provided by the financial contributions of our donor members. We are immensely grateful to everyone who has supported our work over the past six years.

We would particularly like to acknowledge these members of our Tilt West Patron Circle for their very generous gifts in 2021 and 2022:

Marci Auston and Frank Martinez
Kathie Broyles
Donna Bryson and Fred Glick

Sue and Tim Damour

Baryn Futa

Rebecca and Ken Gart

Rick Griffith and Debra Johnson

Sharifa Lafon

Sarah McKenzie and Nico Toutenhoofd

Kate Nicholson

Geoffrey Shamos and Genery Booster