INNER SPACE, GLOBAL MATTER: RECORDING FROM THE STRUCTURES WITHIN

Geraldine Ondrizek

Works from 2009 through 2012

Jane Chin Davidson

University of Houston-Clear Lake Art Gallery
One of the most important developments in the practice of exhibiting art is the concept of “sitedness,” which has transformed the way art produces meaning. Not only does the “place” and location play an integral role in the artistic expression, but the engagement with the community and populace who reside there is central to the significance of the exhibition.

The opportunity to present Inner Space, Global Matter: Recording from the Structures Within for audiences in the NASA community was made possible when artist Geraldine Ondrizek accepted the invitation to exhibit her science-artworks at the three locations of the University of Houston-Clear Lake, the Space Center Houston of Johnson Space Center, and the Florida International University.
Ondrizek’s scientific subject, however, consists of the biological genetic image that appears at first glance unrelated to “rocket science.” Her signature multimedia artwork Cellular reimagines the universal “self” of science by incorporating the sound of human cells dividing with the film of the embryonic stages of the development of spider eggs. The video installation projects the actual recording of the vibration of cells through the AFM, atomic force microscope, and this aural expression is integrated with the gastrulation of blastophores captured on film. Magnified thousands of times in a moving projection, the enormous cellular installation resembles a planet in rotation, a suspended orbiting sphere. Of course, viewers of Cellular at the Houston Space Center are easily deceived until they read the associating information.

The aesthetic imagination provides a clear objective for developing the new relationship between art and science. Whether focusing on planets or cells, the practice of science is discovery, which is compelled by stirrings of the human imagination. The major difference from science, however, as given through Ondrizek’s interpretation, is the contemplative perspective that is unique to the artistic expectation. The viewer is made to “look” with aesthetic appreciation rather than focus the usual scientific gaze toward molecular material observed under the microscope. Artistic and scientific imagination can therefore be integrated in the acceptance of the aesthetic likeness of cells and planets, in which the shared affinity is absolutely more than just appearances. Molecular and subatomic matter all connect as they compose the compositional elements that perpetuate life itself.

Ultimately, the primary concept of this exhibition is the notion that the grand scale of humanity is connected on the cellular level. In its visual and poetic language, a key function of art is to present a portrait of the “self” in relation to the time and place in which we live. The planetary vantage point changes the perspective toward “community,” and to focus on the community of NASA is ideal since it is befitting to think of a “universe” of astrophysicists and engineers. In this way, the distinctions of the community and the universe become cohesive; notwithstanding the fact that they are conceived as different environments determined by scale. Cellular at the Space Center intimates the metaphor of the microscopic cell and the macroscopic planet. Still, a community presumes a peopled constituency whereas a universe is left open to the imagination—one that is inhabited with Martians and microbial life.

The artistic expression provides the opportunity to reconceptualize genetics beyond the disciplinary domains of medical and astronomical science, foregrounding instead the social and cultural contexts for bodies and environments. The NASA science community has already extended into the growth and development of the medical institutions in the Houston area. The prominent question for both scientists and artists today involves the role of nature and culture in genetic identity—the biological “self” distinguished by DNA and genetic makeup can no longer be kept separate from a cultural identity based on gender, “race,” and sexuality. On the popular culture front, several television shows have already dramatized genetic identity by tracing the ancestry of celebrities. But focusing on the scholarly/academic front, Ondrizek’s exhibition exemplifies the intellectual approach to social and cultural issues raised by the new genomic identity. In this way, Cellular and Chromosome Painting exhibited at UHCL reveals more than individual identity, but what’s at stake for the biogenetic community. We look to the arts to comprehend what makes us human, especially as technology transforms the old definitions for a biological and cultural identity.
Regardless of one’s occupation, living in the historically important NASA community of Clear Lake, every individual has been impacted in some way by the highly regarded Johnson Space Center. The space industry is about exploration, invention, and risk taking. The same is true for those of us who work in the discipline of the fine arts. The strong influence of NASA’s scientifically minded community has long been made visible in our local culture and especially in our educational institutions (in UHCL since its founding in 1971). Not only have our science programs blossomed in public and private schools, but space-related themes have increased, and be they of fiction or reality, space concepts occur regularly in classroom art. Art students and professional artists have at their disposal a “local lab” in JSC to research space-related themes. This has been especially useful for graphic artists. Working and teaching at UHCL has been made interesting and challenging by having numerous scientifically minded students in our studio classes as well as astronauts and cosmonauts. The existing partnership between UHCL and JSC continues to provide a unique opportunity for our students both in art history and studio arts to collaborate scientifically and creatively.
The exhibition Cellular combines two large-scale installations, Sound Wall and Cellular. These works, which refer to both architectural and biological cells, are an attempt to understand, represent and experience cellular formation. The forms, sound and images that make up this work are a result of working closely with several research scientists, who have allowed me to observe and use their research. Both works rely on physical interaction; the installations are performance spaces for the viewers to listen, touch and occupy in order to understand the relationship between our senses, internally and externally.

The cell, the smallest unit in a living organism, houses genetic code. Both an object and a vessel, it is a site of activity that is never static or complete. The term cell comes from the Latin cellular, which means a small room. Historically the architectural cell is a space for reverent solitude and meditation, captivity, and confinement. The first to place the term within a biological context as a consequence of his use of microscopic magnification to study and render cellular structure, the British scholar Robert Hooke noted that cork cells resembled the small rooms monks lived in. His etchings of magnified organic forms published in Micrographia of 1665 and 1667 by order of the Royal Society revolutionized the way in which biological organisms were understood. Optics and magnification have continued to give vision to the previously unseen and have changed our understanding of interior systems.

When I asked a colleague Steve Black, professor of developmental biology and zoology at Reed College, if he had any images of gastrulation he could share, an entirely new world opened up to me. Most images we see of biological specimens are flat and still, but the inventions of the stereomicroscope with film-capture technology has enabled researchers to capture images akin to how our eyes see: in three dimensions and in motion. The stereomicroscope has made it possible to record the physical form and the inner workings of a cell. This is vital technology in the fields of embryology, fertilization and the understanding of cellular anomalies. Steve’s lab uses three-dimensional photographs and film-capture technology to understand the cellular mechanics of gastrulation, the process by which a spherically symmetrical egg is rearranged to have axes, such as an inside and an outside; a front and a back; a top and a bottom; a right side and a left side. From these films, they can compare different species and development as it occurs. Cellular is a film of several blastopores. Each segment of the film is a result of more than 200 hours of still images of each embryo made with Atonics Micro fire digital cameras mounted on Olympus stereomicroscopes and made into a film using Astor IIDC imaging software. Twelve films were edited and sliced to make the final art work. Steve Black and his research assistant Allison Egar allowed me to make films of the blastopores. To make my film, I edited ten different films of gastrulation to overlap and repeat the phases of development just before a recognizable body is evident. Watching an endless loop of an egg development and cells dividing is meditative. It looks like we are witnessing the beginning of the earth’s formation or plate tectonics. The pacing is nervous, then fluid. Each egg’s gestation is unique, even though it is the same species. The blastopore, or a multiple cell embryo, is what all creatures begin as. The conditions and the health of the egg determined its survival. This extraordinary phenomenon happens continually and without us knowing.

The set of prints Cellular Film Stills were made in collaboration with Allison Egar to record the major stages of gestation, looking at the subtle but developmentally significant events in each. Throughout this process, it became increasingly clear to me that early embryonic development is flexible, with considerable variation observed even within a single genus.
The sound for the installation and film Cellular was originally made using nanotechnology to record the sounds of healthy to sick cells dividing. Nanotechnology, particularly the AFM (atomic force microscope) pioneered by James Gimzewski, professor of chemistry at University of California, Los Angeles, and Andrew Pelling, associate professor of biophysics at the University of Ottawa, has enabled researchers to touch and listen to cells. Like the blind reading Braille or a hand touching a pulse, the needle of the AFM can touch and feel the vibrations of cell is less than half the diameter of a human half. The new area of study is called sonocytology, which uses the atomic force microscope (AFM) to feel a cell in the same way a needle was used to feel the pattern of vibrations pressed into vinyl records. Gimzewski and Pelling have found that cells with cancer or other diseases emit a very low and strained frequency while healthy cells produce a more pleasant sound.

Sonocytology has proven to be a noninvasive way to detect disease. In 2007, Gimzewski used nanotechnology to demonstrate that metastasized cancer cells are softer than healthy cells. The study represented one of the first times researchers have been able to take living cells from human cancer patients and use nanotechnology to determine which were cancerous through touch. Through touching and hearing rather than only seeing, an entirely new way of studying a form—that of the multiple sensory knowledge—was born. This ability to discern cellular soundings has ultimately revolutionized the understanding of cellular gestation and division and the relationships within the interior architecture of our body.

From top: Cellular at University of Houston-Clear Lake Art Gallery; Cellular at Space Center Houston; Cellular through doors of Miami Beach Urban Studios at Florida International University; Cellular Film Stills, 2009

Row 1:
• Early internalization of cells through the blastopore.
• Internalization continues through the blastopore to create an early lower layer.

Row 2:
• The signaling center, the cumulus, is first apparent and begins its migration towards the prospective dorsal side of the embryo.
• Cumulus migration continues.
• As the cumulus migrates and disperses, an area of cells under its migratory path spreads out to form the “dorsal field”—basically, cells from the body will begin to condense on the side of the cumulus and move away from it.

Row 3:
• The dorsal field continues to expand, changing the area of cells that form the body from a roughly circular shape to an elongated band, and very early segmentation becomes apparent in the anterior body.
• The posterior end of the body begins to form from one end of the germ band and segments are laid down as the growth zone (area with more cells) migrates.

Row 4:
• The posterior body continues to form and segments become more apparent.
• Segments continue to condense and legs begin to bud off of them.

Four rows of eight stills printed on an Epson 9000, Plexiglass, steel frames (refer to images on next page)
CHROMOSOME PAINTING
Genevieve Gaiser Tremblay

In 2009, artist Geraldine Ondrizek, senior genetic counselor and co-director of the University of Washington Genetic Medicine Clinic’s Robin Bennett, and curator Genevieve Gaiser Tremblay collaborated to bring together art and medical science, which culminated in the 2011 public art commission for the UW Medical Center commemorating fifty years of medical genetics at UW.

Ondrizek’s research-based artwork ignites interest and inquiry about the influence of cancer and other diseases on both individuals and entire families. She relies heavily on scientific inquiry, focusing on documenting biological specimen and exploring systems of categorization. She works closely with genetic scientists to trace cultural differences and similarities. Ondrizek enmeshes the material semiotics of cloth and culture with the complex and colorful language of genetic data. She leverages humble craft methods associated with domesticity to create textile portraits, color patterns, and sequences that metaphorically portray what she calls “our coats of many colors.” Her deep inquiry into the more scientific realm of human identity invites us along and delivers not only exquisite aesthetic interpretations, but also a genetic literacy primer to inspire our own self-discoveries.

INHERITANCE
Robin Bennett, UW Senior Genetic Counselor

Genetics touches us all. We take pride in our heritage, and we may boast about characteristics that “run in the family.” Conversely, concerns about family diseases that may be inherited can also lead to feelings of anxiety, guilt, fear of the unknown, or even relief if we discover that a particular disease is not strongly inheritable or we feel empowered to take preventive actions against a disease. The collaboration between my two-year collaboration with Robin Bennett and the Division of Medical Genetics at the University of Washington. First are prototypes made for the 2011 UW commission Chromosome 17 and the piece created for the Portland Art Museum, Case Study. Both works use the National Center for Biotechnical Information (NCBI) database of the human genome as a resource to artistically map scientifically derived gene sequences. The second work, DNA Microarray, located on the balcony, is formed from several large silk panels imprinted with human chromosome maps, are arresting displays of fluorescent color arranged to stunningly depict chromosomal comparisons. Fuchsia neighbors chartreuse, purple sidles up to orange, and soft grays mingle with blues. These juxtapositions spur the eye to dart between various color combinations and arrangements.

The origin of the word chromosoma comes from Greek khrōma (color) and soma (body). These panels, literally made up of different color combinations, physically manifest the “color bodies” (or chromосomеs). Chromosome Paintings as representations of scientific data are optically stunning and will generate dialogues about vibrancy, compliments, contrasts, and tonal ranges of the color combinations, which parallel genetic variance, anomalies, and similarities. The technique of chromosome painting, also known as “fluorescence in situ hybridization” can detect chromosomal aberrations like deletions, duplications, inversions, or rearrangements that are associated with various diseases. For example, chromosome 19 carries

researchers shows the beauty in our DNA and brings this art and genetic science to the public. This work provides an opportunity for dialogue between geneticists and the public to help allay fears and misconceptions related to genetics.

In this exhibition explore the nature of our bio-cultural differences and similarities. Ondrizek assembled a rich collection of images from research done by prominent medical geneticists, including, UW Medical Genetics founders Arno Motulsky and Peter Byers.

In the three bodies of artwork featured in this exhibition—Chromosome 17, DNA Microarray, and Chromosome Painting—Ondrizek enmeshes the material semiotics of cloth and culture with the complex and colorful language of genetic data. She leverages humble craft methods associated with domesticity to create textile portraits, color patterns, and sequences that metaphorically portray what she calls “our coats of many colors.” Her deep inquiry into the more scientific realm of human identity invites us along and delivers not only exquisite aesthetic interpretations, but also a genetic literacy primer to inspi
a gene implicated in leukemia. With these disease associations in mind, each panel is labeled with a type of cancer correlated with a genetic marker present on the chromosome. The chromosome synteny map printed on white silk was originally displayed within a light box so the colors glow from within. These panels are marked with the genetic anomalies linked to different types of cancer found on each gene. The silk panels were also produced in a small edition of ten each, and are now sold to raise funds for the University of Washington Cancer Genetic Medicine Clinic for education and research, and specifically for those who have cancer and are unable to afford medical diagnosis and treatment. Additionally, the funds will benefit those who have cancer and would like to bank their DNA so their children and extended family can benefit from genetic testing.

A version of this essay was first published for the Chromosome Painting exhibition at the Kirkland Arts Center, May 26 through July 6, 2012. Available at http://www.goforwarddesign.com/2012.

A list of chromosome and the cancer markers is listed below.

CHROMOSOME
1. Prostate cancer
2. Ovarian cancer
3. Colon cancer
4. Leukemia
5. Gastric cancer
6. Ovarian cancer
7. Colon cancer
8. Hepatocellular cancer
9. Melanoma
10. Prostate cancer
11. Bladder cancer
12. Oral cancer
13. Pancreatic cancer
14. Lymphoma
15. Hodgkin’s Lymphoma
16. Breast cancer-lobular
17. Breast cancer
18. Pancreatic cancer
19. Leukemia T-cell Acute
20. Colon cancer
21. Breast cancer
22. Leukemia
X. Testicular cancer
INNER SPACE, GLOBAL MATTER

Jane Chin Davidson

Meditated by a technologically enhanced gaze, bodily micro- and macro-worlds, from cells to planets, are becoming an unquestioned part of our everyday life outlook.

Anneke Smelik and Nina Lykke, Bits of Life: Feminism at the Intersections of Media, Bioscience, and Technology (2008).

The new scopic regimes of the twenty-first century can be understood as either microscopic or macroscopic visions that are expressed through the endoscopic or telescopic gaze. These technological ways of seeing propose new questions in regard to representing and interpreting the human “self” in relation to the meaning of both nature and culture, amidst the recent interpolation of the two concepts. Most significant is the microscopic, since medical technology ushered in the new era of the genetic perception of the body. But this is not to diminish the macro impact, especially in view of the photographic quest by the Mars rover vehicle, launched in 2012 to discern biological life-forms on the planet. Both micro/macro visions converge at the spectrometer’s focus on microscopic evidence conducted from the telescopic location of Mars. And, since both scopes fall in the domain of science under its factual rather than expressive utility, the sense of the “real” is inherent in the scientific gaze, as distinguished from the “imaginary” of the artistic gaze. The Geraldine Ondrizek exhibition, titled Inner Space, Global Matter: Recording from the Structures Within, problematizes these classificatory beliefs by challenging the notion that “seeing” is “believing”—her artworks illustrate the conflicted relationships among “self” and nature, biology and culture, bodies and environment. The ways in which these subjects are represented today determines the most important context for an artistic and scientific inquiry.

Ondrizek engages the viewer not only through the visual expression but also through affective sensibilities and aural aspects of the performative in her installations. The viewer of Cellular/Sound Wall (2008–9) experiences the intimacy of the sound of human cells dividing whilst watching the video of the embryonic stages of the development of a spider egg. The filmed process actually involves images of many eggs, since Ondrizek had cut and spliced several loops to create the final video. Each embryonic development is unique, none are exactly the same, and the captured moving image represents the reproductive process which is the same for humans, acknowledging the shared process among species on the cellular level. The multimedia work involves the AFM (atomic force microscope), and this aural expression is integrated with three-dimensional photographs of the gastrulation of blastopores captured on film. Magnified by 2000 times in projection, the moving cellular image appears to be suspended like an orbiting sphere, which bears remarkable likeness to the imagery of planetary systems of the macroscopic world. Key to this affinity of shared likenesses is the dependence on technology since neither cells nor planets are visible to the “naked” human eye. In this twenty-first century homage to the old sense of “wonder,” the mystery of the unseen is still frightening because the “unknown” of the inner space of the “self” is just as awe-filled as the outer space of the universe.

Cellular opens simultaneously at the three locations of Space Center Houston, the University of Houston, Clear Lake, and the Florida International University at Miami—the primary goal of presenting this signature work at all three places is to address the ways in which the site and space of the exhibitions concurrently generate meaning—especially in relation to the history of scientific displays of the natural world. The Space Center’s enormous 180,000 square feet of exhibition space showcases all types of models and simulators that share “the thrill and wonder of space exploration with visitors.” The Space Center appears as a present-day version of the seventeenth-century Wunderkammern in which the futuristic “curiosity cabinet” functions to display the scientific spectacles of the present generation. In presenting one of the largest known samples of Mars meteorites (found in Antarctica in 1980), NASA’s Touch a Piece of Mars exhibition fits perfectly into the original schema of the Wunder collections. The Mars rock, however, was brought out to highlight the Space Center’s live broadcast of the August 6, 2012
landing of the aptly named Curiosity rover on Mars. Presenting Cellular in the context of Touch a Piece of Mars therefore provides a curatorial premise for asserting a conceptual Earthworks analysis of biology’s relationship to geology as a particular development of the phenomenological engagements of contemporary art.

By transgressing the art-science boundary, the opportunity to assess the shift from the modernist scopic regime to the micro/macro technological gaze can be undertaken by tracking the Wunderkammer’s scientific distinction for displays of the terrestrial and the celestial. The previous scopic regime was explained by Martin Jay as the “optical premise for modern epistemology,” establishing the visual field for the normative weltanschauung “worldview.” Jay describes the impact of the “Cartesian perspectivalism” which historians and critics have “claimed to be the dominant, even totally hegemonic, visual model of the modern era.”

By the nineteenth century, the Wunder focus had developed into an imperial gaze toward the “world-as-exhibition” as world’s fairs and colonial expositions competed with tourism and photography to visually “capture” and rule over the colonized subjects under the gaze of nationalism and empire. As Timothy Mitchell asserts, the “world-as-exhibition” was a means to “reduce the ‘world to a system of objects’ in order to ‘evoke some larger meaning, such as the normative ‘world-as-exhibition’ as world’s fairs and colonial expositions competed with tourism and photography to visually “capture” and rule over the colonized subjects under the gaze of nationalism and empire. As Timothy Mitchell asserts, the “world-as-exhibition” was a means to “reduce the ‘world to a system of objects’ in order to ‘evoke some larger meaning, such as the normative ‘worldview.”

The philosophy of materialism in the context of identity has long been a prominent engagement of contemporary art. The Gaze of Wonder: The Touch of Wonder takes into account the complex signifier of consciousness? Laurie Anderson, NASA artist in residence, 2002-3

NASA’s objects of technology at the Space Center function as “mediations” of nature rather than as the Wunderkammer’s “curiosities” of natural science, but the overall task of the many spacecraft simulators is to test the limits of the astronauts’ human bodies against the most powerful forces of nature—of outer space. NASA’s 1960s program aligns with the same art-historical era in which the return to wonder is traceable to Earthworks and Land Art, conceived as performative engagements with the “literal” or real space of the outdoors and nature (attributed now to Minimalism). The continuing development of these concepts into the twenty-first century can be viewed by Inner Space, Global Matter’s engagement of the new biogenetic “self” in relation to NASA’s planetary landscapes. The Space Center’s mission is to

environments, is now a symbol, a relic, of NASAs heyday in space exploration. Exhibiting Inner Space, Global Matter’s in the historic NASA communities in Texas and in Florida ultimately takes into account the complex signifier of the “man in space,” as distinguished from the “local” beyond artistic and scientific abstractions.
offer to visitors a firsthand experience by allowing access to the working space stations and laboratories across the expanse of the sixteenth-hundred-twenty-acre JSC campus. Visitors express their amazement at the monumental scale of aeronautic technology, and in the imagination of the viewer, the enormity of the space capsule emulates the vastness of outer space.

Presenting Ondricek’s installation in this backdrop, the verisimilitude in magnitude and scale of Cellular’s microscopic cell instills the same subjective sense of astonishment in the “real” and “unreal” of the Space Center’s imaginarius. Through the gaze of “wonders,” the viewer becomes entranced by Cellular’s experience, finding it hard to believe that our cells inside our body could look like this, much less sound like this—the idea that our cells make sounds at all is quite unbelievable. But as the viewer listens to the sound of Cellular, the sensory experience functions as further evidence of the cell’s existence within the inner space of the “self.” This performance of a sense-experience that heightens awareness of the precarious moments of landing “terror” instills the recognition that the event of the theatrical landing watched by twenty-three million people on live webcam. NASA engineer Allen Chen announced: “Touchdown confirmed! We’re safe on Mars.” For participants of the live broadcast at the Space Center, the focus on time in the dramatization of the precarious moments of landing “terror” confirms the recognition that the event on another planet is really happening. And through the invitation to “touch” the planet of Mars by proxy of the meteorite, the reality of the experience is confirmed for the viewer on a sensory level.

In following this model, the exhibition of Cellular in the Space Center provides an experience that is similar to the sensory connection of the Touch a Piece of Mars display. Promoted as the “only Martian sample the public can touch,” NASA’s press release states, incredibly, that the twelve-pound rock was “thrown from Mars into space approximately 600,000 years ago.”12 The “official unveiling of the Martian touchstone” took place at the moment prior to the August 6th landing, precisely at 12:31 a.m. CDT, and it was billed as “Curiosity: Seven Minutes of Terror.”13 Jeffrey Kluger of Time magazine describes Curiosity’s “salam into the Martian atmosphere at a blazing 13,000 m.p.h” and its subsequent hover with parachute and retrorockets as the culmination of the theatrical landing watched by twenty-three million people on live webcam. NASA engineer Allen Chen announced: “Touchdown confirmed! We’re safe on Mars.”14 For participants of the live broadcast at the Space Center, the focus on time in the dramatization of the precarious moments of landing “terror” instills the recognition that the event on another planet is really happening. And through the invitation to “touch” the planet of Mars by proxy of the meteorite, the reality of the experience is confirmed for the viewer on a sensory level.

The touch of “wonder” makes “real” the place called Mars, however imaginary a trip to the planet may seem—in similarity to the viewer’s incredulity over Cellular’s representation of the “self.” An embodied engagement through hearing and touch is key to retaining the human connection when confronted with the image of the moving cell as much as when faced with the prosthesis image of the Space Center’s enormous technological showcase. A continuing scientific curiosity compels the sensory contact with cells and planets, although, conceptual artists have long used the sensory potential of the artist’s press release to assert the connection between the body and ontology (no longer Cartesian in the singular selfhood of the cognitive mind). In regard to conceptual practices, Cellular and the Martian meteorite reveals the artificiality of the separation between art and science—what better conceptual art expression of the Mars event could have been created for the viewer of the Mars Landing than the touch of the meteor associated with the rover touchdown? At the Space Center, the old logic of collecting and displaying scientific specimen is maintained from the origins of the Kunstkammern, but the museumgoer’s interactive experience with spacecraft simulation has been impacted by the conceptual aims of site specificity and contemporary artworks, especially of the genre of Earthworks.

The Earthworks of Outer Space

The viewer’s embodied reaction to the theatricalized elements of survival outside of the life-giving atmosphere of the Earth correlates to the response of viewers going out to wilderness areas to experience the awesome nature of Earthwork/Land Art’s earthy space. For instance, visitors of Walter De Maria’s Lightning Field continue to trek the high desert of New Mexico in order to witness the occurrence of lightning conducted across the four hundred steel poles that De Maria installed as a sculptural installation in 1977. Ever since the seventeenth-century landscape painting, the artist’s view of nature was always considered as a scientific perspective. Nature can no longer be “captured” by the artist, so much as it needs to be respected and protected. The tradition of “wonder” renews the reverence to nature, and the sheer beauty of Robert Smithson’s Spiral Getty (1967), his 1500-foot coil of black basalt rocks emerging out of the translucent red water on the shores of Rozel Point, Utah, harkens back to the seventeenth-century era of integrating art and science. Smithson’s decision to build the massive spiral at Utah’s Great Salt Lake was based on the pink color of the bacteria and algae that could thrive in the salinity of the water. But this remote site of abandoned oil rigs and industrial waste was also chosen to monumentalize nature in reaction to its obvious destruction by pollution due to scientific development. In acknowledging the landscape at risk, the point of Land Art was to question the “self” of humanity in the face of awesome nature. Before going outside to establish his artworks as environmental sites, Smithson initially brought boulders inside the space of the gallery in works such as A Nonsite, Franklin, New Jersey (1968). Smithson suggested that “[g]eologists always talk of the earth as ‘a museum’; of the ‘abyss of time’ and treat it in terms of artifacts. The recovery of fragments of lost civilizations and the recovery of rocks makes the earth become a kind of artifact.”15 The Mars rock display follows Smithson’s logic precisely, but for a geology from outer space. The artistic concept is not unlike NASA’s model of scientific simulation. As with De Maria’s Lightning Field (1977) offers viewers the simulation of nature through the embodied experience with a muddy
field. The viewer's engagement with De Maria's "interior earth sculpture" comprised of 280,000 pounds of "real dirt" spanning across 3600 square feet of gallery space, continues the gaze of "wonder" after nature is lost to urban spaces. Attributed to era of 1970s Minimalist exploration, Earthwork artists were questioning the meaning of the presence of humans in the landscape under the conventional wisdom that nature is the great but diminishing force of the wild.

By contrast, the exhibition of the Mars meteorite at the Space Center exemplifies the twenty-first century context for Earthworks, the promise for the forthcoming generations appears to be ascribed to space exploration rather than the diminishing hopes of Earthly preservation. The shift to envision Mars as the place where humans can "go out to nature" under the Land Art model could be viewed by the oncoming reality of privatized space travel. The vision was initiated by the NASA Authorization Act of 2010, eliminating the Constellation moon program and endorsing new technologies and innovative projects such as the launch of the Mars rover Curiosity in 2011—the two-year project serves as the "precursor to NASA's planned missions to Mars in the 2030s." And the success of the launch of the Falcon 9 rocket by Elon Musk's private company SpaceX in its resupply mission to the International Space Station reveals the end of the Kennedy era of nationalistic in uniting the country around moon exploration. The actual material of the rocks have not undergone scientific analysis but NASA reports that the "photographs tell a story all their own." Unlike the logic for viewers of the Touch a Piece of Mars display, the NASA investigator's engagement with rocks on Mars is a mediated
form of scientific analysis. Their assessments are made entirely through Curiosity’s prosthetic eye, convincing it to believe through firsthand investigation by touch of the material objects from Mars. No one would contest the robot’s scientific gaze.

If interpreted through the modern classificatory order for artistic images, the Mars images would be accorded an expressive status rather than one of scientific evidence by their observers. And in the artistic view, Ondříček’s video of the biological cell is treated as an aesthetic expression that is considered as a manipulated image rather than as a microbial record. Under this view, Celluar is not quite believable to our thinking—the blown-up image appears less likely a part of human anatomy because the viewer knows s/he is seeing a mere replica, not the actual thing itself—although, images streaming from Curiosity actually fall into the same category. Ondříček raises Plato’s timeless question regarding the way in which imitation/copies function to deceive, illustrating Gilles Deleuze’s argument that the “simulacrum includes the differential point of view...the observer becomes a part of the simulacrum itself, which is transformed and deformed by this point of view.”29 The Mars model for the combined telescopic and spectrometric image of astronomy presents the new simulacral regime with its classificatory order for the “real” of scientific images and the “unreal” of artistic expression.

As an artistic object, Cellular represents the microscopic world of cells, atoms and particles, the elements of biology and physics that are invisible to the human eye. As an individual culmination of the material real, Cellular constitutes the image of the actual unit of life at the top of the hierarchy of microscopic elements. The recent discovery of the particle thought to match the Higgs Boson (announced in July 2012) attests to the power of the imagination, the wonder that has inspired all important scientific ideas. The Higgs boson was described by journalist Dennis Overbye as “the rendezvous with destiny for a generation of physicists who have believed in the boson for half a century without ever seeing it.”30 In 1964, scientist Peter Higgs had theorized the existence of an energy field for a quantum field theory of interactions between particles, a concept pertaining to the Standard Model for physics. Overbye explains that the boson is “the only manifestation of an invisible force field, a cosmic molasses that permeates space and imbues everyday interaction.”31 Higgs was initially criticized for his ideas—“my colleagues thought I was a bit of an idiot,” But forty years and billions of dollars later, the “Higgs-like” particle was found by two teams of physicists, convincing it to believe through the phenomenon of the senses. The remarkable Epicurean philosophy of Lucretius’s first century BCE poem “On the Nature of Things” (“De Rerum Natura”) was premised on the scientific analysis of “multitudinous atoms that must rise up [out of space].”32 Lucretius’s two thousand-year-old theory attributes to the “atom” the development of all forms of life on earth and on heavenly bodies—the survival of animals, agricultural production, the replenishing of seas, and the perpetuation of all astronomical phenomena—all can be connected to atomic force. The Higgs boson provides material proof of the forcefield that enables the diversity of all living things, articulated by Overbye as the “key to understanding why there is diversity and life in the universe”—the same concept that Lucretius’s wrote about in his philosophical theory.33 The point was to show how human bodies, spiders, stars, and planets are all made of the same matter. The poet-philosopher inquired into the “indestructible particles of absolutely solid matter [that] fly about incessantly throughout eternity” in the space of a universe that is “not bounded in any direction.”34 He called this system of the movement of matter the “cлинамен” or the “swerve,” which constitutes the forces of the laws of nature. Lucretius’s invisible world of particles, atoms and seed was essentially an illusory one; not quite believable to our thinking, it is not new. They were originally conceived by philosophers who have long explored the unseen world of nature as they questioned the existence of cells, Higgs bosons and particles through the phenomenology of the senses.

The Passion of the Icon: The Deception of the Simulacra

In Stephen Greenblatt’s recent historiography of Lucretius’s “De Rerum Natura” entitled The Swerve: How the World Became Modern (2011), the author draws a straight line from the first century theologian to the modern understanding of the universe. The important contribution of Greenblatt’s analysis is in the way in which the literary historian undertakes the artistic impact of the poem. Whilst his teleology is meant to bring comprehension to Lucretius’s “core scientific vision,” Greenblatt attributes the inspiration to the “poet’s sense of wonder.”35 The Swerve reveals how “De Rerum Natura’s” Epicurean philosophy of pleasure and beauty was lost throughout history to theology’s antithetical position of pain and darkness. Amidst the unchanging polemics pitting Science against God, Greenblatt surmises this contrast to be one of pleasure seeking, a vision of God’s providential rage, and an obsession with the afterlife; these were the death knells of everything Lucretius represented.36 His poem was banned, burned and forgotten during transitional periods of Christianity, beginning with Rome’s decline in the fifth century and ending with the counter-reformation in fifteenth century Florence.
Now that the Higgs-like boson provides the passion over the copy. Platonism” in order to relinquish the fear of the removed from the original than the simulacrum. —in Platonism, icons are considered as less of “images-idols” as either copies-icons or as to Deleuze, Plato considered the entire domain venerate the spiritual deity of the saint. According suspicions that the image can lead viewers to worship a piece of wood panel rather than venerate the spiritual deity of the saint. According to Deleuze, Plato considered the entire domain of “images-idols” as either copies-icons or as further reproductions of simulacra-phantasms—in Platonism, icons are considered as less removed from the original than the simulacrum. Still, the Nietzschean “task of the philosophy of the future” is to “reverse Platonism” in order to relinquish the fear of the passion over the copy. Greenblatt affirms the poetic deception, the “notion of atoms was only a dazzling speculation; however, can be attributed to the notion that the imaginary and the real today have little to do with the power of passion and pleasure, questioning the very danger of the power of life itself if indeed passion is the force to be reckon with. Deleuze puts it in this way: The problem no longer has to do with the distinction Essence-Appearance or Model-Copy. This distinction operates completely within the world of representation. Rather, it has to do with undertaking the subversion of this world—the “twilight of the idols.” The simulacrum is not a degraded copy. It harbors a positive power which denies the original and the copy, the model and the reproduction . . . . There is no longer any privileged point of view except that of the object common to all points of view. The privileged perspective of the old scopic regime is attributed to Plato in this treatise on “The Simulacrum and Ancient Philosophy,” written by Deleuze to expound on “Lucretius and the Simulacrum.” Inextricable from the cognitive senses and the sensuous, the atom is unseen and had to be imagined as a sensible object, the concept has to be “thought” just as past worshippers of the icon conjured up Saint Peter in their imaginations. Deleuze invokes the power of the “phantasm” by which the effect of the simulacrum involves the “false as power,” defined by Nietzsche as the highest force in the “Dionysian machine.” The Epicurean formula for the atom exemplifying the diversity of different nature was imagined as reproduced copies of copies into supra-natural infinity. The power of this plenitude is also the power of the “false,” emanating from the imaginary, which is the subversive power that is no longer dictated by the privileged point of view, the Platonic moral norm for truth. As the Inner Space, Global Matter exhibition aims to show, the power of the artistic imaginary and its ability to arouse passion, deceive its participants, is the same power of scientific “wonder.” Greenblatt suggests that the “recovery of “On the Nature of Things” is a story of how the world swerved in a new direction.” By this, he means Lucretius’s impact on artists and scientists of the European world—from Machiavelli and Shakespeare to Darwin and Einstein—those who were influenced by passion of the “false as power.” The irony is in the fact that nearly every culture that came before the modern European telos relied on intricate cosmological principles for living, in the belief that planets, moon, stars are inextricably linked to the changing seasons of life on Earth—the seasons of human beings. The new micro/macro scopic regime is closer in spirit to the old perspective from agricultural systems for culture and society. In fact, the new scopic regime is linked to the ancient scopic fascination with the Aztec sun or the Confucian I Ching. The “Becoming” Body: The Cell and the Planet The modernist scopic regime is now surpassed by the new macro/microscopic vision by which the material “real” of cells and plasm—that is, the intra-extra-terrestrial perception of microbial life—transforms the weltanschauung “ worldview.” When Franklin, Lury, and Stacey distinguished the cell, the blue planet, and the foetus as “global icons” in their study of Global Nature, Global Culture, they speculated the “spheres of life” by focusing on the basic micro/macro symbols that can no longer be confined within their biological or astronomical domains. Rather, the global understanding of contemporary social and cultural life is recognized more and more through biogenetic and bio-planetary information. In this way, the human body and the planet body converges in the focus of a new ontology. When Gayatri Chakravorty Spivak proposed the concept of planetaryarity, her “imperative to re-imagine the planet” was a challenge to accepted notions of empire, nationalism, migration, hybridity, colonial and postcolonial territorializations at the end of the twentieth century. The planetary location of the Earth was meant to transform old territorial claims by taking the perspective from outer space. The global icons of the Cell and the Planet establish a new nature/culture model for understanding inner and outer space, as a development of material feminism. Haraway’s “cyborg, her “integrated homeostatic organism,” would eventually be fulfilled by the genomic identity, and Cellular in...
of the 1960s has been transformed. The legacy of the past and present, is not predetermined by it.” The “false as power” model would be useful for feminists who could reconsider the old patriarchal order by envisioning identity through Lucretius’s diversity of “matter”—now incontrovertible since humans are defined by the microbial material of life. At the micro-macro convergence of Mars exploration, the hierarchy of sub-particles to cells determines the matter of existence. This twenty-first century model of material feminism is nonetheless seen as a continuing development of the 1970s version. Based on the old definition of labor in the context of value and exchange, the choices that humans must make are still circumscribed by economic conditions, material existence.

The strategy for exhibiting Inner Space, Global Matter at the institutional sites of Houston and the Florida space coast was to create a satellite of exhibitions in which the iconic NASA community is integral to a part of the subject and object of display. The event is meant to turn a spotlight onto these urban spaces where both communities are integrally a part of the subject. The aerospace communities are in the midst of change, and as such, Inner Space, Global Matter draws attention to these monumental neighborhoods at a transitional moment. If Smithsonian recovered the fragments of lost civilizations, his rocks representing the Earth as a kind of material artifact, the actual place and the NASA neighborhood can seem like a similar kind of material artifact for the recent history of the institution.

The polemics of the old historical materialism are renewed as the next stage of space travel is premised on privatized explorations. As entrepreneurs talk about building colonies on Mars, the territorialization of other planets besides Earth seems imminent. Opportunities for space flight are now discussed with a spectral gaze toward space travel as a form of entertainment. For instance, Bas Lansdorp’s Mars One company has plans to create a reality show to spectacularize a Mars colony with the camera pointed at prospective residents in their Martian living quarters. Competing adventurers have already made news hearings health checks with their announcements for space tourism such as Aether Sea, a two-channel video projection of jellyfish, are in fact planets or micro-organisms. They suggest the micro and macro-sopic. Anna M. Brown and Christine Borland, eds., Christine Borland, Progressive Disorder (London: Dundee Contemporary Arts, 1999)p.20.

response to old class critiques. Inevitably, the shift to a privatized industry, moving quickly into the inter-planetary-class tourist economy, changes the historical status of space travel and the collective sense of patriotism, heroism, and nationalism that began in the 1960s. The dawn from worldview to planetary view, new and old scopic regimes, is not a utopic dream but a complex set of circumstances in which “wonder” will incline to compel humans to confront who they are through the perceptual and sensory imagination.

I wish to thank Emily Cuming, Sandra Esslinger, and Liliana Leopardi with the consortium of the Art Historians of Southern California for their advice and contributions to this essay.


5. Ibid.


13. Ibid.


20. Ibid. See also NASA, “Mars Exploration Rover Launches,” Press Kit (June 2003).


23. Ibid.

24. Ibid.

25. Ibid.

26. Ibid.

27. Ibid.

28. Ibid.

29. Ibid.

30. Ibid.

31. Ibid.

32. Ibid.
24. Ibid.
25. Roger Highfield, “Prof Peter Higgs Profile,” Telegraph (April 7, 2008).
28. Overbye, “Physicists Find Elusive Particle Seen as Key to Universe.”
31. Ibid., p.29.
35. Deleuze, The Logic of Sense, p.262.
Cellular exists in several physically different configurations across the three venues of the exhibition; in this sense, even the structure of the exhibition reinforces that the work will enact a plurality of meaning. Each site—Houston Space Center (as part of Johnson Space Center); University of Houston-Clear Lake (UHCL) Art Gallery; and Miami Beach Urban Studios, Florida International University (FIU)—provides a slightly different framework through which to view Geraldine Ondrizek’s work. I will focus on the installation at Florida International University as a starting point to consider the significance of this multi-sited iteration of her work.

At FIU, Cellular takes up the entire gallery space; in this sense, the darkened gallery becomes almost a metaphorical incubator for the three projections of a developing organism—the spider embryo. Each segment of the film is composed from over 200 hours of still images of ten eggs—taken with Atonics Micro fire digital cameras and Olympus stereomicroscopes—spliced into a twelve-minute film. Ondrizek explains that she edited ten different films of gastrulation “to overlap and repeat the phases of development just before a recognizable body is evident.” Indeed, although the details of gastrulation vary among species, the mechanisms are surprisingly similar. Editing the films to show the moment right before the blastula becomes a distinct species renders the final video to show a potentially developing human as much as it could be evoking an embryonic arachnoid. The process is the same for both.

Cellular exemplifies the experiments in filming gastrulation enabled by technological advances; however, the project is not just a staging of Cellular as scientific document. Rather, one can conceive of the gallery space of FIU as an incubator—an updated contemporary “womb.
room,” if you will—in which becoming rather than being is of utmost importance. Ondrizek aligns her work with that of Mona Hatoum, who explores her body as a site of surveillance, exploration and exploitation as opposed to the early womb rooms of Faith Wilding, which could not have anticipated the pervasiveness of medical intervention in reproduction in contemporary Western society.

**Projected, Viewing and Celestial Bodies**

Cellular moves beyond the body as an object—or as a singular “self” trapped in its own skin—and towards the body as intercorporeal: the body is one that is connected with and through the bodies of individuals, discursive bodies of knowledge, and even celestial bodies. Indeed, Ondrizek’s Cellular does not appear only as an orb of rapidly dividing cells (healthy or not); the image also suggests the beginning stages of a planet in formation—perhaps even the initial moments of the creation of the universe—or a planet in the process of dying. Cellular presents an (inter)corporeal body in process and in flux, yet importantly still situated in space. Here, space refers to both the abstract concept of the specific discursive space of Florida and to outer space—all points to which I return shortly. Cellular is not only about the projected body; the viewer watching these films is enveloped within the work. One does not watch Cellular with one’s eyes as much as experience it with the body. Ondrizek accomplishes this through the sophisticated use of sound incorporated with the visual. She has magnified the sound human cells make when dividing, drawing upon recent advancements in science—in particular the development of the atomic force microscope (AFM). The AFM allows researchers to touch a cell with the fine tip of a needle and thereby pick up its vibrational signature. Allowing for a multisensory scientific knowledge, its sound is then amplified into the range of human hearing. This revolutionary new area of study of the sounds that cells make is known as sonocrology.

One of the more exciting applications of this new technology is that one can feel/hear whether or not a cell is cancerous: cancerous cells produce a less sonorous sound than healthy ones. The audio of Cellular is a compilation of both healthy and cancerous cells. In this way, Cellular becomes a metaphorical engagement for viewing subjects to see, feel, and touch the beginning of human life; or, on the contrary, the proliferation of cancerous cells leading to the end of life. And in the signification of Florida’s space coast context, the artistic expression refers metaphorically to the stage right before a star dies, when it balloons in size.3 But ultimately, celestial death is the mirror reflection of the creation of the universe. The tension between the telescopic and microscopic, order and chaos, creation and destruction, life and death exists in a taut situation rather than become neatly resolved. And the tension is intensified by the sublimity of the artwork—the dualistic feelings of pleasure and displeasure that Cellular elicits in the viewer.

**Objective/Subjective Bodies**

Directly opposite of the projections of Cellular is a silk panel onto which stills of Cellular have
been printed. The panel is lit in such a way that the still two-dimensional images have a three-dimensional quality. Although the frailty of the ovum through the blastocyst stage, in which each cell is identified as a particular part of the human anatomy, and the development of the ovum through the blastocyst stage, in which each cell is identified as a particular part of the human anatomy, the original cells were magnified 900 times with an electron microscope. The images were scanned, enlarged, and altered on a computer, then transferred on to lithographic plates. Both of these books were placed in rectangular, glass vitrines with rounded corners edged in steel. The vitrines might be described as pod-like as they sit on plinths from which they could become detached—just like a space pod from its (mother) ship. Indeed, the word “pod” refers to a seed container in plants, but since the 1950s, the word has also been used to refer to “a detachable . . . compartment on [a] . . . spacecraft . . . often having a rounded shape.” The metaphor of birth and death in human terms, extending to a subjective sense of the life of the planet, transforms the way in which we view the scientific realm. This may be the most significant contribution that emerges from Ondrizek’s installation at FIU. The embodied experience looking closely and intimately at the handmade books can only be subjective; and at the same time, the three wall-size projections of Cellular produces at times a disorienting, distancing effect in the viewer that more closely approximates the disembodied scientific gaze. Overall, it is the discursive space of NASA in Florida that casts the largest scientific shadow. One is more aware of the sense of living in a “scientific community” in which the frailty and vulnerability of human processes have historically been juxtaposed against the looming objectivity of the rocket, of Cape Canaveral. It is here that Cellular as a work of the aesthetic functions to remind us of the inter-connections between and among—indeed intertwining of—micro and macro bodies, human or otherwise.

1. Ondrizek’s colleague Steve Black, professor of development biology and zoology, at Reed College provided the footage.
3. This is the case for stars that are similar to our sun; stars more massive than our sun do not get larger in size.
4. The books were produced in the summer and fall of 1998, while Ondrizek was on a junior paid leave from Reed College. The project was supported by the Stilman-Drake fund and the Levine funds. The prints were made at Mahaffey Fine Art in Portland; and the books were constructed and bound while Ondrizek was an artist-in-residence at the Women’s Studio Workshop in New York.
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<td><strong>Cellular</strong>, 2008-9</td>
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<td><strong>Fertility Prayer Book</strong>, 1999</td>
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From top left: Cellular installation through doors of Miami Beach Urban Studios at FIU; gallery view of Cellular Film Stills, Cell Tissue, 1999; Ovum Book 1999.

From top left: Cellular installation at Space Center Houston.

Bottom: Touch a Piece of Mars at Space Center Houston.
Geraldine Ondrizek received her BFA from Carnegie Mellon University and an MFA from the University of Washington. She is a professor of art at Reed College in Portland Oregon. Ondrizek was the recent recipient of an Oregon Council and a Ford Foundation Professional Development Grant for the creation and exhibition of Chromosome Painting. She has received the Stillman Drake Fund, the Levine Fund, and Mellon Foundation Faculty Research Awards. In 2006 Ondrizek won the Oregon Council on the Arts Fellowship. She has been an artist in residence at CAMAC in France, Gasworks in London, the Women’s Studio in New York, Kunstseminar in Schwäbisch Hall Germany, the Mattress Factory in Pennsylvania, and the Anderson Arts Center in Colorado.

Commission
2011 University of Washington Medical Center, commissioned work for the front lobby of the University of Washington Hospital honoring Dr. Arno Motulsky and the 50th Anniversary of Medical Genetics.

Solo Exhibitions

2011 Cellular, Sound Wall and Case Study, the Portland Art Museum Apex Award Exhibition

2009 The Sound of Cells Dividing, The Western Gallery, Western Washington University, Bellingham, Washington

2008 Sound Walls, CAMAC Art Center, Marnay sur Seine, France. DNA Fingerprints, The International Museum of Surgical Science, Chicago, Illinois

The Window Project, PDX Gallery, Portland, Oregon


2006 M168: Tracing the Y Chromosome, Hoffmann Gallery, Oregon College of Art and Craft, Portland, Oregon

DNA Fingerprints, The Portland Building, Portland, Oregon

2005 Repairing RNA, Mooney Exhibition Center, College of New Rochelle, New Rochelle, New York

2004 Repairing RNA, The Nine Gallery, Portland, Oregon

Obscured Elements, Solomon Fine Art, Seattle, Washington

ARTIST’S BIOGRAPHY / EXHIBITIONS

2003 RNA, DNA, Gasworks, London

2002 Family Photos, Kunstseminar Schwäbisch Hall, Germany

2001 Recording Bird Songs, Littman Gallery, Portland State University, Portland, Oregon

2000 Stem Cells and Cellular Tissues, Fairbanks Gallery, Oregon State University, Corvallis, Oregon

1999 Thin Sections, West Gallery, Arizona State University, Phoenix, Arizona

1998 De Viscerum Structura, Autzen Gallery, Portland State University, Portland, Oregon

1997 Springs Eternal, Seatrist Gallery, Seattle, Washington

Libri, Douglas F. Cooley Memorial Art Gallery, Reed College, Portland, Oregon

Vera Icôna, Frauenkirche, State Gallery for Contemporary Art, Eriding, Germany

Vera Icôna, Holter Museum of Art, Helena, Montana

1996 Vera Icôna, Matrix Gallery, Sacramento, California

1995 Collectors Chamber, Art Gym, Marylhurst College (now Marylhurst University), Marylhurst, Oregon

1994 Collectors Chamber, Henry Art Gallery, University of Washington, Seattle, Washington

1989 Osage Orange and Sumac, Mattress Factory, Pittsburgh, Pennsylvania

Three Forms, AIR Gallery, New York, New York

Group Exhibitions
2012 Color Mad, Western Washington Gallery of Art, Bellingham, Washington

2011 Art Meets Technology, The Detroit Institute Of Arts, Detroit, Michigan


2009 Book Ends, Pyramid Atlantic, Alexandria, Virginia

2008 4th edition of Fenêtre sur l’Art, Donnemarie-Dontilly, France
The Mattress Factory 30th Anniversary Exhibition, Pittsburgh, Pennsylvania

Speaking In Codes, Form + Content Gallery, Minneapolis, Minnesota, Curator: Diane Mullin, Associate Curator, Weisman Art Museum

2007
Fiber, Linfield Art Gallery, Linfield, Oregon, Curator: Cris Moss, Linfield College

2006
Body of Art: An Exhibition Exploring Biotechnology, Willsoughby and Baltic Fine Arts, Cambridge, Massachusetts

Words to Live By, Solomon Fine Art, Seattle, Washington

100% Centennial: Wall-to-Wall CFA, Regina Gouger Miller Gallery, Carnegie-Mellon University, College of Fine Art, Pittsburgh, Pennsylvania

2005
AFFAIR @ the Jupiter Hotel, Portland, Oregon, represented by Solomon Fine Art, Seattle, Washington

2004
Drawing Conclusions 2004, Museum of Fine Arts, Baltimore, Maryland

New Directions 04, Barrett Art Center, Poughkeepsie, New York

2000
Anniversary Exhibition, Mattress Factory, Pittsburgh, Pennsylvania

Triennial of Prints, Association Mouvement d’Art Contemporain, Chamalières, France

1999
Portland Printmakers, Davidson Gallery, Seattle, Washington

1997
1997 Oregon Biennial, Portland Art Museum, Portland, Oregon

The exhibition traveled in Oregon to the Schneider Museum of Art, Southern Oregon University, Ashland; University of Oregon Museum of Art, Eugene; Hallie Ford Museum of Art, Willamette University, Salem.

Group Exhibition, Mattress Factory, Pittsburgh, Pennsylvania

Lifelines, Hillwood Art Museum, Long Island University, C. W. Post Campus, Brookville, New York

From top: Chromosome Splitting, detail, 2003-5, solvent transfer, embroidery thread, linen. Detail and full.

Torah Binder, 2006, photo prints on linen and silk, embroidery
For the past fifteen years, I have been working with biologists and geneticists and looking closely at cellular anomalies, cell division, and early stages of egg development in the biological sciences. This research is included in the artworks presented in the three-site exhibition entitled Inner Space, Global Matter: Recording from the Structures Within, Geraldine Ondrizek – Works from 2008 through 2012, at the University of Houston-Clear Lake Art Gallery, at NASA’s Space Center Houston, and at Florida International University’s Miami Beach Urban Studios, the occasion for this exhibition catalogue. Included in the FIU exhibition are some earlier works completed in 1998-99, handmade books which detail the images of my investigation of cellular tissue and the blastocyst. In all, the most current technology at the time, such as the electron microscope, was used to obtain the images for my artistic exploration.

From 1999-2002, I continued to make works in graphic media that depict the stages of cell division, chromosome testing, and gestation. Completing forty textile works, the images were printed on cloth and embroidered by hand. From 2002-2012, I continued to develop my work in genetic research. RNA Sample (2003) is a printed and sewn work of installation that was exhibited at Gas Works in London. Other works included the installations entitled Repairing RNA (2005), DNA Finger Prints (2006), and M168 Tracing the Y Chromosome.

In 2007, I returned to my research on cellular anomalies, which led me to work with Andrew Pelling and his research using Nano technology which resulted in the recording of the sounds of cells and the construction of Sound Walls. In 2008, I began working with Steve Black at his laboratory at Reed College to complete the film for Cellular.

In 2008, I was commissioned to create a commemorative and documentary work on behalf of the University of Washington Medical Genetics department, in honor of UW’s founding geneticist Arno Motulsky. This opportunity allowed me to gain access to genetic research and made me aware of testing formats and genetic issues. As a result I not only made the commissioned work, Chromosome 17, which is installed in the UW medical hospital, I was also able to obtain research for the DNA Microarray series and Chromosome Painting. I began working on Chromosome Paintings in 2009 and first exhibited the work in the summer of 2012 at the Kirkland Arts Center.

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In 2008, I was commissioned to create a commemorative and documentary work on behalf of the University of Washington Medical Genetics department, in honor of UW’s founding geneticist Arno Motulsky. This opportunity allowed me to gain access to genetic research and made me aware of testing formats and genetic issues. As a result I not only made the commissioned work, Chromosome 17, which is installed in the UW medical hospital, I was also able to obtain research for the DNA Microarray series and Chromosome Painting. I began working on Chromosome Paintings in 2009 and first exhibited the work in the summer of 2012 at the Kirkland Arts Center.

In this work, I focused on the magnification of organic forms and our cultural preoccupation with inspection. With the invention of the microscope in the seventeenth century, the interior of nature, once closed off to direct perception, was made accessible. This development spurred debates about realism and instrument-mediated knowledge, which are echoed today. Most recently the use of magnification has vastly expanded our knowledge of human reproduction, genetic coding, and fetal tissue. These new frontiers have changed our understanding of and ability to deal with disease and reproduction.

My preoccupation with inspection and collection naturally led me to investigate the magnification of organic matter. I began my first piece, Tissues, by directly scanning plant tissue into the computer and magnifying it ten to twenty times. Through this process I found that the tissues became so abstract they could be read as many types of organic matter. Simultaneously I researched the images made with an electron microscope. I accessed several resources of images of plant tissue and human fetal cell growth. The visual simplicity of these abstract calligraphic marks and the potent content of fetal cell tissue were of particular interest. The framing and diagrammatic display of these images in medical journals and scientific texts gave me a clear understanding of the process of division and formation. This didactic format in juxtaposition with the actual content of each cell further intrigued me: each cell carries an entire map of a human being, representing pure potential. In the book Ovum I focused on making images of the blastogenesis stage, in which the cells...
are identified as a specific part of the body and divide, creating the mid-line or spinal column of the body. I then focused on the various stages of mitosis. The books were produced in the summer and fall of 1998, while on a junior paid leave from Reed College. The project was supported by the Stillman-Drake fund and the Levine funds. The prints were produced at Mahaffey Fine Art in Portland. The books were constructed and bound while I was an artist-in-residence at the Women’s Studio Workshop in New York.

Chromosome 17. 2009-2010

Cloth panels, sateen and cotton voile, hand embroidered with the graphic sequence for Chromosome 17. The book was hand-embroidered text describing genes on Chromosome 17, 9 x 36 x 6, University of Washington Medical Center Collection.

A permanent work commissioned by the department of Medical Genetics at the University of Washington, in honor of the 50th Anniversary of Medical Genetics and its founder Dr. Arno Motulsky. The main entry hall of the University of Washington Medical Center.

In 2009 the department of Medical Genetics at the University of Washington commissioned me to make a work that would both commemorate 50 years of Medical Genetics and honor the founder, Dr. Arno Motulsky. Dr. Arno Motulsky created the Medical Genetics department at the University of Washington in 1957, the first of its kind in the United States. Researchers there have since identified more than one thousand genes. The artwork entitled “Chromosome 17” uses the National Center for Biotechnical Information (NCBI)’s database to access the Human Genome master map of gene sequences. Each graphic in the work represents a marker and location of a gene that codes for significant characteristics or anomalies. Chromosome 17 was used for this work because it contains markers for Ovarian Cancer and breast cancer. It was a founder of the field of pharmacogenetics, which concerns the interaction between genetic variation and drug responsively. He currently studies the role of genetic polymorphisms in resistance and susceptibility to disease caused by environmental agents at the Center of Ecogenetics.

DNA Microarray

A DNA microarray (also commonly known as DNA chip or biochip) is a collection of microscopic DNA spots attached to a solid surface. Scientists use DNA microarrays to measure the expression levels of large numbers of genes simultaneously or to genotype multiple regions of a genome.

The artwork is composed of two layers of cloth, printed, painted and embroidered with graphics that represent the genetic structure of chromosome 17. One sheer and one thick piece of cloth are layered to create depth in the space of the steel and Plexiglas box, which houses the work. The colors and marks on the chromosome were enlarged, the colors enhanced, and many were hand-embroidered to visually emphasize particular genetic qualities. The gene sequence thus appears as a mosaic of layered blue and green tones. Significant terms and graphics such as pedigree maps, pharmacogenetics, and ecogenetics are engraved on the plexiglass plate that protects the cloth. The commission was completed in consultation with Robin Bennett, M.S., C.G.C., Ph.D., Senior Genetic Counselor & Co-Director of the Genetic Medicine Clinics at the University of Washington, and Peter H. Byers, M.D., Professor of Medicine and Pathology Adjunct Professor of Genome Sciences and Reed College alumni from 1969. It was in Peter’s lab that I first discovered the Human Genome master map of a gene sequence graphic for Chromosome 17.

The work honors Arno G. Motulsky, M.D., active Professor Emeritus of Medicine and Genome Sciences. Motulsky was a founder of the field of pharmacogenetics, which concerns the interaction between genetic variation and drug responsively. He currently studies the role of genetic polymorphisms in resistance and susceptibility to disease caused by environmental agents at the Center of Ecogenetics.

DNA Microarray, 2012

Cotton dye with Jacquard dye 8 x 7 ft.

DNA Microarray, 2011

3 small sample color tests Silk laser printed 8 x 10 in.

DNA Microarray, 2010

2 prototype boxes Jacquard dye and dye sublimation, printed on ultra sheer and sheer silk.

Wood box, engraved plexi 25 x 25 x 4 in.

Case Study 22 Chromosomes X & Y, 2011

Front panel: Jacquard dye and hand embroidery on dye sublimation, printed ultra sheer

Back panel: Laser-printed linen, 20 x 108 in.

Portland art Museum Collection

24 scrolls of ultra sheer synthetic silk maps all of the human chromosomes; 22 human autosomal chromosomes, plus the X and Y sex chromosomes.

Each scroll is printed with a graphic that represents the chromosome, and includes prominent genetic markers as well as a selection of genetically inherited diseases and genetic qualities known by the artist’s family lines. For example, certain conditions are both negative and positive markers. In the genetic realm nobody is “clearer than the other.

More information is available at:
http://academic.reed.edu/art/faculty/ondrizek.
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