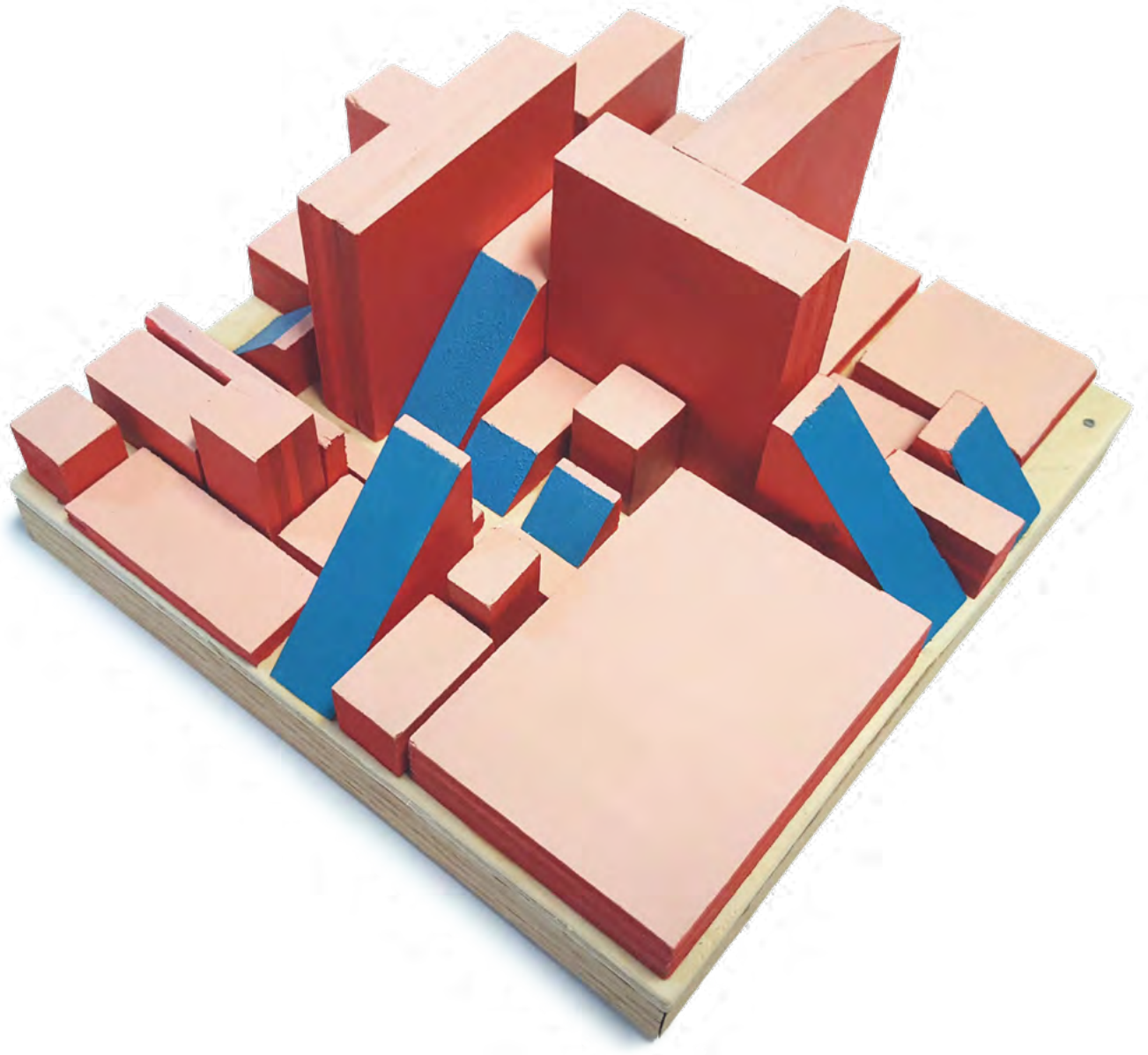
$\Delta r + \beta_\gamma \Pi \cup \infty b = r$

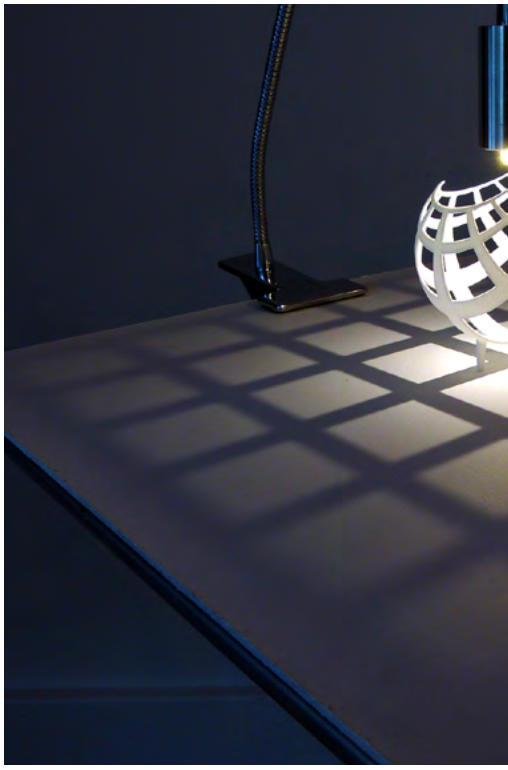


OCTOBER 9 – NOVEMBER 27, 2021

AT PENINSULA SCHOOL OF ART

"Mathematics, rightly viewed, possesses not only truth, but supreme beauty

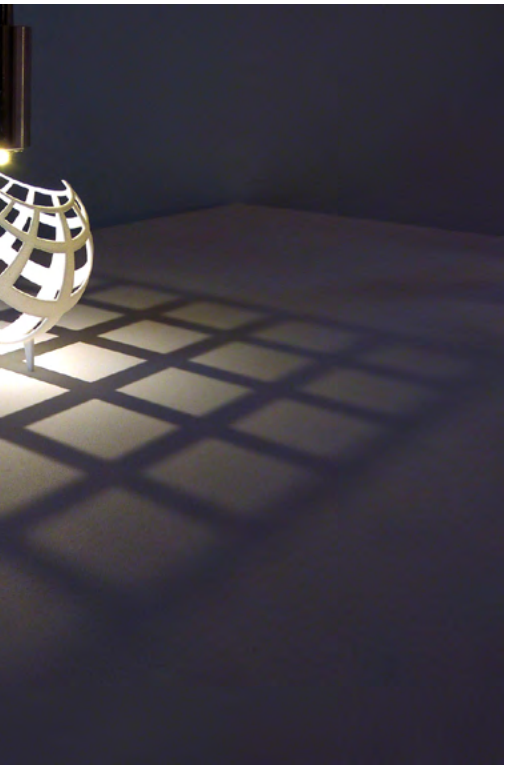
—Bertrand Russell, 1919



A 2014 study showed that for mathematicians, looking at an elegant equation activates the same area of the brain activated when others see a beautiful painting. While this study offered scientific proof, the connection between art, beauty, and mathematics has long been evident. *Art by Number* explores this connection through work resulting from or inspired by mathematics.

For many people, math is a class they had to take in school. It is timed multiplication tests, word problems about passing trains, solving for x, and graphing calculators. Day to day, it is figuring tips and taxes or how many inches up from center you need to place the nail to hang your picture in the right spot. Useful, but hardly inspirational. What most of us learned in school are just the basic tools for math, not the spirit of questioning and discovery in service of which they were developed and are still evolving today. It is like being given a compass, binoculars, and hiking boots when you've only ever been in a small room, and not being told that thing in the wall is a door to uncharted wilderness. Mathematicians are out in that wilderness, using their tools to describe what they see and to answer 'I wonder's and 'what if's, to think and talk about possible realities that can't be accessed any other way. It is these sorts of theories, questions, and curiosities that drive the work in *Art by Number*.

Several of the artists, for example, are thinking about spaces and surfaces. Artists have long been trying to create an illusion of space in their drawings and paintings using systems of perspective. Dick Termes studied them all and became expert in six-point perspective. While other perspectives allow artists to show the scene in front of them or even to the sides, with six-point perspective Termes can show a space in its entirety—front, back, left, right, top, bottom. He paints on globes he calls



Termespheres, describing them as “An inside-out view of the total physical world around you on the outside surface of a hanging and rotating sphere. If you were on the inside of this sphere, the painted image would appear normal, but it is read from the outside.” The Termesphere included in the exhibition, *Parts of the Whole*, is itself a lesson in perspective systems. It shows seven artists in a room, each using a different system. As more points are included, more of the scene is captured.

While Dick Termes is portraying space on the surface of a sphere, Henry Segerman is transferring a pattern from a sphere to a flat surface using stereographic projection, a method of mapping that uses one-to-one correspondence. Imagine a globe resting with its South pole on an infinite sheet of paper. Each city on the globe can be transferred to a spot on the paper along a straight line that starts at the north pole and goes through the city to the paper. Cities on the South pole would end up looking very close together, while those toward the North would look far flung. However, the highways intersecting them would form the same angles. Segerman’s sculptures elegantly illustrate this phenomenon by placing an LED at what would be the North pole of a pierced spherical shell. The light rays act like the imagined lines, casting shadow patterns on the pedestal.

We’ve talked of flat and spherical surfaces, but Gabriele Meyer works with yet another kind. Her hyperbolic surfaces curve in two directions from every point, like a saddle or a Pringle chip. She does this by crocheting around weed-whacker string, adding stitches as the work spirals outward, creating beautiful, ruffled sculptures suspended in air like floating sea creatures.

“In math if you want to prove something really beautiful, you have to understand the structure. And the structure means you understand the beauty of an object and with that knowledge you often times can make a very important and deep proof. That’s why beauty matters tremendously in mathematics.”.”

—Gabriele E. Meyer

Top: Henry Segerman, *Stereographic Projection (Grid)*, 2014. 3D printed nylon, lamp, 10 x 10 x 3 inches.

Left: Dick Termes, *Parts of the Whole*, 2016. Acrylic on polyethylene plastic, 16 x 16 x 16 inches. Courtesy of Termesphere Gallery.

Right: Gabriele E. Meyer, Red Cylinder, 2019. Yarn and shaped line, 22 x 22 x 22 inches.

Cover: Tia Wierenga, *Self Portrait Mini-Series: [34.2] Playground*, 2017. Acrylic paint on wood scraps, 8 x 8 x 4 inches.

THE ARTISTS

JOHN EDMARK is an artist and designer whose explorations range from organically inspired cellular and kinetic works to products for storage, kitchen, and creative play. In addition to teaching classes in design fundamentals, product design, animation, and color in the Department of Art & Art History at Stanford, John is a graduate adviser to students in the Joint Program in Design. JohnEdmark.com

ROBERT FATHAUER, who started as an experimental physicist, currently runs the small business Tessellations, which includes The Dice Lab. His interests include recreational mathematics, designing and producing math-related products, writing books on tessellations and related topics, and creating and curating exhibitions of mathematical art. RobertFathauer.com

COLIN HUNTER is a self-taught artist based out of Ann Arbor Michigan. He creates both 3-D paper sculptures and 2-D designs using technical drawing, computer-aided design, and mathematic algorithms as well as traditional and nontraditional geometric principles. Colin's work stems from his interests in geometry, Islamic tiling, architecture, science, technology, calculus, and nature. ColinDesignGallery.com

JAMES MAI is a professor of painting at Illinois State University. He has participated in over 200 exhibitions of paintings, digital prints, and photographs in the US, Europe, and Asia. James has made over 25 national and international presentations and publications on color, composition, and art & mathematics. His ongoing research interests are in analytical psychology, archetypal symbolism, mythology, and archaeoastronomy.

GABRIELE E. MEYER was born in Tubingen, Germany. She completed her Zwischenprufung for Mathematics and English at University Tubingen, and an MS in Computer Science and Ph.D in Mathematics at Cornell University. Since then, she has taught at Brown University, the State University of New York at Buffalo, and the University of Wisconsin-Madison. people.math.wisc.edu/~Meyer/

HENRY SEGERMAN is an associate professor in the Department of Mathematics at Oklahoma State University. His research interests are in three-dimensional geometry and topology, and in mathematical art and visualization. In visualization he works in 3D printing, spherical video, virtual, and augmented reality. He is the author of the book *Visualizing Mathematics with 3D Printing*. Segerman.org

FELICIA TABING is an artist based in Los Angeles, CA whose work combines mathematics and art. She received her Ph.D. in mathematics at the University of California, Santa Cruz in 2015, and currently is a lecturer at the University of Southern California, where she has taught a seminar in mathematics and art. Her current work involves representing how she experiences synesthesia. dornsife.usc.edu/FeliciaTabing/art/

DICK TERMES has been making on spherical paintings, which he calls Termespheres, since 1968. He received his MA from the University of Wyoming and his MFA from the Otis Art Institute in Los Angeles. Chapters on his spheres can be found in books like *Masters of Deception: Escher, Dalí, & the Artists of Optical Illusion*; *M.C. Escher's Legacy: A Centennial Celebration*; and *Mathematics and Art*, among others. Termespheres.com

TIA WIERENGA is known for her highly rational, often meticulous, works of art using leftover materials or found objects. Graduating from Calvin College in 2012, Tia majored in art and minored in architecture, while also taking two years of engineering coursework. Accordingly, much of her work explores the connection between art and mathematics by creating pieces that are governed by the grid and mathematical sequencing. Instagram.com/TiaRadical

JIANGMEI WU is an interdisciplinary scholar, making spatial and interior art and design projects involving mathematics, science, and engineering. Her origami-inspired, large-scale installations have been exhibited internationally. In addition to winning several awards for her art and design works, she also holds three US patents for her innovative design techniques. JiangmeiWu.com