



# CREATIVE MACHINES

Pioneering new ways to inspire **wonder** and **imagination**.

## JOE O'CONNELL & CREATIVE MACHINES INC.

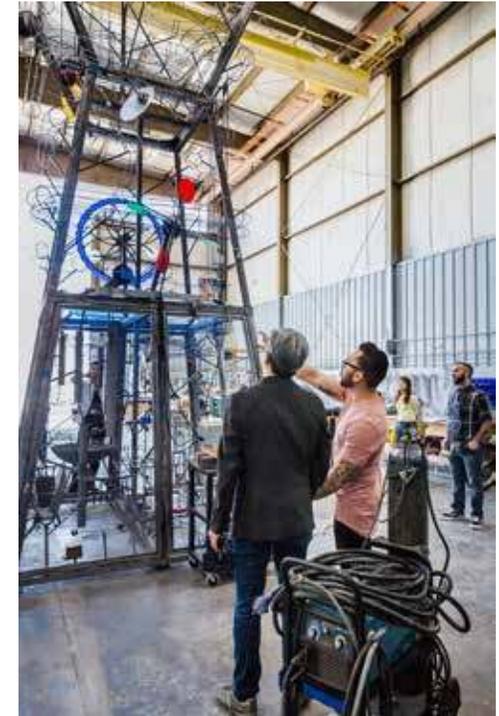
### HISTORY

Joe O'Connell founded his studio, Creative Machines, in 1995 to design and fabricate interactive exhibits for children's museums and science centers. In 2004, he began using the resources of his company to create public art with a strong emphasis on community and interactivity. In 2007, he partnered with kinetic sculptor George Rhoads to continue Rhoads' legacy of designing and fabricating his wildly popular rolling ball sculptures. Joe's work is rooted in science, perception and history and can be enjoyed in museums, science centers, libraries, hospitals, university campuses, transit stops, trade shows, and public spaces all over the world.

### ARTIST STATEMENT

Our goal is to create art that enriches everyday life, deepens human experience and creates an atmosphere of participation, curiosity, and connection. We use a remarkable diversity of forms and materials, but the common thread is our belief that an art piece is not complete until other people have made it their own through interaction. Our work often makes use of light's emotive power and its ability to enliven a space, transforming the area around our sculptures into illuminated landscapes.

We have created sculptures that react to people's touch, their heartbeat, their waving hands, their shadows, and videos on their cellphones. But our understanding of interactivity goes much deeper than technology. It encompasses careful analysis of sight lines, placing sculptures at ground level, creating shapes that invite exploration and forms that encourage people to interact with each other. We offer room for people to bring their own meaning to each art piece in significant ways.



## RESUME



## CREATIVE MACHINES

Since its founding in 1995, Creative Machines has grown to approximately 30 artists, engineers and skilled craftspeople guided by a shared vision of awesomeness. Our 75,000 s.f. shop in Tucson, Arizona is devoted entirely to pushing the boundaries of public art and interactive exhibits through comprehensive prototyping and fabrication. Smart, inquisitive people and extensive capabilities in electronics, CNC machining and 3D forming give us the ability to explore pioneering materials and processes. Creative Machines has created and installed public art and exhibits for clients throughout the world. Because we take projects from start to finish, we can prototype ideas extensively during the design process and can respond quickly to whatever obstacles and opportunities arise during fabrication. With comprehensive resources under one roof, we can extend a consistency of vision to all aspects of a project.

### JOE O'CONNELL

#### *Education*

University of California at San Diego, 1993, Graduate Program in Sociology/Science.

Princeton University, 1992, Graduate Program in History of Science.

University of Chicago, 1989, History, Philosophy and Social Studies of Science and Medicine. Bachelor of Arts, Highest honors, Phi Beta Kappa, Deans List.

Rutgers University, 1987, Rutgers College Honors Program. Double majored in Physics and Philosophy.

#### *Select Honors*

Best Art Installation, 2017, Houston Press

Place by Design Juror, 2014 and 2015, SXSW Eco Public Space Design Competition

Public Art Network Year in Review, 2014, Americans for the Arts

Accel Design Conference, 2014, Bike Chandeliers, San Francisco, CA

Transformative Design Award, 2013, SXSW Eco 'Place By Design' Award.

Mondo\*Arc Magazine, 2013, Art & Design Profile, Issue #75

### CREATIVE MACHINES PROJECT LEADERS

#### *Chrissy McMillan, Vice President*

Chrissy oversees general design management, budgeting, coordination and logistics management.

She coordinates with Project Managers on the progression of all projects. She manages communication, goals, timelines and daily operations.

#### *Dave Davis, Design Manager*

With 24+ patents and significant engineering work with the NSF on the Gemini 8m telescope, Dave brings a proven ability to design and manage projects on time, under budget and exceeding objectives. His respected track record for novel problem solving in design, manufacturing and management in varying industries makes him a valuable asset to our team.

#### *Alexandra Kirschbaum, Project Manager*

Alexandra manages each project from proposal through installation. With a background in art and architecture, Alexandra brings her expertise in these fields to every job. A creative, focused and attentive project manager, Alexandra guides the team to consistently achieve outstanding outcomes.

#### *Christina Albert, Project Manager*

Christina is a creative and detail-oriented professional with proven success in leading projects from conception to completion. She is expertly skilled at steering clients through the entire design process to consistently exceed expectations and bring projects in under budget.

#### *Kim Kwasny, Fabrication Manager*

Kim is a hardworking, hands-on employee who has contributed to many creative environments throughout the years. She oversees the fabrication process of all projects that go on in our workshop to ensure they are coming along on time and constructed with the utmost quality.

#### *Jonathan Katz, Electronics Manager*

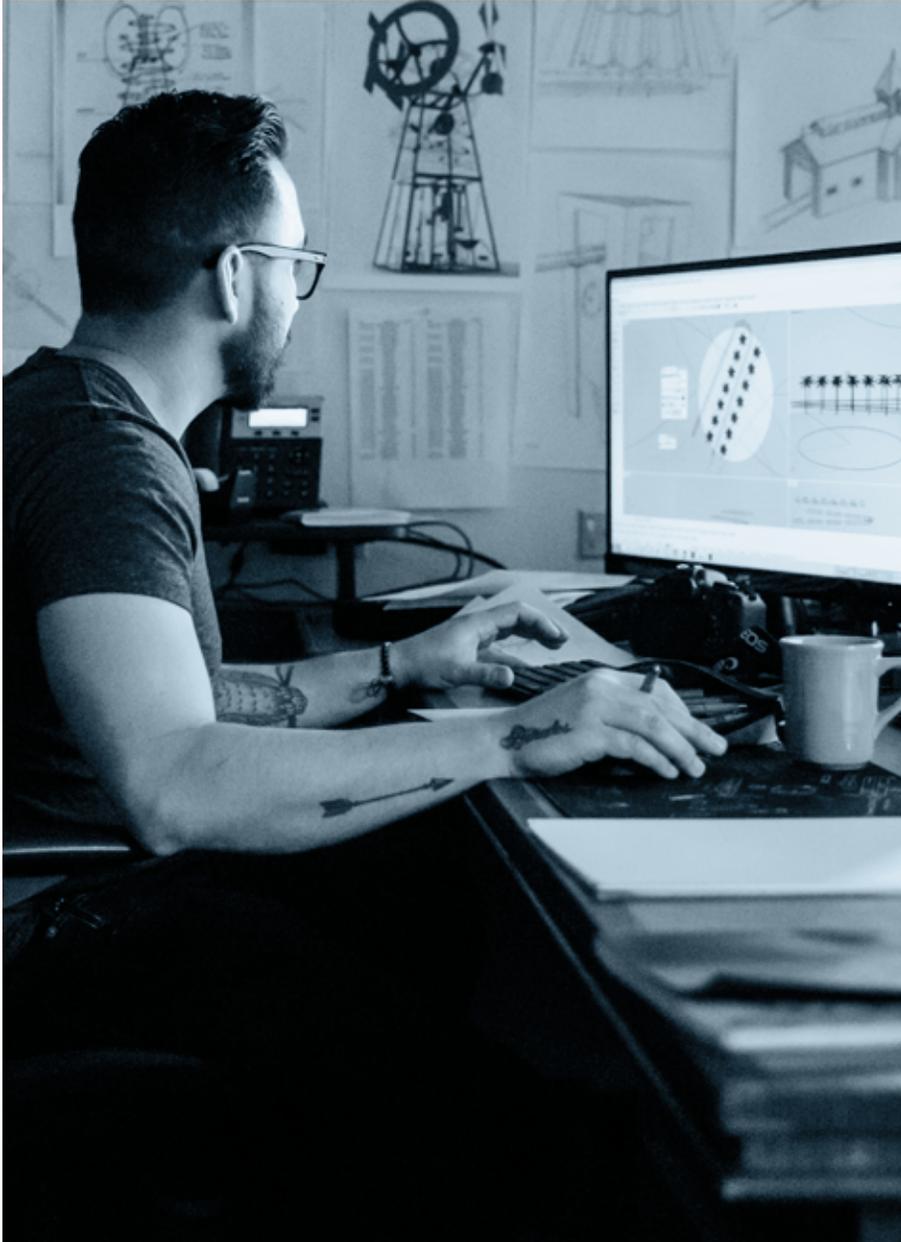
Jon creates impactful visualizations to help communicate concepts that utilize his engineering talents to create unique and inspiring experiences.



ALL UNDER ONE ROOF

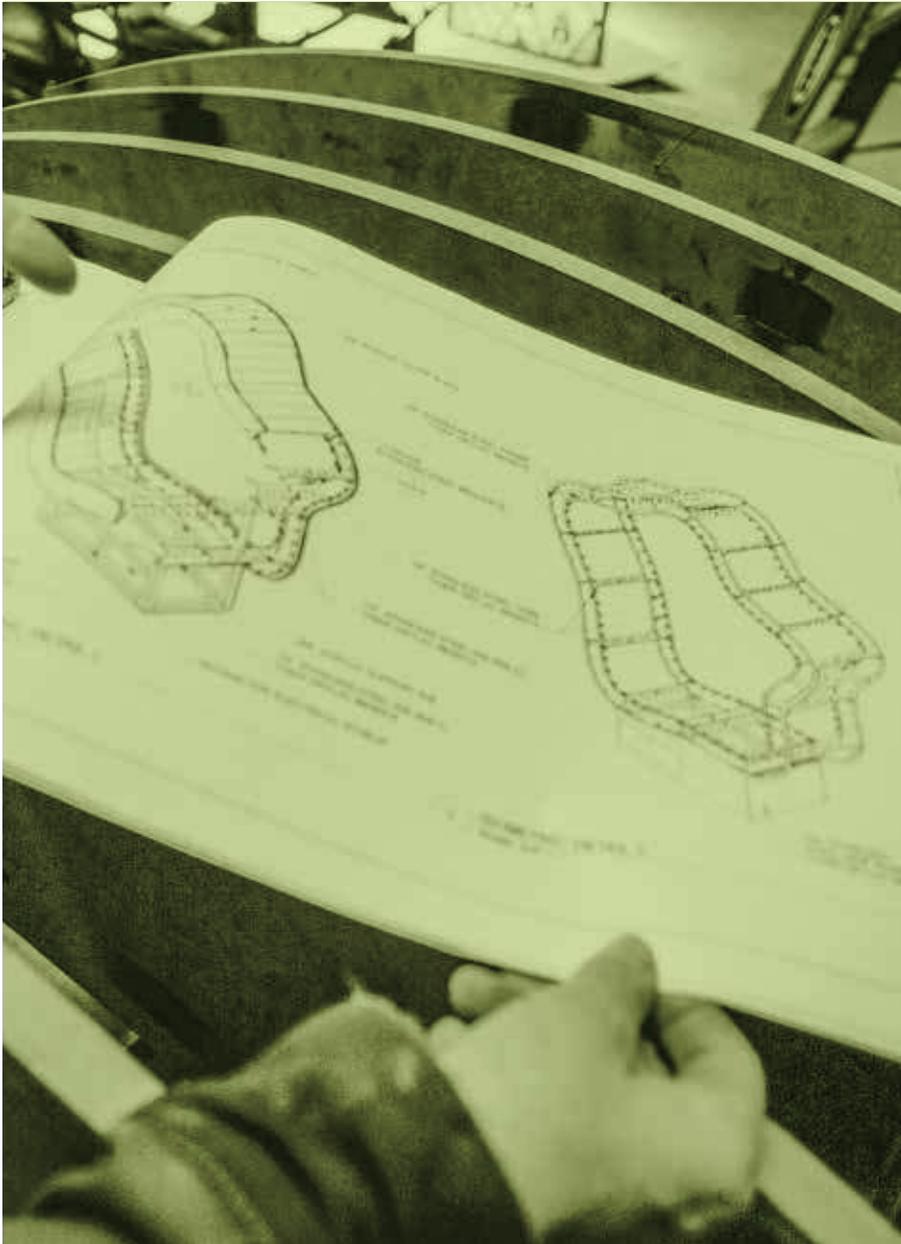
# FROM CONCEPT TO INSTALLATION





## CONCEPT BRAINSTORMING

The team at Creative Machines starts each project by brainstorming ideas for new proposals. Our process begins with a discussion about the goals for the project. These goals get translated into themes and quickly become sketches on the whiteboard. At the end of the brainstorming process concepts are chosen and handed off to the **designer**.



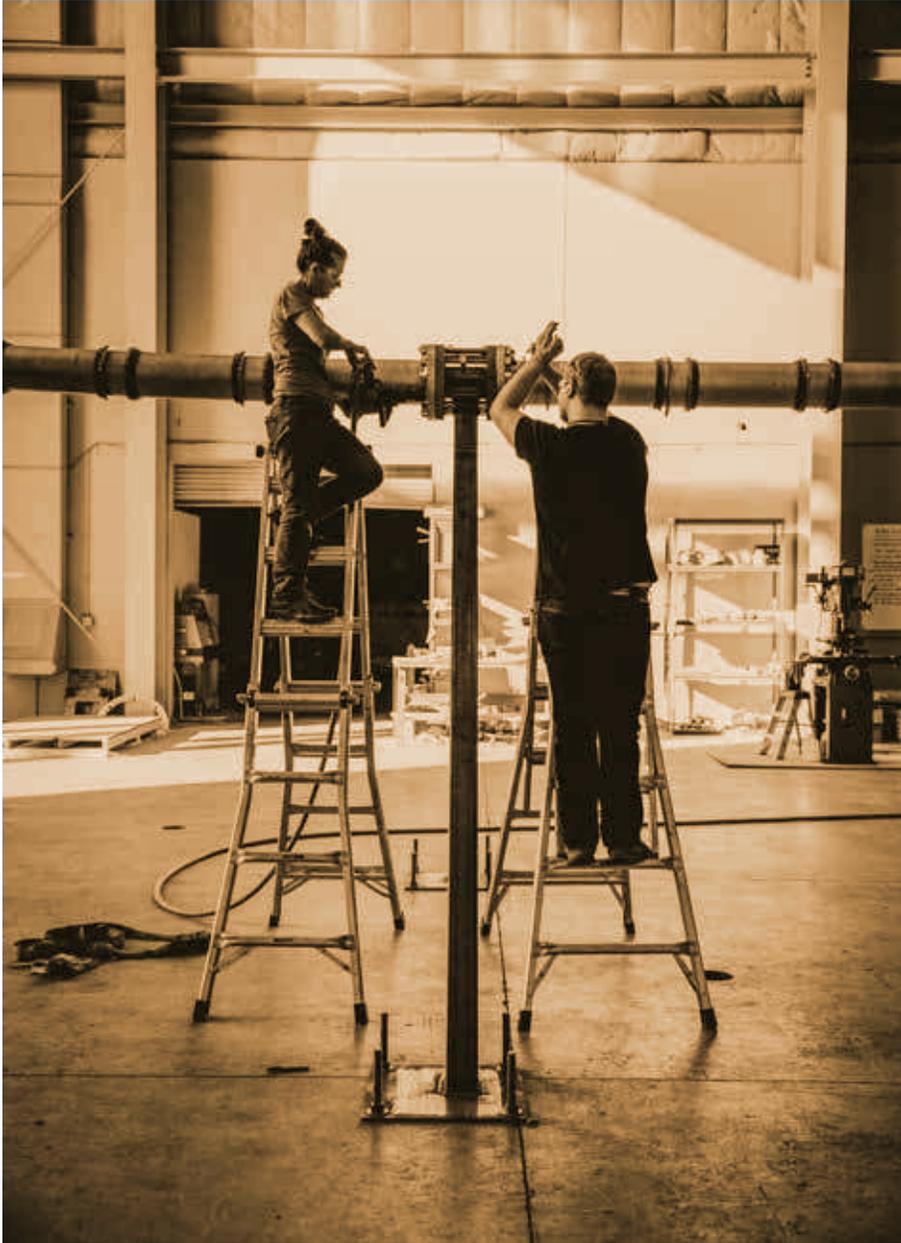
## DESIGN

Designers transform concepts into fully realized designs. Our design process includes modeling the concepts in various software platforms, breaking the design into parts and figuring out how to fabricate it. As designers develop these details they meet with other team members to bounce around ideas. Since most of our designs combine different media, designers consult with our electronics and fabrication teams to design the most compelling project possible. Once we have a viable approach, the designer works alongside a fabricator to **prototype** the project.



## PROTOTYPE

Designers work with skilled structural and electronics fabricators to mock up nearly all of our projects. Whether it is testing a sculpture's structural capacity, experimenting with new fabrication processes or testing interactive lighting effects, prototyping takes the design from the digital realm into reality. During the prototyping phase, the designer and fabricator work through an iterative process of testing and evaluating the design. We often invite people to Creative Machines to test our prototypes so we get a true sense of how the public will interact with the project. Once the design has been vetted, the designer finishes detailing the project and hands off to **fabrication**.



## FABRICATION

Fabrication begins with the identification of a fabrication team based on their specialized skill sets and availability. The Fabrication Manager sets up a schedule for the project and works closely with the designer to resolve problems and ensure accuracy during fabrication. Fabrication timelines vary and are dependent on the installation deadline and the project's complexity. All projects are built, assembled and tested in our shop. Fabrication is complete when the project passes a final quality assurance review. Then, it is disassembled and packed for **shipping**.



## SHIPPING

The project manager is primarily in charge of shipping, and works with the designer and fabricators to get accurate dimensions and weights for each part. We typically build custom crates for our projects and take extra care when packing each item to protect it during transit. We have extensive experience shipping projects that come in all shapes and sizes within the US and to countries around the world. In conjunction with setting up the shipment, the project manager will work with the designer and fabrication manager to plan the **installation**.



## INSTALLATION

Prior to on-site installation, the project manager, designer, and fabrication manager create a detailed installation plan reviewing every detail to ensure a smooth and efficient installation. The team travels to the site and typically meets the trucks to unload the shipment. They carefully install the project making sure that it is properly integrated into the site and in pristine condition. Finally, the team tests all aspects of the project and cleans the site. Following installation, Creative Machines compiles a manual detailing the project and outlining maintenance procedures. Once the manual is sent, the team jumps into the next project.



# WHO WE ARE

A GROUP OF VISIONARY ARTISTS, DESIGNERS, ENGINEERS & FABRICATORS





## SELECT EXHIBIT PROJECTS

*Fernbank Natural History Museum,* Atlanta, GA, 2019, \$483,945

*Science North,* Sudbury, Ontario, Canada, 2019, \$459,279

*Independence Seaport Museum,* Philadelphia, PA, 2018, \$303,849

*MOXI,* Santa Barbara, California, 2017, \$5,600,000

*Exploratorium Kayseri Science Center,* Kayseri, Turkey, 2015, \$123,000

*Thinkery Austin,* Austin TX, 2013, \$531,500.

*Inspira,* Sarpsborg, Norway, 2011, \$405,275

*Pusat Sains Negara,* Kuala Lumpur, 2010, \$161,000

*Durango Discovery Museum,* Durango, Colorado, 2010, \$125,000

*Science Museum of Minnesota,* St. Paul, MN, 2010, \$80,000

*The United Nations,* New York, NY, 2009, \$27,500

*Adventure Science Center,* Nashville, TN, 2009, \$46,000

*Anchorage Museum,* Anchorage, AK, 2008, \$364,150

*Alqanater Children's Museum,* Cairo, Egypt, 2008, \$125,000

*Vitenfabrikken,* Sandnes, Norway, 2008, \$52,000

*Science Centre Singapore,* Singapore, 2008, \$202,000

*NTU Hospital,* Taiwan, 2008, \$110,000

*Don Harrington Discovery Center,* Amarillo, Texas 2008, \$125,000

*VILVITE,* Bergen, Norway, 2008, \$192,500

*The Manitoba Museum,* Winnipeg, Manitoba, Canada, 2008, \$61,500

*Exploratorium,* San Francisco, CA, 2008-2014, \$68,000

*Kendall Healthcare,* Ithaca, NY, 2008, \$48,000

*Liberty Science Center,* Jersey City, New Jersey, 2007, \$373,277

*Children's Museum of Utah,* Salt Lake City, Utah, 2006, \$130,000

*Bishop Museum,* Honolulu, Hawaii, 2005-2010, \$586,500

*California Science Center,* Los Angeles, California, 2004, \$435,770

*phaeno,* Wolfsburg, Germany, 2005-2010, \$151,500

*Calgary Science Center,* Calgary, Alberta, Canada, 2004, \$12,000

*Zeum,* San Francisco, California, 2002, \$28,900

*Long Island Children's Museum,* Garden City, New York, 2001, \$48,000

*Denver Museum of Natural Science,* Denver, Colorado, 2001, \$110,000

*Leepa Rattner Museum of Art,* Tarpon Springs, Florida, 2000, \$189,650

*Gulfoast Wonder and Imagination Zone,* Sarasota, Florida, 1999, \$120,000

*Discovery Science Center,* Santa Ana, California, 1998-2007, \$245,500.



## SELECT BALL MACHINE PROJECTS

*All Systems Go*, Cayton Children's Museum by Sharewell, Santa Monica, CA, 2019

*Perpetual Nephron Machine*, Kidney Week 2018, San Diego, CA, 2018

*Cathedral Coaster*, American Memorial Hospital, Reims, France, 2018

*Newton's Convergence*, The Franklin Institute, Philadelphia, PA, 2018

*Incredibal Journey through Stanford Campus*, Lucile Packard Children's Hospital, Palo Alto, CA, 2017

*PSH*, Penn State Children's Hospital, Hershey, PA, 2017

*Din Don*, Kobe Harborland, Kobe, Japan, 2017

*Sound Machine*, MOXI, Santa Barbara, CA, 2016.

*Le Reve de Newton*, The Pass, Belgium, 2015

*Adcetris*, Seattle Genetics, 2013-2014

*Dream About Shirasagi*, Japanese Railway, Himeji Station, Himeji, Japan, 2013

*Calliope Borealic*, Anchorage Museum, Anchorage, AK, 2010

*Globe Theater*, Shriner's Hospital for Children, Portland, OR, 2010

*Kinetic Ball Theater*, Children's Hospital Boston, Boston, MA, 2009

*Symphony of the Spheres*, private collection, Naples, FL, 2009

*Magic Menagerie*, National Taiwan University Hospital, Taipei, Taiwan, 2008

*Life is a Ball*, WMS Gaming, Waukegan, IL, 2008

*Kugelarium*, private collection, Gentilino, Switzerland, 2007

*Carousaball*, Children's Medical Center, Austin, TX 2007

*Minimenagerie*, private collection, West Simsbury, CT, 2006

*La laballoopa*, Reuter's Children's Outpatient Clinic, Asheville, NC, 2006

*Viewaball You*, YouZeum, Columbia, MO, 2006

*Festiball*, Shriner's Children's Hospital, Springfield, MA, 2006

*Tower of Sisyphus*, Chesapeake Energy Corporation, Oklahoma City, OK, 2005

*Newton's Daydream*, Clark Planetarium, Salt Lake City, UT, 2005

*Ball Game II*, Joe DiMaggio Children's Hospital, Hollywood, FL 2005

*Water Works Gizmo*, Flint River Center, Flint River, GA, 2004

*Poetry in Motion*, Comer Children's Hospital, Chicago, IL, 2004

*Ball Zoo*, Driscoll Clinic, Brownsville, TX, 2004

*Electrical Ball Circus II*, ABT Electronics, Glenview, IL, 2003

*Kinetikon*, National Science & Education Museum, Taipei, Taiwan, 2003

*Carnival of the Animals*, Lincoln Children's Museum, Lincoln, NE, 2002

*La Maquina de Betancourt*, Museum Elder, Las Palmas, Grand Canary Island, 2002

*Cavortech*, Avampato Discovery Museum, Charleston, WV, 2002

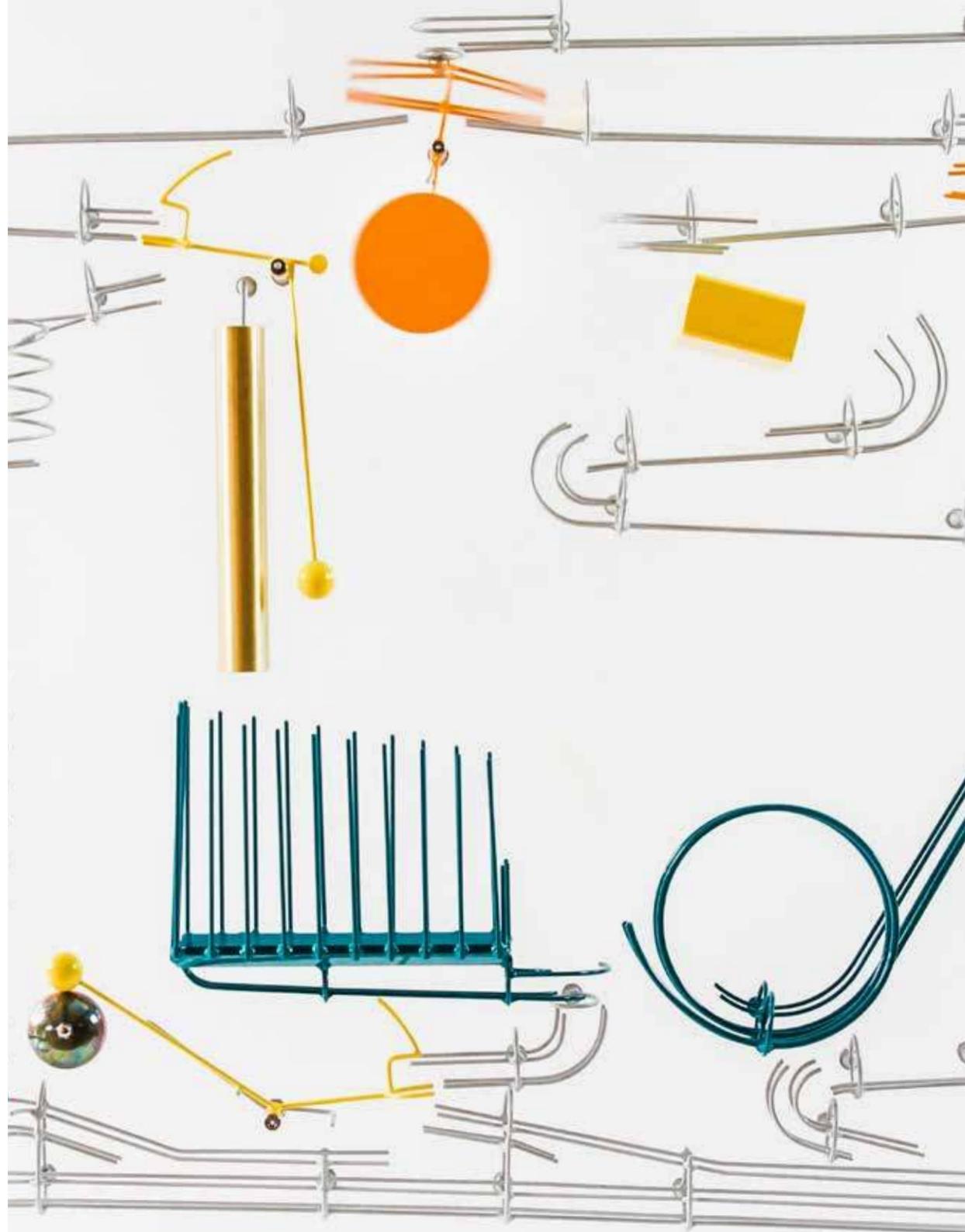
*Ball Play*, Fukui Lions Club, Fukui, Japan, 2002

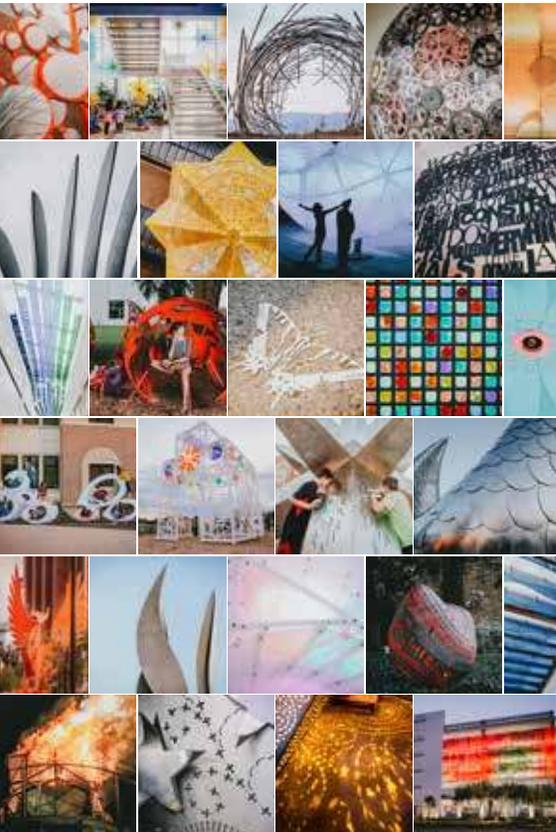
*Fun Ball Box*, Children's Memorial Hospital, Chicago, IL, 2001

*Ballnasium*, Explora, Albuquerque, NM, 2001

*Loopy Links*, Adventure of the Seas, Royal Caribbean Cruise Lines, 2001

*Peaceaball Kingdom*, University Children's Hospital, Chapel Hill, NC, 2001





# SCULPTURE





# EXHIBITS





# BALL MACHINES



# LIGHTING

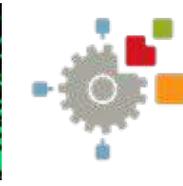
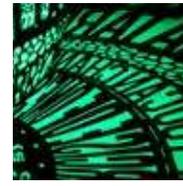




# INTERACTIVITY



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199

PUBLIC ART



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# WINGS OVER WATER

**Date:** 2016

**Dimensions:** 70' length x 25' width x 35' height

**Location:** George R. Brown Convention Center, Houston, TX

**Client:** Houston First Corporation

**Contact:** Sara Kellner  
sara@haatx.com

*Wings Over Water* is a monumental kinetic sculpture integrated into a fountain outside of the George R. Brown Convention Center in Houston, TX. The sculpture was inspired by the theme of migration which is one of the governing metaphors behind the architectural re-design of the convention center. The massive scale and dynamic movement turn the sculpture and fountain into an iconic destination.

The sculpture is composed of two massive wings that beat continuously creating a sense of progress and movement. Around the world, the symbol of birds flying into the air has cultural and spiritual associations representing hope. The sculpture makes the connection between human and avian migration thereby reflecting Houston's diverse population and the idea that people come to Houston to have a better future.

The perpetual motion of the wings creates an energetic focal point that invites viewers to watch the mesmerizing movement of the undulating surfaces. The piece also represents the connection between the environment and the urban landscape. The giant kinetic wings reflect the movement of birds but achieve this effect through mechanical parts. The merging of the migration metaphor with a mechanical system embodies Houston's unique integration of the natural world with the man-made. In addition, the intricate structure of the wings references Houston's aerospace heritage.









# GROWING HOME

**Date:** 2018

**Dimensions:** 17'8" height x 80" diameter (shell only)

**Location:** Park 12 The Collection, San Diego, CA

**Client:** Greystar

**Contact:** Jim Ivory  
jivory@greystar.com

*Growing Home* is a site-specific sculpture group that suggests a scene that one might find on the beach. The centerpiece is a monumental curvilinear sculpture evocative of a turret shell or wentletrap. The shell is surrounded by beach pebbles enlarged for scale. Together they form a welcoming place for people to gather or sit in a small group.

The shell is perforated with text that tells the history of San Diego. The text is arranged in bands that spiral down the shell in the same way that a shell grows from one season to the next. The most recent dates and events in San Diego history are closest to the opening at the bottom of the shell in the same way that a real shell has its most recent additions closest to the opening.

At night, brilliantly colored LED lighting shines through the perforations allowing light to stream through the sculpture, revealing the inner convolutions in the same way that an X-ray would. This light paints the surrounding space with colorful projections, offering a dynamic experience in the day and in the night.

*Growing Home* invites interaction by offering a seat at its base for visitors to stop and pose with the monumental sculpture. The local community has started a hashtag on social media where visitors can share their pictures with the sculpture (#Park12Shellfie).





## ELEMENTS

**Date:** 2018

**Dimensions:** 10' height x 7'6 1/4" diameter

**Location:** Elements, Irvine, CA

**Client:** Campos Verdes, LLC

**Contact:** Betsy Lane

betsylane1@sbcglobal.net

www.betsylaneart.com

*Elements* is a stainless steel teardrop composed of bands with the word “elements” in English, Mandarin, Spanish, Korean, Arabic, Hebrew, Russian, Hindi, German, French, and Vietnamese.

The sculpture operates at a distance as a monumental form but also rewards close scrutiny over many visits thereby maximizing the potential for interaction and discovery. The simple geometry and gentle curve of the teardrop offers an organic contrast to the surrounding architecture. The curving bands

in the sculpture are water jet cut, hammer formed and welded together to create a three-dimensional lantern. The interior of the sphere is powder-coated blue adding subtle color and visual interest during the day.

At night, intense point-source LED lighting brilliantly illuminates the sculpture and projects intricate and colorful shadows. The lighting brings the sculpture to life and activates the surrounding sidewalk with color. The lighting automatically cycles through different colors creating a dynamic experience.





# EARTH'S BLANKET

**Date:** 2017

**Dimensions:** range from 5'1 x 5'w x 3'h to 7'1 x 8'w 4'h

**Location:** Colorado State University Science Quad

**Client:** Colorado State University

**Contact:** Ruth Bruno  
ruth.bruno@state.co.us

*Earth's Blanket* is a chemistry themed series of six interactive sculptures that represent important small molecules: water, carbon dioxide, methane, nitrous oxide, ozone, and freon-12. These molecules are the most abundant greenhouse gases on earth. Animated color sequences within acrylic orbs demonstrate the electrostatic charge distribution on the surface of each molecule - showing each molecule as it looks to other molecules.

The colorful, LED-lit molecules are arranged around the Colorado State University Chemistry Building and Science Quad

in an array that invites exploration and socialization. During the day, the acrylic spheres that make up the molecules will pick up sunlight and glow softly. At night, vibrantly colored lights will illuminate the spheres from the interior creating a spectacular sight upon entering the space.

The sculpture is composed of a powder-coated stainless steel and aluminum support structure, illuminated acrylic hemispheres and custom electronics.





# CHINOOK ARC

**Date:** 2014

**Dimensions:** 15'height x 28'diameter

**Location:** Barb Scott Memorial Park, Calgary, Canada

**Client:** City of Calgary

**Contact:** Barbara Doyle-Frisch  
barbara.doyle-frisch@calgary.ca

*Chinook Arc* is an interactive, illuminated sculpture created as part of a new urban park where downtown Calgary meets a historic residential area.

The site-specific form draws inspiration from the historic Beltline Streetcar loop that once encircled the neighborhood, as well as the Chinook arch weather phenomenon that periodically blankets the Alberta sky. These two influences inspired the crisp edges and rounded curves seen in the work. The enclosed space within the sculpture frames the sky and becomes an immersive color environment in the evening.

Visitors to *Chinook Arc* can control the lighting through an optical sensor that projects the movements and colors it sees onto the sculpture. Visitors can wave their hands, move colored objects or play a movie on their cell phones in order to create their own light sequences.

With this commission, Creative Machines worked closely with the City of Calgary to create an impressive community event celebrating the artwork; featuring food, performances by local dancers in and around the sculpture, and an original score inspired by the art composed by Lorna MacLachlan, a local composer.

*Chinook Arc* was constructed specifically to endure the extreme weather conditions found in Calgary. Careful design and engineering allow for thermal expansion, snow loads, and drainage. In addition, all of the lighting and electronics were CSA certified.

This monumental, placemaking sculpture has become a landmark in the community, operating as an energetic focal point where people congregate for events, stop on their evening walks, pose for photos, or duck under to escape the noise of the surrounding city.









# BODY POLITIC

**Date:** 2018

**Dimensions:** 5ft diameter and 7ft diameter, 2 total

**Location:** Lenexa Recreation Center, Lenexa, KS

**Client:** City of Lenexa

**Contact:** Steven Boody

pap@publicartandpractice.com

*Body Politic* is a series of two spherical sculptures set slightly into the landscape of the Lenexa Rec Center. Because there are two, a close relationship is implied. The large and small spheres together evoke a parent and child – or an older and a younger sibling.

As people approach the artwork, they will see that the spheres are covered with a series of silhouettes of the human form. Each silhouette is drawn to convey an emotion or attitude toward life. Public spaces are all about looking at the silhouettes of others and analyzing their feelings, receptivity to

contact, their past, their station in life, and what they are currently thinking, and these sculptures reflect that thought process. The sphere's shape invites people to circle around the artwork to 'read' the personality and attitude of each silhouette.

Each sculpture is equipped with a touch sensor which allows visitors to curate the mood of the pieces by being able to adjust the color of the interior LED lighting.





# SPROUTS

**Date:** 2017

**Dimensions:** 11 ft to 19 ft

**Location:** Phoenix Children's Hospital, Phoenix, AZ

**Client:** Phoenix Children's Hospital

**Contact:** Kathy Hawthorne

kathy.hathorn@americanartresources.org

*Sprouts* is a series of perforated, curvilinear sculptures that reference the form of a plant shoot or sprout, but at a monumental scale. The field of sculptures creates an abstract yet referential environment that invites people to interact with the piece by moving in and around it. *Sprouts'* gently curving forms create a calming, serene environment that can be explored without eliciting a strong sense of play.

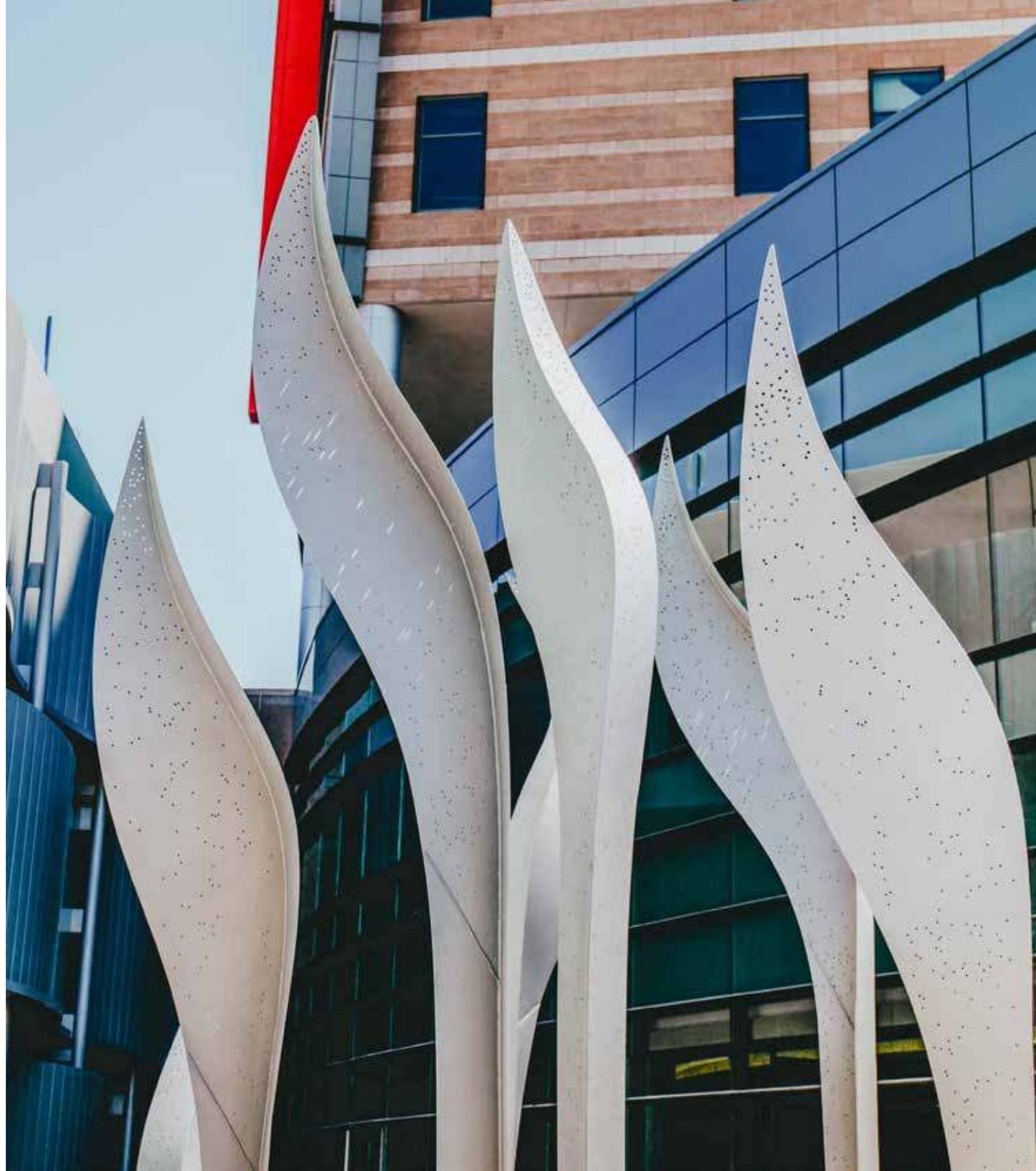
The subtle perforations are made up of different sized circles, rotated and skewed slightly to provide the illusion of small water droplets hitting the surfaces. Overall, visitors to the piece are immersed in a strange yet wondrous world that invites them to use their imagination.

*Sprouts* has many opportunities for interpretation by the diverse groups of people that visit the Phoenix Children's Hospital. Having an artwork that can be

interpreted differently by visitors allows it to be relatable while also creating a unique experience for each person.

The concept for *Sprouts* draws from many sources. The sculpture is meant to evoke the sense of an oasis—one of the hospital's governing metaphors—by creating an isolated area of abstract vegetation that provides a respite for people visiting the hospital.

*Sprouts* also references the early period of growth in the life of a plant as seeds grow upward into shoots. The sculpture alludes to spring and the sense of hope for growth and change. These metaphors easily extend to the idea of children being in an early period of growth and continuously developing.





# FLOWERS

**Date:** 2017

**Dimensions:** range from approximately 15" to 92" diameter

**Location:** Phoenix Children's Hospital, Phoenix, AZ

**Client:** Phoenix Children's Hospital

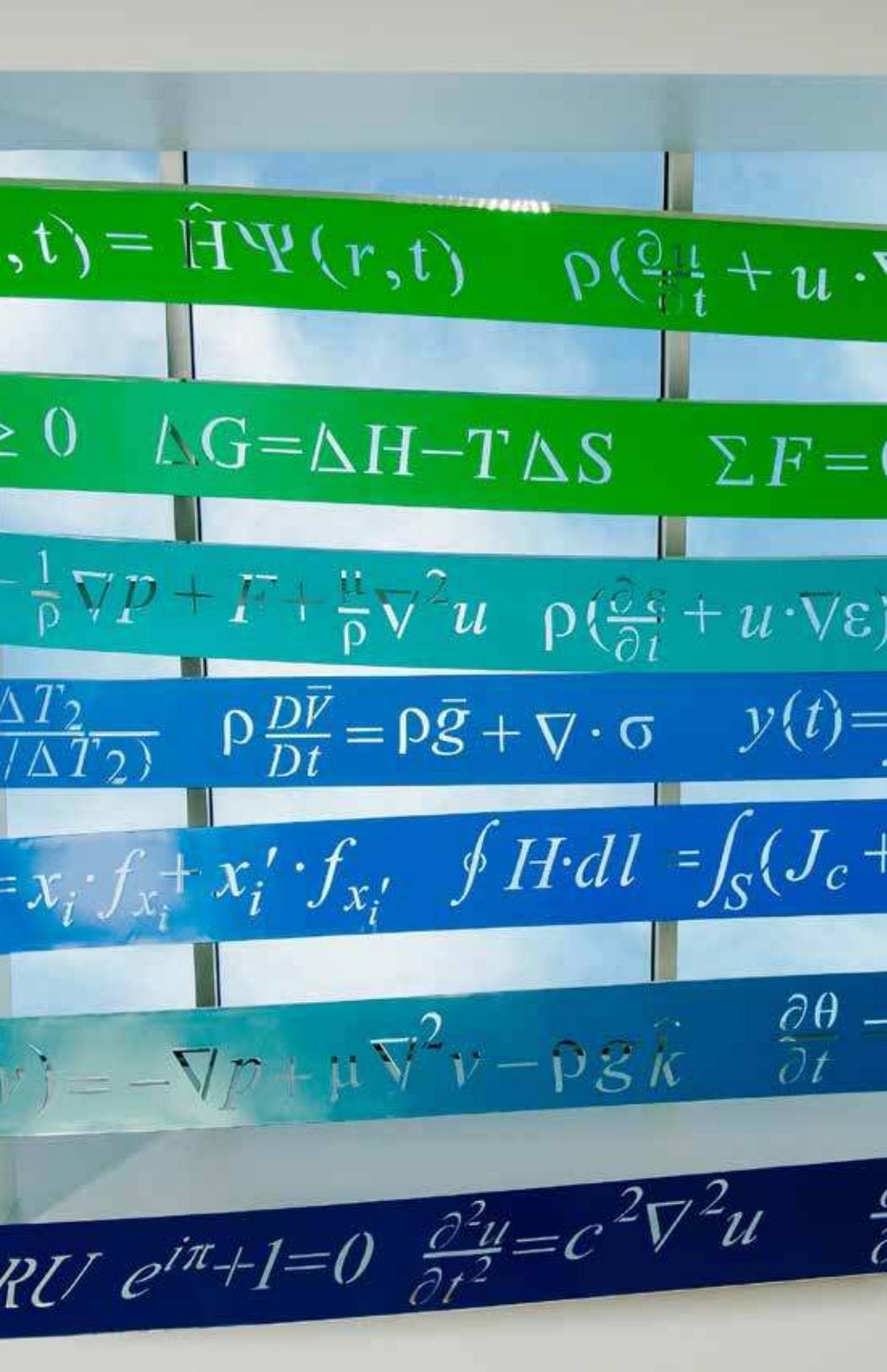
**Contact:** Kathy Hawthorne

kathy.hathorn@americanartresources.org

*Flowers* is a group of twenty-six colorful flowers located in five ceiling alcoves throughout a new emergency room addition in Phoenix Children's Hospital. The artwork creates a welcoming environment for young patients. The goal of the artwork is to make patients feel comfortable as they move through the hospital by replacing the clinical atmosphere with moments of color, optimism, and cheer. The artwork also acts as a method for wayfinding as each alcove is unique.

Composed of vibrantly colored petals, the sculptures evoke child-like representations of flowers, propellers, pinwheels and abstract radial forms. The monumental scale of the installations creates a sense of wonder for visitors of all ages.





# CONVERGENCE

Date: 2017

Dimensions: 40' long x 8'9" wide x 7'5" H

Location: Seamans Center, University of Iowa

Client: University of Iowa

Contact: Shawn Albaugh Kleppe

T: 319.335.1205

*Convergence* is a three-dimensional array of engineering equations cut out of steel ribbons. The goal of the sculpture is to create a monument to the field and study of engineering that abstractly visualizes the process of thinking. Each steel ribbon depicts a series of equations moving through space akin to a student working through these ideas in their mind. From a distance, the sculpture will appear to be a series of flowing bands, but as students look closer they will discover a litany of different symbols, letters, and equations.

Taken as a whole, the ribbons embody a sense of trajectory and movement as they flow upward and out. The ribbons are individual elements, but they come together to achieve the same visual movement contributing to the idea that disparate fields of engineering come together within the school for a collective goal.





# LATENT ENERGY

**Date:** 2017

**Dimensions:** 13' L x 9' W x 25' H

**Location:** Sam Houston State University, Huntsville, TX

**Client:** Sam Houston State University

**Contact:** Terry Whitman

terrywhitman@shsu.edu

The sculpture *Latent Energy* depicts a portion of a hydrocarbon molecule transitioning from its liquid to its solid form. This transition is characterized by the release of energy and expansion in volume. This is the phase transition that Fred Pirkle used in much of his work. Metaphorically speaking, the sculpture also imagines students developing more structure through education. The 'phase transition' that occurs in students as they reach a more solid state is also accompanied by a release of energy as they mature.

The large spheres in *Latent Energy* correspond to carbon atoms. The small spheres correspond to hydrogen atoms.

The two small molecules on the lawn are both methane, the smallest hydrocarbon molecule, each with one carbon atom. The tall structure shows a portion of a longer hydrocarbon molecule moving from a liquid to a solid form. The solid form is characterized by a linear chain of carbon atoms, each of which has two hydrogen atoms attached to it.

The sculpture is located in front of the Fred Pirkle Engineering & Technology Center at Sam Houston State University in Huntsville, TX.



FRED PIRKLE  
ENGINEERING  
TECHNOLOGY  
CENTER





FRED PIRKLE  
ENGINEERING  
TECHNOLOGY  
CENTER





# STORIES INTERWEAVE

**Date:** 2017

**Dimensions:** 5' diameter - 8 total

**Location:** Colfax Avenue Bridge, Aurora, CO

**Client:** Art in Public Places, City of Aurora

**Contact:** Roberta Bloom

rbloom@auroragov.org

*Stories Interweave* was inspired by the variety and diversity of languages spoken in Aurora, CO with the goal of celebrating the connections between these groups through language.

Through an comprehensive community engagement process, we gathered phrases and stories from the local population and combined them to create two-dimensional 'word cloud' patterns to connect these groups in one piece that represents Aurora's population.

The surface of each sculpture is made up of different languages cut into steel and welded together to create three-dimensional lantern-like forms intermixing languages and stories. Each piece invites the viewer to move through the swarm of words and create new phrases or connections with each visit.

During the day and night, intense point source LED lighting casts intricate colored shadows around the hanging sculptures. During the day, the lighting projects into shadowed areas and at night it projects against the ceiling. The lighting automatically cycles through different colors over time.





# PIOLE KABUTO

**Date:** 2014

**Dimensions:** 7' length x 3' width x 9' height

**Location:** Piolo Shopping Center, Himeji, Japan

**Client:** Piolo, Japan Railway Co. Ltd

**Contact:** Daisuke Tanigaki  
tanigaki@rdo4design.com

*Piolo Kabuto* is an abstract interactive sculpture made from polished stainless steel located in a rooftop garden in Himeji, Japan. The rooftop operates as an urban park with a viewing deck, benches, promenade, and multi-purpose stage.

The sculpture is made from many curved scales that fit together in a manner reminiscent of the roof tiles at Himeji Castle, a UNESCO world heritage site which can be seen from the rooftop. The effect is to marry the modern materials and clean aesthetic of the piolo shopping center with the forms and construction methods used in Himeji Castle.

The shape of the sculpture references Kabuto samurai helmets (and the Kuwagata beetle that inspired these helmets). The form also

creates a place for visitors to sit within the piece—a level of interactivity that is unusual in Japan but which has been warmly welcomed.

At night, the sculpture is illuminated with interactive lighting. There is a touch button on the sculpture which allows visitors to cycle through different colors. The lighting incorporates projector optics to cast shadows of the sculpture and visitors onto the white wall behind the piece thereby using the surrounding architecture to create an interactive environment.





# FISH BELLIES

**Date:** 2013

**Dimensions:** 30' length x 12' width x 15' height - 12 total

**Location:** Texas State University, San Marcos, TX

**Client:** Texas State University

**Contact:** Jennifer Seay  
jennifer@artplusartisans.com

*Fish Bellies* is a series of organic, illuminated sculptures created for a dormitory courtyard on the Texas State University campus.

The sculpture marks a new student landmark in the courtyard space by inviting people to leave their dorm rooms in order to climb into and on top of the interlocking series of glowing enclosures. The sculpture encourages socialization while respecting individual space. The illuminated compartments form protective rooms that surround the inhabitant with colored light but at the same time express individuality through color-changing sensors.

Composed of layers of frosted acrylic, *Fish Bellies'* large biomorphic forms draw inspiration from the social and biological

diversity of the nearby San Marcos River, reflecting parallels between its ecological life and the University's varied student body.

During the day, the piece's translucency operates like an ethereal anatomy but at night it transforms into a bioluminescent landscape. This organic tableau is meant to spark additional interest in the unique biology found on campus.

The artwork represents a singular integration of monumental acrylic forms and interactive electronics. Embedded in each belly are two touch-sensitive controllers that allow the public to transform the piece by curating the color and saturation levels of the internal LED lighting.





# BRILLIANCE

**Date:** 2014

**Dimensions:** 5' diameter - 6 total

**Location:** Palo Alto Main Library and Arts Center, Palo Alto, CA

**Client:** City of Palo Alto

**Contact:** Elise DeMarzo

[elise.demarzo@cityofpaloalto.org](mailto:elise.demarzo@cityofpaloalto.org)

*Brilliance* is a family of six sculptures placed throughout the plaza between the Palo Alto Main Library and Arts Center. The sculptures were commissioned in conjunction with the renovation and expansion of these two public institutions with the goal of using the art to tie them together into a cohesive campus.

The series of stainless steel sculptures creates continuity throughout the site as the public moves within and between the pieces. The evolving series increases in complexity and expresses growth through a sequence, drawing visitors from one form to the next. The sculptures operate at a distance but also reward close scrutiny over many visits thereby maximizing the potential for interaction and discovery.

Each sculpture is composed of multi-lingual phrases collected from the community, cut out of steel and welded together in

three-dimensional lantern-like forms. Public participation was an integral part of this project. The artists met with different language communities in the Bay area to select phrases that represented the diversity of the local population.

The artwork transforms the plaza into a dynamic community experience. Many visitors find joy in tracing the details of the lanterns, reading the phrases cut into their surface and recognizing their contribution to the project. Each lantern also includes a touch button that allows visitors to control the sculpture's lighting. People can choose the exact color they want with the press of a button. Children like to run throughout the campus trying to make color patterns that span multiple sculptures.



“Joe responded to our open call with an amazing vision, did a fantastic job with the community outreach and input during the concept development, and remained true to his innovative vision while tailoring the artwork to be site specific to Palo Alto.”

Elise DeMarzo  
Public Art Program, Palo Alto







# TEXAS RISING

**Date:** 2014

**Dimensions:** (Large) 21' diameter, (Medium) 8' diameter,  
(Small) 6' diameter, (Chandeliers) 5' diameter

**Location:** Texas Tech University, Lubbock, TX

**Client:** Texas Tech University

**Contact:** Emily Wilkinson  
emily.wilkinson@ttu.edu

*Texas Rising* is a three-dimensional exploration of a five-pointed star created for a new dormitory complex on the Texas Tech University campus. The piece consists of five sculptures in the courtyard of the West Village and two star chandeliers hanging in nearby archways.

The sculptures in the courtyard show a single geometric form (a stellated dodecahedron) in different stages of development rising out of the ground. As visitors walk around the sculpture, the Texas lone star is visible within the artwork's form and on each of the points.

Each star has a unique 2D pattern cut into the surface. These patterns abstractly represent the university's values, culture, alumni, academic achievements and traditions. The artists developed these patterns through a public art workshop held on campus in which students and employees brainstormed imagery and symbols that represent Texas Tech. Each star has a secret symbol

hidden within its panels, rewarding close examination and encouraging students and alumni to cherish and pass on local traditions.

During the day, the stainless steel stars glisten in the sun providing a place for students to gather. The stainless steel also withstands the intense local sandstorms and harsh winters.

At night, intense point-source LED lighting casts intricate shadows around a much larger space than the sculptures themselves occupy. The 2D patterns glow making the imagery come alive with changing colors.

We worked with the university to create a community event for the opening of the artwork bringing together local Lubbock residents and students. The event included a tour of the artwork, performances by the Saddle Tramps and an appearance by the school's mascot, Raider Red.



“The idea [Joe O’Connell and Creative Machines] proposed for this project, as well as what is seen in their other work, is a perfect blend of innovation, beauty, and clever use of technology.”

Emily Wilkinson, Public Art Manager  
Texas Tech University System







# BALLROOM LUMINOSO

**Date:** 2013

**Dimensions:** 48" diameter - 6 total

**Location:** Theo/Malone Underpass, San Antonio, TX

**Client:** Public Art San Antonio

**Contact:** James LeFlore

[james.leflore@sanantonio.gov](mailto:james.leflore@sanantonio.gov)

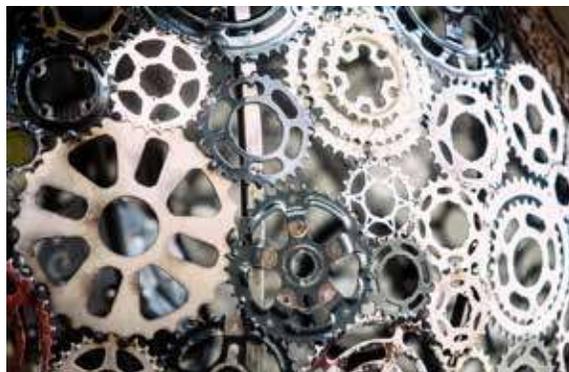
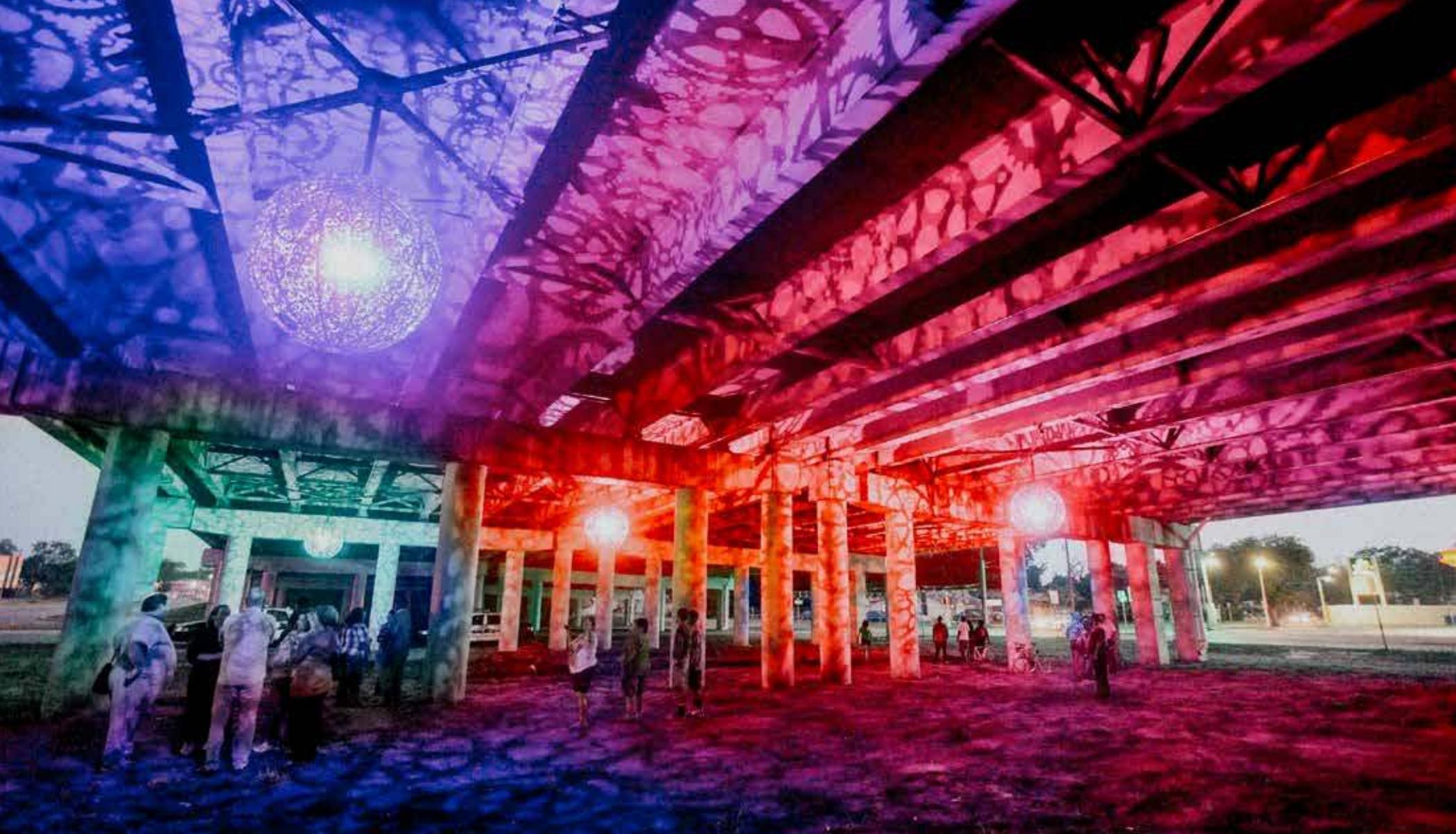
*Ballroom Luminoso* is a series of six brilliantly lit, color-changing chandeliers installed under the IH-35 freeway. The project brought art to the city's south side as a means of enlivening the area for current residents and encouraging cultural diffusion beyond the city center.

Drawing from the formal elegance of the freeway underpass and the cultural currents of the surrounding neighborhoods, the piece transforms a forgotten space into one that connects two communities.

Each globe contains a custom-designed LED light fixture, which casts sharply detailed shadows. The chandeliers paint

the underpass with complex color patterns and ethereal lighting refashioning the space into a majestic ballroom-cum-shadow theater. Melding grandeur with a sense of neighborhood rejuvenation, the sculptures transform recycled bike parts into refined forms.

*Ballroom Luminoso* references the area's past, present, and future in the design of its intricately detailed medallions. The images in the medallions draw on the community's agricultural history, strong Hispanic heritage, and the burgeoning environmental movement. The medallions are a play on the iconography of La Loteria, which has become a touchstone of Hispanic culture.





## MIRROR OF THOUGHTS

**Date:** 2015

**Dimensions:** 8' diameter

**Location:** Rockville Town Square, Rockville, MD

**Client:** Foulger-Pratt Development, LLC

**Contact:** Jack Devine

jack@artcfa.com

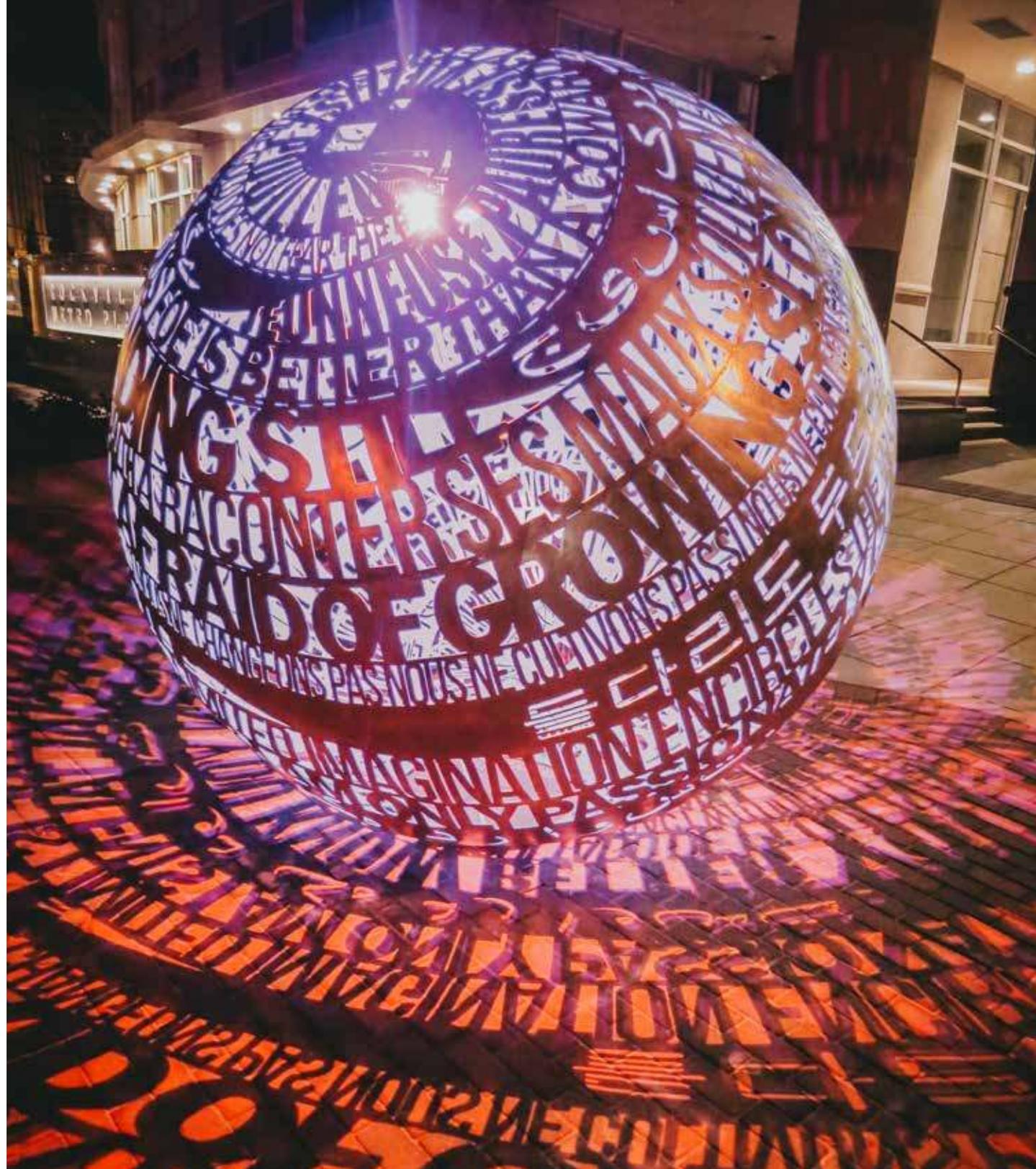
*Mirror of Thoughts* is a stainless steel sphere composed of multi-lingual words, phrases, and symbols representing the diverse demographics of Rockville, MD. Located at a busy street corner, the piece acts as a marker drawing residents and visitors to the nearby Town Square and guiding them through space with light and color.

The sculpture operates at a distance as a monumental form but also rewards close scrutiny over many visits thereby maximizing the potential for interaction and discovery. As people study the surface of the sculpture, their wandering eyes naturally bring to mind unintended phrases formed by juxtapositions of words.

The simple geometry and gentle curve of the sphere offers an organic contrast to the surrounding architecture. The curving bands in the sculpture are water jet cut and welded together to create a three-dimensional

lantern. The interior of the sphere is powder-coated light blue adding subtle color and visual interest during the day. At night, intense point-source LED lighting brilliantly illuminates the sculpture and projects intricate and colorful shadows. The lighting brings the sculpture to life and activates the surrounding sidewalk with color. The lighting automatically cycles through different colors creating a dynamic experience. The sculpture also includes a touch-sensitive button, which allows viewers to choose the exact color they want.

The sculpture contains two-point source LED fixtures. These custom-designed lights have been tested in many of our outdoor public art pieces. When people hold down the button, the LED lighting cycles through the color spectrum allowing each person to choose the color of the sculpture's lighting.





# BIKE CHURCH

**Date:** 2009

**Dimensions:** 12' length x 12' width x 22' height

**Location:** Barrio Anita, Tucson, AZ

**Client:** City of Tucson

**Contact:** Mary Ellen Wooten

mewooten@tucsonpimaartscouncil.org

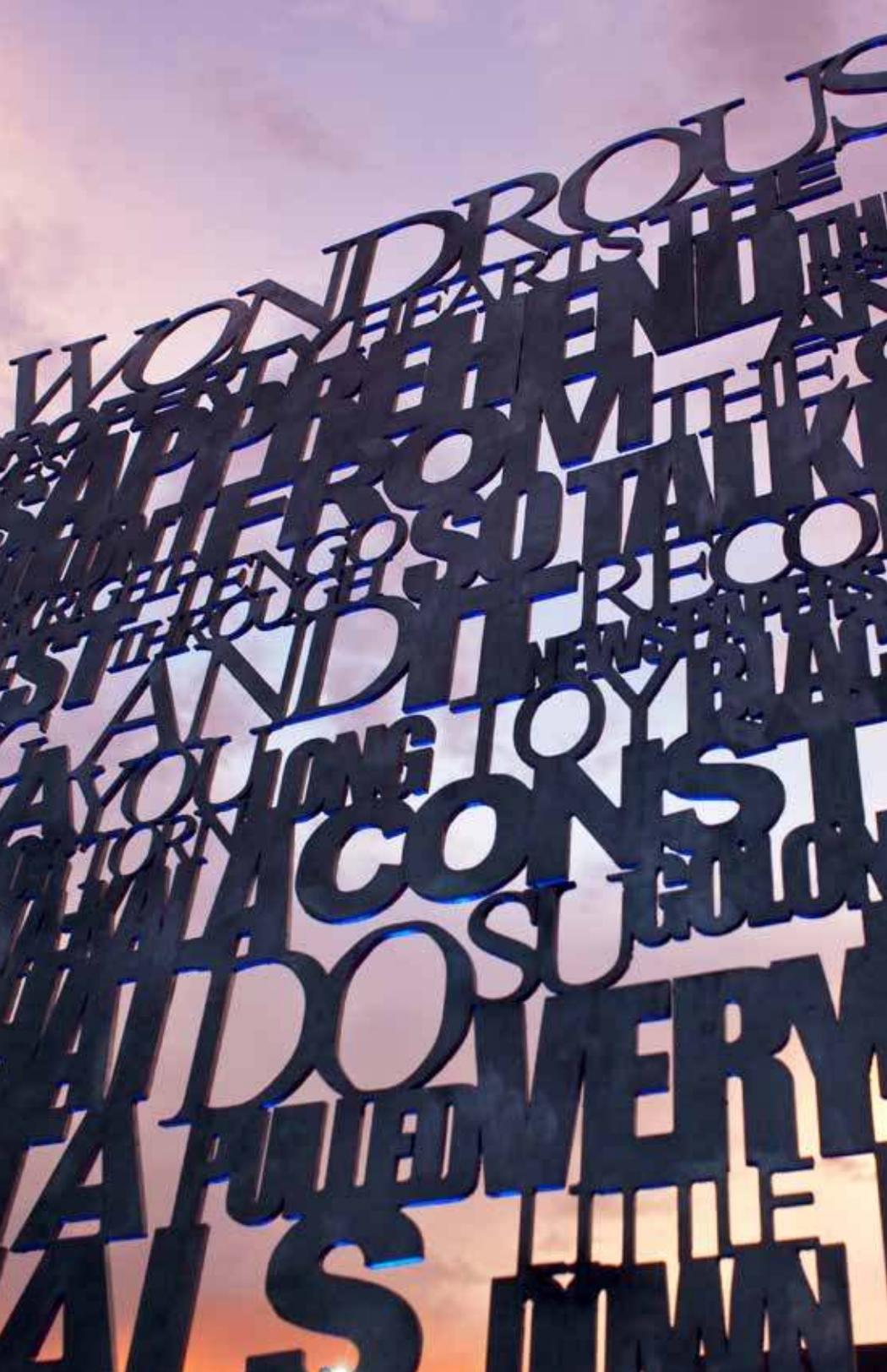
*Bike Church* is a walk-in metal sculpture located in a community-created park and constructed from recycled bike parts arranged into geometric forms. The sculpture was commissioned through the Tucson Pima Arts Council Teaching Artist Grant. The artists led a group of eight high school students in the design and construction of the piece for Barrio Anita, a neighborhood in Tucson with deep cultural roots. *Bike Church* also references the rich cycling culture in Tucson and acts as a communal memorial to fallen cyclists.

The artwork is an inhabitable monument that draws from Christian, Muslim, Jewish, and Native American iconography. The sculpture is composed of recycled bike parts and custom-designed 'stained glass' windows. The windows cast vibrant color

onto the white structure during the day. At night, solar-powered LED lighting illuminates the building creating a glowing beacon in the landscape. Bike part chimes hang like organ pipes that visitors or the wind can play and fill the surrounding area with sound.

The piece has become a landmark and gateway to the neighborhood. As a shrine, *Bike Church* allows visitors to contribute to the sculpture by placing pictures or other mementos at the memorial. It has become a place for sorrow and joy; mourners regularly leave flowers for fallen cyclists and at least one couple has been married inside the piece. *Bike Church* is an aggregate that the public has enlivened by constantly adding to the artwork and using it in new and unexpected ways.





# WONDROUS

Date: 2008

Dimensions: 19' length x 3' width x 9' height

Location: Wheeler Taft Abbett Library, Marana, AZ

Client: Tucson Pima Arts Council

Contact: Mary Ellen Wooten

mewooten@tucsonpimaartscouncil.org

*Wondrous* is a glistening steel sculpture composed of a cloud of words located at the entrance to the Wheeler Taft Abbett Library in Marana, Arizona.

The concept for the artwork emerged as the artist imagined visits to the public library of his childhood. For this piece, the artist imagined a young person going to the library and having the words and phrases of our cultural heritage swirling through his head; the words overlap each other, competing for importance and ultimately recombining into new sentences with new meanings as the mind develops. It references the experience of reading many books simultaneously with phrases from fiction, history, biography, and science swimming around in one's head forming meanings that transcend genre.

In addition, *Wondrous* was created through direct interaction with the community. Local visitors to the library contributed words from a series of different texts ranging from Harry Potter to romance novels.

The phrases were taken from a statistical analysis of works checked out in the public library system. These phrases were then arranged by a computer program written by the artist to arrange them so that the subjects, verbs and objects of different phrases encourage the eye to jump from line to line. This careful distribution of different works encourages the reader of the artwork to move their gaze through the swarm of words and create phrases and connections with new meanings.

At night, three of the world's brightest LEDs project sharp shadows of the phrases onto visitors to the library and neighboring community center.





# CAMARADERIE

**Date:** 2018

**Dimensions:** 19' x 8' x 10'

**Location:** San Jose, CA

**Client:** Department of Veterans Affairs

**Contact:** Andrew Peters

andrew.peters@va.gov

*Camaraderie* is a series of three monumental stainless steel sculptures placed outside a new veteran's clinic in San Jose, California. The piece was inspired by the strong sense of camaraderie found among members of the United States Armed Forces. The sculpture integrates words and phrases collected from veterans in order to share their exceptional stories of friendship and solidarity.

Veterans, active military personnel, and VA patients all share a strong sense of camaraderie, leading to the perspective that 'we are all in this together'. The type of companionship developed out of stressful and extreme experiences is lasting. When exposed to traumatic conditions fellowship becomes the antidote to fear. Through *Camaraderie* we recognize the unique and enduring fellowships that are built within

the military tradition. We believe a good way to remind patients of this support structure is to let them read the supportive words of actual veterans.

The word-clouds are presented on three chevron inspired forms; an important military symbol that dates back to at least the 12th century. These chevrons have been placed on their sides giving reference to a military flight formation. The three sculptures are grouped together to illustrate the importance of teamwork and cooperation.





# UTAH BIT & MINE

**Date:** 2011

**Dimensions:** 5' diameter - 2 total

**Location:** Bingham Junction Light Rail Station, Midvale, UT

**Client:** Utah Transit Authority

**Contact:** Brandon Bott

bbott@rideuta.com

*Utah Bit and Mine* consists of two interactive illuminated sculptures located on the platform of the Bingham Junction Light Rail Station in Midvale, Utah. The sculptures celebrate the identity, history, and values of the Midvale community, home to one of the largest copper mines in the world.

Over Midvale's history, mining companies shaped the land carving a huge descending spiral into the earth with cross-shaped bits. At the same time, the land shaped the society that organized itself around mining.

The sculptures are similar in overall form and material. The two spheres are composed of frosted acrylic perched on three steel legs. However, the faces of each sphere differ. One sphere is shaped like a mining bit while the other looks like a copper mine.

The two sculptures face across the platform and influence each other electronically, echoing the symbiotic relationship between the land and the people who make their living from it. Together they represent the land and the tool that shaped it.

During the day, the acrylic skin of both sculptures glows softly with daylight. At night, it is lit from within by colorful LED lighting. Each sculpture has a stainless steel sensor that allows people to change the colors of the LEDs inside the sculpture. When the sensor on either sphere is touched. Visitors are able to control the colors of all eight sections on each sculpture.

During periods where visitors aren't interacting with the sculpture, the two pieces will communicate with each other by slowly fading through corresponding colors.





# COCOON

**Date:** 2014

**Dimensions:** 38' length x 14' diameter

**Location:** Houghton Road Corridor, Tucson, AZ

**Client:** City of Tucson

**Contact:** Sally Krommes

skrommes@tucsonpimaartscouncil.org

*Cocoon* is a monumental, illuminated sculpture located along a walking/biking path parallel to Houghton Road in Tucson, Arizona. The artwork was created as part of the Irvington-Valencia Improvement Project under the Regional Transportation Authority with the goal of constructing a destination or meeting place along the path for the surrounding community.

Composed of nearly 130 rolled and brushed stainless steel pipes, the sculpture was inspired by nature and wildlife habitats, butterfly and moth cocoons in particular. The cocoon was modeled at the point in time when the chrysalis has just emerged from one end. As visitors move through the piece they feel a sense of enclosure and then release.

The sculpture was welded as a single, solid entity with each pipe placed by hand to create the unique, organic form. At the end of each pipe is a translucent acrylic cap. The sculpture stands nearly 15' high creating a towering presence in the flat landscape. Sunlight glimmers on the steel surface creating an effect that is both natural yet industrial.

At night, colored lighting transforms the inside of the cocoon into a shadow theater where people can see themselves projected onto the surface of the sculpture and its surroundings.





# CYCLORAMA

**Date:** 2012

**Dimensions:** 8' length x 6' width x 6' height - 4 total

**Location:** University of Central Florida, Orlando, FL

**Client:** UCF Art in State Buildings

**Contact:** Diane Daugherty

diane.daugherty@ucf.edu

*Cyclorama* is a series of four sculptures placed between the Theater and Music buildings on the University of Central Florida's campus. The sculptures are located in a clearing under five oak trees. The sculptures create a gathering space and area for social interaction for students and visitors.

From a distance, the sculptures suggest a contemporary stage set and form an inviting formal counterpoint to the trees and the plane of the lawn. Upon closer inspection, visitors can see that the pieces themselves are assembled from shapes and forms that tell archetypal stories in an abstract way. Because of this, the sculptures invite multiple interpretations and repeated inquiry. The sculptures mimic the implicit nature of stories by cutting up and pinning together different elements to create new narratives.

During the day, the bright red color makes the sculptures stand out against the green lawn and surrounding trees. Each sculpture is illuminated by LED lighting. The LEDs, located below the sculptures, emit a tremendous amount of light and cast sharp colored shadows of the sculptures and people sitting or wandering through the artwork onto the trees and nearby buildings. The use of bright colored point-source lighting encourages interactivity as students find their shadows projected throughout the space and onto the tree canopy overhead. As people move among the sculptures, their shadows move through the trees and are visible from hundreds of yards away thereby activating a much larger space than the sculptures themselves occupy. Finally, the lighting alludes to stage lighting and the function of the nearby buildings.





# LENSES

**Date:** 2015

**Dimensions:** 204' length x 18" width x 30' height

**Location:** Scottsdale Quarter, Scottsdale, AZ

**Client:** WP Glimcher

**Contact:** Gwen Jarick

[gjarick@nelsenpartners.com](mailto:gjarick@nelsenpartners.com)

*Lenses* is an illuminated architectural facade that wraps around the parking garage of the Scottsdale Quarter, a unique shopping, dining and entertainment experience in Scottsdale, Arizona.

The artwork is a subtle image operating at a monumental scale created by a pattern of UV-stabilized CNC-cut polycarbonate panels offset from each other and bolted to a steel sub-frame that extends from the concrete parking structure.

During the day, the circle pattern is an abstraction of optical lenses gliding over a textured and colored landscape. At night, the facade becomes a computer-driven rectangular lens gliding over iconic images and displaying a portion of them at a time, in the same way that a roving eye moves over a large image. The effect is created by a custom controller that uses images from art history and contributed by Scottsdale residents.

As the 'lens' moves over the images in the controller, the entire wall becomes a dynamic panorama as it is lit by an array of DMX-controlled LED wall washers.

Visitors to Scottsdale Quarter are invited to contribute images to the library over which the 'lens' moves, thereby making the facade a 'lens' on the greater community of Scottsdale and its visual culture.

The art functions as a contemporary landmark within Scottsdale Quarter aiding in pedestrian and motorist wayfinding during both day and night. The colored panels shade and diffuse any direct sunlight entering the garage during the day. The glowing facade adds ambient light for increased visibility at night.









# HEART BEACON

**Date:** 2013

**Dimensions:** 18' height x 9' diameter

**Location:** Emergency Coordination Center, Portland, OR

**Client:** City of Portland

**Contact:** Kristin Calhoun  
kcalhoun@racc.org

*Heart Beacon* is an interactive enclosure of light, color, and sound located at the Emergency Coordination Center in Portland, Oregon.

The sculpture acts as a symbol of hope and resilience for the community, similar to a lighthouse in that it both comforts and warns. The simple geometry and gentle curve of the two halves resemble wings and exude strength and calm in a time of crisis. During the day, sunlight streams through the acrylic walls creating a diffused glow of light with shadow patterns. Formally, the sculpture also responds to the elegant industrial aesthetic seen in local bridges and architecture.

*Heart Beacon* artistically displays the heartbeats of visitors who interact with the piece. There are two touch-activated

optical pulse sensors that visitors are able to touch and trigger a heartbeat sound within the walls of the sculpture. In the evening, energy-efficient color-changing LED lighting projects rhythmic lighting displays along the walls of the sculpture in sync with visitors' heartbeats. People are encouraged to work together to coordinate the pulse-activated lighting effects.

*Heart Beacon* takes the literal and metaphoric 'pulse' of the Portland community. It celebrates life and the inspiration to protect it by bringing preparedness into each person's daily life. The sculpture visually displays your heartbeat and the heartbeats of those you love creating a powerful visual symbol of what is worth saving.





## DESERT O

**Date:** 2004

**Dimensions:** 6' length x 1.5' width x 7' height

**Location:** Tucson, AZ

**Client:** Tucson Pima Arts Council

**Contact:** Mary Ellen Wooten

mewooten@tucsonpimaartscouncil.org

*Desert O* is an illuminated, translucent torus located outside of the Tucson Museum of Art in downtown Tucson, Arizona. The piece is an outdoor public sculpture constructed with frosted, heat-formed acrylic panels attached to a complex steel skeleton.

The sculpture is human scale and its shape encourages pedestrian interaction by inviting people to sit within the piece, children to climb through it and dogs to jump through the center.

During the day, the solar-powered sculpture gathers energy from the sun through a nearby photovoltaic panel and stores it in a battery. At night, the stored energy is used to activate intensely colored LEDs inside the sculpture.

Every night of the week has a distinct pattern of colored lights that move slowly inside the artwork thereby creating a constantly changing visual identity for the sculpture. The frosted acrylic panels diffuse the color making the entire artwork glow brightly.

Of the hundreds of fasteners covering the sculpture, one is a unique 'secret' touch-sensitive button that allows the public to control the lighting. The 'secret' has spread virally through the community adding another level of interactivity to the piece.





## SEEDPODS

**Date:** currently commissioned

**Dimensions:** 6' diameter - 5 total

**Location:** The Woodlands, Houston, TX

**Client:** Woodlands Development Company

**Contact:** Julie Kinzelman

[julie@kinzelmanart.com](mailto:julie@kinzelmanart.com)

*SeedPods* are interactive public art pieces currently under construction for The Woodlands, TX, a master-planned community in the Houston metropolitan area. A total of 5 sculptures will surround the Tinsletown intersection.

The sculptures are inspired by abstract plant and animal life forms. The pieces explore a sense layered depth through the use of interconnected biomorphic acrylic and steel panels. The clean exterior pod form belies the internal complexity of the organic shapes inside the sphere. The two openings on either end invite viewers to peer into the artwork and discover the visual wonder inside.

During the day, *SeedPods* is a pure white form but at night the acrylic glows with vibrant colors. Visitors interact with the

sculptures through a touch-sensitive lighting design which allows them to change the color of the lighting by touching a button. People can cycle through the entire color wheel exploring different hues. Each visitor is able to select a color and have a direct impact on the visual effect of the artwork.

In addition to this commission, the prototype for *SeedPods* has become an interactive traveling exhibit. The piece has been featured at Spark! Mesa's Festival of Creativity, the Chalk the Block Festival, the Glow Light Festival, AfterGlow, and the Tucson All Souls Procession. The piece continues to be exhibited in different locations.





## EL BOSQUE

**Date:** 2015

**Dimensions:** 30' length x 22' width x 8' height

**Location:** Encino Branch Library, San Antonio, TX

**Client:** Public Art San Antonio

**Contact:** Marissa Laubscher  
marissa.laubscher@sanantonio.gov

*El Bosque* was commissioned as an illuminated, aluminum sculpture for the side patio of the new Encino Branch Library in San Antonio, Texas. The goal of the building project was to bring library services to the area north of Loop 1604 and east of Highway 281. The artwork wanted to celebrate the spirit and art of storytelling and create an iconic image for the new library.

The sculpture represents abstracted storybook pages interwoven within an oak forest. The sculpture represents the magical transformation of reading a story and being transported into a new imaginary world. Words line the walls as abstract oak trees grow out of sentences creating not just a tree, but a forest of knowledge and intrigue.

The artists invited members of the community to submit phrases or quotes from literature related to the theme of the “natural wild” or explore what “nature” or the “wild” means to them. The artwork incorporated these phrases as an abstract word cloud which allows for multiple interpretations of the words as the viewers’ eye moves across the panels. After repeat encounters, the words and phrases blend together creating new meaning and associations.

The sculpture is constructed of 1/2” thick aluminum and finished to shine softly in sunlight. At night, in-ground lighting illuminates the sculpture giving it a constant presence on the site and reminding patrons of the experience of imagination.





# WANDERING STARS

**Date:** 2014

**Dimensions:** (West Bound Stop) 12' length x 7' width x 18' height (East Bound Stop) 31' length x 12' width x 18' height

**Location:** Cushing St. & Granada Ave, Tucson, AZ

**Client:** Tucson Pima Arts Council

**Contact:** Mary Ellen Wooten  
mewooten@tucsonpimaartscouncil.org

**Artist Collaborators:** Blessing Hancock

*Wandering Stars* is a pair of interactive sculptures located at the Cushing Street & Granada Avenue streetcar station in downtown Tucson. Part of the Sun Link Streetcar construction project, the goal of the sculptures was to create a unique piece of art to define the stop among the twenty-two stations along the route and respond to the unifying artistic concept of flow.

The sculptures offer a colorful, chaotic 'swarm' of elements that invite interactivity and celebration. The 'flock' of triangular forms are frozen in motion and elevated on columns that frame the east and west bound stops.

During the day, the bright orange steel frame creates a dynamic form soaring over riders' heads. At night, the frosted acrylic within each triangle glows with different colored LEDs.

Each sculpture contains a touch sensor, which allows visitors to interact with the piece. When pressing the button, people can cycle through different colors and initiate a process in which adjoining triangles influence each other. The visitor selects a color and watches as it moves from one triangle to another creating a vibrant 'flow' of color and light patterns throughout the work.





# LINE & SKY

**Date:** forthcoming

**Dimensions:** 225' length x 27' width x 15' height

**Location:** The Commonlink, Shreveport, LA

**Client:** The City of Shreveport

**Contact:** Kendal Henry & Mona Chen  
mona@jmcartpartners.com

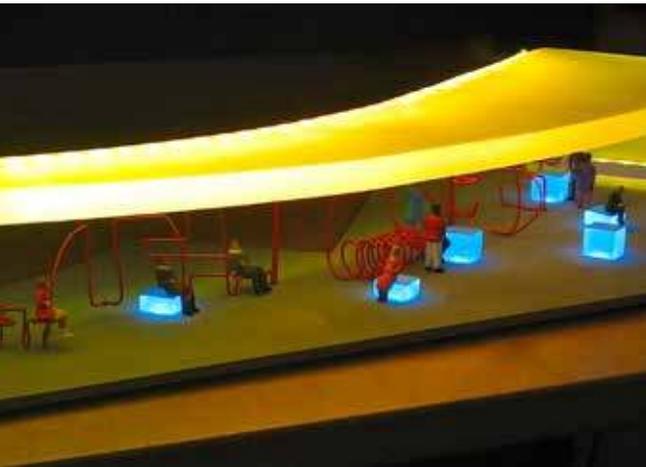
*Line and Sky* is a stage for creative expression that is also a block-long transportation hub and the cornerstone of Shreveport's re-emerging Cultural District. Funding for the design came from a National Endowment for the Arts creative placemaking grant. The project will serve as an example of artist-led economic development.

A striking landscape of color and mass, the illuminated and highly interactive sculpture supports physical exploration, fitness, and play. Nearly 2000 feet of pipe arranged in a single twisting line acts as a three-dimensional sketch moving across the site. The line contorts to form railings, bike racks, seating and signholders while still offering a flexible and open-ended environment that spurs creative interpretation.

The energetic line is carefully framed by a 'floating' mass of light and color wrapping the ends and breaking into cubes along the ground plane. The cubes provide seating but also suggest a map of the transit routes and city blocks through which the line moves.

Emphasis is placed on physical movement as a form of transportation. The artwork is a place to swing, dance, climb, reach, and explore—resulting in a colorful stage open to the community.

To design the line component, the artists ran a week-long workshop involving 30 diverse community groups from church elders to recovering alcoholics. The workshops asked the Shreveport community to join the artists in this creative challenge by using their imagination to answer the question "What if you could construct your whole world out of a continuous line?"





## TWILIGHT GARDEN

**Date:** 2015

**Dimensions:** various sizes

**Location:** Morris Plaza, Mesa, AZ

**Client:** City of Mesa

**Contact:** Trevor Collon  
trevor.collon@mesaaz.gov

*Twilight Garden* is a series of four illuminated translucent sculptures located in Morris Plaza. The sculptures are constructed of frosted acrylic panels held together with stainless steel hardware and illuminated by waterproof LED fixtures.

The sculptures are human scale and their shapes encourage interaction - inviting people to touch, lean on, sit on, look through and gather around the sculptures.

During the day, the acrylic picks up sunlight and glows softly. Each piece is translucent allowing light and shadows to show through the volumes.

At night, intensely colored LEDs inside each sculpture make it glow brightly. Each sculpture has a waterproof pushbutton that allows visitors to adjust the color of the lighting. With complete control over each sculpture, visitors are empowered to establish the look and mood of the Plaza during the evening.

*Twilight Garden* has been placed near a very popular Valley Metro Rail Stop within the Morris Plaza, where people of all ages can enjoy the sculptures at any time of day.



# LITHOGLYPHS



**Date:** 2015

**Dimensions:** 10" length x 10" height

**Location:** University of Arizona, Tucson, AZ

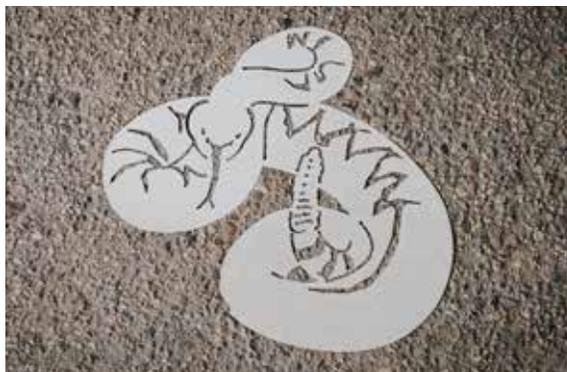
**Client:** University of Arizona

*Lithoglyphs* is a series of 200 playful stainless steel inlays set into the concrete floor of the new Institute for the Environment at the University of Arizona. The inlays were developed by abstracting from regional icons and imagery with the goal of capturing Tucson's unique ecology.

Many of the inlays are very recognizable depicting a hiker, bobcat, javelina, mountain lion, and map of Arizona. Some of the inlays have more scientific roots such as a chart tracking atmospheric carbon dioxide levels over time. These more complex designs are meant to engage the visitors further, asking them to stop and explore the inlays contemplating both the artwork and their local environment. *Lithoglyphs* represents a

new way to engage the public as the project explores the intersection of art, science, and nature.

The artwork was a collaborative effort between Creative Machines and the University of Arizona. Specific inlays were sponsored by donors, and we worked with faculty and staff member to brainstorm and pick the designs. The resulting inlays animate the pathway and courtyard, but also reflect the variety of interests and research of departments housed within the building.





## ON DISPLAY

**Date:** 2015

**Dimensions:** 5' length x 2' width x 7' height - 3 total

**Location:** South Broadway, Denver, CO

**Client:** Denver Arts & Venues Public Art

**Contact:** Michael Chavez

michael.chavez@denvergox.org

*On Display* is a series of glowing enclosures that reference window shopping displays. By interacting with these sculptures the visitor is highlighted within the illuminated frame and becomes the object of interest in the 'window display'. The artists are celebrating the South Broadway business district by putting the public 'on display'. These highly interactive sculptures encourage social collaboration and self-expression as each display will be a unique shape and opportunity to engage visitors.

The sculptures offer a stage for creative expression by encouraging people to show off in public. The project alters people's perception of public space by questioning what is on display, who is the participant and who is the audience. These new gathering spaces draw residents through and within them, transforming the experience of their passage with interactive lighting. The displays

are brilliantly lit with color-changing LEDs, transforming each space into a community stage.

*On Display* can be enjoyed both day and night. Each display is made up of acrylic, with color added either by a powder-coated stainless steel wrap. During the day sunlight streams through the acrylic walls creating a diffused glow of color and shadow patterns, adding visual interest to the streetscape. The stainless steel scrims contain imagery inspired by the surrounding antiques district.

In the evening, touch activated sensors trigger localized light patterns creating powerful sources of color for the surrounding area.





# COLOR FACTORY

**Date:** 2006

**Dimensions:** 40' height x 180' length x 2' width

**Location:** Discovery Gateway Museum, Salt Lake City, UT

**Client:** Children's Museum of Utah / Discovery Gateway

**Contact:** Joanna Fisher  
joannafisher@q.com

*Color Factory* was commissioned as an interactive, kinetic sculpture for a large public atrium.

The sculpture was inspired by the idea of creating a kinetic artwork, which allows visitors to move huge cogs hanging overhead by turning small hand wheels. Therefore, a small amount of power is able to have a monumental effect in the space as the cogs respond to each other in sequence and dynamically animate the atrium.

Each of the cogs contains a series of unique colored acrylic panels developed through an experimental process. As the cogs rotate,

visitors are able to explore the impact of color and change the color of the lighting shining into the glass atrium.

In addition, each cog is unified through the exploration of patterns such as spiral, symmetrical, linear, branching and tessellation patterns. Visitors are able to discover simple sequencing within the artwork such as a series of numbers rotating around a cog.

Finally, the artwork was tested and developed with the help of local children who visited Creative Machines. Children tested the rotating device and painted many of the patterns present in the final piece reinforcing the child-like aesthetic of the sculpture.





## PUBLIC DRUMS

**Date:** 2008

**Dimensions:** 21" length x 21" width x 30" height

**Location:** Ochoa Park, Tucson, AZ

**Client:** Pima Association of Governments, City of Tucson

**Contact:** Sally Krommes

skrommes@tucsonpimaartsCouncil.org

*Public Drums* is an interactive sound-producing sculpture originally commissioned for a troubled park in Tucson. The park was known in the community as a location where criminals shot out streetlights, dealt drugs, and chased away children.

To create this piece, we met with community members and visited the site at different times throughout the day and night. The goal was to create an illuminated sculpture that invited play and filled the park with the friendly sounds of music.

*Public Drums* was designed as a sophisticated yet rugged musical instrument clad entirely with bulletproof polycarbonate.

The piece encourages individual performance and positive group interaction. By tapping the four metal circles on the head of the drum, people can play different sounds. There is also a knob that users can turn to change the pitch of the sounds they are playing thereby creating a simple beat or complex compositions. Finally, the internal lighting changes color when visitors move the pitch wheel to create a dynamic viewing experience as well.

This project spans art and exhibit. It has been popular with both types of clients.





# BLOOM

**Date:** 2014

**Dimensions:** 7' length x 2' width x 5' height – 14 total

**Location:** Alexian Brothers Women and Children's Hospital

**Client:** Alexian Brothers Health System

**Contact:** Blythe Lee

blythe@corporateartworks.com

*Bloom* is a group of fourteen colorful kinetic sculptures commissioned to transform the hospital's entrance stairwell into a welcoming environment for young patients. The goal was to make patients feel comfortable as they entered the hospital by replacing the clinical atmosphere with a moment of optimism and cheer.

Composed of vibrantly colored petals, the sculptures evoke child-like representations of flowers and stand out against the glass atrium setting. The monumental scale of the installation creates a sense of wonder for all visitors as the artwork immerses them in a oversized garden.

Each 'bloom' is connected to a motor and slowly rotates creating kinetic movement that draws the eye upward through the two

story space and activates the otherwise-static lobby. These hybrid blossom-pinwheels create a vibrant and hopeful image celebrating the life and renewal associated with new flowers in springtime. The artwork gives visitors a sense of joy even in the hospital setting.

A panel on the railing allows visitors to control the spinning pinwheels through touch points. Each touch point corresponds to an individual flower. Visitors can choose to move specific 'blooms' or move a series of flowers in tandem. The chance to control the pinwheels movement provides a simple task that patients of all ages and physical abilities can do. The colorful, spinning flowers enchant children and adults alike.





# AS ABOVE, SO BELOW

**Date:** 2016

**Dimensions:** 75" W x 82"L x 73" H

**Location:** Abu Dhabi, United Arab Emirates

**Client:** Alsowah Square Properties, LLC

**Contact:** Nancy Sweeney

nancy@artadvisoryservice.com

The Four Seasons is Abu Dhabi's newest and most exciting luxury hotel. Set on Abu Dhabi's waterfront in a dynamic and walkable urban environment, the hotel also features our latest sculpture series *As Above, So Below*. The five pointed star is decorated with what appears to be a straightforward floral arabesque inspired by Islamic calligraphy. But, the 'vines' are created using conic sections – ellipses, parabolas and spirals – the sort of pathways that stars and other bodies in space would take when guided only by gravity and their own inertia. They are also the pathways taken by subatomic particles after collisions.

The title for the sculptures *As Above, So Below* suggests that not only do the same laws of nature apply on the scale of the universe as well as on earth, but that there is an aesthetic similarity between the motions of heavenly bodies and plant forms on earth. At night hundreds of tiny point source lights inside the sculptures project these calligraphic patterns onto nearby objects and visitors to the hotel.





# CRESCENT

**Date:** 2016

**Dimensions:** 75" W x 82" L x 73" H

**Location:** Abu Dhabi, United Arab Emirates

**Client:** Alsowah Square Properties, LLC

**Contact:** Nancy Sweeney

nancy@artadvisoryservice.com

*Crescent* is a stainless steel sculpture inspired by the crescent symbol that is used to represent the moon in the first quarter of its lunar phase. The crescent shape has been used throughout history in cultures around the world but is prominently associated with the Islamic faith. The intention of this sculpture is to make the crescent shape three-dimensional and use it as a symbol to welcome visitors to the Four Seasons hotel and to the United Arab Emirates. *Crescent* is an addition to the previous project, *As Above, So Below*.

This piece was a collaboration with Emirati artist Ashwaq al Hosani who developed the design for the calligraphy which is laser-cut into and wrapped around the sculpture. The calligraphic design is Ashwaq's interpretation of a poem by Sheik Zayed, the founder of the UAE.

At night, the sculpture comes alive with colorful led lights and illuminates the calligraphic words for visitors entering the hotel. The colored lights are programmable, making it possible for the hotel to change the colors in honor of special guests or holidays.





# SMALL TALK ABOUT THE WEATHER

**Date:** 2016

**Dimensions:** 126' L x 16' W x 4' H

**Budget:** \$185,000

**Location:** Parking Garage Pedestrian Corridor, Oklahoma City, OK

**Client:** Oklahoma City Arts Commission

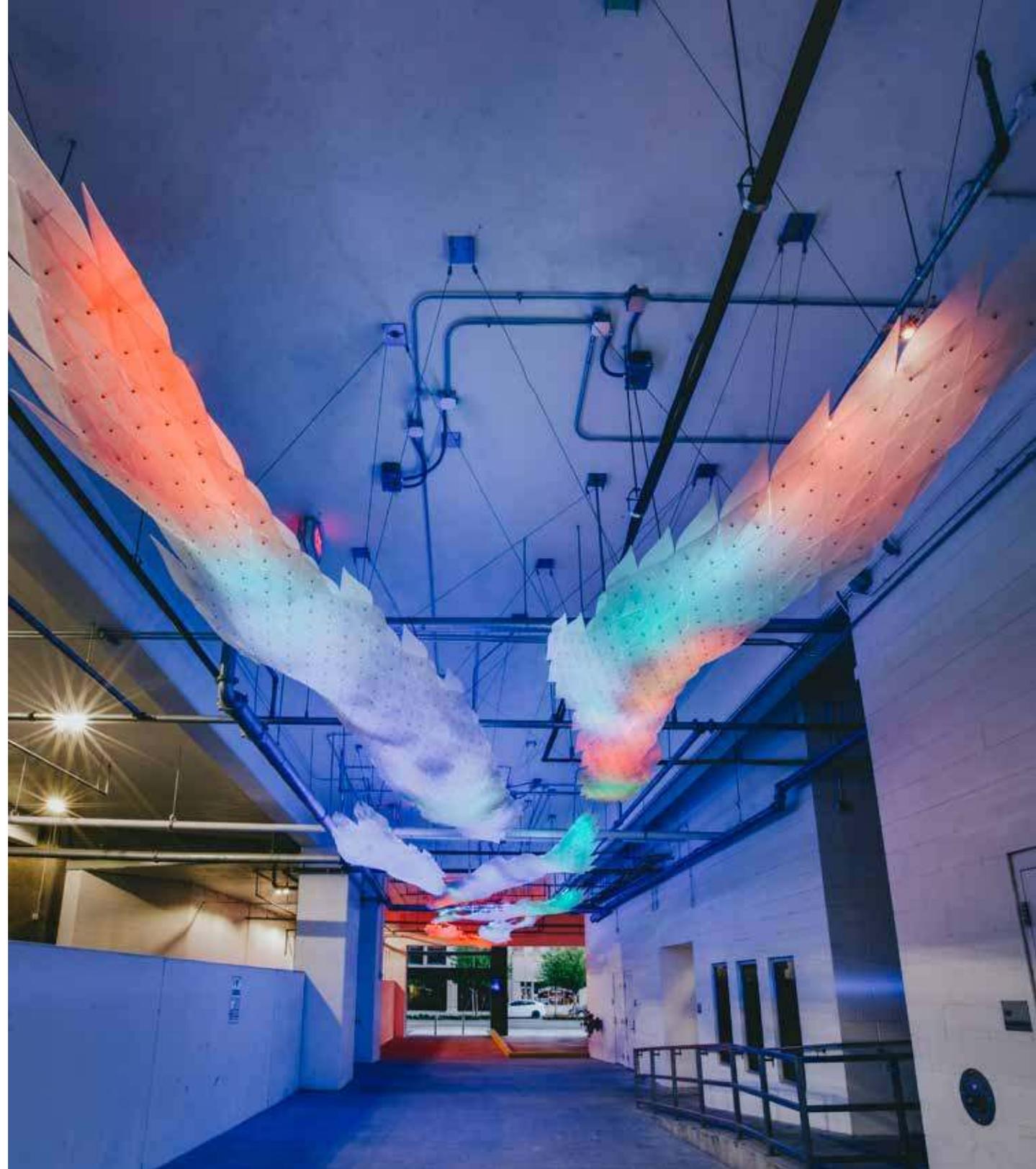
**Contact:** Robbie Kienzle  
robbiel.kienzle@okc.gov

*Small Talk About the Weather* is a touchstone for the communal sharing of life's experiences. The weather in Oklahoma City ties residents together through shared experience. The spectacular extremes of the local climate and its ever-presence are made visible and interactive through *Small Talk About the Weather*. In Oklahoma City the weather is both terrifying and amazing, and is a topic that runs through daily life. The weather remains at the back of people's minds and comes out through casual conversation and friendly banter.

By taking the powerful and unpredictable experience of Oklahoma City weather and defusing it's energy through 'small talk' we

at once acknowledge it's presence and find community in the shared experience. It is through this 'small talk' that residents come together and find their commonality, their compassion and their community.

As artists we look for key impressions that tell a story about a place and capture it's essence. *Small Talk About the Weather* is one of those anchors. This concept contains layers of information and can inform and inspire when looked at from multiple perspectives. Indeed, talk about the weather can be trivial, but it is also talk about an element that has shaped the character of the local people for generations and that is far from trivial.



EXHIBITS



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## OVERHEAD FANS

**Location:** Science North  
**Themes:** Discovery, airflow

Nestled up high in the ceiling, *Overhead Fans* allows guests to stand beneath one of twelve spots on the floor below where photoelectric occupancy sensors point downward at reflective targets. When a user breaks the photoelectric sensor beam, the corresponding fan quickly turns on to propel and levitate a balloon. This is a discoverable activity that is intended to surprise visitors when they walk below the overhead structure.

Multiple visitors can work together to complete challenges such as propelling the balloon in a circle around the exhibit by turning on the fans in succession using their bodies. Each fan motor has an LED ring that illuminates to provide visual feedback to users when the fans turns on.





# SHAKE TABLE

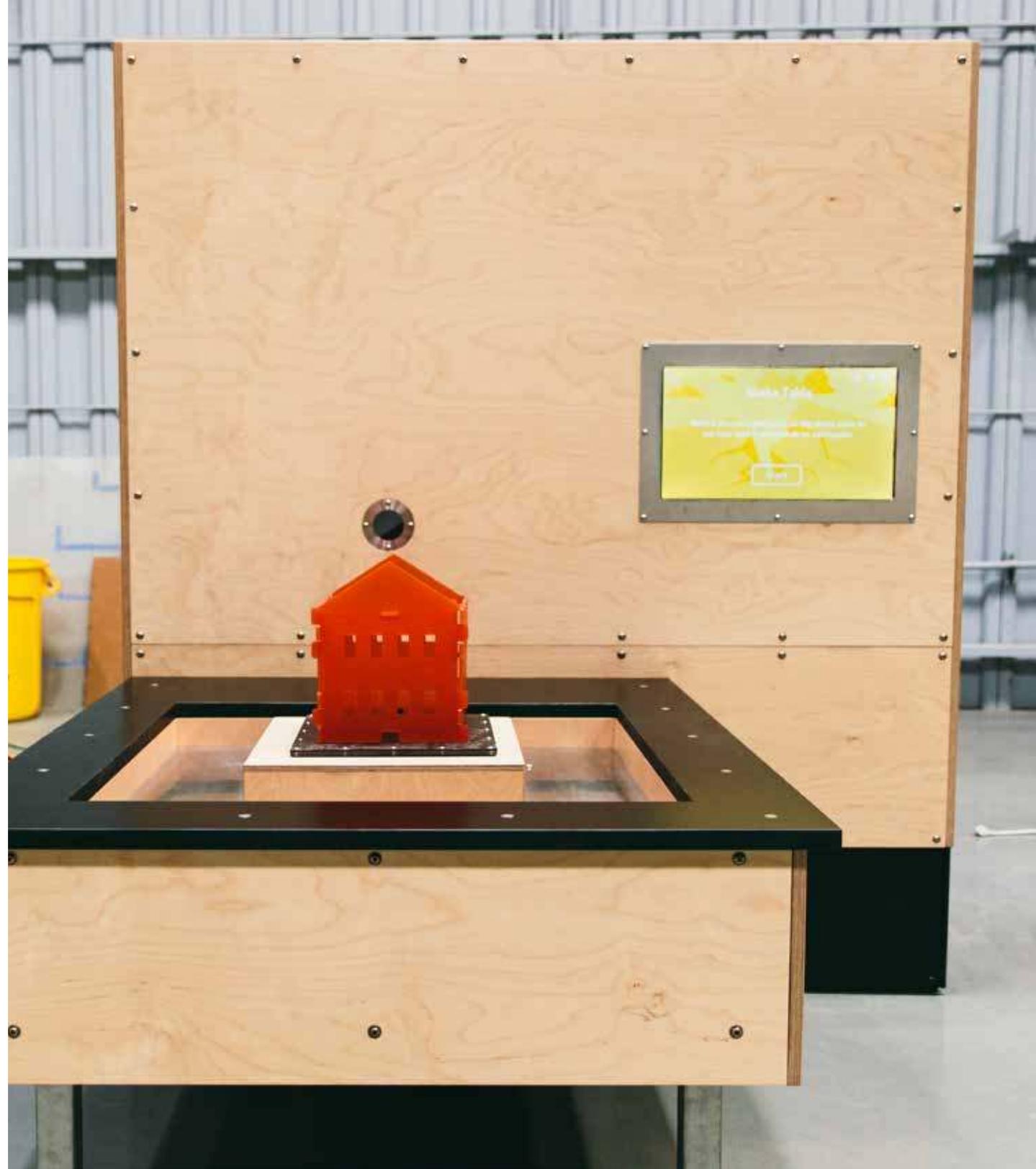
**Select Locations:** Hong Kong Science Museum,  
Fernbank Museum of Natural History, Liberty Science Center  
**Themes:** Earthquakes, plate tectonics, structural integrity

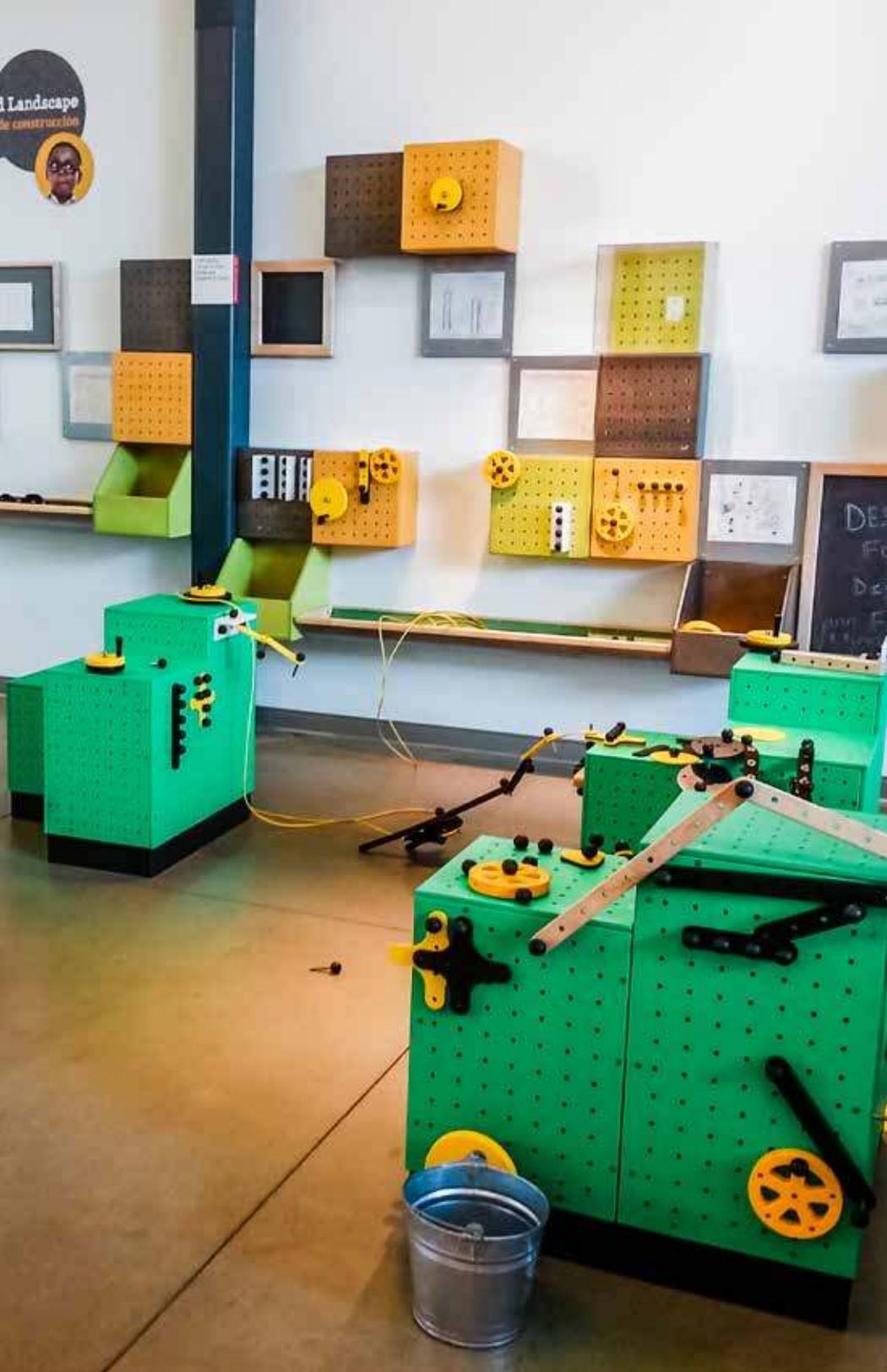
What principles of building construction are important for helping a building to survive an earthquake?

With *Shake Table*, visitors construct a building, place it on the shake surface, select a historic earthquake from the computer menu and observe how well the building withstands the tremors. A slow-motion video replay of the building during the earthquake is viewable on the screen so that visitors can tell exactly how their test building failed and try again.

A manual version of this exhibit is also available and serves as a stripped-down, 100% hand-powered version of the computer-driven digital option.

With either *Shake Table* option, visitors will learn about the importance of various building principles as they adjust their buildings to withstand stronger and stronger earthquakes.





# BUILD LANDSCAPE

**Select Locations:** Science North, Thinkery  
**Themes:** Construction and building mechanisms

*Build Landscape* is a zone where various building/construction style exhibits come together. Guests can build with a variety of construction sets and peg wall boxes, including pulleys, stretchy bands, joining plates, wood struts, webbing struts, quick release pins, highwire rollers, and high wires.

Pulleys are on  $\frac{3}{8}$ " shafts that fit into all peg hole boxes. Various lengths of stretchy bands and multiple sizes of pulley combinations allow guests to construct complex belt and pulley assemblies, even spanning multiple pegboxes. The construction sets have no official play method, instead, they allow the guests to explore and create using creativity and imagination. All parts can be connected making building possibilities virtually limitless.





# HOT WAX VOLCANO

**Select Locations:** Bishop Museum, Anchorage Museum,  
Fernbank Museum of Natural History,  
**Themes:** Volcanoes, volcanic formation, lava flow, geology

*Hot Wax Volcano* allows visitors to pump hot wax up through a steel plate to simulate the formation of shield volcanoes through the changing flow rates of hot lava.

Visitors have control over the wax speed, pressure, and flow thereby duplicating the features of natural phenomenon such as lava tubes.

Turning a hand crank clockwise pushes molten wax out of the hole in the steel plate. Wax then flows over the surface to create an additive volcano-like structure. Using various combinations of pumping, waiting and sucking, qualities of real flowing lava are easily achieved.





# LIQUEFACTION

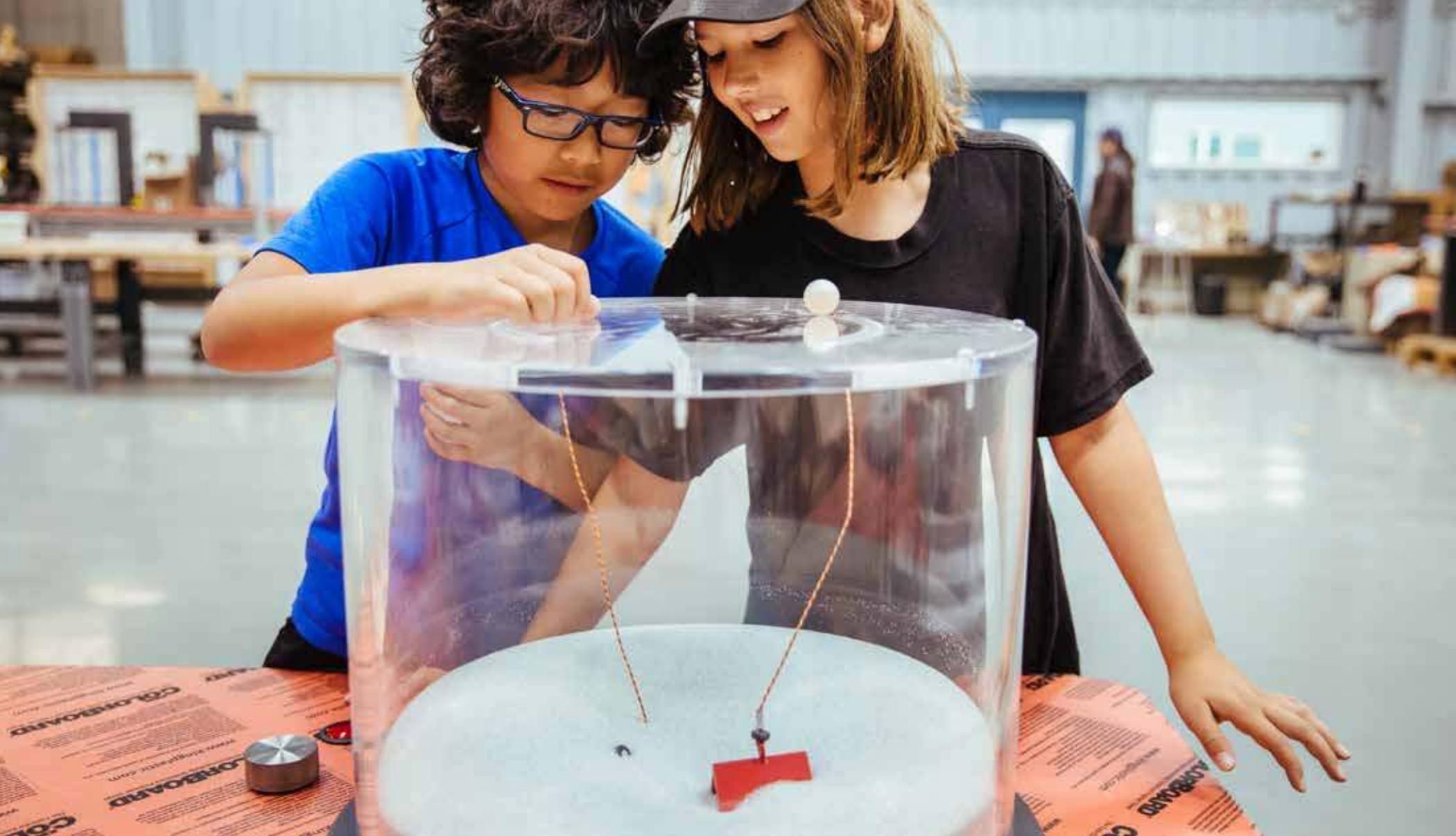
**Select Locations:** Anchorage Museum, Fernbank  
Museum of Natural History

**Themes:** Ground surface changes, soil integrity and stability,  
earthquakes

Liquefaction is a physical process that causes soils to temporarily lose strength and behave more like a viscous fluid than a solid.

Our *Liquefaction* exhibit consists of two stations consisting of acrylic tubes filled with glass abrasive media representing soil and either houses, a car, or a tree. Visitors pull on the cords protruding from the lids to reset the objects to be on top of the soil. Users then press the red button to activate vibratory motors, causing a liquefaction effect.

The motors will run for a programmed length of time from the initial button press, meaning that the time can be extended indefinitely by pressing the button again. Users can adjust the intensity of the motors by turning the knob, resulting in objects sinking faster, slower, or even rising out of the soil.





# WATER PLAY

**Select Locations:** INSPIRIA Science Centre, Independence Seaport Museum

**Themes:** Waterways, Fluid Mechanics

*In Water Play*, users experience the properties of water and experiment with water flow and blockage in a large stainless steel basin.

Water flows constantly down a gently sloped surface in the basin. A variety of objects are available for the user to build embankments, channels, and dams to divert and block the water flow. There is a pinwheel that will spin when placed in the current and several small boats, fish and crayfish that will float (or move along the bottom) and swirl around in the eddies created by the dams. Pieces are meant to represent either solid

or permeable materials. The flowing water moves downstream to drain before the water is filtered and recirculated.

The water is filtered before getting recirculated by a particulate and ultraviolet filter, as well as a copper ion generator to help kill any germs. Water levels are controlled by a micro-controller to prevent overflow in the event of large dams.





## WATER CYCLE PUZZLE

**Select Locations:** Independence Seaport Museum  
**Themes:** Water Cycle, Human Impact on Environment

At *Water Cycle Puzzle*, visitors puzzle out the water cycle- including the human intrusion into the natural process through the urban water use cycle- by placing 12 pucks representing different key points of the cycle onto a schematic background graphic. Magnets hold the pucks in place on the slanted vertical surface. As a puck is placed in its correct spot, it triggers embedded LEDs to light up, representing that part of the endless flow of the water cycle.

When all pucks are in the right place, all the LED lights will be lit and connected, causing them to flash, indicating the visitor's success. A reset button would switch off the electromagnets holding the pucks in place, causing them to slide off the slanted graphic and back into a holding bin at the base of the exhibit.





## RIVER CONTINUUM TRIGGERS

**Select Locations:** Independence Seaport Museum  
**Themes:** Cause and Effect, Biodiversity, Water Conservation  
**Collaborators:** Blue Cadet (projection screen)

*River Continuum* is an interactive media expression of the amazingly diverse life in and around the Delaware River. From the smallest phytoplankton to fish, birds, bears—even humans—*River Continuum* places them all in a moving, changing ecosystem. To create this varied view of the river, visitors must physically activate the experience by engaging with the five input stations provided.

Visitors interact with simple physical “trigger” stations installed on five pedestals; these include rolling a ball, spinning a paddle-wheel, blowing through a tube, or striking a drum!

When users provide input on the trigger stations, feedback is provided by white LEDs installed around the physical mechanisms, with the light brightness being proportional to the input level. As users activate the trigger stations, life in the river begins to build. Trees grow, grasses wave, eels wriggle, mussels appear, butterflies and birds swoop about. As visitors collaborate to build diversity, special “surprise moments,” like an explosion of butterflies or a sudden rush of migrating fish or burst of ship traffic, are triggered that take over and wash across the wall. The more the visitors work together using the input stations, the more wonderful moments of delight they will discover.





## RATE THE RISK

**Select Locations:** Independence Seaport Museum  
**Themes:** Conservation, Public Opinion, Environmental Impact

At *Rate the Risk*, visitors are encouraged to consider simple environmental risk concepts (e.g., pollution, loss of species, climate change, quality of tap water, the impact of individual actions, non-point vs. point pollution, etc.), and vote on “What concerns you most?”

To vote, users place a red Plexiglas peg in a hole surrounding that risk, which then lights up like a Lite-Brite. Visitors can move pegs from one risk to another as they wish, creating an ever-changing physical expression of collective opinion. This user-generated sculpture will always be in flux, representing the diversity of views as they flow through the museum.

The *Rate the Risk* experience is intended to reflect current events in order to make direct links to contemporary issues that are often hard to address in museum exhibitions.



## RISKS TO THE RIVER

Rank six risks to the river in order of importance. Use a peg to vote!

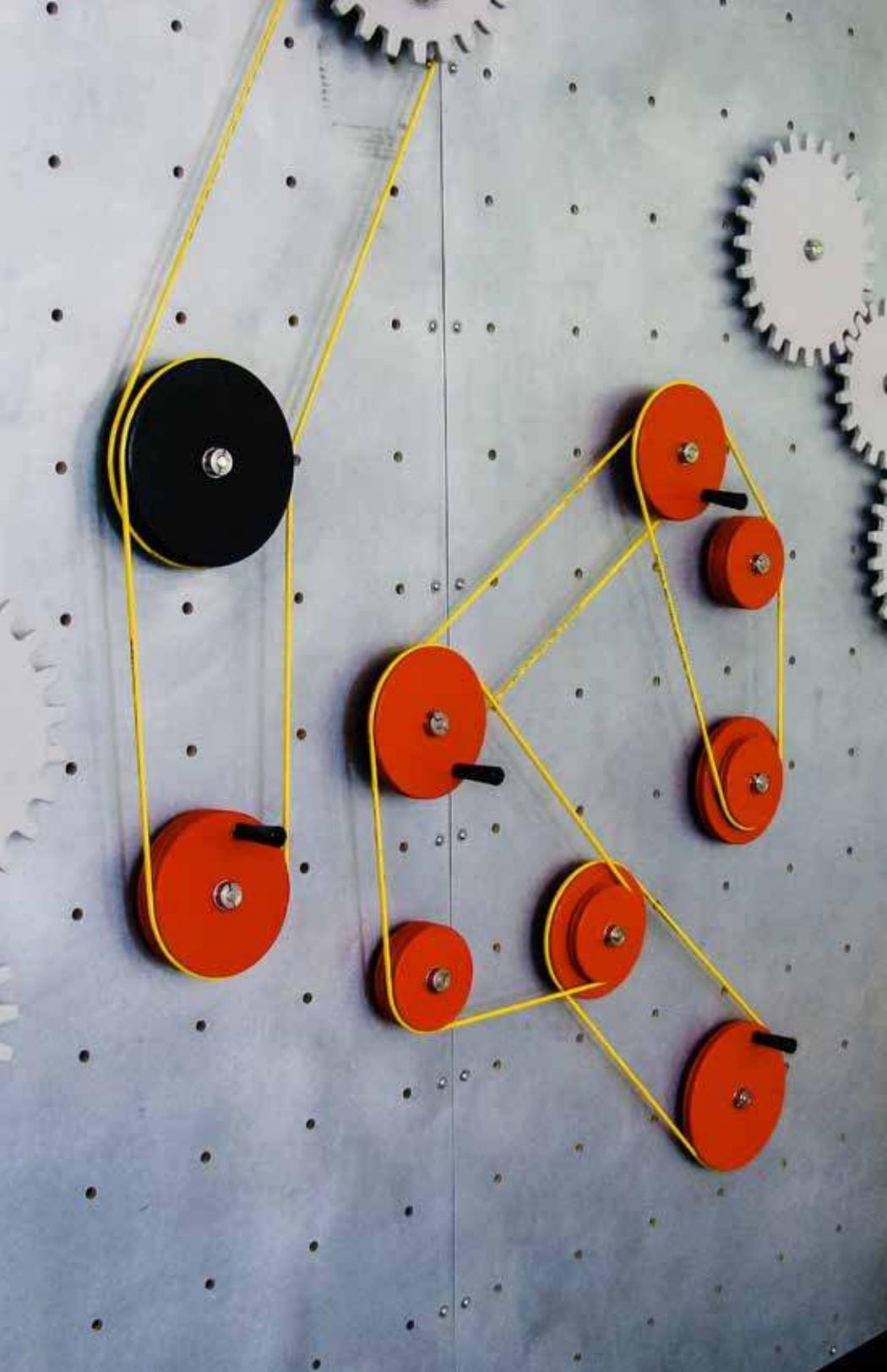
Consider the following issues seen on the left. Which do you think pose the biggest risk to the river now?

Use a peg to vote!

!

...





## SIMPLE MACHINES

**Location:** Thinkery  
**Themes:** Construction and building mechanisms,  
basic mechanisms

At *Simple Machines*, museum-goers build gear and pulley assemblies on a galvanized steel peg wall. Pulleys are on  $\frac{1}{2}$ " shafts that fit into the peg wall. Various lengths of stretchy bands and multiple size pulley combinations allow the guest to construct complex belt and pulley assemblies. Gears are magnetic and can be built anywhere on the wall. Guest also control three overhead shafts, two gear and pulley driven shafts and one internal camshaft.





# ANIMATION WORKSTATION

**Select Locations:** Thinkery Austin, Laramie Library, INSPIRIA Science Centre, Exploratorium  
**Themes & Learning Objectives:** Stop Motion, Storytelling, Conceptualization

*Animation Workstation* allows visitors to create their own stop-motion animations by moving objects on a stage and taking a series of still “frames.” Our custom software makes recording a series of frames effortless. Recording is fast and efficient and most visitors can record 50 or more frames in just a minute or two.

The workstation includes a staging area in which visitors manipulate props, a video camera that records the stage area, a computer, an LCD monitor, and nine push buttons. Typical props range from small colorful blocks to animal figurines, but almost any small object will work. The props allow for endless variations and combinations

for storytelling. Blocks can be used to build structures or landscapes, make funny faces or spell out messages. Visitors can make elaborate stories following a single character or say Happy Birthday in a unique way. The *Animation Workstation* turns people of all ages into animators.

The exhibit lets visitors view their animations on-site, e-mail themselves a link to their video or upload it to YouTube. This allows users to enjoy their animation after they leave and share it with others.



# Animation Station

## Estación de animación



**Make your own stop motion animated movie.**  
 Crea tu propia película de animación de cuadros por cuadro.

Can you make a movie that tells a story?  
 ¿Puedes hacer una película que cuente una historia?

**What is stop motion animation?** A series of still photos, each frame slightly different, is played back quickly to create action.  
 ¿Qué es la animación de cuadros por cuadro? Una serie de fotos estáticas, cada una un poco diferente, se reproducen rápidamente para crear acción.

- 1 Snap a photo. *Cómete una foto.*
- 2 Move the props. *Mueve los objetos.*
- 3 Take another. *Tómate otra.*
- 4 Add sound if you like. *Añade sonido si te gusta.*





# WATERCOLOR WALL

**Select Location:** Square & Compass Children's Clinic, Boston  
Children's Hospital, Thinkery Austin

**Themes & Learning Objectives:** Light, Color, Self Expression

*Watercolor Wall* is an illuminated, interactive sculpture. *Watercolor Walls* have been installed in hospitals and children's museums across the country.

The sculpture allows people to explore a rainbow of colors with just one touch. Visitors can paint the wall by pressing their fingers to the silver rings. By holding their hands to these touch-sensitive points, they can change areas of the wall to different colors along a continuously variable spectrum.

Colors leak between the regions in a manner similar to how watercolor paint blends on paper turning each visitor into an artist.

The piece was inspired by using creativity and play to promote healing. Our designers researched how play reduces the stress experienced by children in a healthcare setting and actually shortens hospital stays and reduces the use of analgesics during recovery. *Watercolor Wall* is a purposefully simple artwork that allows visitors of all ages and ability levels to have a reassuring and creative 'play' experience by transforming the colors in the piece.

There are countless variations for different colors and patterns allowing people to continuously explore the piece.





# AIR ROCKETS

**Select Locations:** Astronaut Hall of Fame at Kennedy Space Center, Adventure Science Center, Ann Arbor Hands-On Museum, Chicago Museum of Science and Industry, Great Lakes Science Center, INSPIRIA Science Centre, MOXI The Wolf Museum of Exploration + Innovation, Fernbank Museum

**Themes:** Aerodynamics, Physics, Air Pressure

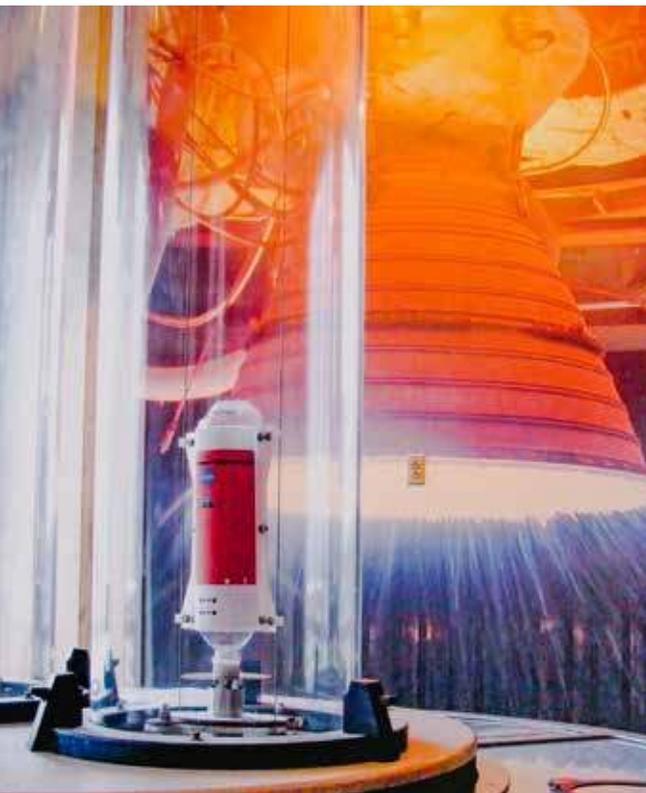
With our *Air Rockets* exhibit, visitors blast rockets into the air up to 30 feet high. Flying up guide wires, each rocket is powered by a stream of escaping air that makes an exciting “whoosh!” sound.

*Air Rockets* allow visitors to explore the concepts of air pressure and weight. The rockets are both 2-liter bottles but have different weights. We also have 1- and 1.5-liter rockets available for smaller spaces.

The exhibit includes two buttons: “fill” and “launch” which allow visitors to fill one or both rocket to a desired pressure (indicated on the pressure gauge) and then launch the rocket into the air. Within seconds of launch, the rocket falls back to a spring-loaded

landing pad. Visitors are able to test out different air pressures exploring how high they can send the rockets. The cycle time is short enough that visitors can quickly try a variety of air pressures.

Once landed, the system resets itself and is ready to pressurize again in just a few seconds. The two rockets are completely independent, and they may be used simultaneously or separately. This exhibit typically requires a compressed air source, although we do have an alternate version available with hand-operated air pumps.





# JUMP TIME

**Select Location:** INSPIRIA Science Centre,  
VilVite Bergen Science Center,  
MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Movement, Physics

*Jump Time* uses a high-speed digital camera to capture the motion of visitors as they jump.

As a visitor steps onto the mat, the system indicates that it is ready for them to jump. The visitor jumps vertically, landing back on the mat as the computer records their jump and landing. A digital display shows how many hundredths of a second they spent aloft.d.

The monitor displays their jump in slow motion forward and backward. Visitors gain a new understanding of the mechanics of a person jumping as the slow-motion replay emphasizes each movement. A scale behind the jumper allows him/her to see how high they jumped.

The latest version of this exhibit includes a separate touchscreen interface with sliders that allow visitors to playback each other's jumps by sliding their finger along the screen.





## BUILDING WITH LIGHT

**Location:** Thinkery Austin, Science North,  
**Themes:** Light, Color, Spatial Reasoning  
**Collaborators:** Gyroscope Inc.

Our *Building with Light* exhibit allows guests to work at one of four stations with rows of colorful LED lighting. Visitors build with sanded acrylic TETRIS pieces, creating shapes and designs on top of a kaleidoscopic color-changing surface.

Guests use touch points to control colored LEDs as entire rows or columns. There are eight rows of LED strips each with sixteen individually addressable LEDs. By holding one vertical and one horizontal touch point at the same time, visitors are able to control individual points of lights rather than the entire strip allowing people the freedom to design and create complex light patterns.

Light from the LEDs illuminate the acrylic building pieces and allow the guest to transmit light from block to block giving them the feeling that they are actually building with color.

The LED colors can be reset to default colors at any point.

“Their work is top notch in terms of user interface, high quality visitor interaction, reliability, and ease of maintenance. They are one of the best firms in the world when it comes to the engineering and fabrication of complex interactive and multimedia exhibits.”

Joe Hastings, Executive Director  
Explora





# THE LAUNCHER!

**Location:** Thinkery Austin, Fernbank Museum  
**Themes:** Aerodynamics, Motion, Engineering, Air Pressure  
**Collaborators:** Gyroscope Inc.

With *The Launcher!*, visitors launch custom built foam flyers across the room, using variable air pressure, with just the push of a button.

An adjustable knob on the side of *The Launcher!* allows guests to control the amount of compressed air (from 0 to 60 psi) they want to use to launch their aircraft skyward.

As the pressure increases, the 15' tall tower lights up. Then, when the desired pressure is reached, the light rapidly falls as the flyer shoots from the nozzle.

Visitors can build their own unique flyers choosing from a variety of 10 building styles, 22 wing styles in 6 colors, and 6 tail styles in 6 different colors. After visitors build their flyer they can test it using *The Launcher!* allowing them to explore which styles perform better.

Depending on the body and wing configuration, flights of up to 30 feet can be achieved.

Build your best flyer, take aim, and launch!





# HANDPRINT GLOBE

**Location:** MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Digital Imaging, Technology, Collaboration  
**Collaborators:** Gyroscope Inc.

The *Handprint Globe* sets the tone for the large-scale, kid-powered, collaborative experiences at MOXI The Wolf Museum of Exploration + Innovation, an award winning interactive children's museum in Santa Barbara.

At *Handprint Globe*, visitors use their hands to create collaborative imagery on a large glowing overhead LED sphere. The visitor stations capture live infrared and visible light imagery. With computer control of the LED system, the handprints are digitally displayed

over the entire surface of the globe allowing visitors to work together from their stations to manipulate the dynamic patterns. This strong visual is a collective measuring device and can be used to communicate how each person's individual contributions add up to create the overall environment.

Visitors can alter their handprint display by selecting one of the many effects available on the visitor's station.

For special events and private rentals, the globe can be programmed for specific audiences. It can display feeds from other exhibits or show event video footage.





## STREAM TABLE

**Location:** Anchorage Museum, Explora, California Science Center  
Amgen Center for Science Learning, VilVite Bergen Science Center,  
Connecticut Science Center, Liberty Science Center  
**Themes:** Erosion, Water, Natural Waterways, Engineering

In the *Stream Table* exhibit, water empties from a reflecting pool, flows through a special sand-like substance and creates beautiful patterns before being filtered and pumped into the reflecting pool again.

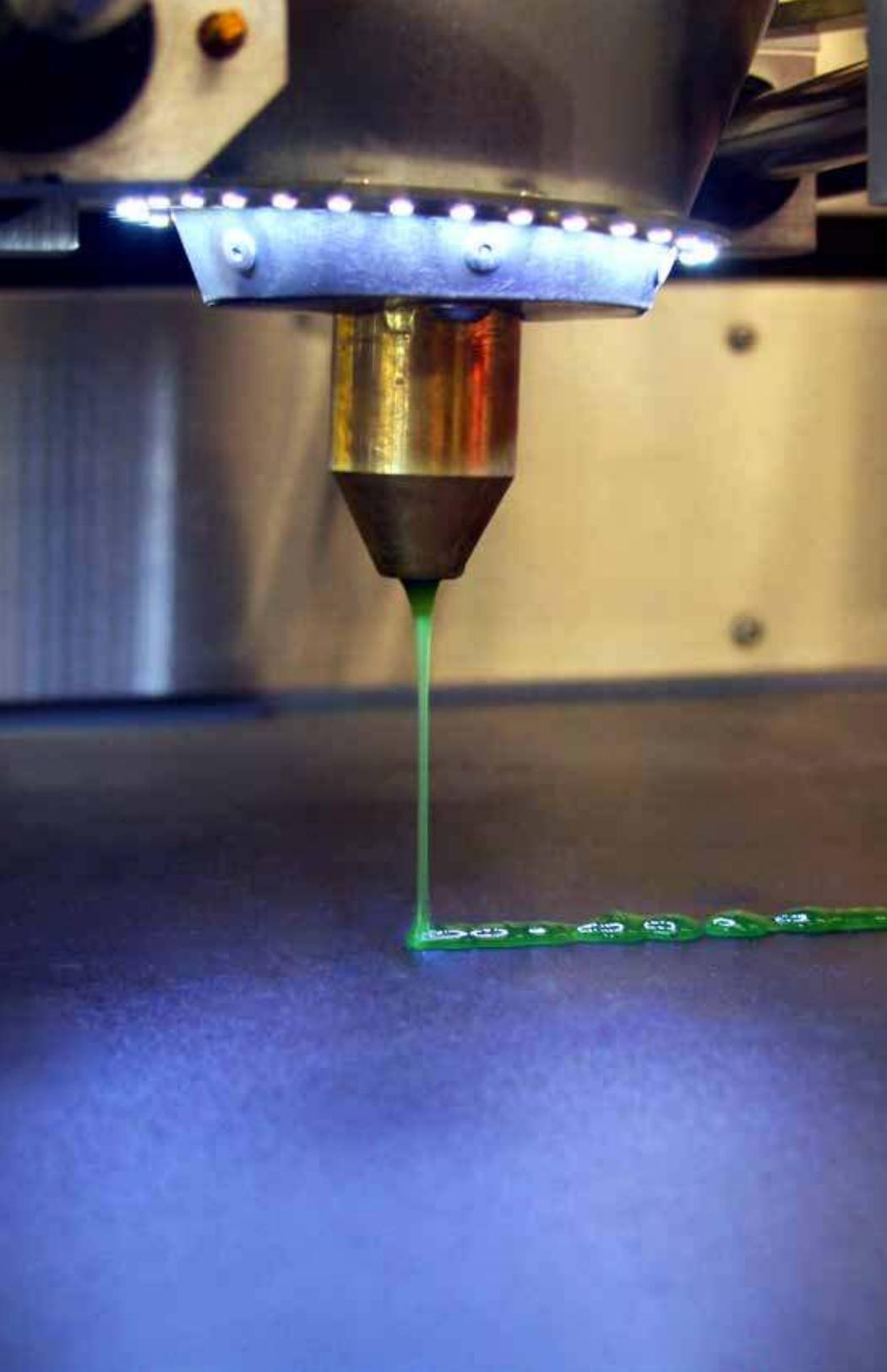
Left on its own, the water will produce river deltas, a shifting river bed, and even oxbows. When visitors dig in, they can create dams, jetties and other civil engineering projects.

We have chosen a mix of recycled plastics in five different grits for the sand-like media. Each grit is a slightly different shade and

settles at a slightly different water velocity, producing beautiful and instructive patterns. Not only does this plastic grit produce patterns on a smaller scale than sand or gravel, but it harbors fewer bacteria because it is smooth on a microscopic level.

The circulating water passes through an ultraviolet filter to kill germs and is automatically replaced with fresh water as needed. This exhibit requires a water supply and drain.





# WAX ART

**Location:** Thinkery Austin

**Themes:** Self Expression, Creativity

**Collaborators:** Gyroscope Inc.

*Wax Art* is an interactive exhibit that allows visitors to create unique and inventive drawings using melted wax.

Each person can control a large extruder using an X & Y joystick, Up/Down and dispense buttons to design their wax creation. The drawing area is enclosed to prevent anyone from accidentally touching the hot wax.

The visitor is given three minutes to draw anything they can imagine onto the non-stick conveyor belt. People often enjoy spelling out words, writing their name, and drawing faces, animals or imaginary creatures.

After their three minutes are up, the conveyor belt automatically advances giving the next user a clean slate to begin his or her creation. The designs are then displayed on shelves above the exhibit for everyone to enjoy.





# SOLAR TRACKING MIRROR

**Location:** Durango Discovery Museum  
**Themes:** Solar Energy, Light, Movement, Technology

The *Solar Tracking Mirror* puts 25 square feet of focused sunlight at visitors' fingertips. Visitors move a large exterior mirror to bounce concentrated sunlight into the museum.

Nothing is hidden with our system of mechanical linkages that allow even small children to manipulate the 800-pound mirror array to reflect sunlight into the building through a small window at any time of day and year.

The light coming through this window is then reflected down by a secondary mirror onto a solar activity table where visitors use the concentrated sunlight to power solar cars, operate a monorail and cast colored patterns using a variety of filters.





## BERNOULLI WORKTABLE

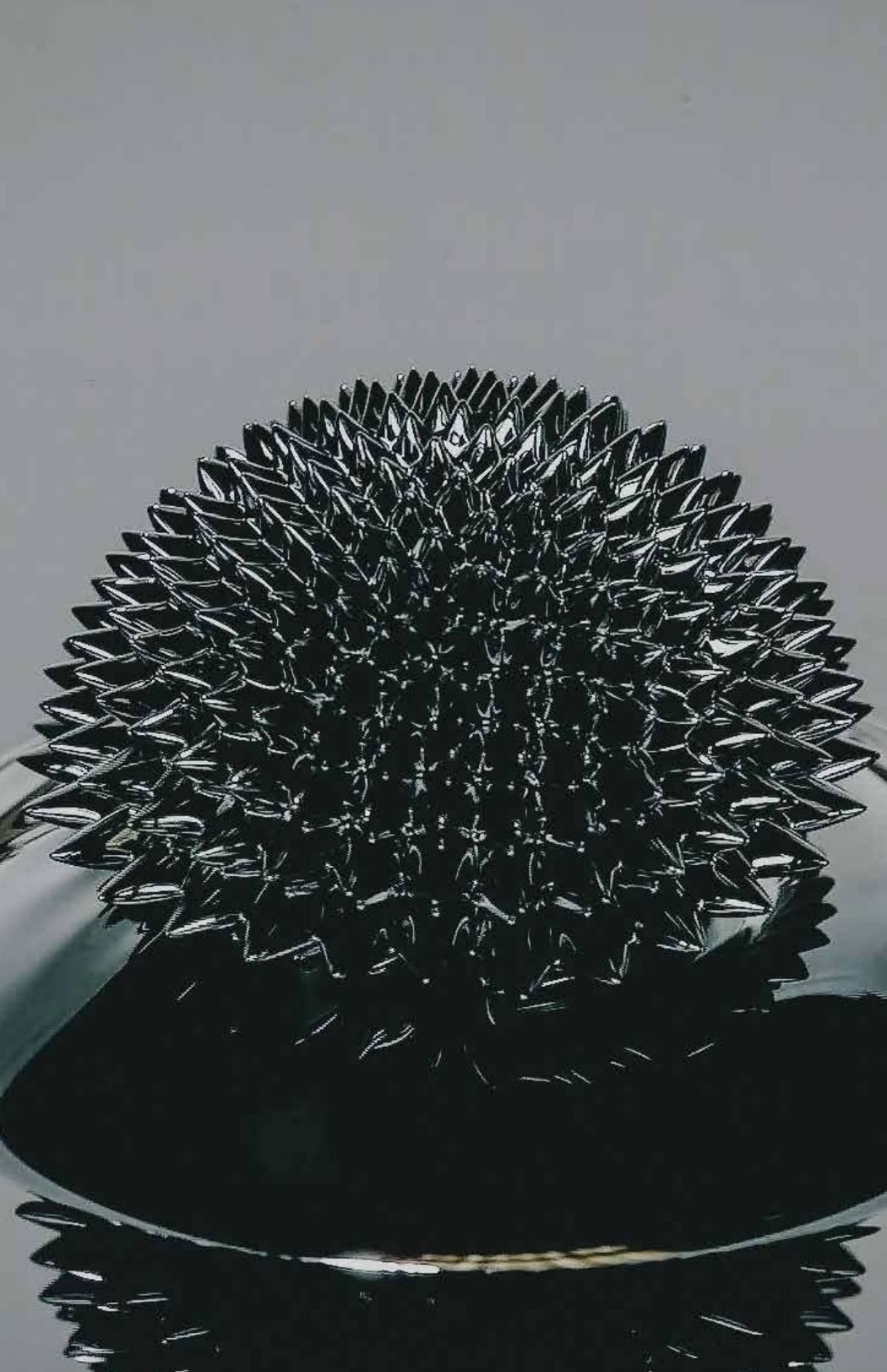
**Select Locations:** California Science Center, Amgen Center for Science Learning, INSPIRIA Science Centre  
**Themes:** Bernoulli's Principle, Physics, Air Flow, Movement

With the *Bernoulli Worktable* visitors control four powerful blowers that draw air up through openings in the exhibit cabinet to suspend balls in the upward moving streams of air. The blowers are activated by pressing a push-button at each of the four stations and the speed of the blowers (amount of airflow created) is controlled by turning a knob.

The air streams are directional, and the visitor is able to adjust the reinforced flexible tubing to move the ball around in mid-air.

Additionally, the flexible tubing has various nozzles that can be attached to the ends to alter the air stream. Adjusting the nozzles and airflow will enable the visitor to discover the proper combination of variables that allow for the suspended ball to be lifted and carried through a hoop and slowly brought back around to its starting place without falling.





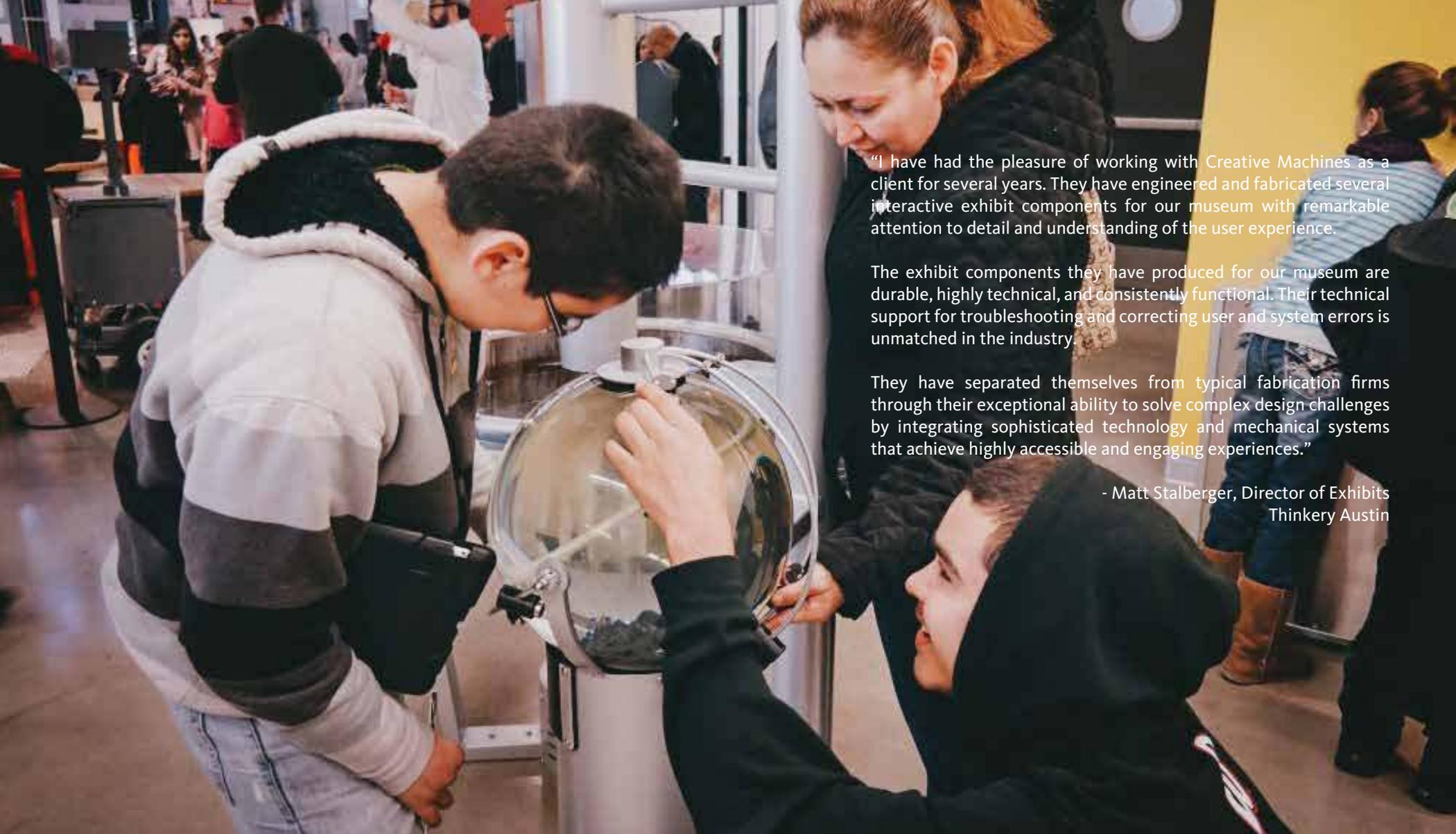
# FERROFLUID

**Select Locations:** Thinkery Austin,  
MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Electromagnetism, Magnetic Field Reactions  
**Collaborators:** Gyroscope Inc.

*Ferrofluid* is an exhibit in which visitors interact with a liquid that becomes strongly magnetized when in the presence of a magnetic field, in a variety of fun and interesting ways.

The exhibit has two places for exploring ferrofluid. In the main cylinder, individual electromagnets placed under metal objects allow visitors to magnetize those objects and explore how the ferrofluid climbs, descends, and makes interesting shapes. In the center of the cylinder, a dual upper and lower electro-magnet system gives the visitor the opportunity to find the balance between upper and lower magnetic fields creating a string of ferrofluid between the two.

In addition, *Ferrofluid* has a fully-sealed sphere where visitors can use magnetic wands to make the ferrofluid climb the walls, drop from the top, and watch it fall through the suspension fluid.

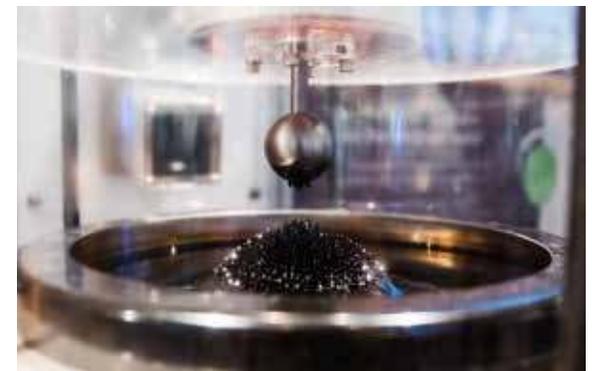


"I have had the pleasure of working with Creative Machines as a client for several years. They have engineered and fabricated several interactive exhibit components for our museum with remarkable attention to detail and understanding of the user experience.

The exhibit components they have produced for our museum are durable, highly technical, and consistently functional. Their technical support for troubleshooting and correcting user and system errors is unmatched in the industry.

They have separated themselves from typical fabrication firms through their exceptional ability to solve complex design challenges by integrating sophisticated technology and mechanical systems that achieve highly accessible and engaging experiences."

- Matt Stalberger, Director of Exhibits  
Thinkery Austin





# SEED POP!

**Location:** National Mall in Washington DC  
**Themes:** Solar Energy, Sustainability

*Seed[pop!]* is an interactive sculpture/exhibit that uses sunlight to make popcorn atop a 10-foot tower. The sculpture was part of the University of Arizona's Prototype house entry for the 2010 U.S. Department of Energy Solar Decathlon which explored the theme of homeostasis.

The Prototype House and *Seed[pop!]* were exhibited for the public at the National Mall in downtown Washington DC. *Seed[pop!]* explored the potential of using only solar power to create a treat that everyone visiting the Prototype house could enjoy and simultaneously demonstrated the power of solar energy.

The popcorn popper is heated using three vacuum-controlled, four-foot diameter circular reflectors fabricated from aluminized Mylar. As the popper fills, the popcorn spills over the edge and into a metallic funnel connected to a plastic tube that brings the popcorn down to the catch basin where it can be scooped into bags for visitors.

*Seed[pop!]* created a multi-sensory experience for visitors as the smell of cooking popcorn filled the air, steam could be seen out of the popper, and finally, people could taste the delicious popcorn thereby connecting all these elements as direct effects of solar power.





# CIRCUITS

**Location:** Thinkery Austin,  
MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Technology, Electricity, Wiring  
**Collaborators:** Gyroscope Inc.

With *Circuits*, guests can connect electrical components through a colorful control panel. In this exhibit, electricity flows in a loop through wires from batteries to the lights and motors and then back to the power source.

The control panel is connected to loads that are attached to the suspended conduit. There are 12 loads total, RGB 1, RGB2, LED wheel 1, LED wheel 2, Moire 1, Moire2, and Thaumatrope 1, Thaumatrope 2.

Visitors are invited to use the wires and knobs to complete and control the circuits that power the lights and motors.

Each “half” of the control panel has a button that can be used to activate the circuit. Once depressed, the button light turns on solid, indicating that the circuit is active. When the circuit is not active, the button will pulse asking visitors to press it.





# ERUPTION EFFECT

**Location:** Bernice Pauahi Bishop Museum  
**Themes:** Volcanoes, Volcanic Eruptions, Geology  
**Collaborators:** Gyroscope Inc.

*Eruption Effect* is the world's largest scientifically accurate simulation of an erupting volcano. A lake of glowing orange liquid simulates hot lava with volcanic "ash" floating on top that appears to move around sluggishly. A layer of steam hangs over the lake as periodic eruptions occur. During an eruption, large amounts of the liquid "lava" are shot in the air where they are lit by lights from above.

Visitors can control one of four eruption nozzles from the Rainbow Bridge. They have two buttons: "Magma" and "Gas" which control the flow of liquid and the injection of gas.

The volcano erupts three to four times an hour producing different effects such as swirling eruptions, bubbling interludes, and an hourly giant eruption.

The exhibit involves computer control of multiple three-phase pumps, injection of compressed gases, and hundreds of gallons of a proprietary glowing liquid. A volcanologist based in Hawaii reviewed the exhibit to verify the authenticity of the effect. This exhibit requires 3 phase power, compressed air, a water supply, and drain.





## COMPUTER CONTROLLED MIRROR

**Select Locations:** Kidz World Exhibit National Science Centre Kuala Lumpur Malaysia, INSPIRIA Science Centre

**Themes:** Reflectivity, Movement, Expression

*Computer Controlled Mirror* is a flexible fun-house mirror attached to 15 computer-controlled motors. Visitors can choose from programs like “tall and short,” “wiggle foot,” “belly dance,” and “suddenly studios” at the kiosk located in front of the mirror.

They can freeze and hold the mirror still at any point to figure out how it creates its effects by a combination of convex and concave surfaces.

The exhibit is a great ice breaker when located at the entrance to an exhibition. Visitors laugh at themselves and are far more apt to take chances and engage with other museum-goers.





## LITE-BITE

**Location:** Lite-BiTE was originally created to appear at ASH (American Society of Hematology) 2014 but will be traveling to other annual meetings and expositions that Amgen attends.

**Themes:** Light, Movement, Technology

*Lite-BiTE* was a bold and unexpected interactive traffic builder created for Amgen, the world's largest independent biotechnology company.

*Lite-BiTE* is a play on the children's toy, Lite-Brite, but at a monumental scale and includes a giant moving T-cell interacting with a cancer cell. We created it to showcase an experimental technology called BiTE (Bispecific T-cell Engager) and educate and elevate conference delegates' understanding of Amgen's ground-breaking technology. The T-cell and malignant cell are connected to an automated computer-programmed pulley

system that gives the visual illusion of the cells moving through the bloodstream. Convention delegates were invited to initiate the process by placing a BiTE molecule peg into one of the three receptors on the static malignant cell. Once the connection was made, a signal was sent to a roaming T-cell, which began the engagement with the malignant cell by binding to the BiTE molecule. The ensuing visual experience depicted (using light) the creation of synapse and the release of the perforins and granzymes. Perforins and granzymes transferred visually (again using light) from the T-cell into the malignant cell.





## STAIR TOWER

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Light, Movement, Technology

**Collaborators:** Gyroscope Inc.

The main stair between the 1st & 2nd floor is also a fun and engaging exhibit, *Stair Tower*, that features bicycle wheel animations.

As visitors to the museum head up and down the stairs, the wheels are activated by motion sensor. Lights along the inner part of the bicycle wheel display moving animations within the wheel frame as it spins. Each wheel is activated separately and will only turn on once passed. At the bottom of the stairs, there is a separate wheel that spins by the crank of a handwheel. As visitors spin the wheel, the lights behave the same

way, creating an animation, however this animation can be changed by using the nearby touch screen. Although the effects are the same, this separation allows visitors at the bottom of the stairs to play with one wheel without disrupting the actions other visitors are creating by traveling up and down the stairs.





# RING LAUNCHER

**Location:** MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Electromagnetism

*Ring Launcher* features three electromagnets that are visible through an acrylic vitrine. Atop each electromagnet is a rod extended up to the top of Innovation Wall. Each rod has an aluminum ring around it, resting just above the electromagnet coil. When the button on the front of the exhibit post is pressed, the three rings are launched up the rods and fall back down to be launched again.

The energy of the coils causes a strong counter electromagnetic field that shoots the rings up a rod to various heights. Once they reach their peak height, each ring immediately falls back down for another launch. Each ring is a different shape and thickness to illustrate how different weights and thicknesses are affected by the electromagnetic field.

By pressing the button on the front of the exhibit post, the user causes the three electromagnetic coils to energize momentarily, inducing a large current in each of the three styles of aluminum rings.





# GIANT GUITAR

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Sound

**Collaborators:** Gyroscope Inc.

*Giant Guitar* is an interactive sound exhibit. Visitors can climb inside and experience how the plucking of the strings becomes audible through the resonating wood of the interior of the guitar body. Each person interacts with the guitar by strumming from either the outside and inside the guitar. They can also press the strings against the working frets by hand to change the tones.

There is an adjustable capo that can also alter the tones of the guitar on all six strings. Visitors are encouraged to slide the capo along all eight of the frets on the neck of the guitar to see how the tone changes.



# QUIET QUEST

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Sound, Movement

**Collaborators:** Gyroscope Inc.



Too loud!  
Start again!

¡Demasiado fuerte!  
¡Comienzo de nuevo!

Visitors to *Quiet Quest* interact with this exhibit by entering the enclosure and trying to walk across a gravel path as quietly as possible. This exhibit is an adaptation of the Exploratorium's *Out Quiet Yourself*.

Visitors enter the enclosure by walking up the stairs on the right of the exhibit. Directly in the line of site is a button that the visitors press to start the exhibit. Once they've pressed the button to start the exhibit, they then walk across the gravel pit as quietly as

they can. There is an array of speakers below the gravel pit. These speakers pick up the sound of visitors walking across the gravel.

There is a viewing window at the height of the gravel path, so outside viewers can watch as the visitor walks along. This exhibit gives visitors a score based on the decibel volume they produce. The score is displayed on the monitor on the front of the exhibit to entice other visitors to participate and the monitor within the exhibit directly in front of the path.





# PULSE TOWER

**Location:** INSPIRIA Science Centre

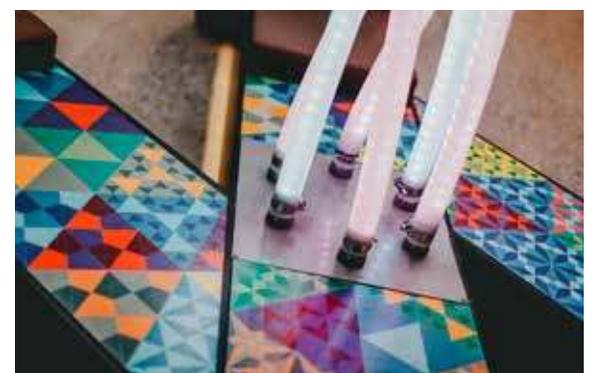
**Themes:** Light, Movement

The *Pulse Tower* is a large vertical LED display consisting of interactive stations and LED-lit tubes that connect floor to ceiling over 30 feet.

Visitors interact with the exhibit by placing their hands onto brass electrodes located at each of the broadcast center consoles. The visitor will feel a slight tactile feedback that is mirrored by the animation of their tube as the lighting responds to the visitor's heartbeat.

Upon removing their hands, the heart beat persists at the same beat but fades into the background animation over several beats.

When a tube on the *Pulse Tower* is not displaying a heartbeat the whole tube is illuminated with a color that changes hue over time.





# FOLEY STUDIO

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Sound

**Collaborators:** Gyroscope Inc.

Foley Studios are isolated booths that encourage visitors to experiment with recreating the Foley sound effects of popular movie clips using a variety of everyday objects. These sound effects can be recorded for playback to hear how dramatically sound tracks affect the experience of the movie viewer. Visitors interact by recreating the sounds of short film clips using the same props employed by Foley Artists.

The professional quality enclosure has wall-to-wall acoustic foam and a pentagonal shape with non-parallel walls to reduce standing waves. There are two microphones located in each exhibit. One centered above the prop desk, and one centered on the base plate of the prop desk. A hardwood floors give visitors a chance to create the sounds of footsteps.





# BLOOM BUILD

**Location:** MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Engineering, Nature

The *Bloom Build* exhibit features 3 whimsically organic flower-like forms that soar over museum visitors. The slender steel 'stalks' sprout up from a bench-like base and take a bulbous form at the tip, similar to a bud.

*Bloom Build* allows visitors the opportunity to build up around the stem using green life size pieces that have been cut to fit together. Although unseen, the force of gravity is constantly influencing how these structures stand up.

This activity teaches structural engineering in a fun and intuitive way. Rolling benches offer seating and storage for the excess leaf parts.





# TURNTABLES

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Movement, Nature

**Collaborators:** Gyroscope Inc.

*Turntables* is a collaborative group activity that is particularly good at encouraging intergenerational interactions and conversation. The exhibit provides an open-ended platform for experimenting with rotational forces, momentum and the nature of orbits.

The turntables are flexible in both their physical setup and their content, allowing easy change to address different learning styles, group sizes and physical locations. The three units can be clustered for a larger, group collaborative experience, or used separately for a small family cluster.

The choice of the loose parts directly affects the learning outcomes and content connections. Rings and disks are great for exploring gyroscopic forces; balls are good for visualizing orbits; and paper and pencils demonstrate rotational patterns.





# MAGNETIC ISLAND

**Location:** MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Nature

Magnetic Island consists of three, multi-level “islands”, each having strong magnets at their center. The magnetic force allows visitors to build organic bridging structures and forms using simple steel washers.

The multi-level layout of this exhibit engages all ages. In addition, the multiple “islands” allows for collaborative building efforts.

Visitors can build in a variety of directions and can build a bridge between columns and even between islands. Washers are stored in the serving dishes as well as in the base of the exhibit.





# WIND COLUMNS

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Air, Movement

**Collaborators:** Gyroscope Inc.

*Wind Column* is a series of wind producing columns that allows visitors to send objects flying into the air or simply let them hover. Visitors use a variety of everyday materials such as paper or scarves to invent their own flying contraptions. Visitors can then test their devices by placing them in the Wind Column and adjusting the speed. Workstations surrounding the Wind Columns allow visitors to design and redesign their flying devices as many times as they wish.

Visitors are encouraged to test their designs and compare their results with others creating a collaborative learning experience.





## BUILD IT, TEST IT, RACE IT!

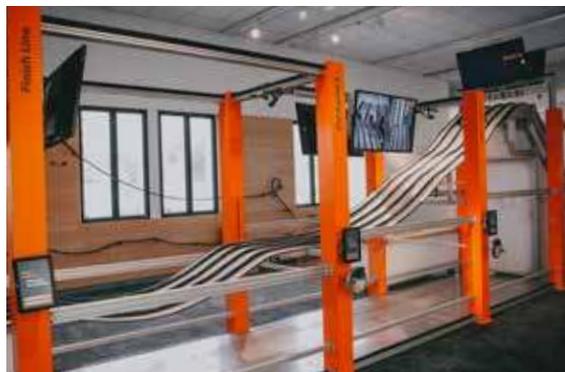
**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Scientific Process, Trial and Error, Engineering

**Collaborators:** Gyroscope Inc.

*Build it, Test it, Race it* includes three components that work together to provide opportunities for children to practice important STEAM elements of inquiry, testing, tinkering, observing, and measuring and to share their theories.

Visitors get to design and build a vehicle at multiple work stations. They can then race it on the track where speed and acceleration will be measured and displayed. Children can then rebuild the car to make it travel faster down the track. They can also change the shape of the track to introduce another variable. All this tinkering with materials, building, testing, and rebuilding of cars teaches important aspects of the scientific process, a key science standard. In the process, children learn valuable engineering and design skills.





# ROLL IT

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Movement, Nature

**Collaborators:** Gyroscope Inc.

Located along the length of the museum, *Roll it*, is a fantastic, flexible landscape of perforated wall sections, ramps, and movable racetracks. The perforations are located on all the wall surfaces and also on freestanding workstations throughout the space. The workstations provide a structure that children use to place and connect track. Workstations are also used to store rubber track and clips that can be used for creating 3D roller coasters and race tracks.

Guests can create their own roller coaster with loops and hills, then evaluate their creation by rolling a ball down the track. Small metal buckets are included to create targets for catching balls as they roll off the end of a track section. Small steel ladders are provided as a way to add height to the track.





# WALK, LEAP, JUMP

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Movement

**Collaborators:** Gyroscope Inc.

The *Walk, Leap, Jump* exhibit is part performance space and part scientific data collection. At first glance, it is a stage to capture silly walks and dances as looping digital animations. Children run, walk, skip and jump in front of a screen. The camera and computer system captures their movements and analyzes their stride, height and speed. The computer can calculate and display miles per hour, amount of energy used, calories burned and compare data to other visitors. It also displays animations of previous visitors moving and dancing together on screens overhead.





# MAGLEV TRAIN

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Nature, Movement

**Collaborators:** Gyroscope Inc.

*MagLev Train* introduces the visitor to transportation through magnetic levitation. Running parallel to the rail outside the museum, *MagLev Train* has two levels of track; one track is completely straight and the other has a hill in the middle. Both tracks have a double row of magnets inside a hidden channel. The train cars have magnets attached to their underside. When placed on the track, the train cars 'hover' above the track.

Visitors can push the cars along the track to see how far they will travel. Each train car has a rubber bumper on either end. One bumper is a soft rubber while the other is a harder rubber. The bumpers allow for train cars to be pushed into each other to experiment with elastic and inelastic collisions.



Maglev Train  
Museum of Science and Industry



## COLOR MIXING MACHINE

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Movement, Light

*Color Mixing Machine* is an interactive exhibit that allows visitors to mix colors on the wheels in front of them. The back wheel is stationary and features six large and 12 small different colored films. The front wheel contains 3 large and 3 small colored films. As visitors spin the helm in front of the large color wheels, they can see the different effects of moving a blue film over yellow, green over orange and so on.

By placing this exhibit in a large window, this dramatic color-mixing machine takes advantage of the natural light streaming in.



# LIGHT PATTERNS

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Light

*Light Patterns* is a large scale version of the classic children's toy, Lite Brite. This exhibit allows children of all ages to make designs of their own using light transmitted through various colored pegs. The wall sized exhibit encourages artistic collaboration and teamwork. The multi colored pegs are stored in bins at the foot of the exhibit allowing even the smallest of visitors a chance to create.





## MOSAIC FACES

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Light

**Collaborators:** Gyroscope Inc.

*Mosaic Faces* allows visitors to create a unique mosaic of their own image. Visitors start by taking a picture of their face through one of the kiosks on either side. The exhibit then generates a version of their image made up from hundreds of other photos. Visitors can select from multiple themes when creating their mosaic. When the mosaic has been completed visitors have the option to send their image to friends via email. *Mosaic Faces* demonstrates how our eyes see different images and color when playing with relative image scale. Clients can supply unique image libraries with local significance for inclusion.



# KALEIDOSCOPE

**Location:** MOXI The Wolf Museum of Exploration + Innovation  
**Themes:** Light

The *Kaleidoscope* allows visitors to create fantastic visuals using colored props, light, and mirrors. Visitors start by placing different props into multi-colored bins at one end of the exhibit. Light shines through the base of the bins illuminating the objects within. Visitors can look through the eye piece at the front of the *Kaleidoscope* to observe how the mirrors affect the shape of the objects in the bins. The *Kaleidoscope* has a twisted pulley system that allows visitors to watch as they spin the multicolored bins.





# LIGHT LAB

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Light

**Collaborators:** Gyroscope Inc.

*Light Lab* is a circular light table where visitors can illuminate semitransparent objects such as slides or colored acrylic. In the center of the table, light illuminates a fiber-optic chandelier that is located directly overhead. Visitors interact with the exhibit by sliding semitransparent colored objects under the base of the fiber-optic chandelier. When visitors place objects between the light table and the base of the fiber optics it changes the color of the ends of the fiber-optics. This change can be seen by visitors when looking up at the chandelier.





## LIGHT + SHADOW

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Light

**Collaborators:** Gyroscope Inc.

*Light + Shadow* encourages visitors to work together to create a digital and physical projection landscape. Visitors can create images on a touchscreen or by scanning textures in with a MicroEye video microscope. The images are projected over to the projection area where a variety of differently shaped white cardboard boxes sit. The visitors can move, stack, and balance the boxes to create a 3D white landscape to receive the projected image. By allowing control of both the projected image and the landscape, visitors can discover creative ways to make the two interact - for example, drawing windows and a door on a vertical stack of boxes to create a building.





## PAINTING WITH LIGHT

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Light

**Collaborators:** Gyroscope Inc.

*Painting with Light* allows visitors to be creative using light and color. Visitors can create tessellating patterns, by digitally creating fantastic wallpaper designs that are projected onto a large white wall. Visitors can control the design of their illuminated wall paper by using an assortment of tools including various brushes and stamps.

Visitors start by select a tessellating framework on which to draw. Using the touch screen they can paint their design using a variety of different colors. Each brush stroke the visitor makes is instantly repeated to create a wallpaper pattern.





# WHITE WATER

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Water

**Collaborators:** Gyroscope Inc.

*White Water* is a large-scale, water play landscape that provides multiple opportunities for visitors to experiment, change variables and observe cause and effect systems. It's a natural platform for exploring engineering and the physics of water, while also celebrating the artful pattern-making properties of fluids. This exhibit incorporates jets, currents, rapids, eddies, foam, froth and all the interesting things that happen when water mixes with air. There are full body dryers mounted to the side of the exhibit allowing visitors to have uninhibited fun without worrying about staying dry.





# WEATHER ORCHESTRA

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Air, Nature, Sound

*Weather Orchestra* is a collection of musical instruments that are played by the weather. Scientific instruments and devices that mimic the weather are also included in the orchestra. *Weather Orchestra* is located on the roof where it is subject to different weather conditions. The exhibit will spark questions about weather and encourage thoughtful conversation about how weather changes from season to season. Visitors may discover that wind is coming from different directions at different times of the day or that the sun's position in the sky is changing due to the rotation of the earth and the seasons. These variables influence how the musical instruments are played and through careful observations, visitors can be the conductors of this 'weather orchestra.' The juxtaposition of science, art and technology allows many entry points for engaging with STEAM.





## LOOKOUT TOWER

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Technology, Nature, Light

**Collaborators:** Gyroscope Inc.

*Lookout Tower* is a great spot to soak up some amazing views. This exhibit is unique in that it allows visitors the opportunity to look out on the landscape in a variety of ways. The Infrared imaging reveals a heat view of the environment prompting visitors to ask questions about heat loss and gain. Why is the ocean cold, but the rooftops hot? Why is a car's hood hot, but the windshield cold? This encourages conversations about sustainability.

The other viewers use lenses and mirrors to change perspectives. There is a telescope that allows visitors to see far away, a periscope that allows visitors to see around corners and a kaleidoscope that creates patterns out of the landscape.



Handbook and  
Binoculars

The Special Project





# MINDBALL

**Location:** MOXI The Wolf Museum of Exploration + Innovation

**Themes:** Mental Focus, Attention

**Collaborators:** Gyroscope Inc.

*Mindball* is a fun and interactive exhibit that tests visitors' focusing abilities. Exhibit users have the opportunity to challenge their opponent in a mental competition. The goal of playing is to move the giant overhead ball towards your opponents side until it reaches the end.

Each side of the table features a headset that players set their foreheads against to play. After pushing the start button, each headset begins to read the visitors' EEG signals. Mindball computes the EEG signals into a score. As readings are taken, the large overhead ball begins to move towards the visitor with the lower score. Players can see their progress through a small window on the tabletop that has a small metal ball, moving back and forth as watchers can see the progress through the movement of the overhead ball. Once the ball reaches one side, the game is over and ready for new a new competition.

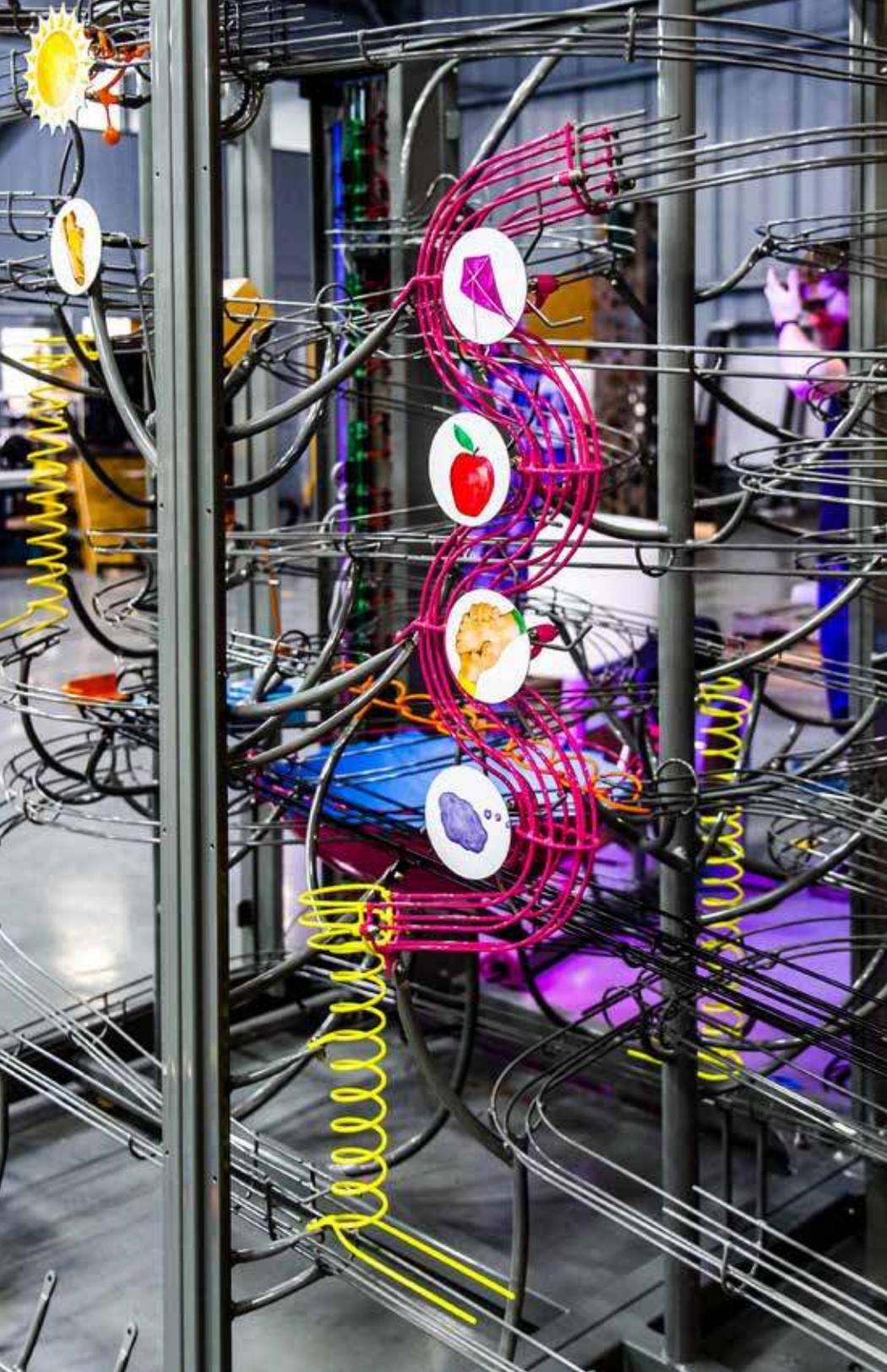


BALL MACHINES



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# ALL SYSTEMS GO

**Date:** 1983; fully restored, 2015

**Dimensions:** 8'L x 8'W x 8'H

**Location:** Port Authority Bus Terminal, New York, NY

*All Systems Go* is a highly interactive Ball Machine designed for the Cayton Children's Museum, whose mission is to combine activity, learning and rest into a "whole museum" experience.

The message of the *All Systems Go* Ball Machine is that "each choice impacts the next, for us and our families." Through interacting with the Turning Knob, Bouncy Seat, Hand Crank, and Bike interactives, visitors can learn the impact good or bad choices have within the machine and relate that message to their own lives.





# PERPETUAL NEPHRON MACHINE

**Date:** 2018

**Dimensions:** 92" L x 44" W x 168" H

**Location:** Multiple Locations

*Perpetual Nephron Machine* is designed to describe the process of uric acid removal in patients with CKD (chronic kidney disease) and gout.

Pink and blue balls begin their journey on their individual tracks at the glomerulus. A track hidden behind the top cross member queues the balls which are released when the previous balls have completed their journey. When released, approximately 10 balls roll through the track at a time. Meanwhile, in another section of the sculpture, pink

and blue balls flow along the track which winds horizontally overhead as well as down vertically. This allows viewers standing at ground level to easily view the path of the balls. The machine is also equipped with sound effects to represent processes that occur in each location of the sculpture.

*Perpetual Nephron Machine* made its debut at Kidney Week 2018 in San Diego, California and will make its another appearance in 2019 at the conference in Washington, DC.





# NEWTON'S CONVERGENCE

**Date:** 2018

**Dimensions:** 14'L x 5.5'W x 6.5'H

**Location:** The Franklin Institute, Philadelphia, PA

*Newton's Convergence* is a large, two-chamber ball machine made for The Franklin Institute, one of the oldest and most beloved science museums in the US located in Philadelphia, PA. The sculpture replaced the long-standing and well-loved Newton's Dream ball machine originally installed in 1990. This state of the art machine has a sleek new design and a wide range of fun, up-to-date devices and features. The machine is housed in the Sir Issac's Loft section of the museum, a space that celebrates and explores all things kinetic.



# CATHEDRAL COASTER

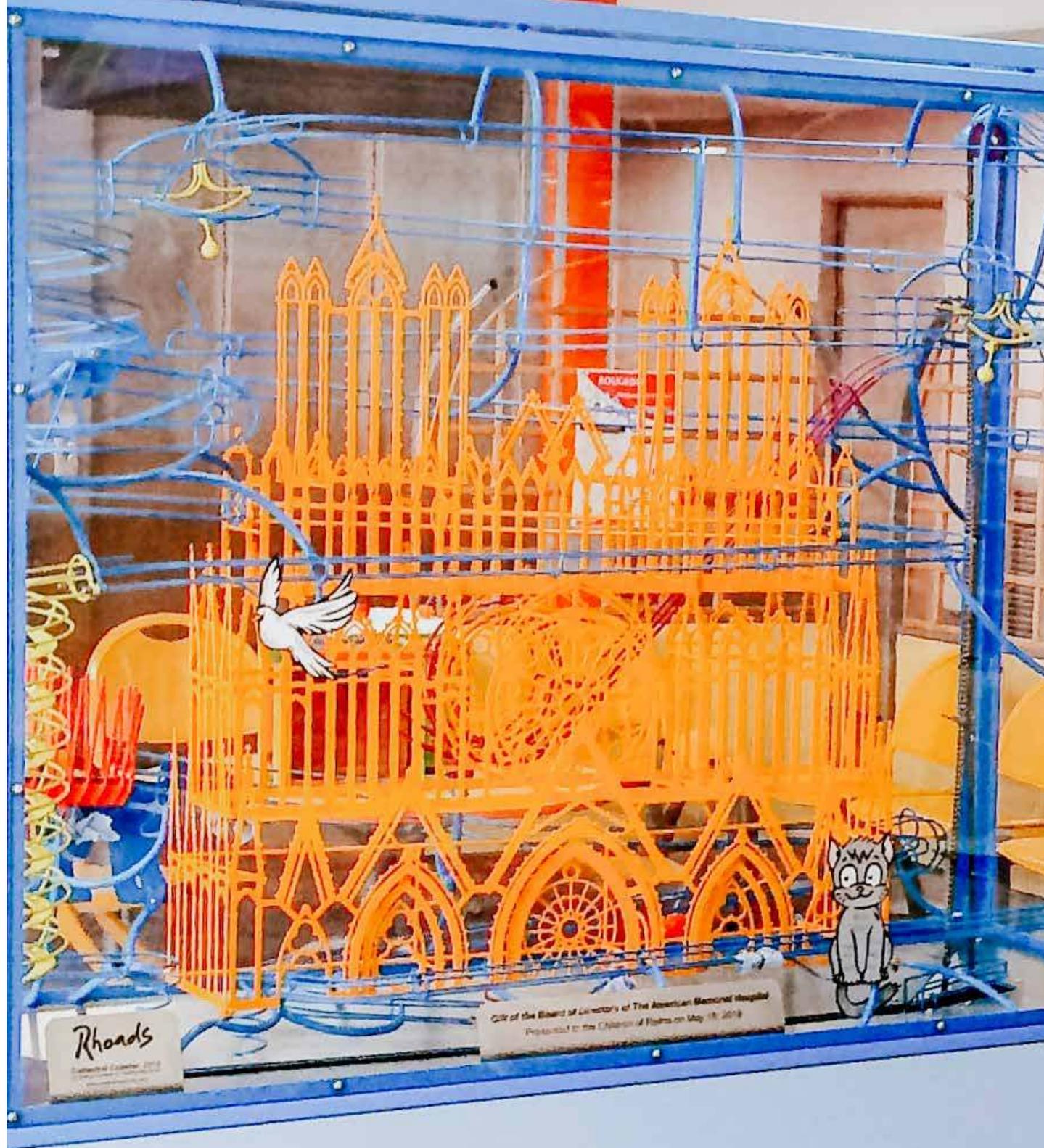


**Date:** 2018

**Dimensions:** 2M L x .75M D x 2M H

**Location:** American Memorial Hospital, Reims, France

*Cathedral Coaster* is a rolling ball sculpture that was commissioned by American Memorial Hospital, a hospital located in Reims, France that specializes in pediatric medicine. This delightfully colorful kinetic machine celebrates the rich history of the region through devices that include a depiction of Reims Cathedral and many other whimsical elements. This sculpture features a variety of classic devices, including hammer-bells, loop-de-loops, ball lifters, swinging-birds and spiral helixes integrated with highly custom pieces like the Reims Cathedral model.



CATHEDRAL COASTER



# DIN DON

**Date:** 2017

**Dimensions:** 8'L x 8'W x 22'H

**Location:** Harborland Shopping Center, Himeji, Japan

*Din Don* was created by George Rhoads at Rock Stream Studios in Ithaca, New York in 1992. The sculpture was designed to be larger than life, reaching high up to the atrium near a walkway on the second floor. The sculpture was placed near the doorway to introduce guests and set a tone of fun and playfulness.

In 2016 Creative Machines began the restoration process and completed re-installation in 2017.





## INCREDIBALL JOURNEY THROUGH STANFORD

**Date:** 2017

**Dimensions:** 94.5" L X 76.5" W X 97" H

**Location:** Lucile Packard Children's Hospital at Stanford University, Palo Alto, CA

*Incrediball Journey through Stanford Campus* is a Ball Machine Sculpture located at the Lucile Packard Children's Hospital at Stanford University. The balls travel through this custom machine and give viewers the opportunity to experience Stanford Campus in an entirely new way. As visitors watch, the ball travels along the track, passing many of the artistic, academic, historical and memorable places on the campus, re-imagined as small ball machine devices and models. These notable places include Hoover Tower, Bing Concert Hall, Cantor Center and The Thinker.





# SOUND MACHINE

**Date:** 2017

**Dimensions:** 10'H x 12'D

**Location:** MOXI The Wolf Museum of Exploration + Innovation,  
Santa Barbara, CA

*Sound Machine* is an audio-kinetic ball machine sculpture created for MOXI, The Wolf Museum of Exploration + Innovation. Living up to its name, *Sound Machine* features a variety of sound producing elements that attract visitors' attention. Some of these devices include bells, a symbol, wooden blocks, and a xylophone.

The ball machine sculpture is composed of two sections that visitors can walk through; this gives visitors the chance to gain a unique view, similar to what they would see if they were inside any other ball machine.

*Sound Machine* also provides visitors with the opportunity to manipulate the track through interaction. This can happen 2 ways: by spinning a handwheel or turning a knob. Lastly, *Sound Machine* features 3 electronic light columns that give this ball machine a modern look. This fully immersive experience is something completely unique to the *Sound Machine* and something we hope to incorporate in future ball machines.





## 42<sup>ND</sup> STREET BALLROOM

**Date:** 1983; fully restored, 2015

**Dimensions:** 8'L x 8'W x 8'H

**Location:** Port Authority Bus Terminal, New York, NY

With its unique and ingenious devices, *42nd Street Ballroom* by artist George Rhoads was truly a prize of its time. In 1983, the ball machine was installed in the lobby of the Port Authority Bus Terminal, welcoming viewers with its curious sounds and striking visuals. At that time, *42nd Street Ballroom* was the largest and most complex sculpture Rhoads had created, and the piece ushered in a period of prolific production of larger pieces.

*42nd Street Ballroom* features over 15 devices that range in function from producing bell and chime sounds to ensuring random movement of balls. 24 billiard balls roll through the track along 4 separate paths. Each path the balls take, give viewers the opportunity to experience a unique

sequence of events largely in part due to the randomizing devices present in each track. Visitors can sit and watch the machine for hours without exhausting all of the possible sequences. The sculpture currently operates with a timer, but the new machine also features a push button that allows visitors to activate the balls at any time.

Through its time at the Port Authority, *42nd Street Ballroom* has become a well known attraction to visitors of the terminal and a classic example of Rhoads' artwork. Many of the devices that were seen in the original artwork have been created once again using sturdier materials to ensure the longevity of the machine.





# DREAM ABOUT SHIRASAGI

**Date:** 2013

**Dimensions:** 7'L x 7'W x 10'H

**Location:** Piole Shopping Center, Himeji, Japan

*Dream About Shirasagi* is a ball machine sculpture created in collaboration with the renowned kinetic artist George Rhoads. The sculpture depicts an egret (shirasagi) circling the sky, appearing to children in dreams and leading them to Himeji castle, a UNESCO landmark in Himeji, Japan. Like a dream, the movement of each ball is random and its path unpredictable. The viewer is meant to imagine themselves in the sculpture and enjoy the adventure.

The sculpture delights people of all ages and backgrounds with its swooping tracks, ingenious devices (that transform the movement of the rolling balls), sound producing elements and charming miniatures.

In *Dream About Shirasagi*, there are three separate tracks for the balls to travel along. They move through devices such as a Bounce & Catch, Jiggle Pin Board, Hammer & Chime, Rock Back, Vee Bounce and Spinning Ferris Wheel.

Devices that are unique to this sculpture include wooden organ pipes that play low resonate tones and a hand-crafted miniature of the Himeji Castle. The sculpture also features Randomizing Pendulums with two white egrets attached and one large motorized egret that majestically flies overhead.





## LE REVE DE NEWTON

**Date:** 2015

**Dimensions:** 8'L x 2'W x 10'H

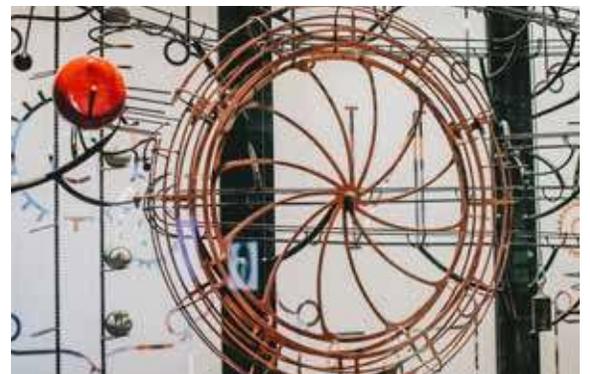
**Location:** Pass Museum, Frameries, Belgium

*Le Reve de Newton* is a visual exploration of the concept of energy located at the interactive PASS Museum in Frameries, Belgium. This compelling Ball Machine Sculpture sits at the entrance of the museum's latest exhibition, "Energy, the New Dreams" and welcomes visitors into the space. The exhibition creates the opportunity to explore the world of energy asking people to investigate the science hidden within our everyday lives and dream of new ways to consume, experience and share energy.

The Ball Machine Sculpture we have designed features a number of devices that explore these themes. For example, the machine includes a Chaos Wheel, which takes balls spins them around using their own energy

and releases them in a different location. It also features a Dip Fall in which a ball rolls back and forth until it loses energy and falls unto the track below.

The sculpture includes a number of classic devices as well like left-right switches and sound producing elements like hammer bells and wooden blocks for the ball to jump down. The balls, track, and devices in *Le Reve de Newton* are dynamic examples of how energy is conserved, transferred, and transformed.





## LIMITED EDITION SERIES

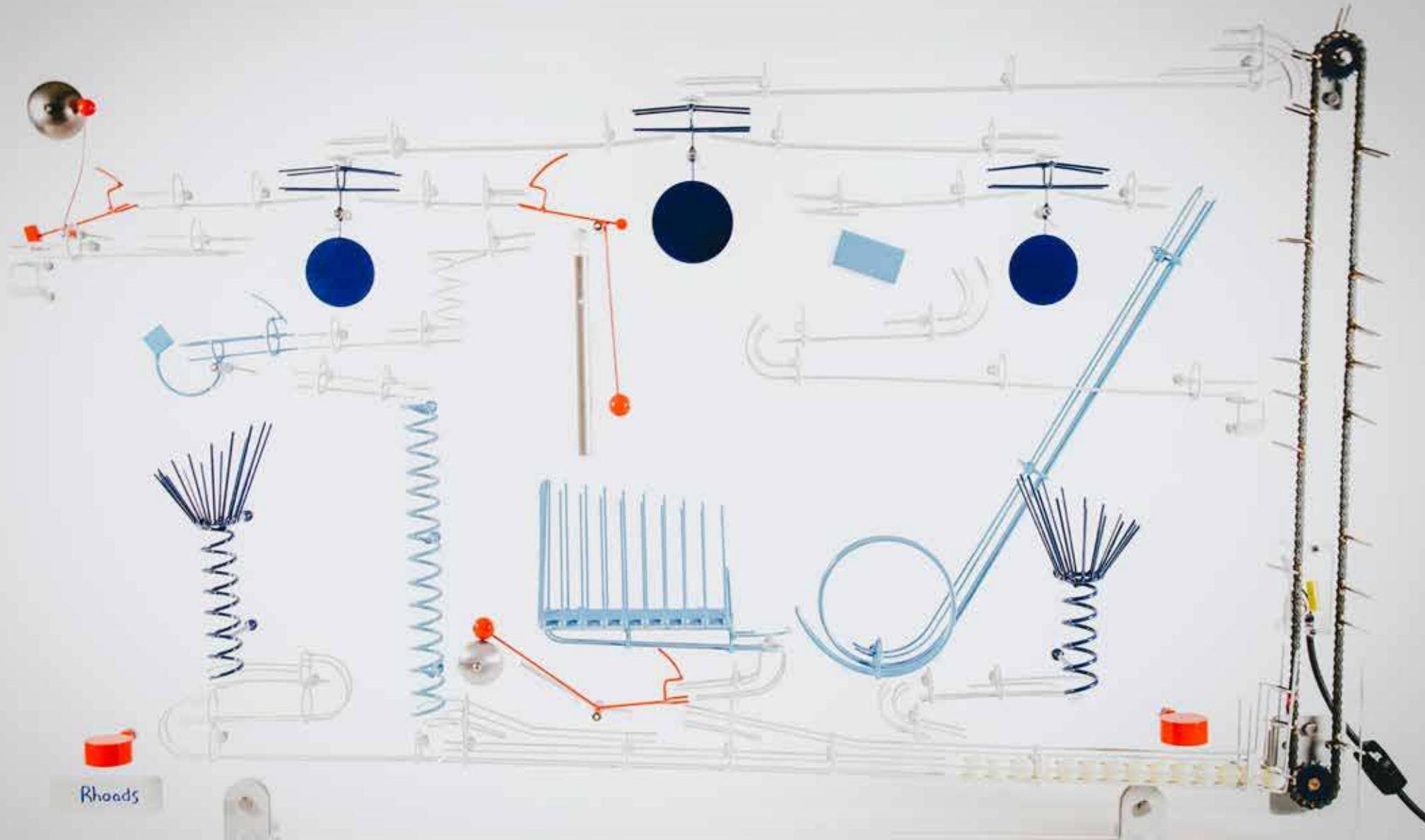
**Date:** Currently available  
**Dimensions:** 5'L x 10"W x 3'H  
**Location:** Multiple

Our *Limited Edition Ball Machine* Sculptures are a series of wall pieces that are ideal for private art collectors, hospital waiting areas, and smaller public spaces.

The current "Fantasy" series includes a total of 100 ball machine sculptures, but for the first time we are offering sculptures in two different color palettes. There are 50 "Summer Fantasy" sculptures with a warm color palette, and 50 "Winter Fantasy" sculptures in a cool color palette. Each sculpture is numbered, signed and dated by the artist George Rhoads.

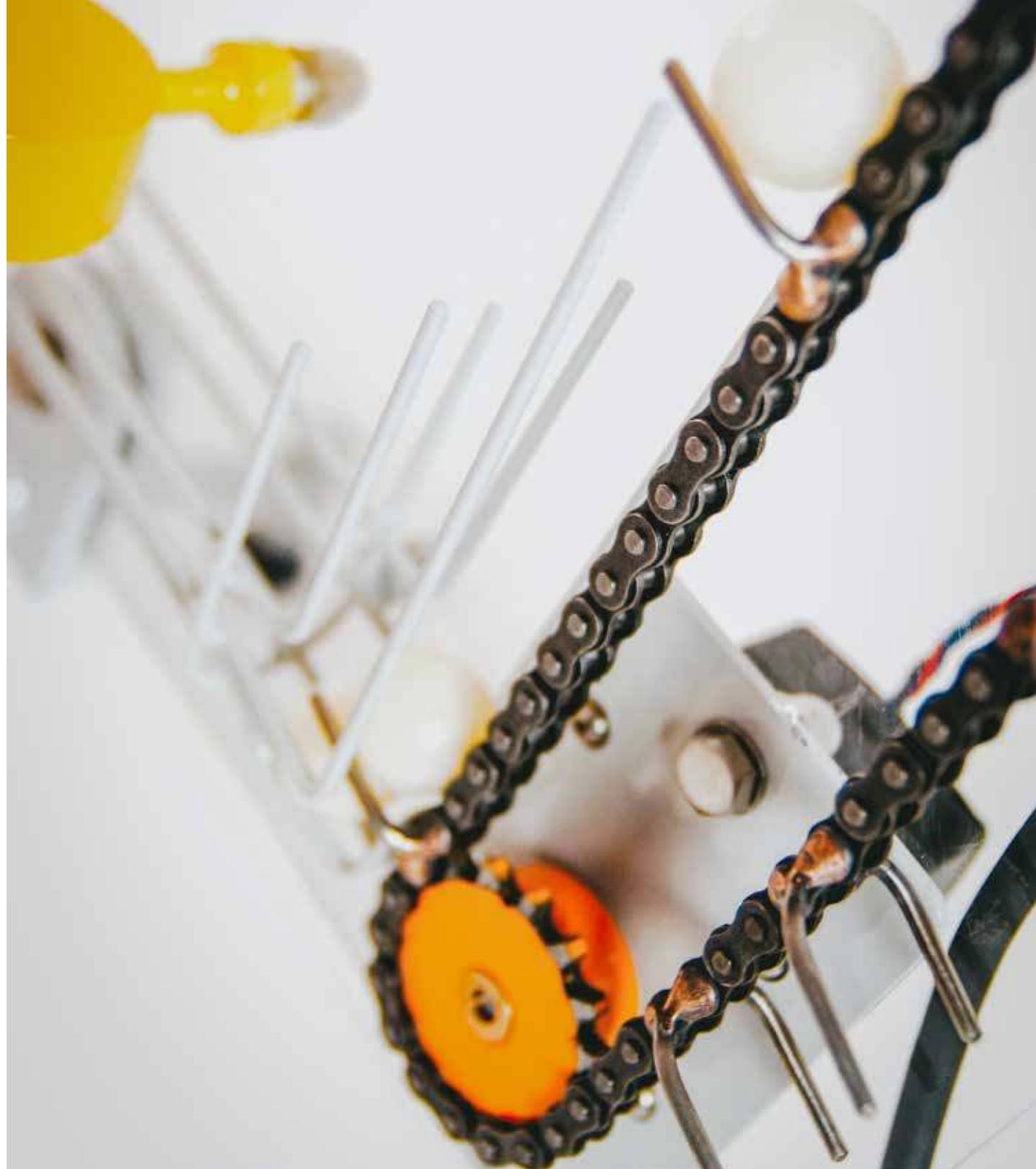
These sculptures include many classic devices such as Randomizing Pendulums, a Hammer Chime, a Bounce & Catch, and 2 Hammer Bells. Both the devices and tracks appear to float against the clear acrylic background.

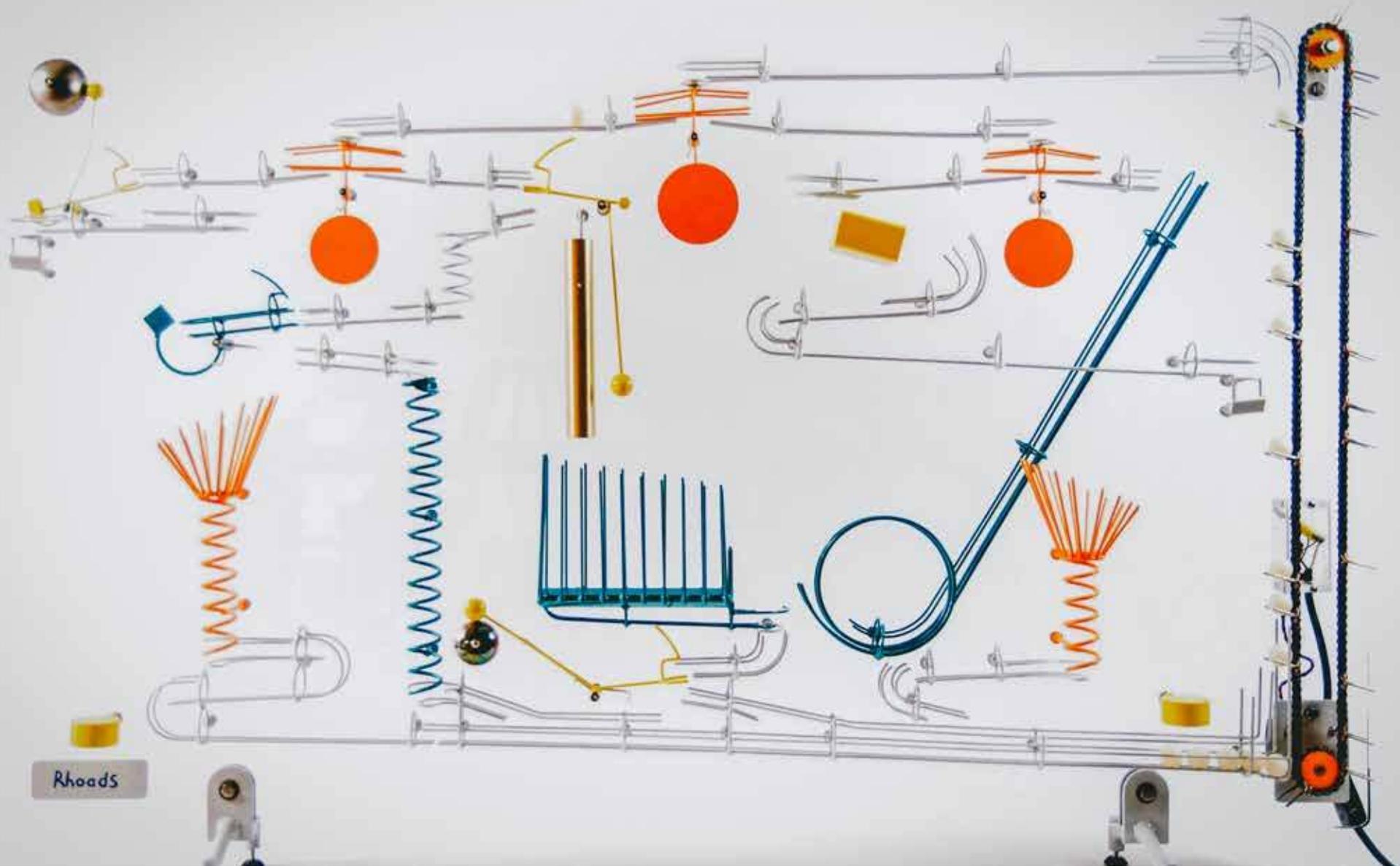
Each artwork is designed to be free standing running on a table or desk top, however we also offer options for case enclosures that can house and protect the ball machine. These cases can range in color and size, and can include a timer that triggers the machine or a push button that turns the machine on and off.



Rhoads









## NEWTON'S DAYDREAM

**Date:** 2005

**Dimensions:** 30'L x 15'W x 36'H

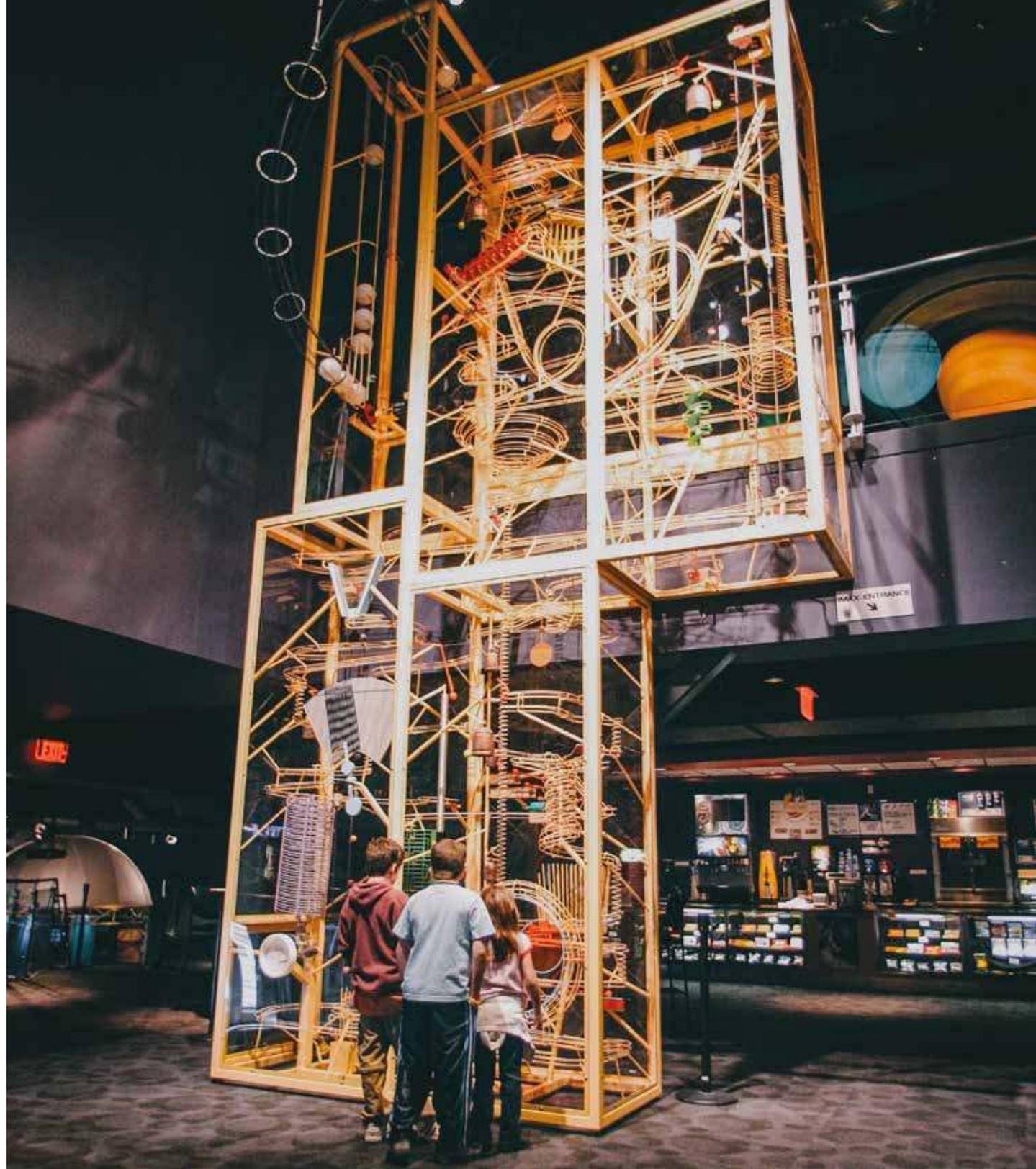
**Location:** Clark Planetarium, Salt Lake City, UT

*Newton's Daydream* is a 30-foot, audio kinetic ball sculpture at the Clark Planetarium in Salt Lake City, Utah. This one-of-a-kind ball machine sculpture uses two sizes of balls so that the action at the top can be seen by viewers below.

The sculpture is located on the stairway in the planetarium's main lobby and is a focal point for all visitors. The artwork spans two stories allowing visitors to explore its intricate maze of track from two vantage points. The large vertical space allows for some exciting movement, as balls roll down spirals and staircases and fly through the air moving through intricate devices such as the Orrery, Climber, Wraparound, and Spinner. The sculpture also features an interactive

wheel where visitors can affect the pathway of the balls causing them to climb up and roll down in a chaotic fashion.

The piece contains approximately 300' of track and even covers the ceiling with a swirling path meandering around seven illuminated planet-like spheres. We are currently restoring this sculpture integrating a new "comet" lighting effect in which rings of LED lights wrap around the track. As the ball moves the rings will light up matching the ball's motion and creating a dynamic glow of moving light across the ceiling. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





# ARCHIMEDEAN EXCOGITATION

**Date:** 1987

**Dimensions:** 8'L x 8'W x 27'H

**Location:** Museum of Science, Boston, MA

*Archimedean Excogitation* is a dynamic ball machine sculpture located at the Museum of Science in Boston, Massachusetts. The sculpture explores the theme of “a new way of seeing,” and uses visual and kinetic elements to explore how we see and offers new ways of looking at the world.

Rising nearly thirty feet into the air, viewers enjoy the sculpture from the ground as balls and devices dance in front of them and over their heads. People on the nearby stair landing and balcony can also experience a unique view of the top section's constellation of moving shapes spinning and twirling around the machine. These colorful counterbalanced shapes move through space evoking an aesthetic similar to Alexander Calder's artwork.

This machine includes nearly thirty moving or sound producing devices with two different ball sizes featuring billiard balls in the bottom section and small bowling balls in the top. Balls move through the sculpture looping, rolling, and falling as they trigger hammer drums and bounce on xylophone keys. The sculpture has been used as a teaching device demonstrating simple machines and potential and kinetic energy. *Archimedean Excogitation* embodies the goal of the museum to represent scientific concepts in an educational yet fun way. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





# BALL ZOO

**Date:** 2004

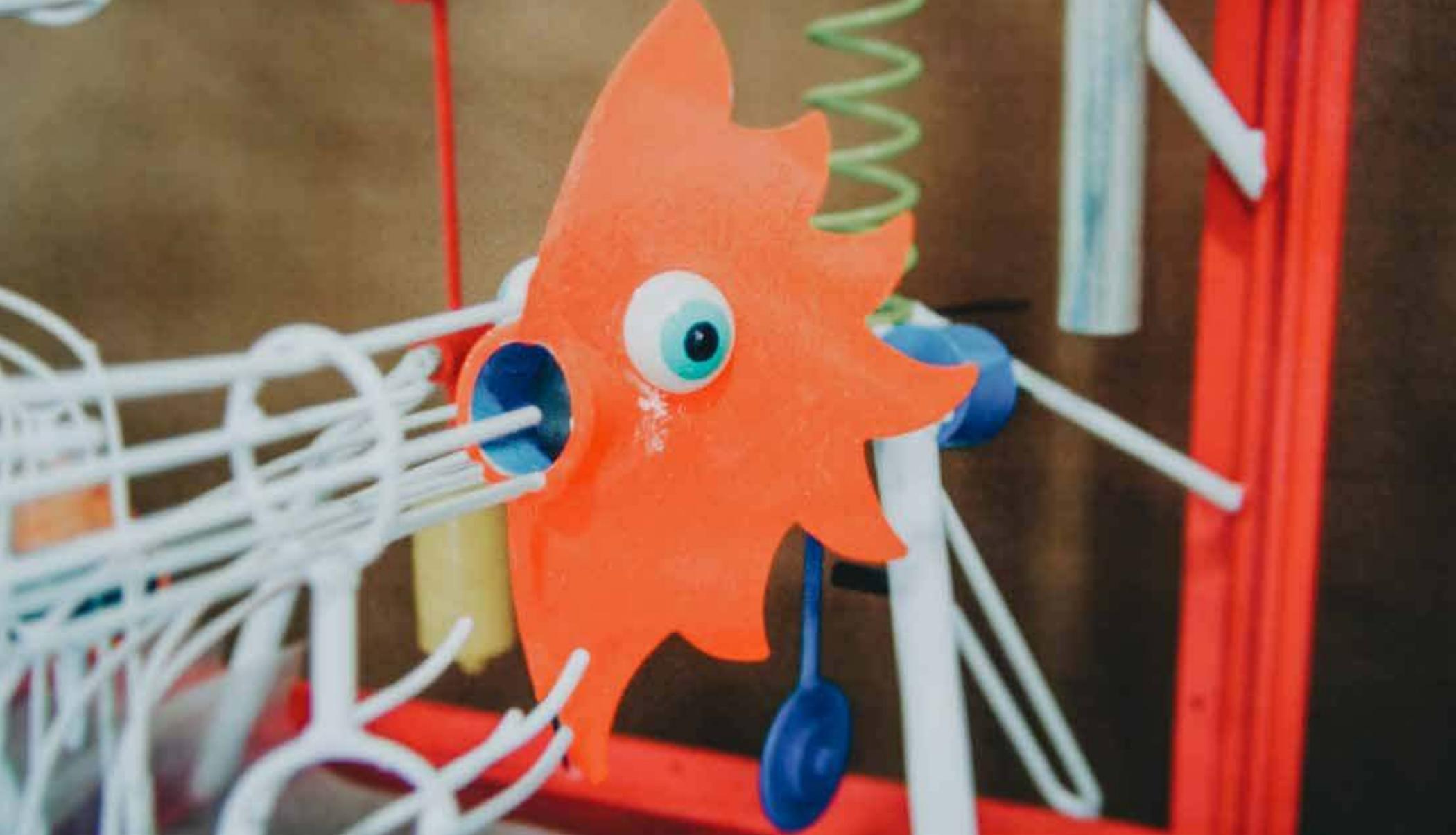
**Dimensions:** 4'L x 4'W x 7'H

**Location:** Driscoll Clinic, Brownsville, TX

*Ball Zoo* is a playful ball machine sculpture filled with a menagerie of cartoon animals located in the Driscoll Clinic in Corpus Christi, Texas. The sculpture has three tracks and almost twenty devices that bring the zoo alive through movement and sound. This freestanding sculpture allows visitors to view the ball machine from every angle and includes a button to turn the sculpture on and off. This artwork brings a sense of fun to the hospital setting and give visitors the ability to enjoy watching the balls move through the playful machine.

Bell, a Hammer Xylophone and Chime. The ball machine includes polka dot and striped fish swimming among speckled green frogs. The sculpture has a colorful Worm dumper and a wire Go-through Chicken and Turtle. Finally, the rosy red frame pops against the room's neutral color palette. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.

Balls zoom along the white track clanking into a series of cheerful sound-producing elements like a Rod Chime Row, Rapid Hit





# ODYSSEA

**Date:** Currently available for purchase

**Dimensions:** 35" H x 25" Dia.

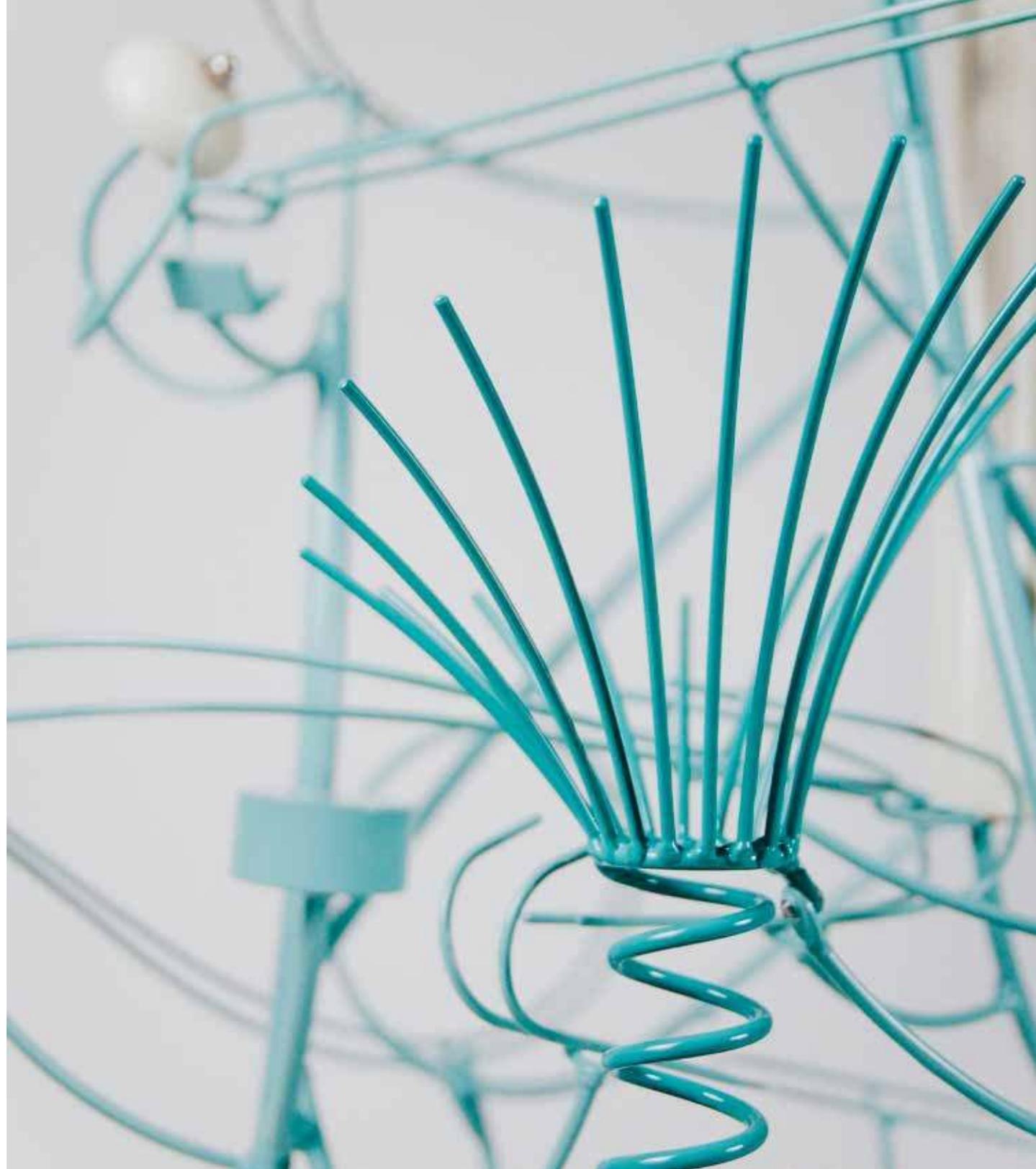
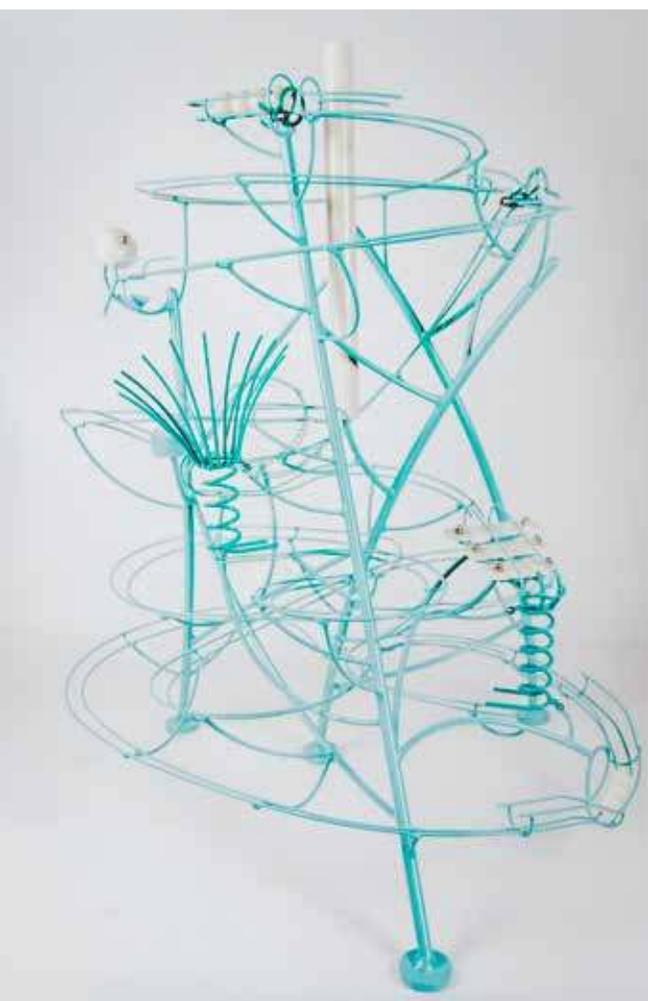
*OdysSea* is a unique three-dimensional table-top ball machine that features many classic devices found in most larger ball machines.

Once triggered, the manual switch feature of this machine releases a ball onto the track. The ball travels along a single path until entering a Left-Right Switch, which then directs the ball onto one of two different tracks.

Balls entering the first track will encounter a Loop-the-Loop, tap a Chime and run across a set of Xylo-Chimes. Balls following the second track will hit a bell, then fall, enter the Bounce and Catch, travel down the helix of the Catch basket, and follow along a winding

path until reaching a small portion of track that sends them in a zig zag motion back and forth. As balls finish their sequences, they will gather at the bottom and wait until the viewer moves them back up to the top to start over again.

Unlike many other two-dimensional table-top Ball Machines, *OdysSea's* three-dimensional track sequences provide a more lively and exciting experience for viewers.





## INCREDIBALL CIRCUS II

**Date:** 1993

**Dimensions:** 20'L x 18"W x 9'H

**Location:** Akron Children's Hospital, Akron, OH

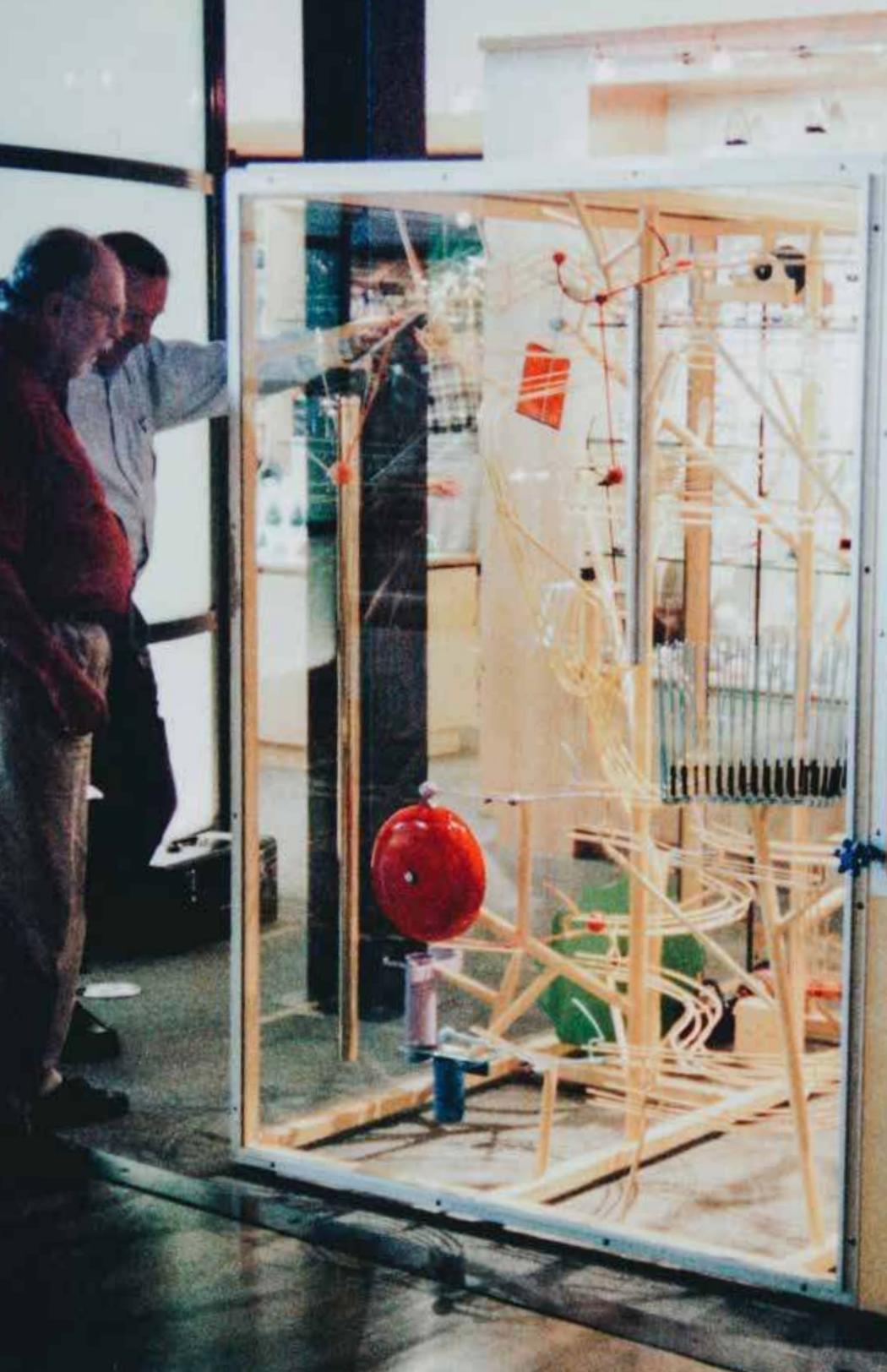
*Incrediball Circus II* is a playful ball machine sculpture with a circus theme created for Akron Children's Hospital in Akron, Ohio. The sculpture is located in the main lobby atrium and is a centerpiece to each child's visit to the hospital. The artwork becomes a lighthearted diversion for adults and children facing difficult situations bringing a sense of play and joy to the space.

Approximately forty balls run through a maze of track spinning and twirling through Helices, Dips, a Bounce & Catch, a Vee-Bounce, and a Triple Loop. Colorful shapes and painted clowns intermix with musical

elements like Hammer chimes, Xylophone bars, Gongs, Bells, and Wood Blocks. The sculpture even includes a separate Triple Chaos Pendulum activated by its own 2 1/2 inch steel ball.

The sculpture's bright color palette stands out against the surrounding architecture. The piece can be viewed from both sides inviting visitors to move around the artwork following the ball or discovering new details. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





## S'MARBLOUS

**Date:** 1999

**Dimensions:** 6'L x 5'W x 6'H

**Location:** Museum of Glass, Corning, NY

*S'Marblous* is a unique ball machine sculpture created for the Museum of Glass in Corning, New York. This machine features many classic devices such as the Hammer Chime, Loop-the-Loop and Catch Basket. However, the artwork was specifically themed around the Museum of Glass and therefore contains a number of glass devices including a glass bell. Although devices are typically made out of steel, these unique glass devices give the sculpture a singular look and audio experience. In addition, the machine was designed to inspire and mimic innovation so as to reflect the Museum of Glass itself.

This machine features two tracks for the balls and a separate track for marbles that the visitor can activate. Visitors are able to deposit tokens into the machine and unleash a helix full of glass marbles into the sculpture. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





## ZIPPY ZOO

**Date:** 1996

**Dimensions:** 6'L x 30"W x 7'H

**Location:** Columbia Presbyterian Children's Hospital, New York, NY

*Zippy Zoo* was the fourth ball machine to be installed in a US Children's Hospital. It is located at Columbia Presbyterian Babies & Children's Hospital in New York, New York.

The sculpture contains many devices that are themed around whimsical animals for both children and parents to enjoy. There are two pendulum switches one with a cat and another with a monkey. The pendulums swing back and forth as the ball passes through them making the animals' eyes jiggle. The machine features a cartoon Ostrich with a counterbalance that rocks back and forth as balls enter and leave its mouth.

The Hammer Chime appears as a fish swallowing and then releasing a ball. Finally, there is a specially designed turtle that opens its mouth when balls roll up to it, swallows the balls causing its legs to move and then the balls exit the turtle spilling back onto the track. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.



WELCOME  
BABIES HOSPITAL  
SLOANE HOSPITAL  
FOR WOMEN  
VISITING HOURS  
CHILDREN 12 TO 8 PM  
MATERNITY 6 & 7 FLOORS  
630 TO 8 PM  
TWINS 330 TO 430 PM  
NO CHILDREN UNDER 14 YEARS





## BASED ON BALLS

**Date:** 1998

**Dimensions:** 10'L x 10'W x 41'H

**Location:** Chase Field Ballpark, Phoenix, AZ

*Based on Balls* is an entertaining ball machine sculpture with a baseball theme located at Chase Field in Phoenix, Arizona and inspired by the Arizona Diamondbacks. The monumental sculpture sits outdoors housed within an air-conditioned derrick that extends into the sky with a baseball bat, plate, and giant baseball at the top.

The sculpture uses two different sized balls, includes four tracks and almost fifty devices. With just a press of a button, visitors can set the sculpture into motion. When the machine is moving a ball bounces down a xylophone stair playing "Take me out to the Ball Game." Another ball hits a paddle, rings a bell, and activates a sound box, which yells, "You're out!" A miniature batter swings futilely at a ball that flies through the air from a Loop-the-Loop into a basket.

A ball zips along the track causing a tiny crowd to do "The Wave" and whizzes through a diamondback rattlesnake that swallows the ball whole. A Dumper drops a load of balls down a set of bleachers and then balls zoom around miniatures of a hot dog, peanut, and cleated shoe before flying through a Catcher's open mouth.

The machine captures the spirit of baseball and the joy of a day at the baseball park. Fans of all ages love to stop and watch the ball machine on their way in and out of the stadium. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





## POETRY IN MOTION

**Date:** 2004

**Dimensions:** 7'L X 18" x7'H

**Location:** Comer Children's Hospital , Chicago, IL

*Poetry in Motion* is a playful ball machine sculpture located in the Comer Children's Hospital in Chicago, Illinois. The sculpture features an animal-theme inspired by a series of seven poems by poets such as Matsuo Basho and Ogden Nash. This kinetic artwork makes the poems come to life.

The machine includes fun devices such as an orange Hammer Bell, yellow Pin Board, red Loop-the-Loop, and swirling Helices. It also has three Randomizing Pendulums with painted images of a fish, turtle, and

bright red cardinal. Balls hop down a series of green Wood Block Frogs, slink through a Snake Kinky Tube, and are grabbed by the mouth of a Nodding Dragon and dropped onto a track below. The colorful animals pop against the white track and blue background. The sculpture includes a button that allows visitors to turn the piece on and off. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





## SWEET MORNING LOVE TOWER

**Date:** 1993

**Dimensions:** 10'L x 10'W x 41'H

**Location:** Aekyung Department Store, Seoul, Korea

Standing just over 40 feet tall, *Sweet Morning Love Tower* sits directly on the atrium floor of the Aekyung Department Store in Seoul, South Korea. The lower section is enclosed with scratch resistant Plexiglas while the upper section is open. This ball machine operates with billiard balls running down four separate tracks. The balls travel through the machine encountering many whimsical devices, such as the Wok, Bounce & Catch, Loop-the-Loop, Stairway Chimes, Sound Pendulums etc. Melodious sounds fill the room when balls pass over the xylophone bars, hit the hammer chimes, bounce on the wood blocks or interact with the other sound

producing elements. Atop the ball machine are 2 large rotating shapes and a rotating vertical helix with a ball hanging from a chord that introduces more movement throughout the entire piece.

*Sweet Morning Love Tower* is a piece that demands a considerable presence in the space in which it exists. It can be viewed from a distance but also draws people in through complex yet intimate interactions when the piece is viewed up close. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





# MAIN STREET BALLROOM

**Date:** 1998

**Dimensions:** 5'L x 5'W x 18'H

**Location:** Blue Cross Blue Shield, Rochester, NY

*Main Street Ballroom* sits in the lobby of the Blue Cross Blue Shield Headquarters in Rochester, New York. The ball machine welcomes visitors into the space with its charming sound-producing and dynamic devices. Made up of two distinct sections, upper and lower, *Main Street Ballroom* contains a wide range of classic devices, such as pendulum switches, hanging rod chimes, a wood block series, and bounce & catch baskets.

The lower section of *Main Street Ballroom* contains all of the track. Each of 3 tracks within this ball machine sculpture contains

3-5 devices that interact with the rubber lacrosse balls. The upper section contains 3 motorized rocking wands that work independently to provide a more kinetic visual experience to passersby. The blue color scheme corresponds well with the company's colors and the cooler toned lobby, while the complimentary yellow elements provide nice visual contrast within the space, calling attention the ball machine sculpture as it's own entity. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.



BlueCross BlueShield  
Finger Lakes Long Term  
MedAmerica  
Excellus Good



## HOMAGE TO THE ART OF SCIENCE

**Date:** 1997

**Dimensions:** 24'L x 5'W x 11'H

**Location:** Imagination Station, Toledo, OH

*Homage to the Art of Science* is a freestanding monumental sculpture. In the lower section small balls activate a series of sound and motion devices. The balls move on 1 of 4 tracks engaging devices such as bells, xylo bars, chimes and a mirror that each produce unique sounds.

The lower section includes 6 interactive stations. Visitors can turn an auger to raise a ball, release a dumper full of balls, and introduce them into the Double Bounce & Catch. With this device, two visitors are required to coordinate their efforts with the possibility of balls colliding.

The Avalanche is one of the interactive devices. The visitor puts the ball into play. The ball rolls over to the Avalanche and drops onto the first shelf. The next ball nudges the first ball and comes to a rest. Balls build up in

this manner until one or more of them roll off striking a chime and land on the next shelf. The action is such that sometimes one ball cascades through the system and sometimes several balls break loose and roll together.

Astrodynamic is also an exclusive device featuring a 24' track at the top of the sculpture. It is pivoted in the center to rock vertically so that the ends of the track rise and fall about 4-5 inches on either side. The device operates in a pattern similar to that of space vehicles, which accelerate continuously until about half way through their journey and then decelerate for the rest of the way. This is the fastest way for any vehicle to travel if, like a space ship, it cannot make use of friction to brake. This unique device and its theming reflect the museum's surrounding space exhibits.





# HAVING A BALL

**Date:** 1989

**Dimensions:** 14'H x 14'Dia.

**Location:** Ontario Science Center, Toronto, Canada

*Having a Ball* is a fun, entertaining Ball Machine Sculpture specifically designed for the Ontario Science Center. The sculpture includes interactive elements that allow visitors to affect the machine.

This monumental sculpture fits in a circular pad with a 14' diameter. There are two sections, one that uses small billiard balls and another that contains larger bowling balls. The small ball section includes 6 different tracks for the balls to travel through, each with their own device patterns. At the top of the first track is a pendulum switch that randomly directs balls onto different paths. Each track also contains unique musical devices that gong, chime, whistle, etc. when they are activated.

The large ball section operates on a motorized hook drive that lifts balls from 6' to 10' in the air. Balls roll down the helix with a wrap around device, jump onto a trampoline and continue on until reaching the lifting motor. The large ball section runs continuously and functions independently from the small ball section.

This ball machine sculpture is not enclosed like many other pieces but instead is surrounded by a fence that visitors can lean on and closely inspect the balls moving along track. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





# ADCETRIS

**Date:** 2013

**Dimensions:** 12'L x 6'W x 8'H

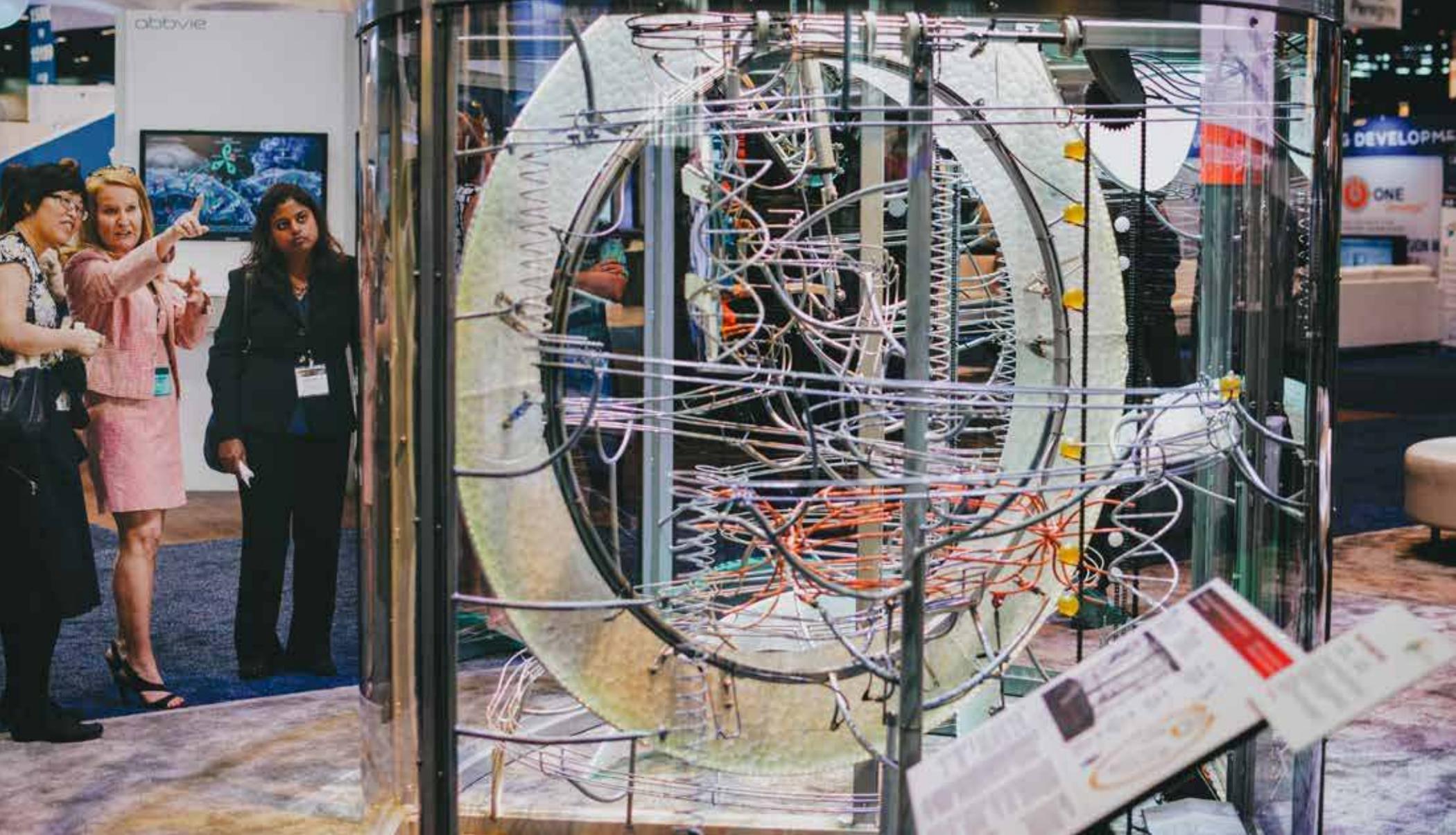
**Location:** Multiple Locations

*Adcetris* is a unique ball machine that primarily focuses on the visual narration of a sequential story. Compared to other ball machines that contain a more loose narrative, *Adcetris* is meant to display a specific process showing how a certain type of medication works inside the human body.

The client, Seattle Genetics, makes antibody-drug conjugate (ADC) medicines to help patients with cancer. This ball machine was an attention-getting way to attract doctors to the company's booth to learn about the journey of the ADC through the bloodstream, its binding with a cell-surface receptor, and how it enters the cell to attack the cancer.

The machine has been displayed at the ASH (American Society of Hematology) 2013 and ASCO (American Society of Clinical Oncology) 2014 annual meetings. The client took the ball machine to multiple events due to its success in drawing visitors to the Seattle Genetics booth.

Similar to more traditional ball machines, *Adcetris* contains multiple tracks. Mechanical devices within the sculpture move the balls from one side of the machine to the other, and a carousel carries balls between sequences. The machine features heat-formed textured panels that are motorized and pivot back and forth creating an open and closing action. These panels are lined with custom color changing LED lights that turn on once activated.



# CHOCKABLOCK CLOCK

**Date:** 1988

**Dimensions:** 13'L x 9'W x 46'H

**Location:** Strawberry Square, Harrisburg, PA

*Chockablock Clock* is a forty-six foot tower installed at the Strawberry Square mall in Harrisburg, Pennsylvania. The sculpture contains numerous billiard balls that run through a maze that is several hundred feet long. The balls activate a series of sound and motion devices such as Chimes, Xylo Bars, Bells, Wood Blocks, Drums, Helices, a Bounce & Catch and many more. The sculpture includes two corkscrew lifts that move the balls from the ground to the balcony before sending them through the maze of track once again.

Unique to this device is the large clock at the top of the sculpture. Partially powered by moving balls, the clock-striking-mechanism

chimes on the hour releasing a cuckoo and activating the four large motor-driven Rotating Shapes at the top. The sculpture's one of a kind clock creates an entertaining experience that visitors of all ages can enjoy.

Spanning two stories, the sculpture can be viewed from a distance or visitors can explore its complex mechanisms up close at each level. Visitors are continually mesmerized by the moving balls, spinning wheels, and pleasant ringing chimes. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.



## COLOR COASTER

**Date:** 1999

**Dimensions:** 27'H x 7' Dia.

**Location:** Stepping Stones Museum, Norwalk, CT

*Color Coaster* is an interactive color-kinetic sculpture on an architectural scale - an attraction that draws visitors to the Stepping Stones Museum for Children's tower and holds them in a whimsy of light, color and motion. Capturing sunlight as it streams into the tower, the *Color Coaster's* prisms, mirrors and crystals scatter light in a moving dance on the tower's inner walls and floor.

Tracks pierce the tower's wall to extend the experience overhead into the museum, where brightly colored polycarbonate elements, activated by the motion of balls, create ever-changing patterns of reflected light and color.

Directing balls through a maze of chutes, gates and switches, children and adults are engaged in hands-on play. Visitors study the twists and turns of the colorful balls along their path, tracking mechanical motions that reveal the machine's inner workings while honing observational skills. The *Color Coaster* is, in itself, a giant mechanical toy, a collection of simple mechanisms interconnected in an archetypal 'invention' machine. The sculpture dynamically integrates the architecture of the museum's landmark tower with the captivating ball machine. It is a one-of-a-kind attraction, created expressly for the Stepping Stones Museum for Children. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.



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## GOOD TIME CLOCK

**Date:** 1982, fully restored 2010

**Dimensions:** 4'L x 2'W x 6'H

**Location:** Multiple

The *Good Time Clock* is a medium size ball machine and one of George Rhoads' earliest sculptures. Creative Machines restored the sculpture in 2010. The piece is composed of two sections and contains many classic devices that emphasize the central concepts behind all ball machine sculptures such as engaging people in play and demystifying technology.

One unique element is the sculpture has a circular stained glass window with elements rotating around a center circle that evokes image of the sun or a clock. *Good Time Clock* has a vibrant color palette with strong primary colors and brightly color cogs that

further emphasizes the clock theme. The sides of the sculpture are completely open which allows people to inspect the machine from all angles and appreciate the full effect of sound producing elements such as bells and chimes.

The sculpture has been installed in a variety of locations and is one of the few ball machine sculptures available for use a temporary events. The casters attached to the bottom of the frame make it easy to move into new spaces. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.





## SCIENCE ON A ROLL

**Date:** 1990

**Dimensions:** 12'L x 4'W x 16'H

**Location:** The Tech Museum of Innovation, San Jose, CA

*Science on a Roll* is a unique machine that was originally created for the Tech Museum of Innovation in 1990. This monumental ball machine contains 5 motors and uses 2.25 diameter Billiard balls. There are 30 balls that travel through the different tracks.

Since this machine was inspired by technical innovations, it contains many devices that others do not. One of the motors powers the ball lifter and the pendulums, which runs whenever the machine is in operation. There is an Elliptical Gear motor and Two Sprocket Device motors that are energized

by switches enabled by certain mechanisms when the balls are traveling by. There is also a mechanized 6 ball dumper that relays information to certain switches throughout the machine eventually causing all of the balls to dump back onto the track.

This sculpture has been housed both indoors and out. At one time, it was integrated into the entrance staircase outside of the museum. This ball machine was designed by George Rhoads in collaboration with Rock Stream Studios.

# ENTROPY DREAMS

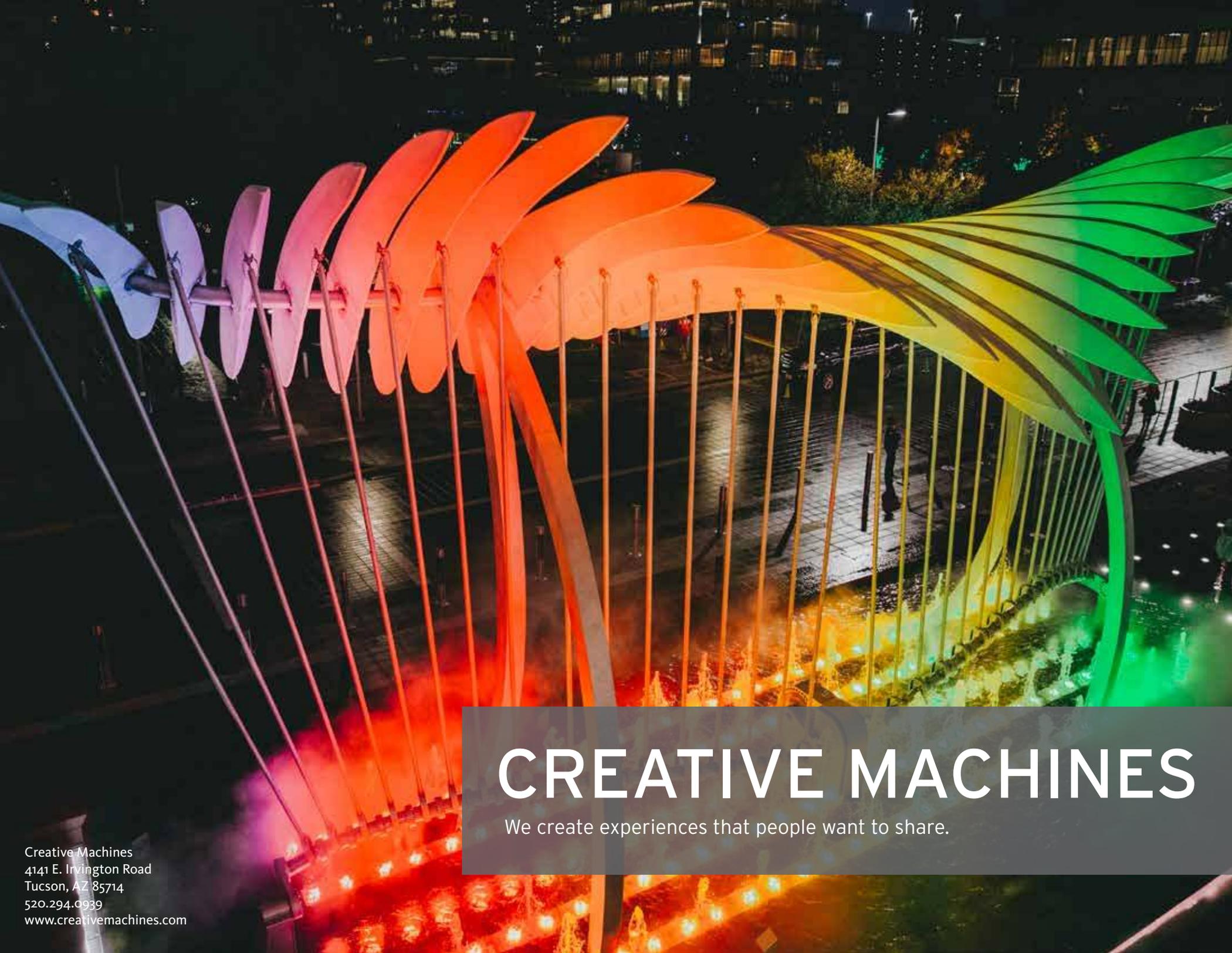
**Date:** currently commissioned  
**Dimensions:** 13'L x 28"W x 20'H  
**Location:** University of Alaska, Anchorage, AK

*Entropy Dreams* is an audio-kinetic ball machine sculpture inspired by the mission of the University of Alaska Anchorage's engineering building. The building strives to put engineering on display. Likewise, this sculpture acts as an instrument to spark engineers' imaginations, intrigues them with the basic principles of engineering and encourage investigation of the sculpture's kinetic and graphic parts. *Entropy Dreams* seeks to tap into the inquisitiveness that drew these students into the engineering field by engaging their desire to figure out how mechanisms and natural forces operate under different conditions.

Unlike other static artworks and sculptures with limited motion, *Entropy Dreams* creates a dynamic mechanism that will

draw students and visitors to its constantly changing behavior. Each ball machine sculpture is composed of two main parts: track that the ball travels on through the sculpture and devices that transform the balls' movement. *Entropy Dreams* contains devices that highlight root principles of engineering including simple elements such as gears, levers, and pulleys. Each of these mechanisms is on display expressing the design and engineering of the machine.

Finally, the machine is largely two dimensional with the idea that the ball machine is like an engineering drawing that comes to life highlighting the process of translation that nearly every engineer faces when bringing a drawing or idea into reality.



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