

When I heard the learn'd astronomer

*When I heard the learn'd astronomer,
When the proofs, the figures, were ranged in columns before me,
When I was shown the charts and diagrams, to add, divide, and measure them,
When I sitting heard the astronomer where he lectured with much applause in the lecture-room,
How soon unaccountable I became tired and sick,
Till rising and gliding out I wander'd off by myself,
In the mystical moist night-air, and from time to time,
Look'd up in perfect silence at the stars.*

Walt Whitman, from *Leaves of Grass*, 1867

At the heart of Walt Whitman's poem *When I Heard the Learn'd Astronomer* is the search for balance. A student struggles to maintain a sense of wonder about the cosmos as it gets reduced to numbers; feeling stifled by the brilliant but droning lecture, he leaves the classroom to see the stars with his own eyes.

Full of contrasts like *lecture-room* and *night-air*, *much applause* and *perfect silence*, *sitting* and *rising and gliding*, Whitman's poem sets up a metaphor for conflict that can be viewed through the lens of his own experience. Whitman was enthralled with science, and educated himself in a variety of subjects from astronomy to biology; his love for its structure and exactitude are found throughout his work. He was also a schoolteacher and an early advocate of progressive educational reform, which promoted individualized, experiential learning over the rote memorization of classical training.¹ From this perspective, *When I Heard the Learn'd Astronomer* reads not just as a desire to balance science with art, but as a reminder that we should constantly question the information we are presented.

Like Whitman's young scholar, the artists in this exhibition seek to balance fact with poetry and mystery. With hybrid practices that combine methodologies from both science and art, their projects offer new methods for presenting and interpreting data, make visible the systems of our environment, and reveal factors that mediate our experience of the natural world. Common to all their endeavors is an investigation into how we look and observe. What tools help us to see and simultaneously, what do they prevent us from seeing? What are the limitations and the barriers to comprehension? And above all, when we reach a place of understanding, does the mystery fade?

Former astronomy student **Nathalie Miebach** intentionally bridges art and science by using the visual vocabulary of one to create an "alternative entry point" into the other. Frustrated by the limitations of slide lectures to convey the dimension of outer space – and spurred by Whitman's suggestion that data and beauty might be mutually exclusive – Miebach began using basketweaving to interpret astronomical diagrams in three dimensions. A residency at the Woods Hole Oceanographic Institute led her to begin translating weather data by the same

means. “Central to this work is my desire to explore the role visual aesthetics play in the translation and understanding of science information. By utilizing artistic processes and everyday materials, I am questioning and expanding boundaries through which science data has been traditionally visually translated (ex: graphs, diagrams), while at the same time provoking expectations of what kind of visual vocabulary is considered to be in the domain of ‘science’ or ‘art’.”ⁱⁱ

On view at SPACE are two 10-foot-high towers from Miebach’s series *Changing Waters*, which uses data collected by Gulf of Maine weather buoys to express meteorological and oceanic interactions. The core structure of the work is woven reed, which also acts as a grid on which the artist plots weather data, using beads, flags, handwritten notations, and other colorful elements that resemble TinkerToys. The natural tension of the reed helps guide the form of the sculpture to reveal behavioral relationships that wouldn’t be visible on a two-dimensional graph. Building in three dimensions is Miebach’s answer to reconciling the experience of something with its representation, but it is more than just a different way of visualizing data. Like much of the work in this exhibition, her sculptures reveal how she processes information: “To me my sculptures reveal less about science, but provide a window into human thought and the way one constructs meaning and understanding.”ⁱⁱⁱ

Where Nathalie Miebach revels in the complexity of data, digital media artist **Jane D. Marsching** abstracts it, finding meaning in one element of a particular site. In her 2011 project *Ice Out*, Marsching mapped 150 years of wind data from Walden Pond in Concord, MA, according to the ice out dates (the term for when a lake is 90% free of ice). Mythologized as the site of Henry David Thoreau’s Transcendental experiment in self-sustained living, Walden exists as both a place and a narrative at the intersection of historical, scientific, and cultural production. Marsching’s project pairs Thoreau’s observations with contemporary weather readings to re-imagine the experience of wilderness through its information. Her hybrid approach was a way to “make connections between the different disciplines that intersect our understanding of how climate change is affecting the ecosystems that surround us. Working with data from scientists, meteorological observatories, home weather stations, almanacs, scholars and many other sources creates a pool of information that can be translated into stories of the site that are more complex and richer than any single discipline can tell.”^{iv}

Using custom *Wind Notation Code* software written with artist Michael Shanley, Marsching translated wind speed and force into dance steps that were plotted across a series of five prints, and then performed in five corresponding dances. The prints are a mix of techniques, including collograph, woodcut, drypoint, and digital print, each chosen for its ability to convey qualitative and quantitative data, as well as historic and geologic time. For example, wind barbs – symbols that indicate wind force and direction, but also correspond to foot placement in this series – appear in drypoint for Thoreau’s data, and are digitally printed for contemporary readings. Different stages of the ice-out process, which happens gradually across the five prints, are expressed with areas of smooth woodcut or the crackle of inked Min-Wax. Though technically and conceptually complex, these prints remain visually subtle. *If wind now*, the series of dances performed by Sarah Baumer, echoes this character in simple, fluid movements.

As she moves through a variety of exurban landscapes – parking lots and neighborhoods where wilderness, much like Walden, persists as an idea – her body expresses the sensorial experience of wind, bringing data to life in physical translation.

Like Marsching, Paul Bartow and Richard Metzgar investigate particular sites to reveal and understand the network of relationships that affect our experiences of those places. Working as a collective, **Bartow+Metzgar** focus their interest on “human and nonhuman entanglements, which can be thought of as interwoven systems involving history, culture, nonhuman agents, material interactions, and time.”^v Their field-based practice is a mindful navigation of the world, an ongoing series of physical interactions with the landscape whose outcome bears no trace of their own bodies. Instead, they facilitate the production of art by other means: their nonhuman drawings, which they describe as “mechanical interfaces with the environment,” replace the hand of the artist with environmental or machine agents.

For their *Tree Drawings*, Bartow+Metzgar build simple aluminum platforms that support a sheet of paper underneath a pen tied to a tree branch. The tree’s movement, influenced by conditions such as wind speed, plant species, humidity, and temperature, acts upon the pen to produce a variety of marks, lines, and squiggles over a defined period of time. In order to gather *Microbial Drawings*, the artists sandwich sheets of vellum in between pieces of Plexiglas, then bury them 12 inches in the ground, allowing microbial activity in the soil, insect activity, weather, and decomposition – among a host of other environmental factors – to leave their traces. Collectively, these drawings function as both a record and an expression of a specific set of environmental conditions across time. A week’s worth of drawings from an urban plot in Portland, Maine produced visible differences from day to day that can be read as shifts in the “relational forces” that allow the drawing to occur: the wind force, the random movement of the branches – in other words, the qualitative data from the site. Although these drawings are complete expressions, they also rest at an intermediary point, as the artists consider where they might lead next as a new form of raw data to be translated again and again.

The attention to forces beyond the scope of our vision is also a preoccupation of **Deb Todd Wheeler**, who shares a similar interest in the ways in which the tools we build both illuminate and mediate our understanding of our surroundings. Conceptually and aesthetically, her work often draws from the early 19th century, a time when artists and scientists were more closely linked for their compatible skills in both examining and documenting the natural world. Using materials from the environment, Wheeler creates personal and intimate viewing experiences that draw our attention to how we see, while simultaneously revealing “the true costs of humanity’s desire to be productive, to be industrious, and to push technology forward.”^{vi}

Cypress and Star, 2012 is a 50” circular panorama of cyanotypes, an early photographic process that produces ghostly white images on a deep blue ground. Made by exposing light through polyethylene plastic laid on tissue paper, the prints were developed and wrapped around pieces of Plexiglas, fit together to form the top of a round table that rests on vintage casters. Installed in the bay window at SPACE, light shifts across and through the translucent prints to fall on a small convex lens placed on the floor below, in which the reflection appears as a tiny

round globe. This optical play is analogous to the hidden worlds that are revealed when we put our eye to an instrument, but also points to the underlying environmental message common to much of Wheeler's work: things are not always what they seem. *Cypress and Star* resembles a large viewfinder through which one can see the ocean, teeming with marine life – but in fact the images were made with the type of plastic trash that now chokes our global waters.

Wheeler is aware that the telescope provides a close but narrow view of the stars, so to speak – that instruments of observation mediate our experience of the environment even as they help us better understand it. But at the same time, as if possible to regain some of the sense of scale lost by looking through a lens, these devices suggest new worlds beyond our imaginations, calling us to look more closely so that we might think more broadly. This idea is explored by the **League of Imaginary Scientists**, a collective based in Los Angeles that attempts to close the gap between art and science while poking fun at the seemingly arbitrary divisions between them. The League “concocts interdisciplinary research projects in collaboration with scientists, technologists, and artists engaged in many media. In playful interdisciplinary leaps, the League creates everyday mythologies based on scientific information. As evidenced by the League's many experiments, *imaginary scientists* balance scientific inquiry with a healthful dose of fun.”^{vii} Clowning aside, the League uses humor as the hook that draws viewers and audiences into considering some of the weightiest environmental questions facing the planet.

Inspired by the subject of Whitman's poem, the League constructed *A Model of the Working Universe*, a small viewing box that appears simultaneously nostalgic and futuristic, made from an old typewriter case with a viewfinder on the front and long red air horns sprouting from the top. Through the convex lens one sees an image of League member Dr. Stephan Schleidan gazing off into the distance and sporting an array of optical devices – glasses, goggles, a camera with an outsized scope – all ostensibly to aid his vision and sharpen his focus. To his side is an array of gauges, toggle switches and input jacks that suggest the possibility of adjusting space and time. Small monitors on the sides of the sculpture show footage of the scientist tinkering with gears and controls. And what is our role? We can look, but not touch – a nearby sign reads “Please Do Not Interfere with the Inner Workings of the Universe” – and yet, the message of the attendant documentary, *How the Universe Works*, is that the viewer is partly responsible for keeping the universe in motion.

An opening lecture by Prof. William T. Madmann, *Charting the Constellations and Other Universal Matters*, introduced the League's work and their discoveries while mimicking the omniscient position of Whitman's ‘learn'd astronomer’. The performance of academia is an important element in the League's work, which on the whole can be seen as a kind of ironic meta-teaching. Each Imaginary Scientist has a pseudonym and academic title (Doctor or Professor), suggesting that in order to do science, one must simply imagine oneself a scientist: we all have the capacity to experiment, to contribute, to solve problems. As the documentary's narrator asks, “If the universe is composed of digits and equations, why can't it be solved? If we can solve for Y, why can't we solve global warming? What is it that keeps us from solving the universe permanently? These questions are ultimately useless. The important question is not *who* can solve the universe, but how we can continuously probe it.”

With the increasing overlap between contemporary activities in the studio, the gallery, and the laboratory, the difference between art and science may ultimately be another useless question. In the meantime, the space of not-knowing is fertile ground for both artists and scientists – both real and imagined.

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ⁱ For more information see Bernard Hirschhorn, “Views on Education” in J.R. LeMaster and Donald D. Kummings, eds., *Walt Whitman: An Encyclopedia* (New York: Garland Publishing, 1998) accessed online at http://whitmanarchive.org/criticism/current/encyclopedia/entry_2.html

ⁱⁱ Artist statement, www.nathaliemiebach.com

ⁱⁱⁱ Whitney Dail, “Driven by Data: Nathalie Miebach on Basketweaving and Tinkering,” National Endowment for the Arts interview

^{iv} Artist statement, *Evolving Territories: Jane D. Marsching and Lalie Schewadron*, exh. cat., Lucy Mackintosh Gallery, Lausanne, Switzerland, May-June 2011.

^v Artist statement, via “Bartow+Metzgar, Stratimentation: Investigations of a Metamorphic Landscape,” <http://stratimentation.wordpress.com/>

^{vi} Artist statement, 2012, via email exchange with the artist

^{vii} www.imaginaryscience.org