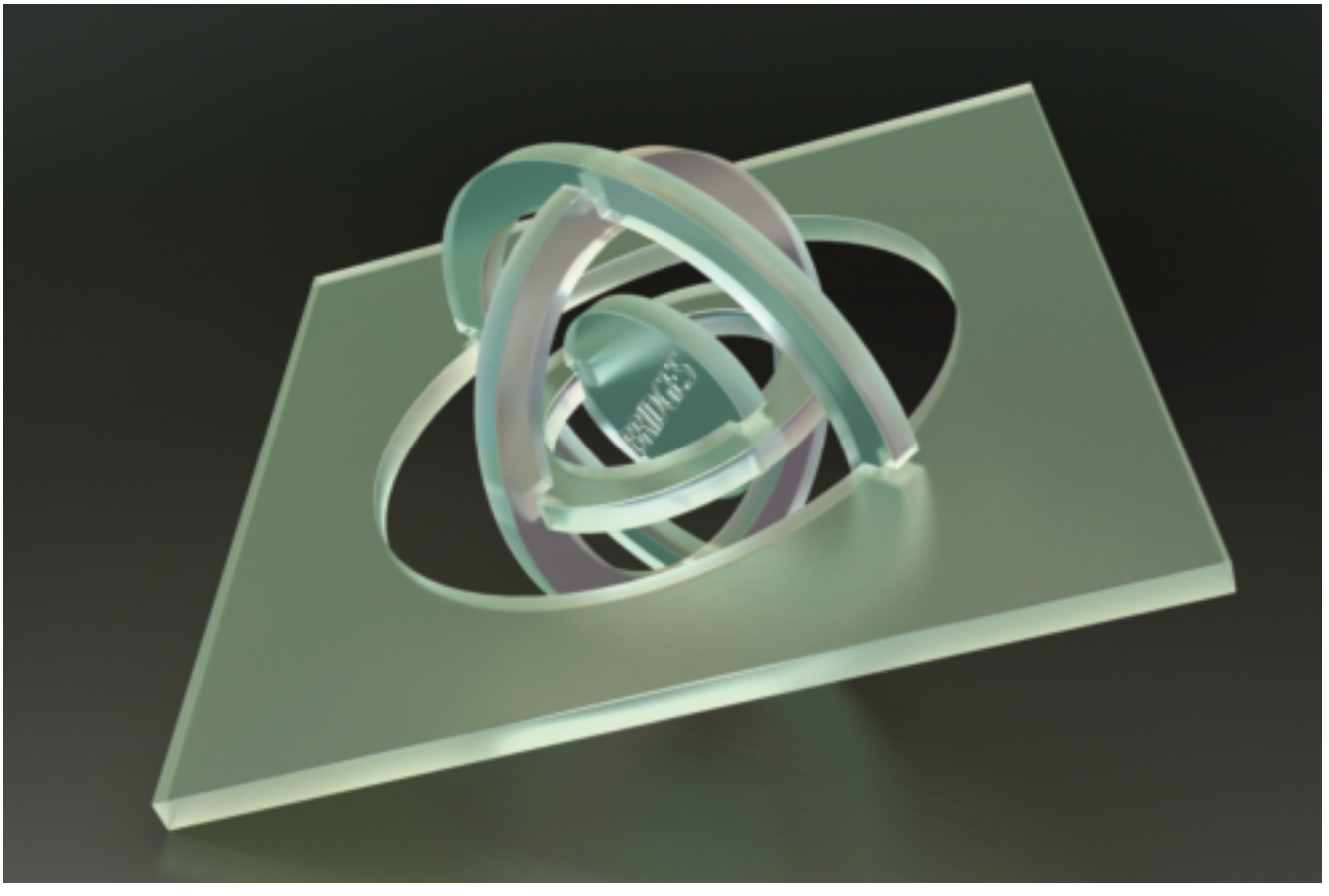
SELECTION OF ART FOR AUCTION W8 ON MARCH 30, 2014

Celebrating the 16th Annual Bridges Conference
at the University of Twente and Saxion University of Applied Sciences
Enschede, the Netherlands



Art Exhibition Catalog 2013

Robert Fathauer and Nathan Selikoff, Editors

Tessellations Publishing, Phoenix, Arizona

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PREFACE

The International Bridges Conference, created in 1998 and running annually since, provides a model of how to integrate the seemingly diverse disciplines of mathematics and the arts. Practicing mathematicians, scientists, artists, teachers, musicians, writers, computer scientists, sculptors, dancers, weavers, and model builders come together in a lively and highly charged atmosphere of mutual exchange and encouragement.

After visiting many countries, including a flourishing and fruitful Bridges 2008 Conference in Leeuwarden, the Netherlands, the city where M.C. Escher was born, this year Bridges returns to the Netherlands, but now to the city of Enschede, one of the most attractive and cultural cities in the eastern part of the country, the province of Overjssel, and the Twente region.

The Universiteit Twente (University of Twente), a university with mostly technical studies, is located in Enschede. It's one of the three technical universities in the Netherlands (besides Delft University of Technology and Eindhoven University of Technology). The Universiteit Twente is also the only large campus university in the Netherlands.

Enschede is also home to one of the three campuses of Saxion University of Applied Sciences (Saxion Hogeschool Enschede), a polytechnical school offering internationally recognized Bachelor's degrees and Master's degrees in a wide range of fields, including engineering, economics, and health care. The other campuses are located in Deventer and Apeldoorn.

Enschede also has an academy of arts and design combined with a conservatory, named ArtEZ.

An exhibition of mathematical art has been an annual feature of Bridges since 2001, and it has grown steadily over the years under the dedicated leadership of Robert Fathauer. At this year's conference, we have again been able to put together what must be the largest exhibition of mathematical art ever, with one hundred forty artists included. Diverse artistic media are represented, including wood, metal, stone, ceramics, beadwork, and fabric, in addition to a variety of two-dimensional media. Computer-printed sculpture continues to have a growing presence in the exhibition. Anne Burns, Nat Friedman, Mojgan Lisar, and Nathan Selikoff joined Robert Fathauer on the jury.

The Bridges Organization website, including the art exhibition pages, is managed by Nathan Selikoff, who also created both the cover and interior of the full-color catalog documenting the art exhibition.

The Bridges Organization
bridgesmathart.org

CHRIS BARTLETT

Professor of Art
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STATEMENT/WORK

An important principle of design and composition is repetition, so creating any structure such that the elements of a painting are aligned within self-similar areas and consequently at repeating measures from each other would satisfy the goal of unity. It is the thread that holds together an otherwise loose tapestry of forms in space and provides a structure of harmonizing ratios of distance. The aspect ratio of this canvas is the root of the golden ratio (1: 1.272 or 1: √Φ). Unique to this √Φ rectangle is that the vertical and horizontal lines drawn at the intersection of a diagonal and one at right angles to it bisect the short and long sides and the diagonal at golden ratio divisions. Using one intersection creates four interior rectangles, three of which are similar √Φ rectangles and one made up of two horizontal squares. Mathematical alignments so created form an invisible structure to give a unified self-referential system of organization.

Greek Island House
11 x 14 in
Acrylic on canvas
2012

Greek Island House
11 x 14 in
Acrylic on canvas
2012

ANNE BURNS

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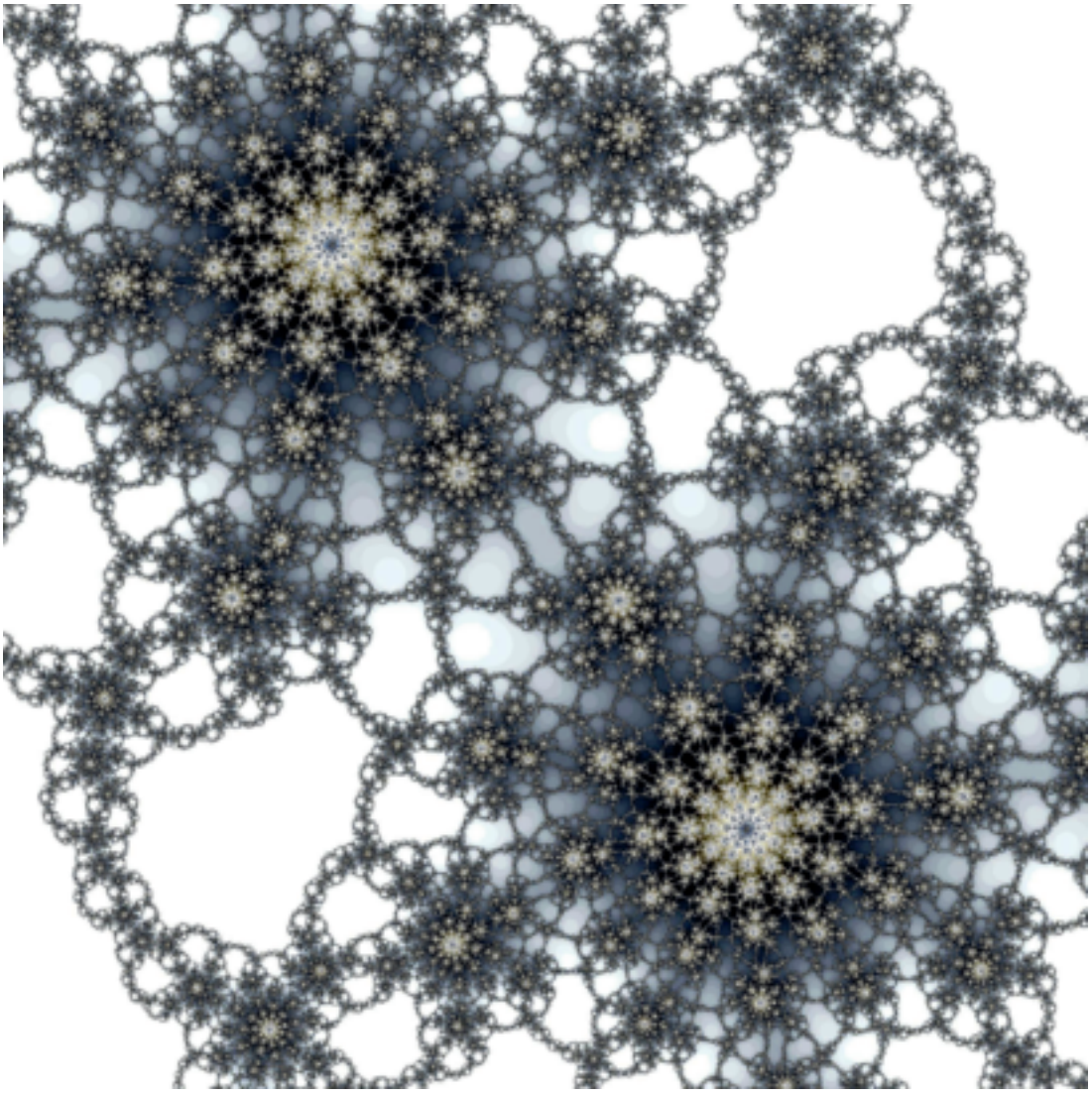
STATEMENT

For many years I have been fascinated by the connections between art and mathematics. I began college as an art major, but then discovered that I loved mathematics and went on to a career as a mathematics professor. When I bought my first computer in the 1980's I discovered that computer graphics allowed me to combine my interests.



Gray Julia
12 x 12 in
Digital print
2013

WORK

"Gray Julia" is the Julia Set of a rational function that has a pole of order 3 at the origin. The white regions are 'pre-poles'; that is, a point is colored white if its orbit enters the "trap door" surrounding the pole. A point is colored black if its orbit remains bounded. All points except the black points have an orbit that eventually escapes. The number of iterations it takes for the orbit to escape determines the color.

DALLAS CLEMENT

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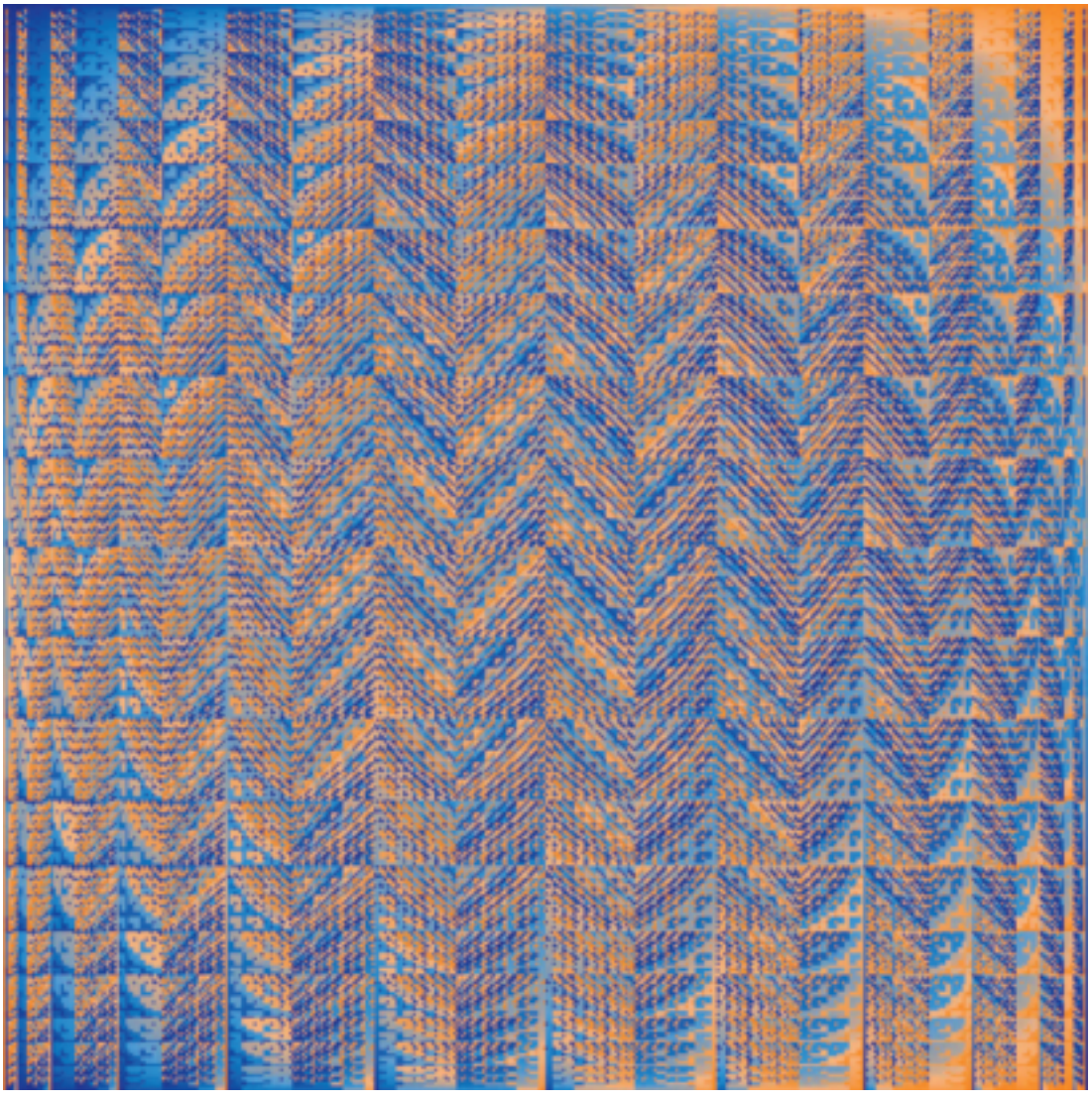
STATEMENT

I have been interested in mathematics and art for a long time, but only recently have I tried combine these two disciplines. My current work is an investigation into the abstract paintings or pictures that result from the Cayley table of a group. I decided to work with these mathematical objects after repeatedly failing to convey their innate beauty to my friends. The rigidity of the groups structure forces me to play with the colour combinations or the texture of the paint to bring out the natural beauty in these objects. Modern technology allows me to represent much larger groups than would be possible with oil paint. By creating the pictures using a computer program, I am able to try out many combinations of groups and colours. My paintings and pictures use the layout that Cayley used, featuring no row or column header.



I told you groups were pretty Trisha! (Large Dihedral)
24 x 24 in
Computer Graphics
2013

WORK

This work was inspired by conversations with my friend. I would go on and on about how beautiful groups were, and she would barely listen. I decided to convey the beauty of groups by creating a series of artworks that depicted the Cayley table of a group. A Cayley table depicts the result of the group operation between elements of the group. In this case, the group elements are symmetries of a regular polygon with 225 sides. The artwork was created using the gap and python programming languages. Every element in the group is represented in the picture by a square with a unique colour.

JUAN G. ESCUDERO

Universidad de Oviedo
Oviedo, Spain

STATEMENT

"L´art est à l´opposé des idées générales, ne décrit que l´individuel, ne désire que l´unique. Il ne classe pas; il déclasse" (Art is opposite of general ideas; it describes only the individual, desires only what is unique. It does not classify; it declassifies)

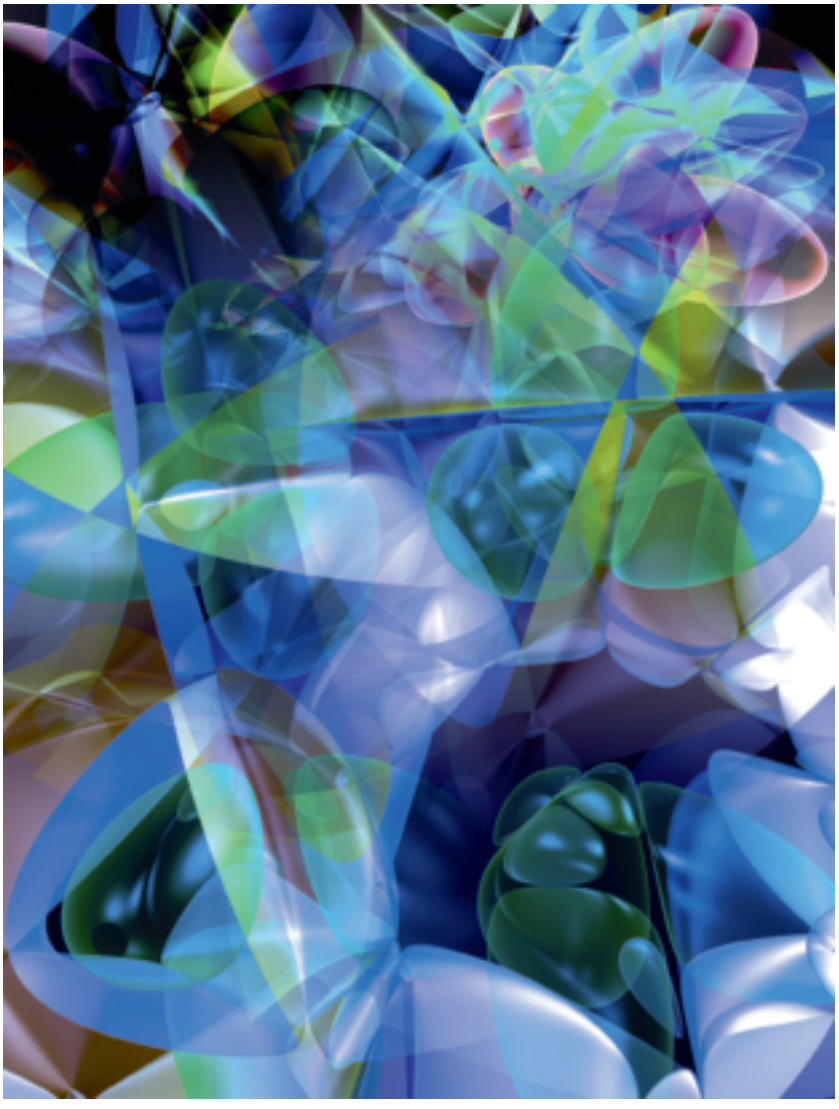
(Marcel Schwob, quoted by José Ángel Valente in "Diario anónimo")

"Das Einzelne erweist sich immer wieder als unwichtig, aber die Möglichkeit jedes Einzelnen gibt uns einen Aufschluss über das Wesen der Welt"

(Again and again the individual case turns out to be unimportant, but the possibility of each individual case discloses something about the essence of the world)

(Ludwig Wittgenstein, Tractatus Logico-Philosophicus)

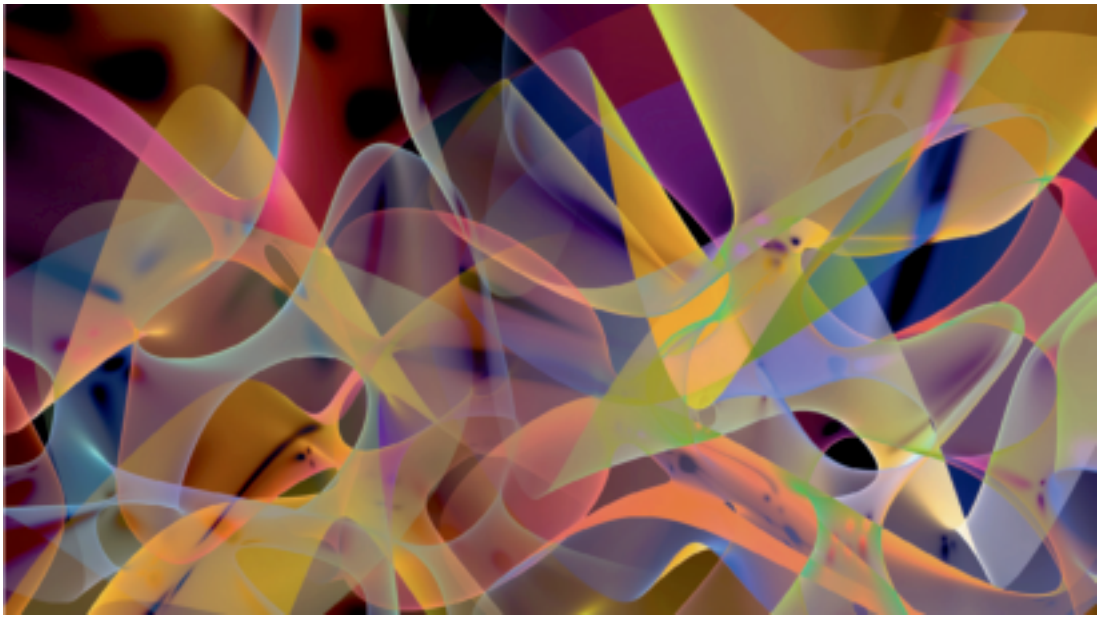
"In theory there is no difference between theory and practice. In practice there is." (Berra, quoted by G.M. Greuel and G. Pfister in "A Singular Introduction to Commutative Algebra")



d9-RootA3
45 x 35 cm
Digital Print
2012

WORK

Folding polynomials of degree d with integer coefficients were used by S. Chmutov in 1991 to generate a family of complex algebraic surfaces with many nodes. For d=6,7,8,10 and 12, surfaces introduced by W. Barth, O. Labs, S. Endrass and A. Sarti, have a higher number of singularities. For d=3n, there is a family of surfaces S having also more singularities, which can be obtained by using certain bivariate polynomials Q with complex coefficients. As the folding polynomials, Q are related to the generalized cosine associated to the affine Weyl group of the root system A2. There are real variants of S with the same number of singularities which turn out to be real. (Hypersurfaces with many Aj-singularities: Explicit constructions. Journal of Computational and Applied Mathematics. http://dx.doi.org/10.1016/j.cam.2013.03.045).



d6-RootA3-IC
32 x 50 cm
Digital Print
2013

d9-VCompl-II
35 x 45 cm
Digital Print
2012

MARITZA GRANADOS MANJARRÉS

Professor of Aesthetics
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STATEMENT

This artistic work and architectonic approach is developed around the fold, and how it can be used as a device for creation. However, when the approach to the fold was made, and it was solved theoretically, an exploration on tessellations was made as the primary source to solve the folding patterns. From then on every object that has been modeled was thought as the result of one of the 28 tessellations described and drawn in mathematics literature (Aslaksen, 2010; Steinhaus 1999; Wells 1991). On the other hand, every piece was designed to fulfill at least two conditions: It must be able to be completely collapsed into flat origami, and it must be able to form a 3D model when closed by its ends. This experimentation had as a result of 15 models that can be seen on the website. As an evolution of that work a new set of models is in progress. An evolution that aims to make a more complex production by perforating the surface to reflect the tessellation used as a folding pattern.

Tessellated Filigree
30 x 50 x 50 cm
Laser Cut Paper 180 gr.
2012

Caterpillar
30 x 50 x 50 cm
Laser Cut Paper 180 gr.
2012

WORK

This work is part of the exploration that was made about tessellations and folded surfaces. The work, that was originally thought as an approximation to the space experience in architecture, was searching to understand changes in space through the concept of fold and how it could affect the way space is seen. However, in the process of designing the folding patterns, in order to fulfill the conditions required for each model, the exploration addressed numerous papers on the mathematics of Flat Origami and every piece shown here and on the web site meet all the criteria proposed by this type of origami. In addition, this work tries to reflect the tessellation pattern that gave the final form to the art work, through the perforation of the surface which gives the possibility of thinking the product as a fractal piece.

GARY GREENFIELD

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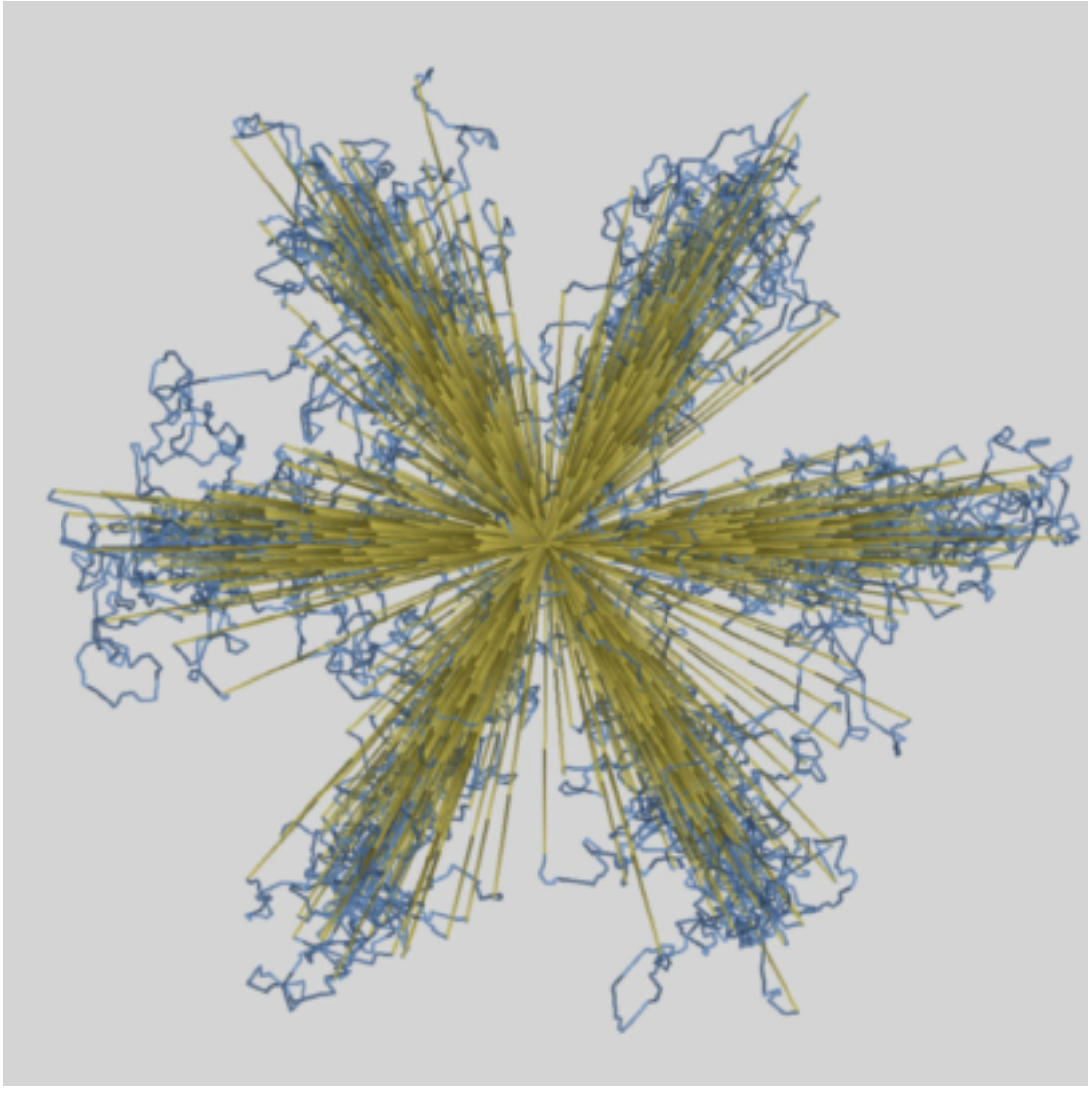
STATEMENT

Many of my computer generated algorithmic art works are based on visualizations resulting from simulating mathematical models of natural processes. Examples include cell morphogenesis, reaction-diffusion, and swarm behavior. By experimenting with parameter settings and drawing attributes, I try to focus the viewer's attention on the complexity underlying such processes.



Untitled
10.5 x 10.5 in
Digital Print
2012

WORK

This visualization is based on the foraging behavior of the seed harvesting ant P. barbatus, a species which does not use pheromone trails for finding food. Here, 1000 ants stream out of the nest along six patroller trails and then intermittently break-off to initiate random searches for seeds. When seeds are encountered ants collect them and return directly to the nest. The simulation lasts for only 500 time steps. In nature, typically 1800 ants are foraging at any one time, the patroller trails are not uniform in length or uniformly separated, and foraging continues for several thousand time steps thus obscuring the foraging patterns and structure we are able to observe and recover using our more modest set-up. Color gradations are used to disambiguate the search phase from the return phase and reinforce the dynamic aspects of the process.

RICHARD HARRINGTON

Artist
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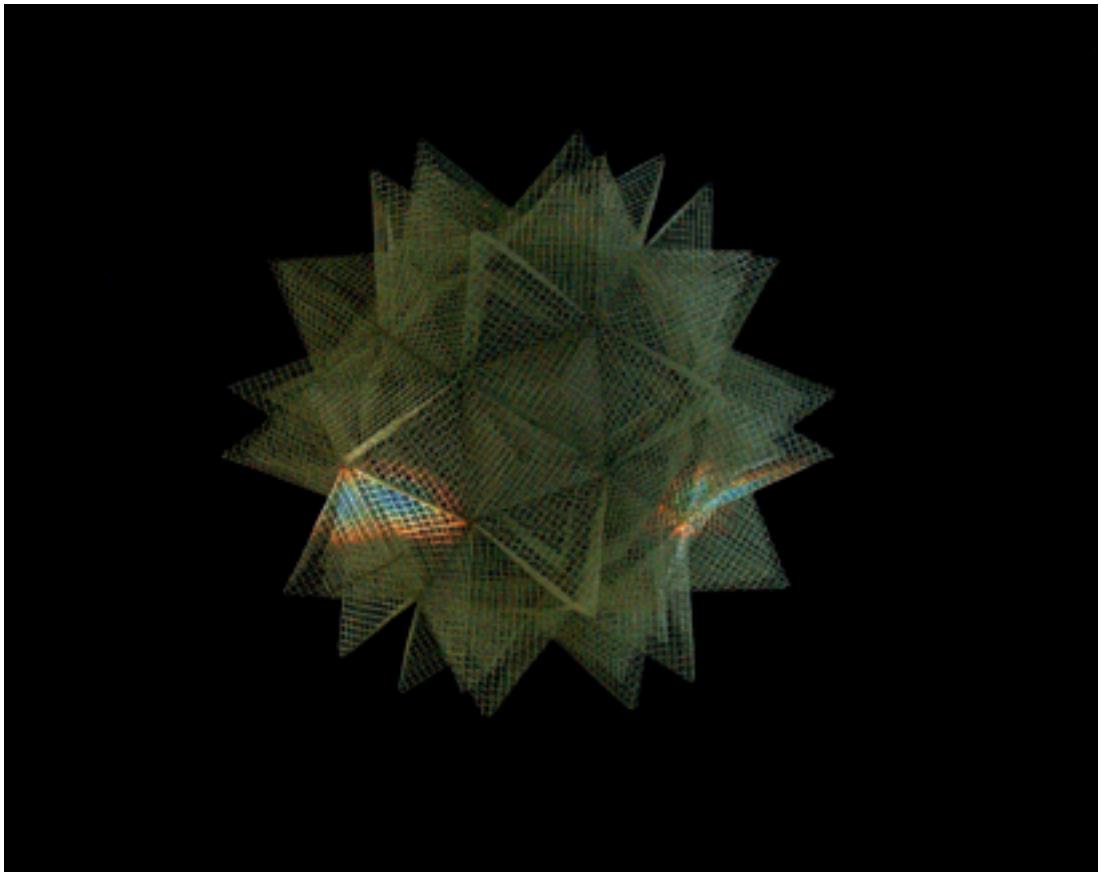
http://berkshirereview.newyorkarts.net/2011/12/12/zero-sum-greylock-arts-adams-massachusetts-autumn-2011-richard-harrington/#.UUuIrt1UpX8

STATEMENT

Over the years my artwork has been concerned with visual perception in various manifestations. To my mind, one of the most important developments of the 20th century, and of the early 21st, has been in the domain of perceptual psychology. Mathematics in various forms have been instrumental to these developments. The things I make are really concerned with these topics. There have been people who have phrased this far more succinctly than I. A prime example comes from the words of the perceptual psychologist Bela Julesz in his very profound and influential book Foundations of Cyclopean Perception... "Math is to infinity as psychology is to consciousness."



STELLATED DODECAHEDRAL VARIANT
22 x 22 x 22 in
Folded hardware cloth
2011

WORK

Each face of the dodecahedral seed of this sculpture is made of five isosceles tetrahedra. Thus sixty interlocking tetrahedra observe the rules of the Euler Equation: V-E+F-C=0. It was designed so that a viewer could alternately look at or through the object, and that the object must be more than a simple display of vertices and edges. The sculpture observes the condition of origami that all its tetrahedral edges are convex. To achieve a maximum amount of moiré patterns, the layers of material must be parallel or nearly parallel to each other. Because the lengths of the edges of this object are similar, the surface tension is distributed uniformly, and achieves an overall equilibrium like that of a stellated soccer ball. Using John Conway's rules of nomenclature this object would perhaps be classified as a stellated pentakis dodecahedron.

ANDREA HAWKSLEY

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STATEMENT

I enjoy finding and creating mathematical patterns in the everyday.

Seeing Stars
14 x 14 x 14 in
and 10 x 10 x 10 in
Plastic Novelty Sunglasses
2012

WORK

Seeing Stars is a series of geometric sculptures wherein one can see many stars—made out of a material itself intended for seeing stars (or at least the sun!).

Novelty sunglasses in six different colors interlock without glue or adhesives to create these intricate, chiral sculptures. Although the individual pairs of glasses are closed in the normal manner, their interlacing enables them to maintain distinctive forms.

The larger, icosahedral sculpture is made from 60 pairs of sunglasses. It is symmetrically colored such that the edges around the structure are accentuated. In contrast, the coloring of the 24-pair octahedral sculpture emphasizes the square faces and cubic symmetry.

MICKEY SHAW-HUBBARD

Artist
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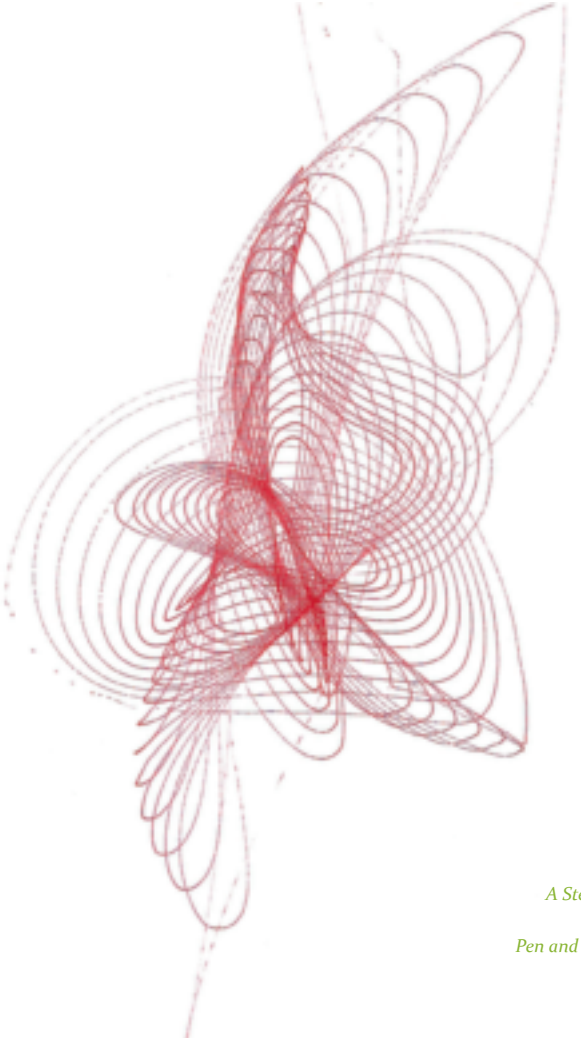
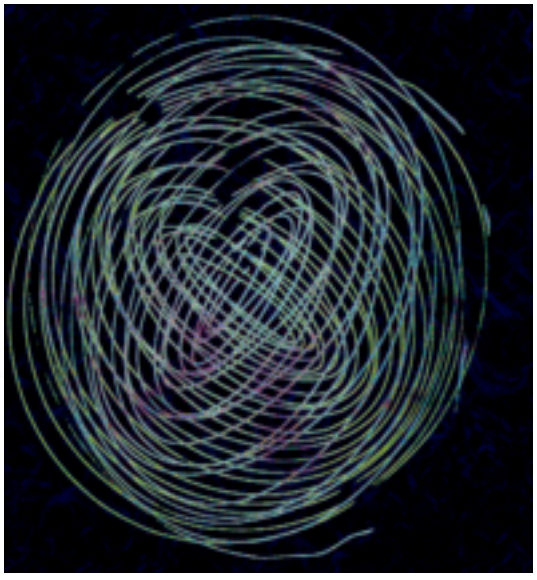
STATEMENT

My inspirations are drawn from nature, mathematics and science. These inspirations are combined with my own experiences and emotions, creating a union between what is seen, what is known and what is felt internally. As an artist, my goal is to create for the viewer, visually, the concept that art, mathematics and science display a fundamental connection conveying the idea that all three encompass more than what can just be seen. I believe that art is an intrinsic aspect of all visual experiences and mathematics can provide a basis for understanding and recreating those same experiences.



A Steady Rhythm
11 x 8.5 in
Pen and Ink Drawing
2010



Spiraling Spheres of Light
10 x 8 in
Computer alteration of an Original Pen and Ink Drawing
2013

WORK

Spirals are curves emanating from central points, progressively growing further away as they revolve around the point. This drawing is a unique, one of a kind rendition of spirals created in reverse direction from outer edges into a central point. Some variations resembling Sinusoidal, Archimedean and Hyperbolic spirals are created. The drawings are created on a drawing board suspended from a pole with an attached arm holding a pen. The board is set in motion by hand. Drawings are manipulated by changing the motion of the drawing board. This particular drawing was the result of creating then stopping the motion, moving the paper's position and then restarting the motion. As the artist, I decide when the final stop of motion is made. The spiral drawing conveys a two-dimensional visualization and exploration of the connections between art, mathematics, and science combining drawing, spiral and pendulum theories.

This picture was created from one of my spiral drawings. Spirals are curves emanating from central points, progressively growing further away as they revolve around the point. These spirals are unique, as they are a one of a kind rendition of spirals created in reverse direction from outer edges into a central point. The original drawing was created on a drawing board suspended from a pole with an attached arm holding a pen. The board was set in motion by hand. The drawing was manipulated by changing the motion of the drawing board. This particular rendition of the drawing was the result of taking my exploration of spirals as art to the next level; creating a spiral picture through computer manipulation of the original drawing. This spiral picture conveys a two-dimensional visualization and exploration of the connections between art, mathematics, and science combining drawing, computer, spiral and pendulum theories.

ANDREA JONES

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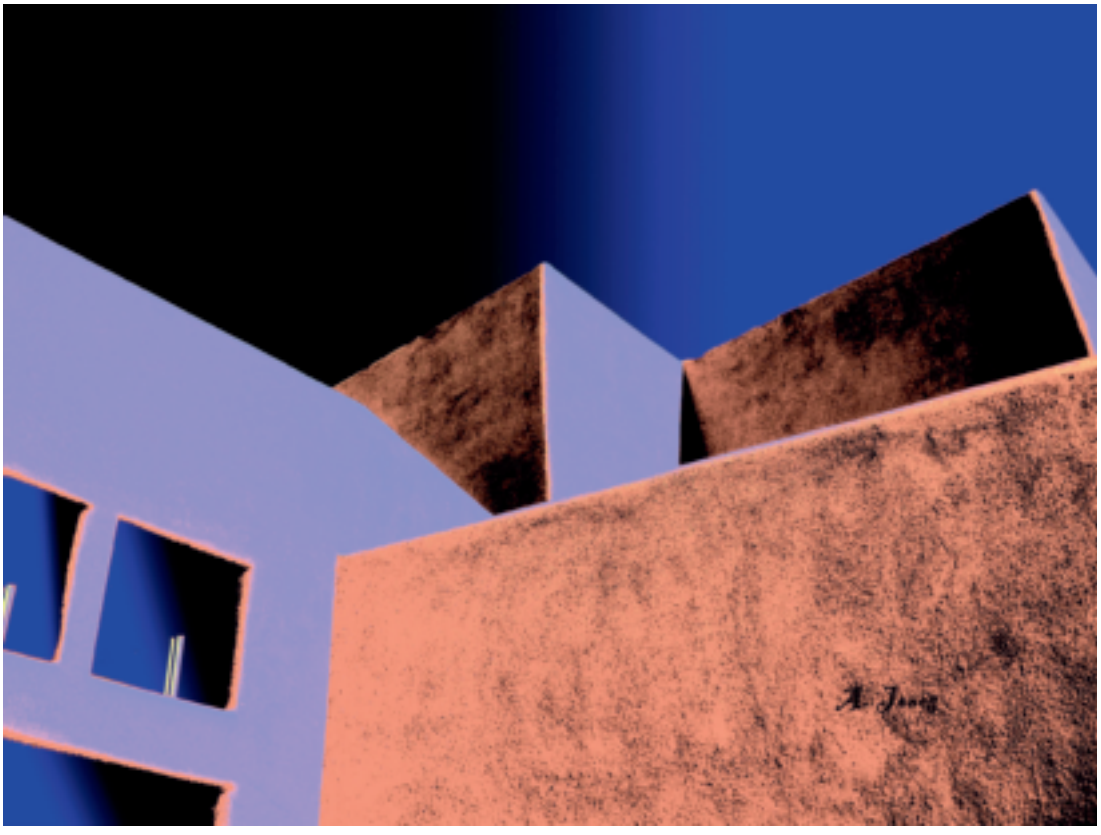
STATEMENT

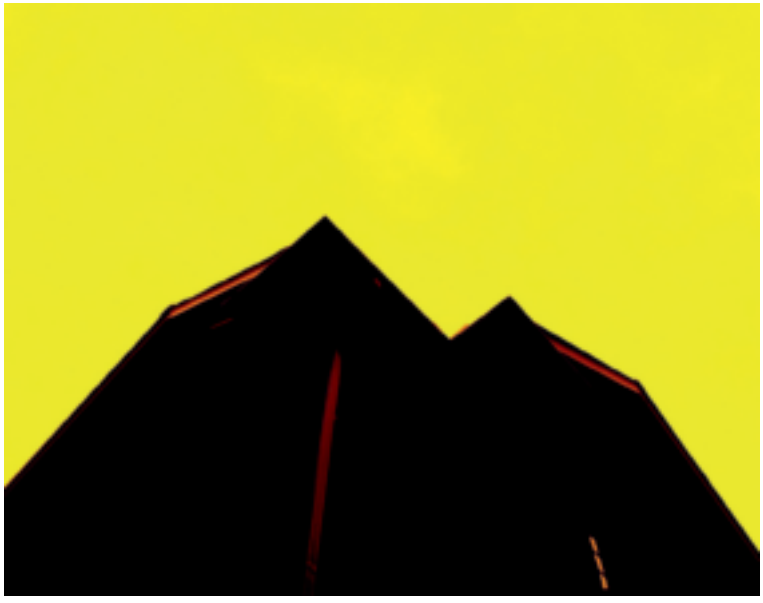
Finding mathematical forms within my surroundings and recreating architectural shapes with my camera into geometrical forms is a hidden passion of mine. Once I find the right object or building, the camera in my hand becomes a tool with which I compose my geometrical vision. To reach the perfect result I work with illustration software for shading, contrast and shape retrieval. I manipulate the picture so that every angle, shape and color provides the viewer with a harmonious but intricate experience.



Architectural Screen I
24 x 30 in
Digital Photography
2009

WORK

I used Southwestern architecture to create this cubist variation against lights and shadows. Gradient shading was used to create distinctive contrast and harmonic but mysterious qualities. Mathematical and architectural rules apply through this bold geometrical statement.



Architectural Screen II
24 x 30 in
Digital Photography
2009

Forms dancing in space, almost like the space shuttle hurtling through the universe. There was something mesmerizing about these forms, creating the illusion of discovering the unknown. I had a very rewarding feeling after completing this photo. I went for a wild ride through the illusion of space. Another fun combination of light, architecture, shades and the mathematical possibilities that surround us.

Architectural Screen III
24 x 30 in
Digital Photography
2009

Architectural elements in their simplest yet unconventional space create a strict feeling. Clean forms, balance of color and soothing angles give way to a feeling of harmony. Symmetrical outlines provide an inviting space for eyes to wander, infused with a relaxing atmosphere.

KARL KATTCHEE

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STATEMENT

Art and mathematics are inseparable. I use pencil, pen, pastel, paper, cardboard, scanner, camera, computer, and printer to achieve my desired effects. Math is part of my creative process, on many levels, and while there is mathematical content in most of my artwork, I am not always intentional about it.

Habitat Green
16 x 20 in
Digital print
2012

WORK

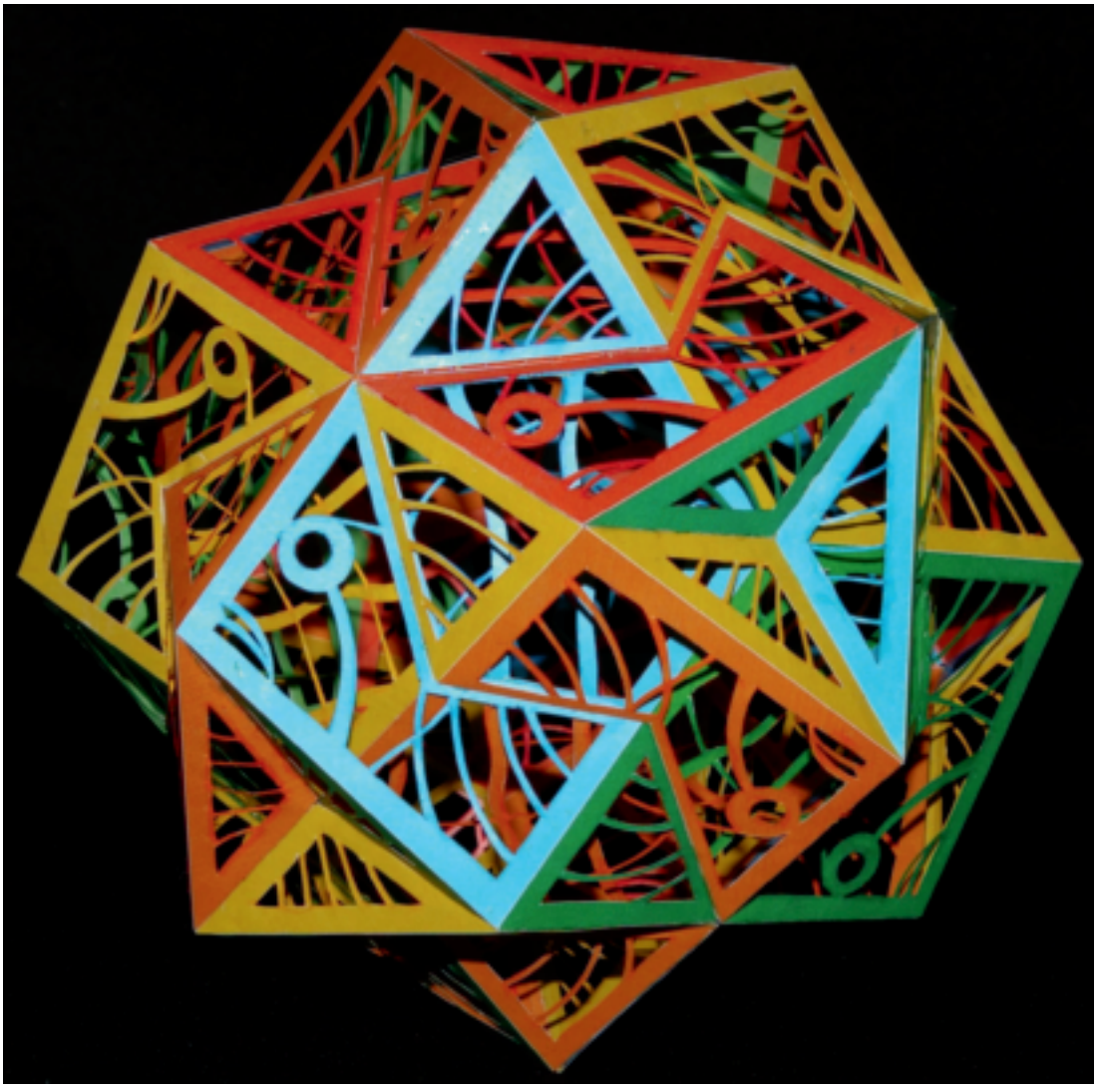
Habitat Green began as a pencil drawing on scratch paper. After digitizing the sketch, I implemented a sequence of reproductions, rotations, reflections, translations, and superpositions intended to breed a sense of chaos. The result of that process is found in each quadrant. The symmetry in the final image is obvious and intended, but I was stunned by it and declared the work done.

ULRICH MIKLOWEIT

Freelance Artist
Essen, Germany
http://www.polyedergarten.de

STATEMENT

The objects of my art are paper polyhedron models, most preferable uniform ones. The nets are constructed on a computer and printed on white paper of 80 g/m2. They are cut out with scissors and knives and assembled with glue. My initial motivation came from pictures of M. C. Escher.



24 Scalars
Diameter 20 cm
Xerographic paper, 80 g/m²
2013

WORK

This polyhedron is a self-dual isohedral and isogonal icositetrahedron. It was found by Robert Webb (http://www.software3d.com/Forums/viewtopic.php?t=36) in 2008 by faceting the snub cube.

The faces are crossed pentagons. It is one of the first additions to Brückner's 1906 models (http://www.bulatov.org/polyhedra/bruckner1906/index.html) since more than 100 years! Since parts of the faces are covered by other faces, this polyhedron is an ideal candidate for being designed in the "polyart-style" (http://www.polyedergarten.de/) where you can see the inner parts through holes which are cut into the surface.

KERRY MITCHELL

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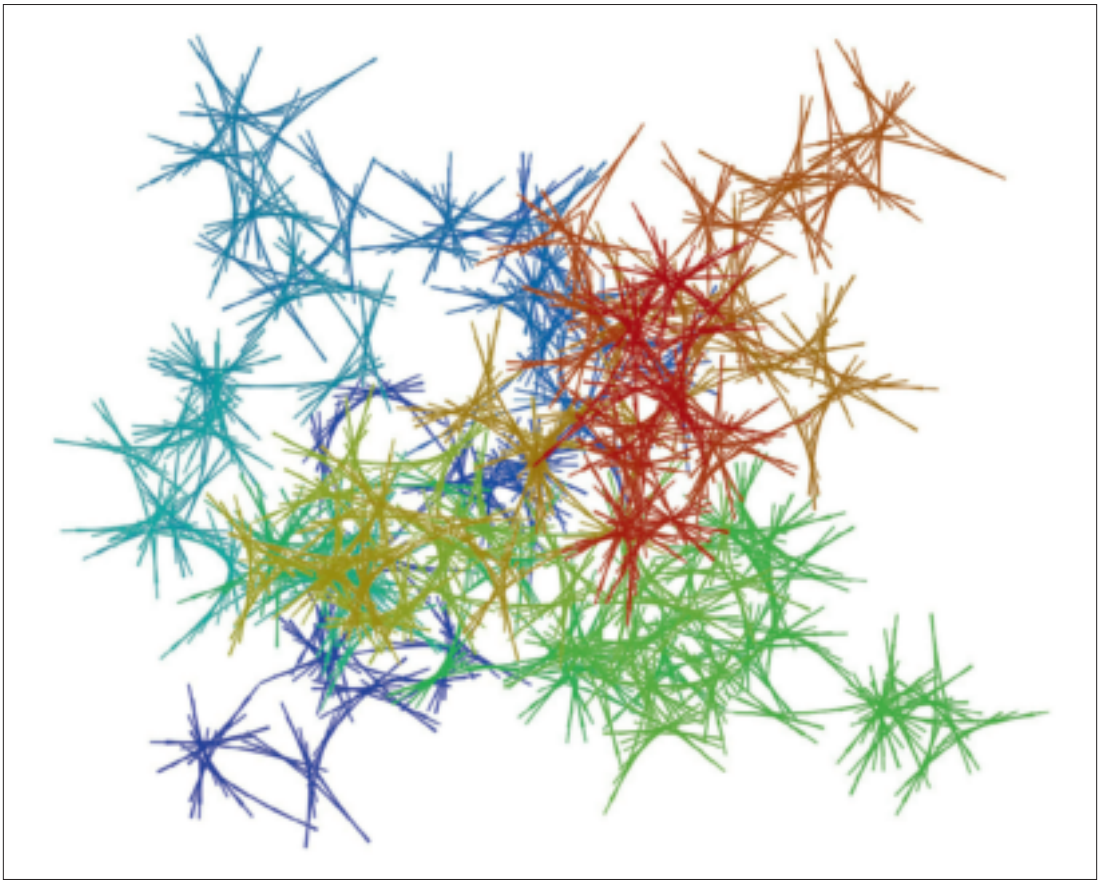
STATEMENT

My work is composed primarily of computer generated, mathematically-inspired, abstract images. I draw from the areas of geometry, fractals and numerical analysis, and combine them with image processing technology. The resulting images powerfully reflect the beauty of mathematics that is often obscured by dry formulae and analyses.

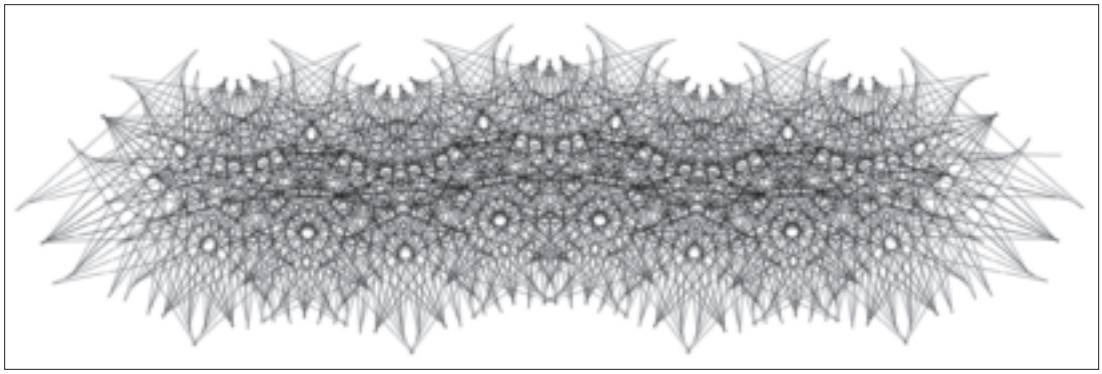
An overriding theme that encompasses all of my work is the wondrous beauty and complexity that flows from a few, relatively simple, rules. Inherent in this process are feedback and connectivity; these are the elements that generate the patterns. They also demonstrate to me that mathematics is, in many cases, a metaphor for the beauty and complexity in life. This is what I try to capture.



Kolakoski Spirolateral
16 x 20 in
Digital print on aluminum panel
2013

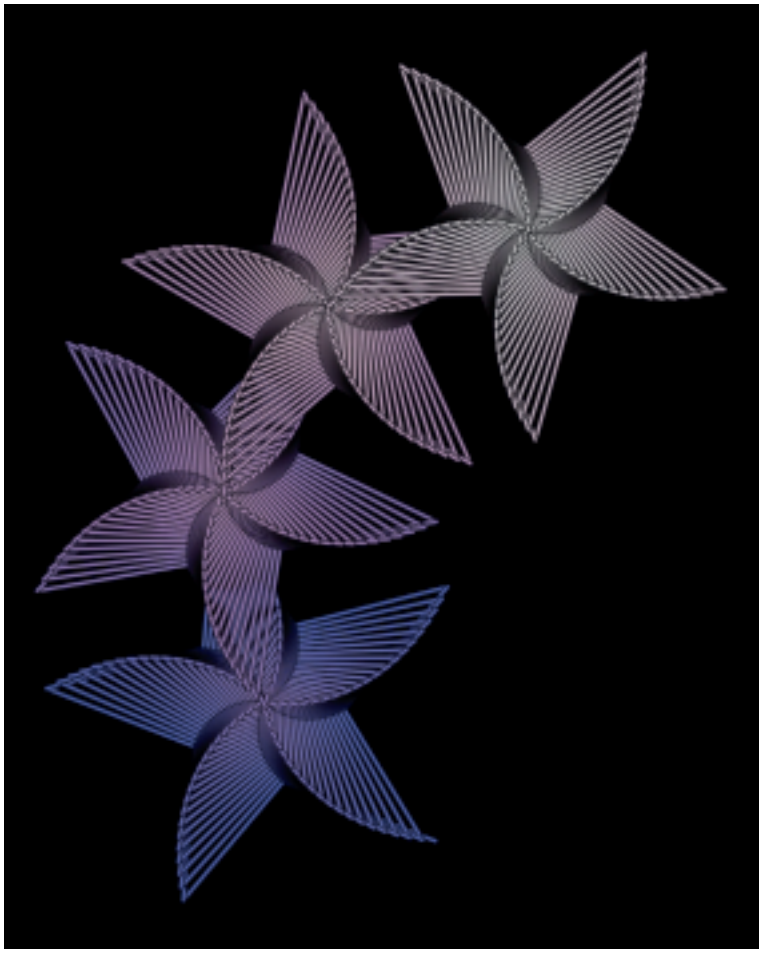
WORK

This image is a generalization of the spirolateral concept. It was drawn using 50,000 terms of the self-referential Kolakoski sequence: 1, 2, 2, 1, 1, 2, 1, ... A "1" in the sequence meant to turn left by 179 degrees and draw a segment 1 unit long. A "2" meant to turn right by 179 degrees and draw a segment 1 unit long.



Batman
6 x 18 in
Digital print on aluminum panel
2013

This image is a generalization of the spirolateral concept. It was drawn using 21 iterations of the Fibonacci word. The first iteration is "0" and the second is "1." Each subsequent iteration concatenates the previous two. A "0" in the sequence meant to turn left by 170 degrees and draw a segment 1 unit long. A "1" meant to turn right by 170 degrees and draw a segment 1 unit long. The resulting pattern has structures reminiscent of bats, hence the title.



4 x 5
20 x 16 in
Digital print on aluminum panel
2013

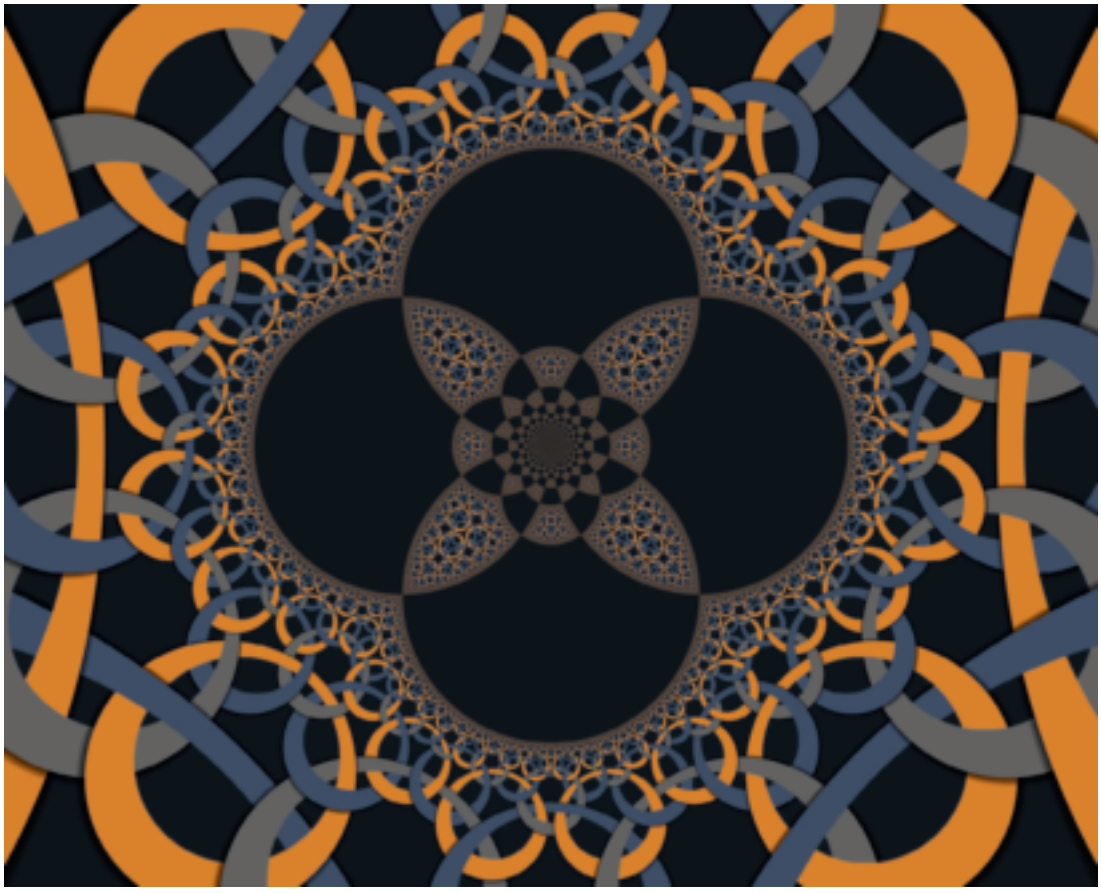
This image is a generalization of the spirolateral concept. It was drawn using 400 points of the base-100 digit sum sequence. This sequence is the sum of the digits of the positive integers expressed in base 100. Each term of the sequence corresponds to a left turn of approximately 144 degrees and drawing a segment whose length is the value of the term. The title reflects the four sets of five-pointed stars, as well as the width:height ratio of the image.

STANISLAV OČOVAJ

Artist
Chair of Computer Technology, Faculty of Technical Sciences, Novi Sad
Novi Sad, Serbia

STATEMENT

As an artist with background in mathematics and computer technology I'm mostly interested in generative and computational art. I first discovered fractals when I was 17, and I've been experimenting with different algorithms ever since. Recently, my main field of interest has become visualization of hyperbolic tessellations in the Poincaré disk and other conformal models.



Der Umstand
20 x 16 in
Digital print
2012

WORK

A (4,3,3) hyperbolic tessellation in the Poincaré disk model conformally transformed using Schwarz–Christoffel mapping and inversion.

PAUL SALOMON

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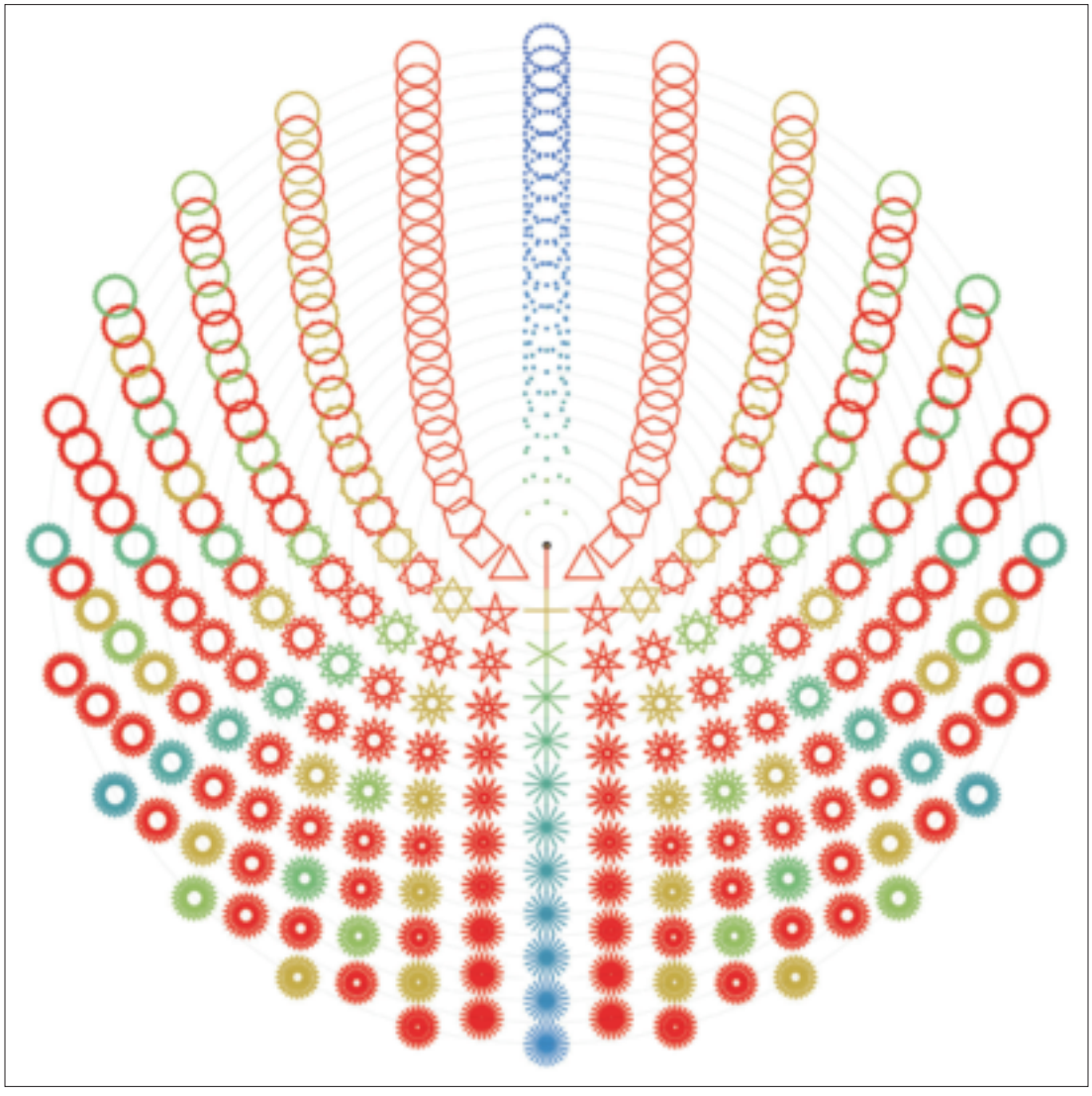
STATEMENT

My earliest love of mathematics came when I realized its utility in creating beautiful things. As a third grader (and ever since), I spent countless afternoons drawing stars and patterned shapes with a protractor or compass. In my work as a teacher I get to share that beauty in creation with my students. In my art I sometimes try to illuminate the complex structure and interconnectedness of simple, patterned objects. I'm compelled to understand complete spaces of related works and how my choices as an artist locate me within that space.



Stars of The Mind's Sky
Digital print
2012

WORK

Stars of the Mind's Sky is the title of a series of works exploring the space of regular star polygons. Here we see 300 stars "in orbit" along concentric circles. The number of points on a star increases with the radius, and stars of a given number of points are spaced evenly along their circle according to "density," or the "jump number" used in generating them. Algebraically, these represent the subgroups and cosets generated by elements of a cyclic group. They have been colored on a gradient to indicate the number of cosets; a red star signifies a generating element. As a consequence of these structural choices, we may observe congruent stars with increasingly many cosets, shifting their way to blue along central rays through any red star.

MAKOTO SASAO

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STATEMENT

I have been trying to make something in between 2 & 3 dimensions. It requires mathematical rules.

Alphabet in Cube
42 x 42 x 42 mm,
35 x 42 x 42 mm
(26 pieces from "A" to "Z")
Paper
2013

WORK

There are 26 cubes.

Each cube is supposed to be divided into 2 parts.

Each part consists of the same alphabet, which is cut in the opposite way: One is as if pulled up at the center of the letter so as to become a pyramid. Another is as if pushed down.

You can not make out what it is, when you look from the side.

You can find an alphabet when you look from above.

SUE SIMON

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STATEMENT

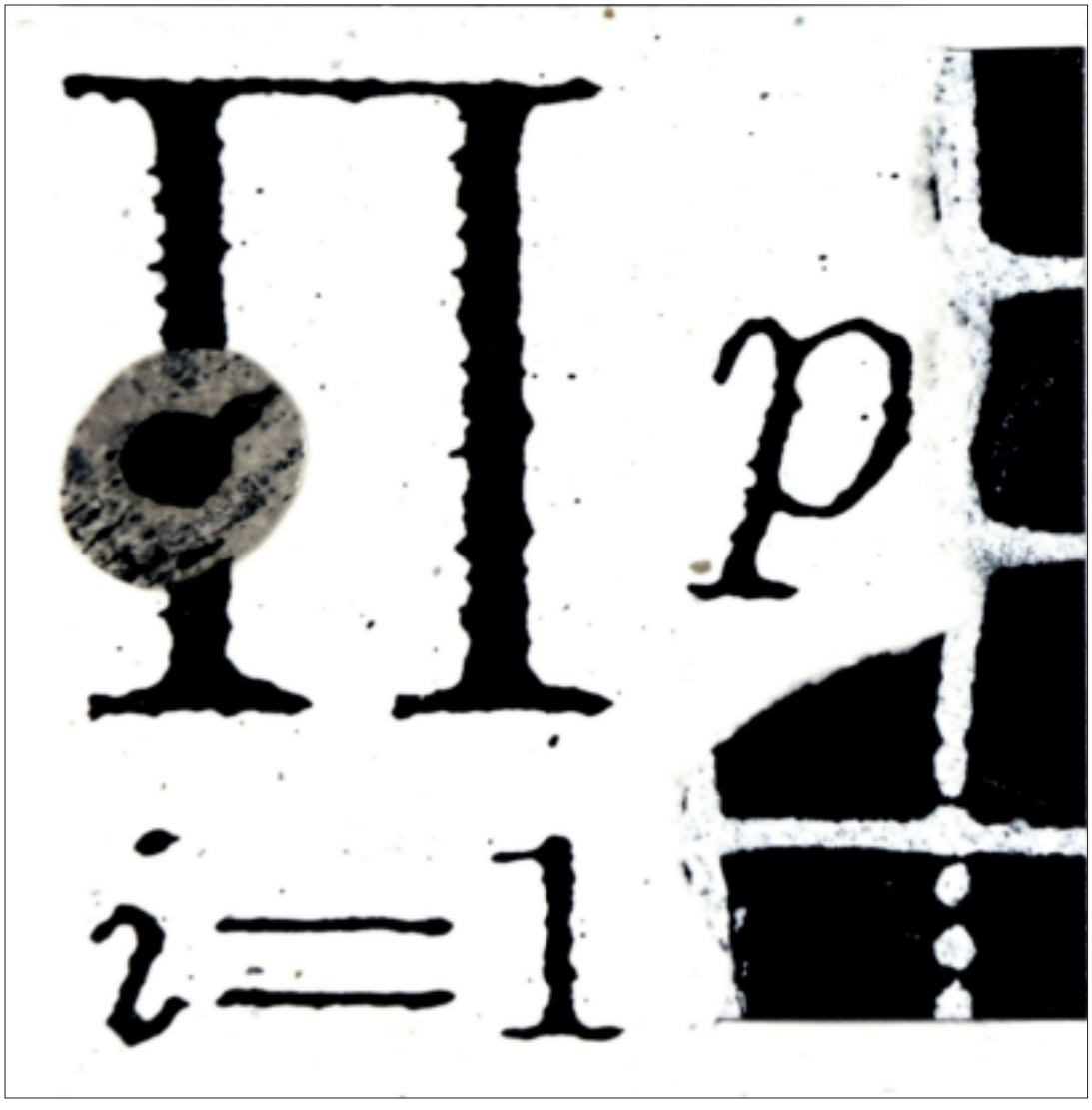
My artwork deals exclusively with scientific ideas. I paint and draw what scientists and mathematicians study and conceptualize. For many years I have incorporated scientific images and notation in my artwork. The science and mathematics in my paintings come from current research.

Life, matter, the universal forces, and art as well, form complex systems. I attempt to describe how the many different parts are linked and integrated. Combining the elegance of science and the visual richness of art is the focus of my work.

I have shown in galleries, universities, museums, in group and solo exhibits, and have several commissions in scientific institutions. I am represented in the book "Colorado Abstract, Painting and Sculpture".

In 2013 my math artwork was shown at the California Women's Museum, San Diego, CA. and online at The Museum of the Golden Ratio and Bob Grumman's blog: M@h*(pOet)?ica at the Scientific American website.

View my work at: suesimon.com and sparkgallery.com



A Mathematical Fragment
12 x 12 in
Acrylic and collage on board
2013

WORK

This is a collage which uses pieces of acrylic monotypes, cut and reconfigured, as well as parts of equations. I think of this as a mathematical landscape in which some things are seen and some are hidden.

MELLE STOEL

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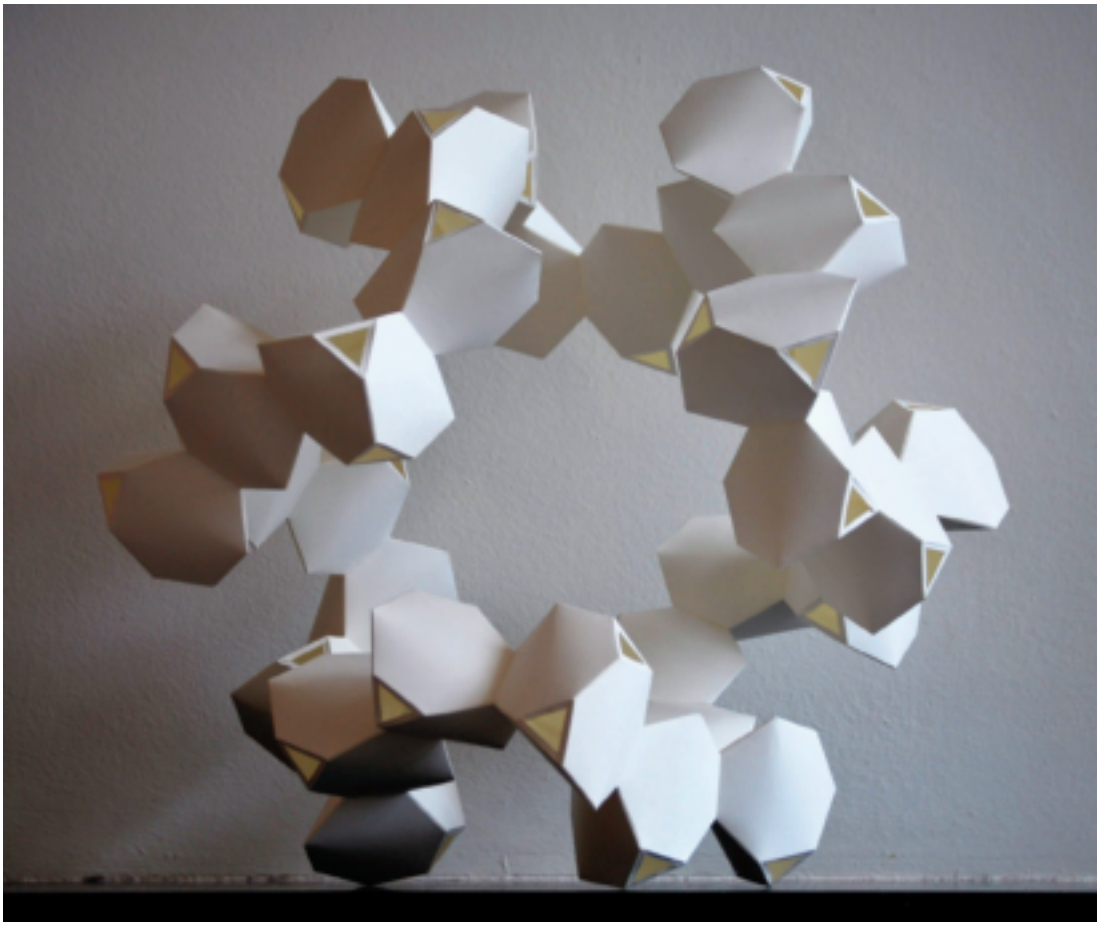
STATEMENT

Instead of becoming a furniture maker, I graduated for this, I did other jobs instead. My interests lied more in music which I studied in my free time by playing classical guitar. Besides odd rhythms and exciting structures in music my interest in (mathematical) art forms developed. In particular Islamic architecture inspired me to make geometrical patterns myself. Certainly I started to experiment with only heptagrams. After I found several interesting discoveries with 7 folded pieces of paper like objects based on Platonic and Archimedian solids and a segment which can be connected in several ways as becoming circular, meandering objects I went to the printing office who made ready-cut heptagrams for me. The inquisitiveness on this subject as well as the restriction by having just these heptagrams made me keep exploring 7 fold geometry. Cutting of or folding sides got me into more insight of its possibilities.



L.L.Rb.R.Rb /
R.R.Lb.L.Lb
42 x 42 x 29.5 cm
Paper, glue
2013

WORK

A pair of heptagrams are attached together on 2 of their sides. On the bottom side, seen from those 2 attachments, another pair is connected with an angle of 90° so that both pairs are connected at 4 sides. This segment can be placed on another by their equilateral triangular restforms in 3 different ways. By putting the segments in a 'straight' way on top of each other a flat circle of 12 pieces is created; the angle of the 2 restforms is 30°. Another 12 circles can be attached through the segments of this 'centre circle' which moves outside from it with a 90° angle. To explain the title of my artwork a half length of a circle just mentioned is held vertically with the curve aimed left. Four segments are chopped off so 2 leftover. The 4 segments make place for 1 who turns right. At the bottom of this one another turns right. The code follows with Rb / R.R.Lb.L.Lb. x 3. The code is seen from the inside of the artwork. More codes are possible to make different circles.

kinetic solid
26 x 26 x 19 cm
Paper, glue
2012

Lines 7-5, 5-1, 1-4 and 4-2 of a heptagram are folded downwards. Five of these figures are attached to each other with lines 7-1 on 1-2. This unit can be folded in and outside. In this case, the 'legs' are fold so they are attached to each other.

The solid is formed by 12 of these units combined with 20 units which has been connected on the same way, only these are formed with 3 heptagrams with the legs outside. These 2 units are connected with sides 3-4, 4-5 and 5-6. A pentagram of this kinetic solid has been pressed inside.

dodecahedron
21 x 21 x 21 cm
Paper, glue
2012

Line 1-3 of a heptagram has been cut of. Through this line point x is placed with a side-length distance from point 3. Line 6-x is fold upwards. Line 4-x and 5-x are fold downwards. This form is attached on 4 others with lines 3-x to 1-7. Twelve of these pentagrams are attached on each other. The outside lines 4-5 have got no attachments which makes the equilateral triangles seen on the solid.

ANNA URSYN

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STATEMENT

Typically; my creation process runs through several stages. First I draw abstract geometric designs for executing my computer programs. I use the computer on different levels. Some of my computer programs produce two-dimensional images; others are three—depending on my composition's final dictates. Then I add photographic content using scanners and digital cameras. The programs that produce two-dimensional artwork serve as a point of departure for prints on canvas and paper. They are included both into my two-dimensional and three-dimensional works. All of these approaches are combined for image creation with the use of painterly markings. I drew inspiration for my Visible Geometry series from drawing exercises I owe to studying geometry.

Selections
8 x 10 in
Archival print
2011

Quartus
8 x 10 in
Archival print
2011

WORK

Small parts of available material can construct a new shape. Dividing and organizing aids communication.

K_ VAN

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STATEMENT

Looking at the art presented at the Bridges Organization on Mathematical Art I am encouraged and pleased to find that mathematicians and artists have taken a moment to share and celebrate their progress. It is like climbing a mountain and this is a moment when we turn around and look back at the astounding view that unfolds before your eyes.

My own work deals with painting two dimensional polygon meshes using colour contrasts. Starting from my sketch book I take models that I have drawn, rebuild them in 3D programs and break them down into low polygon meshes. I then transfer the model onto canvas, going from high tech to needle and embroidery thread tracing each vector from its starting point to its ending point. Once the threads are in place I start painting the planes. This process may take months of carefully adjusting the colours of the paints to achieve various warm and cold colour contrasts.

sculpture of animals with two children [side view]
50 x 70 cm
Embroidery thread, oil on canvas
2012

WORK

This art work belongs to a triptych entitled: sculpture of animals with two children. I had started on this work in the late summer of 2011, a complete breakthrough in idea and colour use. Previously I had been busy for 5 years on 50 abstract paintings, experimenting with 3D work, computer animations, modelling and CNC techniques. After talks with Sofia Kapnissi (artist and art consultant) we concluded that I should merge them together. The bulky images of the computer models on the computer monitor screen seemed so fascinating. Taking the works out of the computer and physically working and shaping them on a painter's canvas makes a real impact. This is because I can use different colour contrast models. The green paints for instance are not mixed with black or white to give contrasts by tones, but rather with yellows and blues moving from warm to cold on the colour circle; this, having as starting point J.Itten's fundamental studies on colour.

SUMAN VAZE

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STATEMENT

I seek to depict interesting mathematical truths, curiosities and puzzles in visually descriptive ways. Mathematical amusements inspire the colour and form in my paintings, and I try to strike a balance between the concepts and their depiction in art.

Persistence of Shape (Juggernaut)
24 x 36 in
Acrylic on canvas
2013

WORK

"Are there four shapes, no two of them alike (mirror images not considered different), that can be put together in four different ways to make larger replicas of each shape?" This question was first asked by C. Dudley Langford and passed on to Martin Gardner. This is the hexomino solution to the replication problem evocative of Jagganath of Puri.

The Persistence of Shape
16 x 32 in
Acrylic on canvas
2013

"Are there four shapes, no two of them alike (mirror images not considered different), that can be put together in four different ways to make larger replicas of each shape?" This question was first asked by C. Dudley Langford and passed on to Martin Gardner. This is the octomino solution.

The Persistence of Shape (The Life of Pi)
36 x 24 in
Acrylic on canvas
2013

"Are there four shapes, no two of them alike (mirror images not considered different), that can be put together in four different ways to make larger replicas of each shape?" This question was first asked by C. Dudley Langford and passed on to Martin Gardner. This is the tetrabolo solution to the replication problem.

WILD & GERACI

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STATEMENT

Ron Wild creates intense, multi-dimensional "smART Map" collages. These vibrant mash-ups remix up to 100 layers of finely detailed mathematical and scientific imagery. Ron's extreme mapping approach results in rich visual montages that spark many novel ideas and insights. You can't just casually look at these 'smART Maps', you really have to wonder about them. As science is not just for the scientists, art is not just for the artists. Here is an emerging explorer at the art and science frontier, who bridges the divide between the two. With a foot firmly planted in each camp, Ron's extreme mapping approach results in rich visual montages that spark many novel perspectives and insights. Ron Wild is a western-Canadian Digital Art / Science Collaborator, currently working in downtown Toronto. He believes that unless people ask "but is it art?" it isn't.

Reckoning
24 x 36 in
Digital Chromogenic
Original
2013

WORK

Reckoning is the result of an effort which attempted to create an aesthetically pleasing piece involving an explosive brew of mathematical imagery. Many of the images are unlikely to be understood by the general public, however the hieroglyphic characteristic of modern mathematics is none the less, beautiful. The piece features characteristic elements from geometry, topology, combinatorics, physics, analysis, and algebra.

Dr. Joseph Geraci is a mathematical physicist working in medicine and drug discovery. He uses mathematical structures to strip away the cacophony of noise that is inherent in medical data sets where the goal is the ability to predict the most effective treatment for individual patients. Currently he works on several cancer projects and mood disorder treatments. He utilizes graph theory, topology, geometry, statistics, dynamical systems theory and beyond.

NATHAN WILSON

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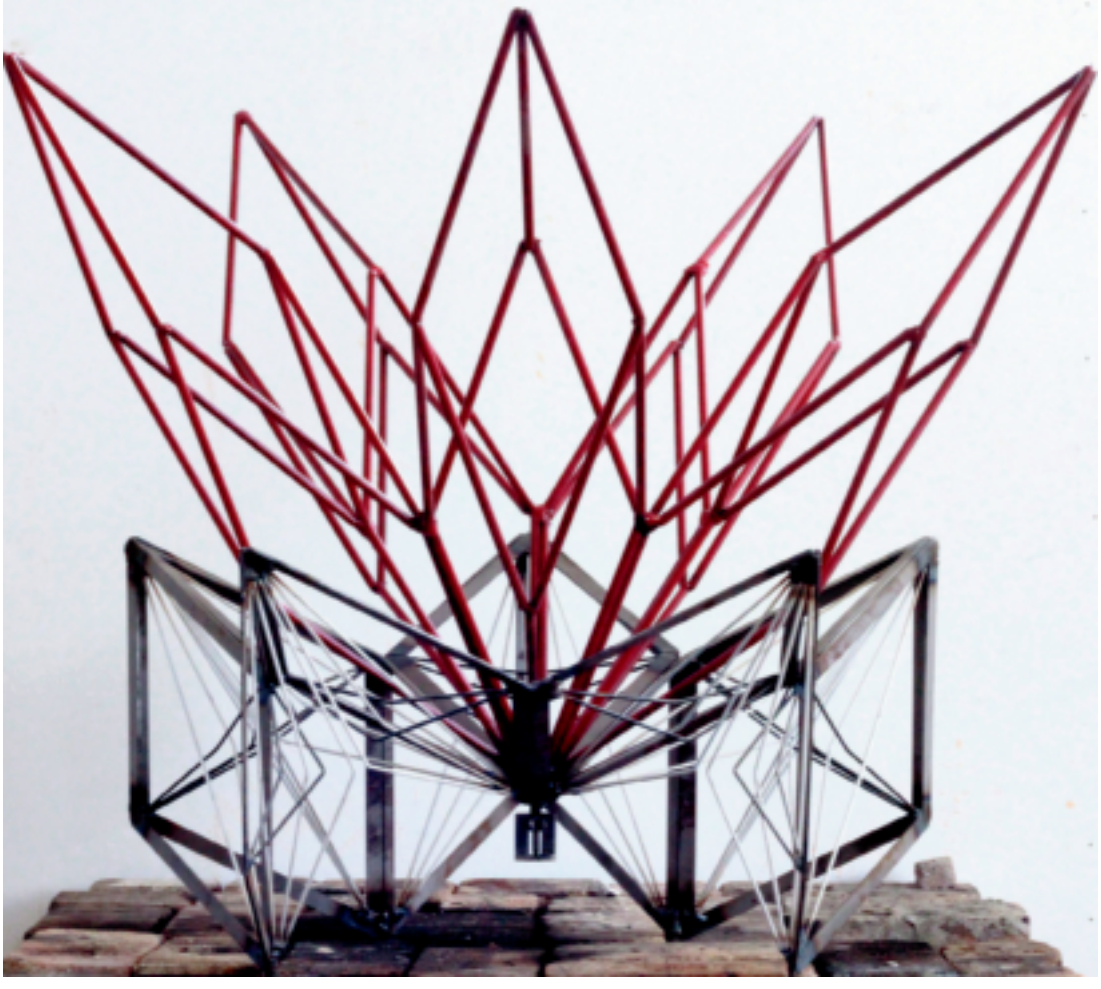
STATEMENT

With the creation of each new piece I endeavor to bring my Natural Science education to an applied level that can be physically presented. My Thesis is concerning the determination of core properties with which we conceive the world and I find a good audience provides the best data in this pursuit. Exposure to proportionality, symmetry groups and notions of inflation/deflation and partitioning can lay the groundwork for a comprehensively nourishing educational foundation. Although there is a fair amount of theory involved in the Sciences it need not be memorized. Introduction of principles using physical manipulatives sets the stage for the subsequent presentation of theory perfectly. My most recent pieces deal with applications of aperiodicity and 5-fold symmetry as I believe these and concepts of spatial growth are enticing to most human beings inherently.



Creeping Order
38 x 34 x 34 in
Steel finished with paint
2013

WORK

Over the past year I have been privileged to work with Professors at my College on individualized programs regarding Crystallographic and Quasicrystalline modeling. In my studies I have considered aesthetic and mathematical elements of both planar and spatial aperiodic lattice structures and it is from this field of study that my submitted work arises. Both portions of my piece are partial constructions of vertex star aggregations, which due to common Icosahedral symmetry, nest in each other. The bottom portion is based on the Rhombic Hexecontahedron and is further deconstructed with black and white "projections", the maximums of which are influenced by the dihedral angles of Danzers K prototile. The nested portion above is a partial construction of a 120 faced vertex star composed of prolate rhombuses as seen in the planar Penrose Tiling. This is a construction that draws immediate attention to equivalence and interconnection adherent when examining data from multiple perspectives.