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CHARLES GINNEVER: GIANT STEPS

NAT FRIEDMAN

Introduction

A sculpture is defined as a form (object) in a fixed position relative to a horizontal plane (base, ground). Two sculptures are congruent if they consist of the same form in different positions. The interesting point is that congruent sculptures can look quite different. A hypersculpture is a set of congruent sculptures. A hypersculpture is a more complete presentation of the sculptural possibilities of a form. Hypersculptures by Robert Morris, Tony Smith, Arthur Silverman, Richard Serra, and Charles Ginnever were discussed in [2]. The hypersculptures by Morris were Untitled (Two Columns), 1961, and Untitled (Two L-shapes), 1965; by Smith, Five C's, 1980; by Silverman, Attitudes, 1986; by Serra , 58 by 64 by 70, 1996, 4-5-6, 2000, Equal Weights and Measures, 2006, and Sante Fe Depot, 2006; and by Ginnever, Kitsune, 1988, Rashomon, 1993-1998, Transitions for Thelonius Monk, 1993- 2001, Mirage(formerly KujitsuShi), 2001-2005, and Giant Steps, 2006-2008.

We note that the four hypersculptures by Serra each consist of a rectangular forged steel block with three different dimensions in each case and placed in either three or six different positions. The hypersculptures 4-5-6 and Equal Weights and Measures each consist of three congruent sculptures, where the block is positioned with three different heights. The hypersculptures 58 by 64 by 70 and Sante Fe Depot each consist of six congruent sculptures. In each case two sculptures have the same height but one sculpture is rotated ninety degrees with respect to the other. The blocks are lined up in a row so that six different rectangular faces of the block are visible from one viewpoint.

The five hypersculptures by Ginnever are quite varied. The corresponding five different forms are each an open steel construction consisting of bands of steel welded on edges. There are also a different number of positions in each case of which there are two in Kitsune, fifteen in Rashomon, four in Transitions for Thelonius Monk, six in Mirage, and ten in Giant Steps. We note that when Serra viewed Ginnever's 1988 Hypersculpture Kitsune in 1993, he initially did not believe it was the same form in two different positions, as related by Mary Maggini in [1].

The name Giant Steps refers to the

Figure 1. Giant Steps 1

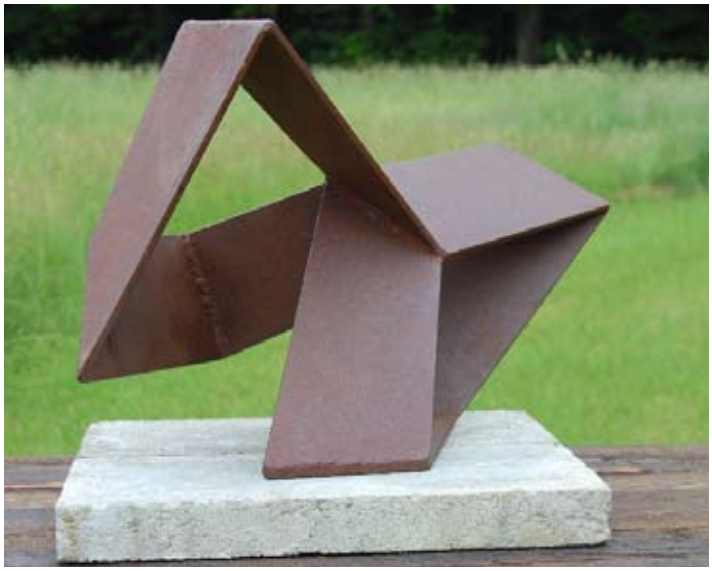

Figure 2. Giant Steps 1, Alternate view

Figure 3. Giant Steps 2

Figure 4. Giant Steps 2. Alternate view

Jazz album by John Coltrane. In [2] Giant Steps was shown as four congruent sculptures. Here we will present Giant Steps as ten congruent sculptures, which will simply be labeled 1-10, as shown below. Giant Steps is a remarkable hypersculpture in the sense that it consists of ten impressive congruent sculptures that are all quite different. It is hard to believe these sculptures are all the same form in ten different positions.

The fundamental statement below by the Basque sculptor Eduardo Chillida is particularly applicable to the following images of Giant Steps.

Figure 5. Giant Steps 3

Figure 6. Giant Steps 3, Alternate view

Figure 7. Giant Steps 4

Figure 8. Giant Steps 4, alternate view

Figure 9. Giant Steps 5

Figure 10. Giant Steps 5, Alternate view

Only one of the three dimensions is active (the one which comes toward me from far to near), but all three must be in power, alternating their activity.

- Eduardo Chillida

Figure 11. Giant Steps 6

References

[1] Mary Maggini, Ginnever at Runnymede, Runneymede Sculpture Farm, 1993.

[2] Nat Friedman, Hypersculptures, Hyperseeing, May, 2007, www.isama.org/hyperseeing/

Figure 12. Giant Steps 6, Alternate view

Figure 13. Giant Steps 7

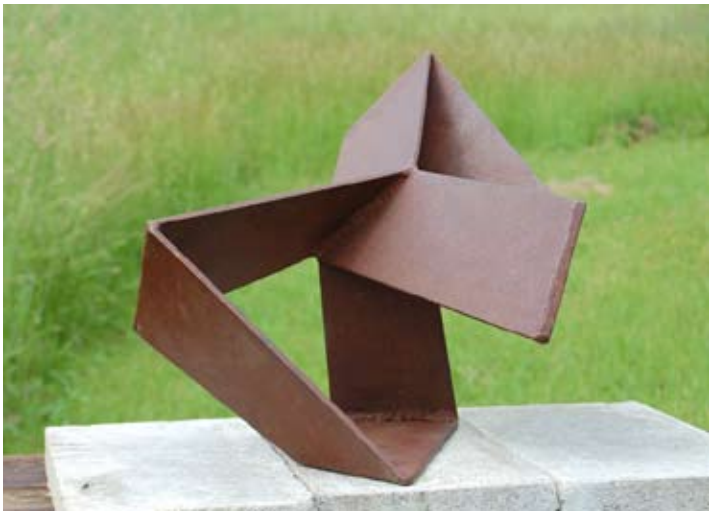

Figure 14. Giant Steps 7, Alternate view

Figure 15. Giant Steps 8

Figure 16. Giant Steps 8, Alternate view

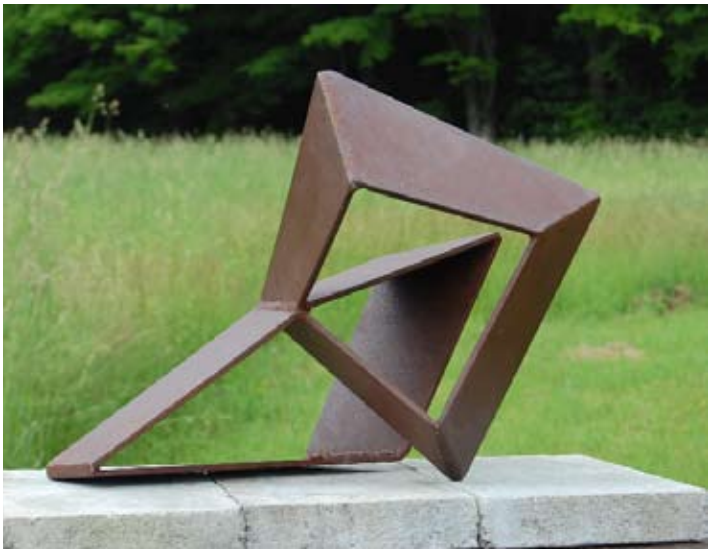

Figure 17. Giant Steps 9

Figure 18. Giant Steps 9, Alternate view

Figure 19. Giant Steps 10

BRECKENRIDGE SNOW SCULPTURE 2008: DAVID CHAMBERLAIN, *COLD HANDS, WARM HEART*

STAN WAGON
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Introduction

Since 1999, some friends and I have taken part in the Breckenridge International Snow Sculpture Contest. This has been lots of fun and we have even won some prizes and honorable mentions. Most important, we have developed as sculptors over the years, learning from masters such as Helaman Ferguson, Robert Longhurst, Bathsheba Grossman, Brent Collins, Carlo Séquin, and most recently, David Chamberlain [1,2]. For descriptions of past contests, see my website http://stanwagon.com Last year we carved Cool Jazz, a musical motif designed by the sculptor David Chamberlain [3]. This year we carved Cold Hands, Warm Heart, a romantic and swinging shape also designed by Chamberlain.

Model by David Chamberlain

David provided the model for Cold Hands, Warm Heart shown in Figure 1. It was made of Styrofoam wrapped in plaster and could be moved easily as it was light weight. It was exactly 1/5 scale (1/125 the volume of the final sculpture), thus making the transfer of measurements simple.

The sculpture is very impressive. In particular, the two views in Figure 1 are quite different. The view on the left in Figure 1 is dominated by the horizontal curving form on the left, which spirals into the center and then blends into the three scalloped concave forms (fingers) on the upper center right. The view on the right in Figure 1 is dominated by the strong vertical edge in the center, which divides into the heart shape in the lower center. This is a beautiful model and really inspired the team, which consisted of David Chamberlain (Halifax, Massachusetts), Stan Wagon (St. Paul, Minnesota and Silverthorne, Colorado), Dan Schwalbe (Hamel, Minnesota), and Rich and Beth Seeley (Silverthorne). The team is shown in Figure 2 in front of the finished sculpture.

The process of carving the sculpture will now be described. Before carving the full-size sculpture we first practiced on smaller versions. Indeed this year we did double practice (Styrofoam and snow), in part because David emphasized that the deceptively simple shape was difficult to get exactly right. We knew from past experience that when a strut passes through a loop, it is very

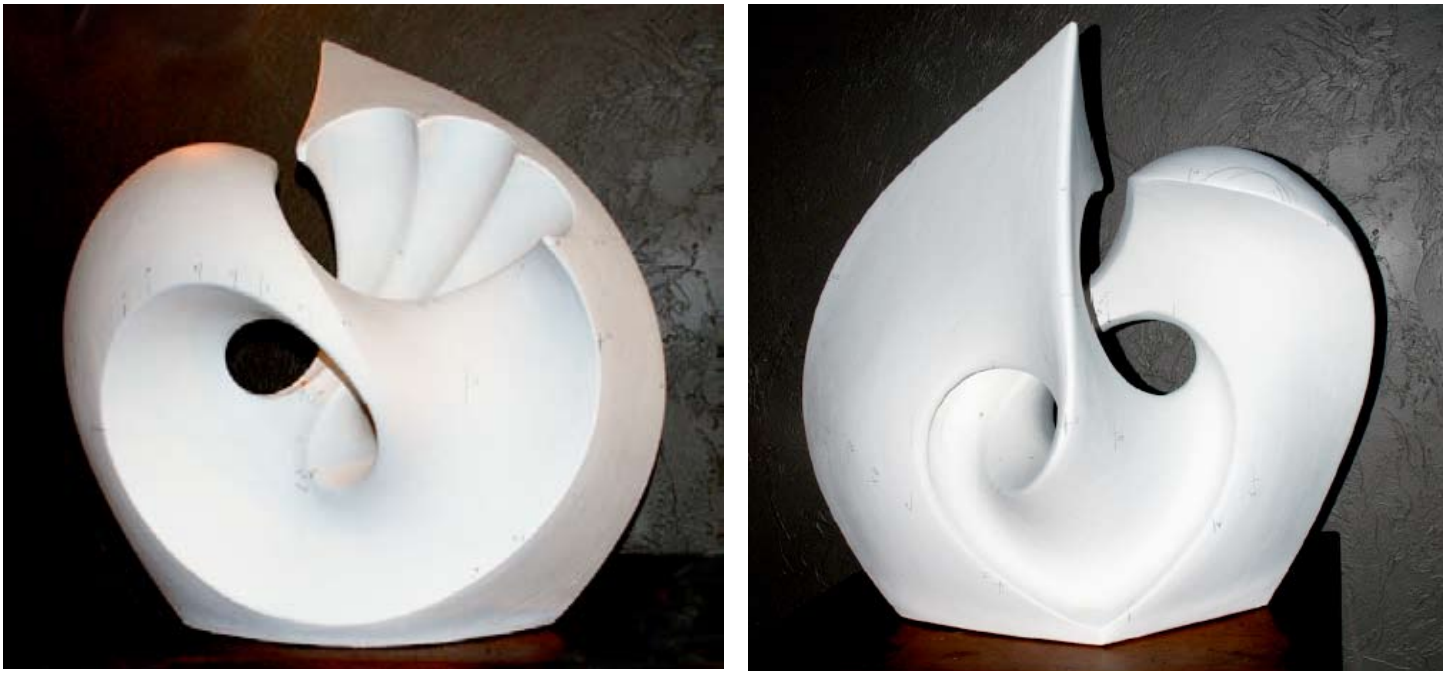


Figure 1. David Chamberlain, Model for Cold Hands, Warm Heart, Styrofoam and plaster, 2' w x 2'd x 2.4'h

Figure 2. Team on Saturday night, from left: Dan, Rich, Beth, David, and Stan

easy to make an error: as the team works, all struts and surfaces are thicker than in the final form.

Comments by David Chamberlain

"*Viewers of artwork like intellectual stimulation and I try to reward them through the development of articulated surfaces that are unpredictable, playful, and somewhat elusive. I want to engage viewers and lure them into the sculpture so their time and curiosity will be well invested. The surprise factor is important and that there are extraordinary things happening is a primary reason I felt compelled to make the piece in the first place. Ideally, the closer we get to a sculpture, the more intrigued we become, wondering: Where does this feature come from, and how does it get there, and where does it go? We feel the need to see it from varying distances, angles, directions, and perspectives. The essence of the piece is the visual puzzle -- the way the curves and surfaces fit together -- that gives the sculpture its reason for existence, its life. This design is meant to be viewed from a lot of places and directions (hyperseeing) in order to be understood, and it takes a while to achieve this comprehension.*

For example, the heart shape on the large face (Figure 1, right) is oriented typically with its point on the bottom, but is actually not a heart at all. Rather, the edges defining it are a series of disconnected spirals in space that dance around and pass by each other, relating to several different planes and surfaces. As with a successful magic trick, viewers are fooled at their own levels: they all think they have it figured out, only to discover the final surprise of the effect.

There are some visual puns in CHWH as well, such as the top point coming down as a front edge through the middle of the heart shape, going around and behind itself to become the point of the heart, then back around again -- to disappear as it leads us to the opposite side of the sculpture. In order to follow it there we have to leave the front, so we lose our place, temporarily, to reveal a larger cardioid pattern on the opposite face (a heart without the point, like an apple) bounding and framing a yin-yang image forming a dimensional heart made of a pair of interlocking positive and a negative surfaces (that, from a distance, change concavity/convexity). The fun is that, at some point, we realize it is all one interwoven surface.

As a serious sculptor who imagines that I become the material I sculpt as I fashion it, I have an intimate understanding of many materials I carve, such as stone and wood. Styrofoam is probably the closest I can come to the hard-packed snow at this event, for like snow it is uniformly crystalline (yet almost without grain), and luminous white (both reflecting and refracting light). There are good reasons why artists have sculpted white marble over the millennia, and why plaster is an ideal medium for making sketches and models.

White shows everything, and more. Snow is quite strong in both compression and tension (surprisingly), it tools beautifully, and it finishes well. You can even patch a little here and there. Of all the white media I am familiar with, snow is the most facile. How else could four people make a 12-foot piece in 65 hours? The most intriguing and prominent feature of snow as a medium, which is honest and true to the nature of the arts, is that it melts away! So we must respect and appreciate the creative process as well as the product, for the process (and photos) are all that we have left after a couple of weeks."

Figure 3. Styrofoam practice. Model on left with Stan and David, Styrofoam practice cube on right

Two Days To Go:
Styrofoam Practice,
Sunday, Jan. 20

We spent the day carving Styrofoam and working on our tools. We managed to turn the Styrofoam cube into a pale cousin of the beautiful model made by David. Frankly, working in Styrofoam is messy work -- it clings to everything -- and I looked forward to working on a practice snow block the next day.

One Day To Go:
Snow Block Practice,
Monday, January 21

On Monday the team worked hard on the practice snow block. We were not concerned about the structural integrity of the design so we could focus on getting the shape right, and it all seemed to work. We also continued to work on our collection of tools and our plan of attack. We wanted to be able to move efficiently once the event began on Tuesday at 11 AM. We started work on the practice snow block using the rough Styrofoam attempt from Sunday as a guide. Then we switched to David's finely made model, and by the end of a snowy Monday we had the decent replica shown in Figure 4. A useful team observation that gained us much efficiency was the realization that we could place a square wooden frame around the base of the block, with

Figure 4. Stan with finished small snow replica and model

some additional structure to maintain the right angles. We could mark up this frame, visible in Figures 8 and 9, not only with footmarks, but with many other points relevant to the sculpture. With this in place, we could plumb down from the top to locate the exact positions of various points in 3-space. This addressed two problems: the supporting asphalt base slopes a little and the sides of the block are never exactly vertical. We had never seen this idea used by other teams, but in practice it worked very, very well.

Figure 5. Finished snow blocks awaiting the teams from around the world

Constructing the Blocks

Construction of the blocks is complicated. Snow is made on the ski hill, trucked down, dumped, and then blown into forms that are ten-feet square by twelve feet high. Residents stomp the snow several times to insure it is hard packed. Its final density is about one half that of solid ice. The finished blocks awaiting the teams are shown in Figure 5. There were sixteen teams from the United States, Canada, Mexico, Netherlands, China, France, Germany, Spain, and Lithuania.

Tools

We made many new tools this year, to ease the task of sculpting the specific shapes. Shown in Figure 6 are some that worked especially well. The best were the stainless steel helmet in the center, the lexan with mending plates to its right, and the short-handled tool with a curved sharp blade just below the half-round sono-tube.

We had now practiced and prepared our tools. Our 20-ton block of snow shown in Figure 7 was waiting for

Figure 6. Tools

us to begin carving. I recall our first year at this event when we faced the block and thought, "What now?" That year we had few tools and no experience in this medium. Ten years later we moved efficiently with the initial measuring and cutting of the planes.

Day One: Tuesday

We began by using a chain (a sequence of chain saw blades) that works well to saw large pieces off. In Figure 8 Dan and Stan are working the chain to cut off a huge piece.

We sawed off some more planes and then moved to drilling some long holes. We use a four-inch diameter ice-fishing drill to bore about five feet from one side and the same from the other, in the hope that the holes meet. Using the wood frame, a level and a long stick on the top of the block for directional alignment, we are able to drill very accurate holes, and it is very satisfying when they meet. A pleasing combination of geometry and careful work by eye.

Day Two: Wednesday

Lots of snow removal today. We started with some big planes, and then slowly hacked away to get what we think is a good rough form. The amount left to do is intimidating, but we have to work slowly to avoid mistakes. We can't put anything back in case of error! The weather seemed to be a non-issue this year. Not warm enough to melt anything but cold enough to freeze hands and feet. The progress made on Wednesday is shown in Figure 9. The small hole in the center is a drilled hole that goes all the way through.

Figure 7. Model and snow block, 10'w x 10'd x 12' h

Figure 8. Dan and Stan sawing a huge piece

Figure 9. Progress on Wednesday

Figure 10. Progress on Thursday

Day Three: Thursday

We removed a lot of snow on Thursday and got our basic shape. Now on to the Friday-Saturday marathon.

Days Four and Five: Friday and Saturday

By the end of Thursday we believed we had the form right and so Friday and Saturday would be devoted to fine-tuning the curves and finishing the faces. We felt under time pressure from the beginning, but yet, as in past years, accomplished a tremendous amount on Friday and by Friday night we knew we had it.

The transformation from Thursday night to Friday night was quite remarkable. On Saturday morning we did remove many snowflakes, both newly fallen and embedded, to thin out the sculpture a bit, but the hard work was now over. The comparison of the model and the final sculpture in Figure 12 shows that we succeeded in accurately locating all the important control points in

Figure 11. Friday night progress

space. This would not have been possible without the wooden frame around the base, which guaranteed accurate placement of points. And of course knowledge of the exact location of 20-30 points in three dimensions makes connecting them in the right way much easier.

The daylight views in Figures 13 and 14 emphasize how the sculpture is a beautiful composition of form, space, light, and shadow. As in the model, the horizontal curve sweeping from the left spiraling into the center and the scallops (fingers) dominate the view in Figure13.

The strong vertical edge interacts nicely with the curved form on the right with distinct light and shadow in Figure 14. A beautiful detail shot is shown in Figure 15.

We end with two striking night views in Figures 16 and 17. The heart shape is seen in the lower center of Figure 16. The view in Figure 17 shows the icy finish due to a day in the sun.

Figure 12. Comparison of model and full size sculpture

Results

As we surveyed our work on Saturday we knew that this piece was harder than our previous work here, and that the great effort spent in practice and tool development paid off. We were very happy with Cold Hands, Warm Heart. Last year we took second place, which was gratifying, but not as gratifying as simply completing the tricky and delicate sculpture, which is what snow sculpture is all about. This year the judges did not award us a prize, and I believe they felt our work wasn't risky enough (winning sculptures (China, Yukon, Germany) can be seen at http://stanwagon.com/snow/breck2008/index.html.). Yet we knew the design was very risky and the passage from right-angled cube to swooping curves was fraught with difficulty. Errors quickly crept into the practice blocks, and we could with care avoid making them again; yet the curves, the tools, and

Figure 13. Daylight view with horizontal curve and scallops (fingers)

Figure 14. Daylight view with vertical edge and curved form on right

Figure 15. Detail image: Scallops and Curves

the enthusiasm with which we remove snow can quickly lead to disaster, so we were pleased that all the curves and surfaces emerged as they were supposed to.

Snow was a perfect medium for our sculpture. The large surfaces and swooping curves looked elegant and refined and the finished surface could easily be mistaken for marble or alabaster. Snow also accentuates light and shadow effects. And of course, as the more intricate sculptures lost detail after the event (one crashed within hours), Cold Hands, Warm Heart slowly and gracefully got a little thinner each day, and still looked as good a week later.

Photo Credits: Figure 1, David Chamberlain; Figures 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, Rich Seeley; Figures 14 and 15, Janet Halasinski; Figures 16, 17, Dan Schwalbe.

References

[1] David Chamberlain, Melodic Forms: The Sculpture of David Chamberlain, Boston, Godine, 1990.

[2] Nat Friedman, David Chamberlain:Melodic Forms, Hyperseeing, June, 2007, www.isama.org/hyperseeing/

[3] David Chamberlain, Dan Schwalbe, Richard and Beth Seeley, and Stan Wagon, Cool Jazz: Geometry, Music, and Snow, Hyperseeing, February, 2007, www.isama.org/hyperseeing/

Figure 16. Night view, The Heart

Figure 17. Night view, Icy Finish

III: GRID GEOMETRY/ EUCLIDEAN SPACE PERIOD (1971-1988)

DOUGLAS PEDEN

Figure 1: Landscape # 56 (1972) 40X54"

In continuance of my previous article in Hyperseeing, this is my third stylistic change in painting, where I go from a flat linear space to a grid space.

The foundation of grid space, for the most part, is simply the Cartesian grid — our common graph paper format. The grid format gave me the opportunity, by painting the individual grid cells, to break up the previously flat, horizontal color spaces into diagonal rhythms of variegated colors and tones, as illustrated in a typical painting of this period, Landscape # 56, Figure 1. These diagonal rhythms added a musically conceived background and counterpoint — an added dynamism to the painting as compared to the horizontal background colors and landscape symbols discussed in my previous article. Also, painting the individual cells added a "color space articulation," similar in effect to the 19th century French Impressionists. Though this was a much slower painting process, I felt it worth the time for furthering the effect of mood and "music." Another example is illustrated in Figure 2, Landscape #44. Note here the use of a vertically oriented canvas; also, the augmented mathematical positioning of the grid cells in the lower portion of the painting to break the strict 45 degree diagonal common to a Cartesian grid format. To add to the sense of movement and variation, I experimented with the addition of textural dabs of paint in a few pieces to create scattered points of shadow and highlighting, which would change with the position of the viewer and lighting. An example can be seen in Landscape # 55, Figure 3.

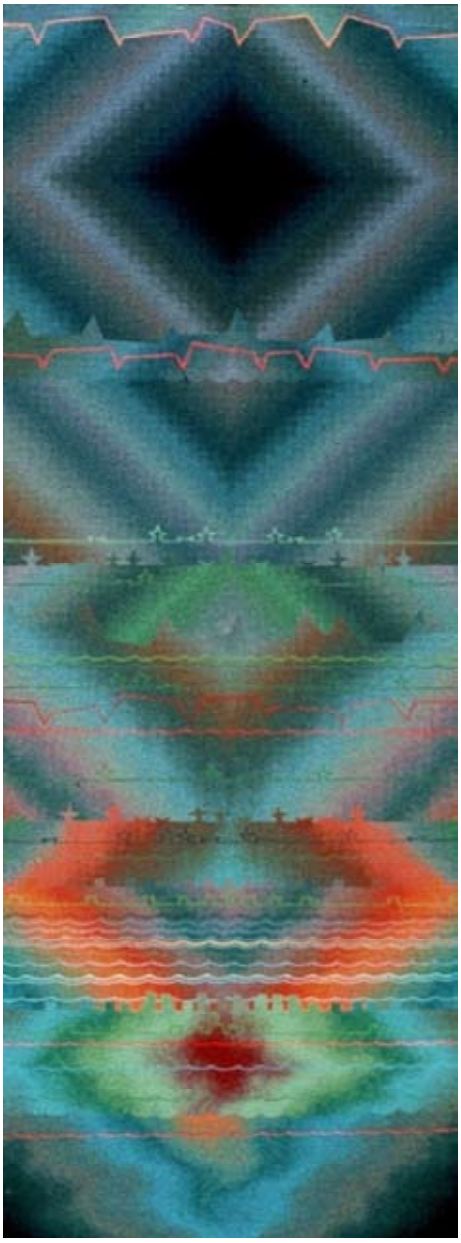


Figure 2: Landscape #44 (1971)

During this period, I became more aware of the implied musical possibilities in structure, which ultimately led me away from the landscape idiom to other possibilities.

Figure 3: Landscape # 55 (1972) 40X54"

One such idea is illustrated in Figure 4, # 120, Dragon Wars. Here I created an abstract theme structured in grid space in the symbolic image of a dragon. The dragon is seen in various situations, such as melding together from their facing positions, as in the lower right section; and, with size, color, orientation, and rhythmic variations, with interlocking arrangements similar to tessellated Escher patterns. It should be mentioned here that my numbering system also changed from a landscape number to more of an opus number. Other avenues of exploration at this time can be seen in my construct — a "built-out," sculptural construction, Figure 5, Tchaikovsky Variations # 1, Opus 119. Here, using a parallelogram grid foundation, an abstract theme based purely on a combination of geometric shapes was used; however, one can still see leftover suggestions of landscape water rhythms, especially in the upper and lower parts of the composition. The theme, however, is based on a specific combination of shapes as a whole statement, with thematic fragmentation sometimes being emphasized in the "built-out" areas: indeed, all this much in the spirit of classical music with its thematic statements and developmental sections. Another construct (I only did 17) completed during the same period, exploring the possibilities in a freer sculptural expression, is shown in Figure 6. In this piece, I briefly returned to the landscape style; in retrospect, a time of thematic transition. However, here I pushed the piece beyond the restrictions of a rectangular format. The underlying, strict grid design is highlighted as a visual (musical) crescendo in the upper extension while a geometric, spatial contrast, using a totally random grid format, is highlighted in the central section of the painting — again exceeding a boundary which, in this case, is the mathematical simplicity of a Cartesian grid. Figure 7, A Child's Journey Into Winter, is a slightly earlier construct demonstrating the use of a landscape theme.

Another example of a totally abstract, musically inclined painting with a 5 section theme can be

Figure 4: #120: Dragon Wars (1980) 21X65"

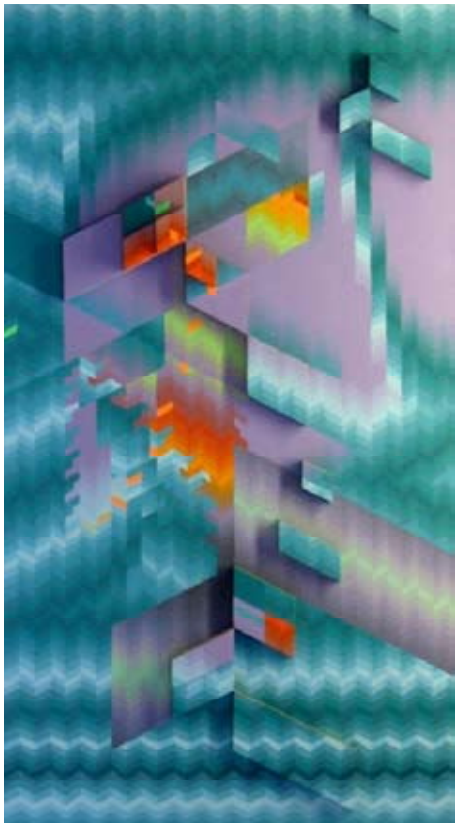


Figure 5: #119: Tchaikovsky Variations #1 (1980) 48X24X4"

seen in Figure 8, Opus 108, Theme Variations, based on a triangle grid. It should be noted, that I was making a greater use of an extended horizontal or vertical framework for my paintings. This was to take into account an episodic development of the

Figure 6: #122: Humoresque of Separate Cities (1980) 30X28X3"

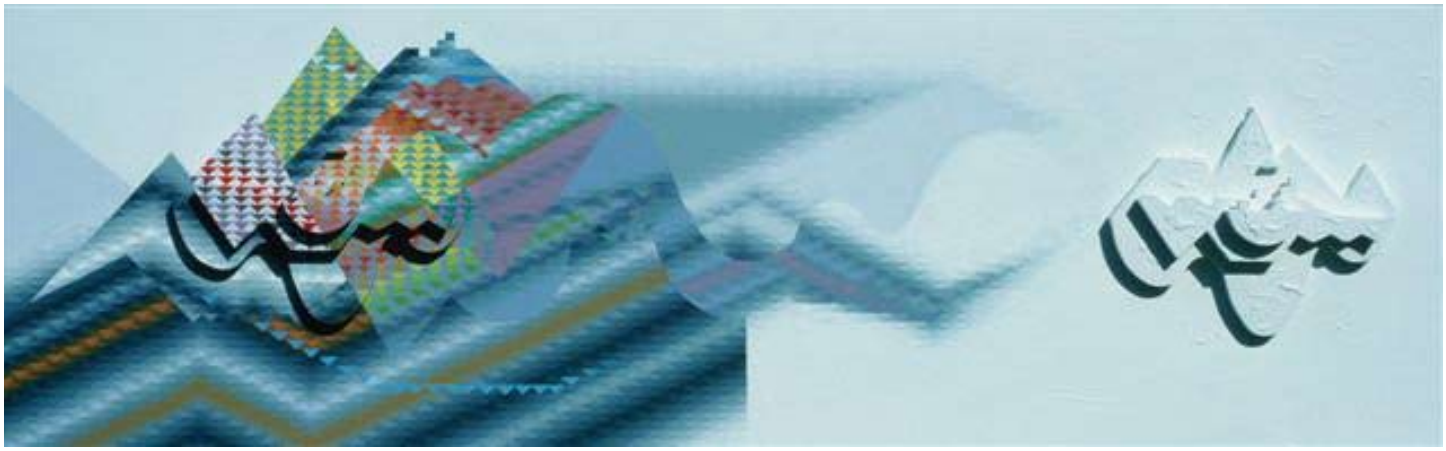


Figure 7: #115: A Child's Journey Into Winter (1979) 22X66X4"

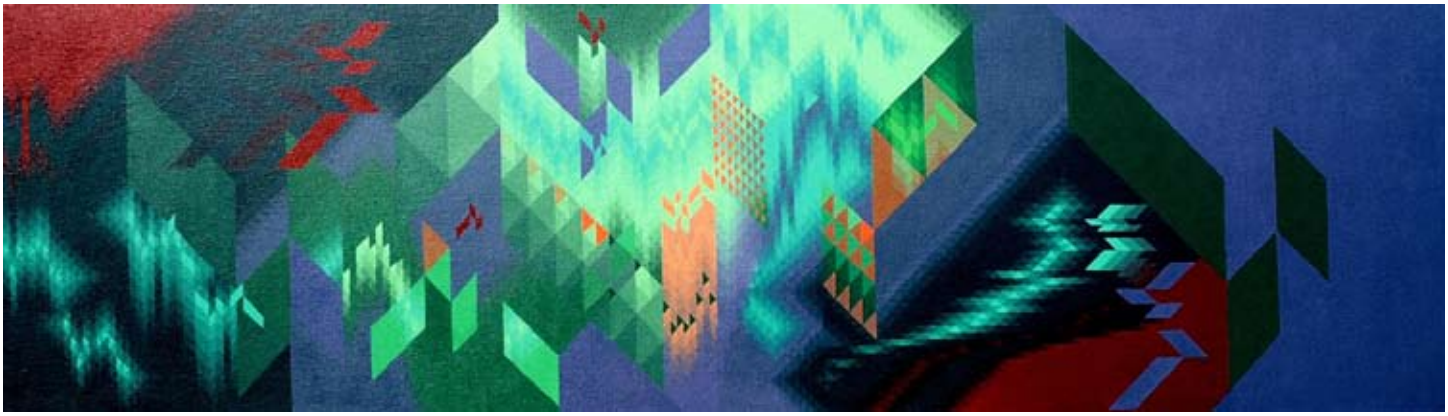


Figure 8: #108: Theme Variations (1977) 24X84"

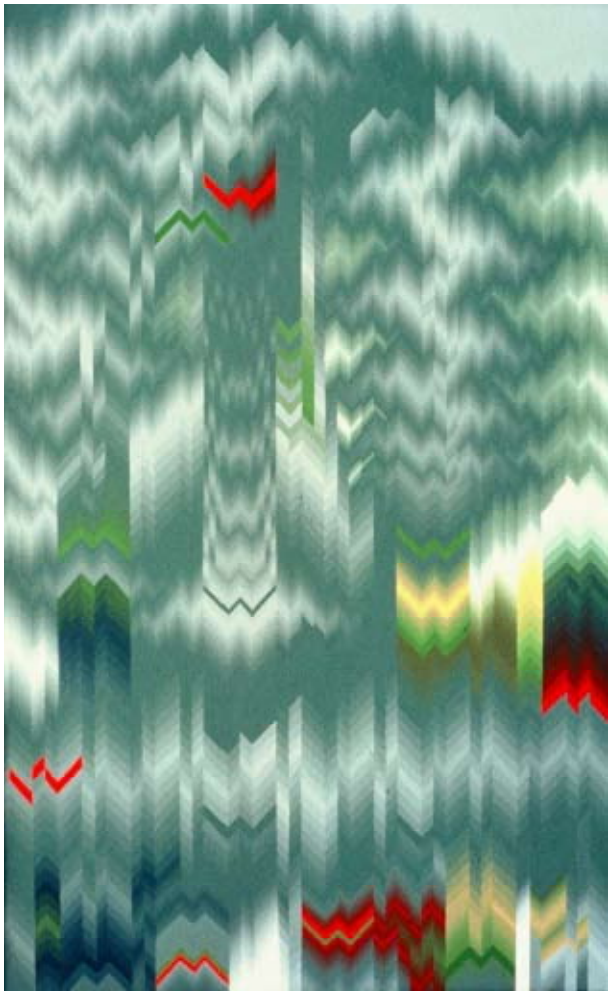


Figure 9; #113 (1978) 65X40”

Figure 10; #45 (1971) 52X56”

thematic material to encourage the viewer to read the work horizontally or vertically rather than accept it viewed all at once as a whole. This was an area I explored later in greater complexity and depth, as I feel these concepts, as those before, can always be pushed further.

For good measure, let me include some other examples of my oeuvre during this period: Figure 9 is clearly a more musical piece expressed with a W theme and its variations. Figures 10, 11, & 12 are landscape paintings. Note in the triangle painting, Figure 10, the painted V shaped diagonal rhythms countering the strong diagonal framework. Note also, that the composition of Figure 11 was inspired by Sung Dynasty

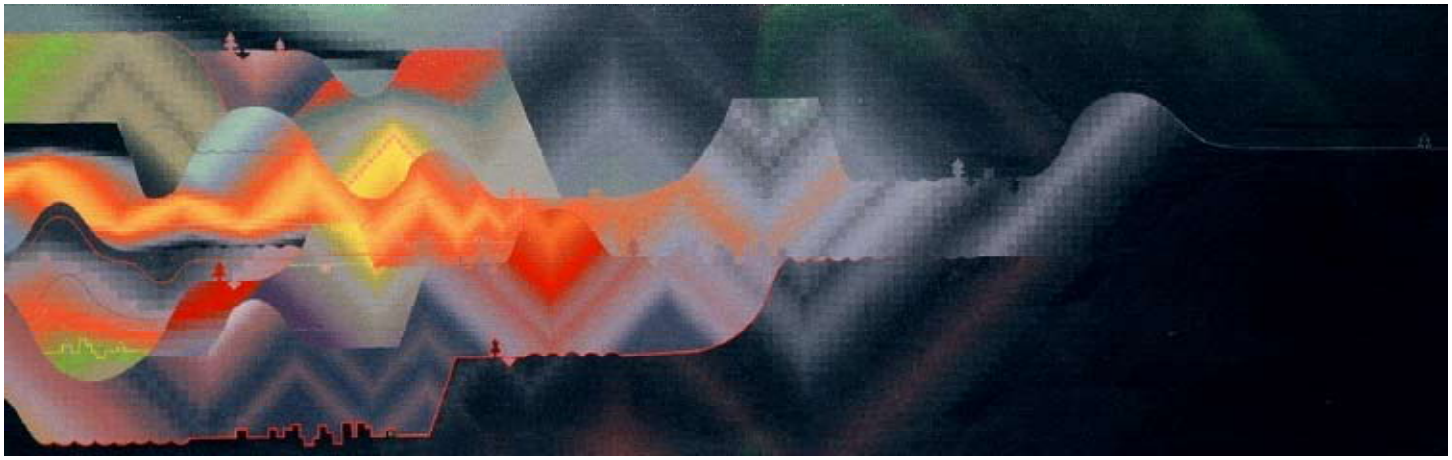


Figure 11: #81: Creation Myth (1974) 24X84”

Figure 12: #101: Space Trails (1976) 50X67”

Chinese painting, seen in its complexity on one side and “balanced” by the essentially blank black extension on the other side. Figure 12 tends to be a more “airier” piece, appropriately titled Space Trails.

VTo end this essay, my last example, Figure 13, is my next to the last painting of Period III. In this completely abstract piece, the title pretty much explains the intent, especially in the line rhythms and mathematical progressions (musical beats?); plus, the 4 variations of a shape.

Stay tuned! My next article will deal with the beginnings of a new spatial concept in art called Grid-Field Geometry and Wave Space Art, Period IV.

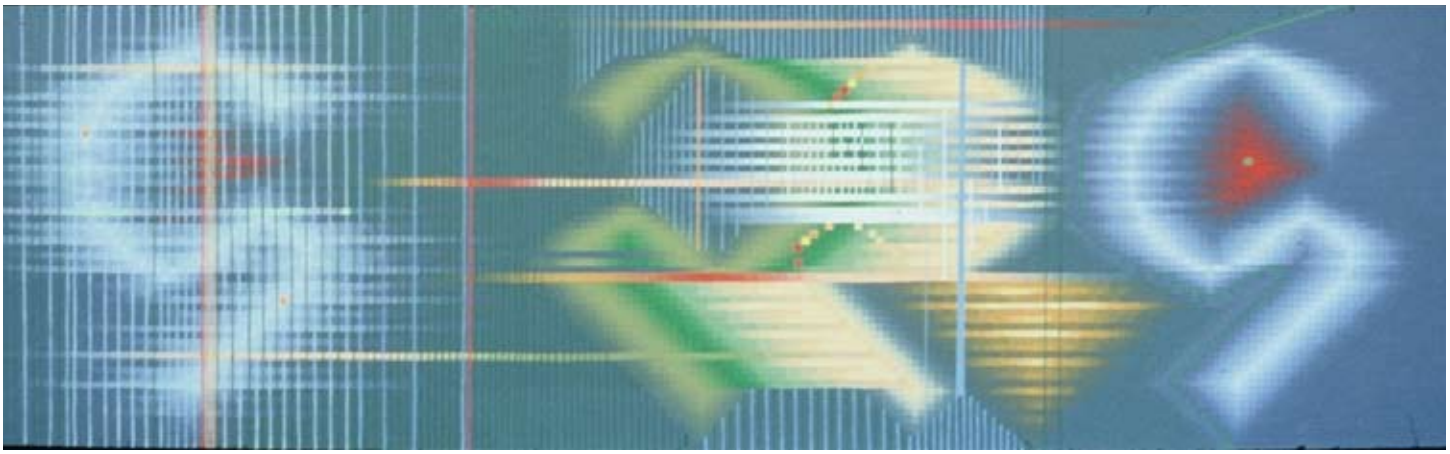


Figure 13: #139: Concerto for Line & Shape (1987) 16X51”

GYÖNGY LAKY: CROSSING BORDERS

NAT FRIEDMAN

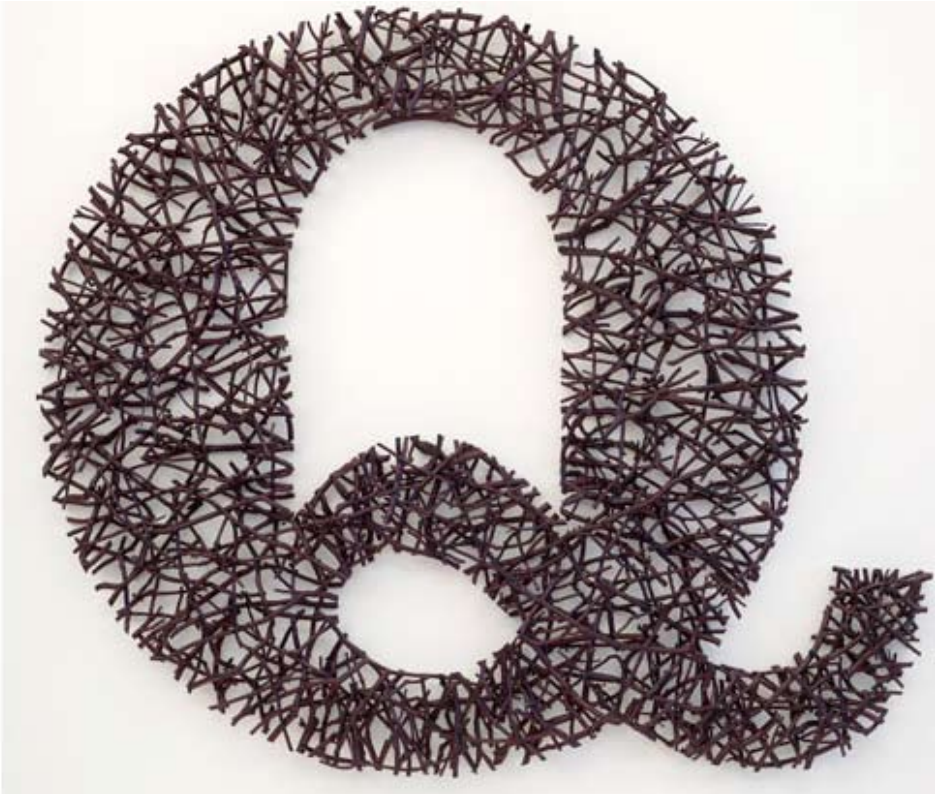


Figure 1. Big Question, 2007, 68" x 78" x 5", Manzanita, blue ink, bullets for building, photo Ben Blackwell

Introduction

Gyöngy Laky was born in 1944 in Budapest, Hungary. Her mother Zyta Udrycka Laky was a painter, pianist and dancer and her father Laszlo Laky was an educator. In 1948 the family fled Hungary and were given refuge with a family in St. Gilgen, Austria. In 1949 the family arrived in the US and lived in Ohio (with the Stocker family), Oklahoma, and Texas before settling in Carmel, California in 1956. After graduating from Carmel High School in 1962, she traveled, studied, and worked before beginning studies at UC Berkeley in January, 1967.

Figure 2. One and One, 2007, 11" x 27.5", Apple, paint, screws, Collection of Peter and Betty Lipman, Portola Valley, CA, Photo Ben Blackwell

She completed a Bachelor of Arts in 1970 and a Master's degree from UC Berkeley in 1971, where she worked with Ed Rossbach, Peter Voulkos, and Lillian Elliott.

She then traveled extensively and in 1973 she opened Fiberworks, Center for the Textile Arts in Berkeley and remained its executive director until 1977. In 1978 she was appointed Acting Associate Professor at UC Davis and received tenure in 1979 and promoted to Full Professor in 1985. She chaired the Department of Art from 1995 to 1997. She has had a very successful career as an artist, teacher, conference organizer, and administrator. In 2005 she retired to devote full time to studio work

Gyöngy Laky was an invited speaker at AM98, the Art and Mathematics Conference held in 2008 at the University of California, Berkeley, co-organized with Carlo Séquin.

Comments by Gyöngy Laky

My work is heavily influenced

Figure 3. Pale Weather, 1994, 20" h x 31" diam. , almond, dowels, glue photo: Jacques Cressaty, private collection, New Jersey

by my association with architects and architecture. Studying at UC Berkeley in the College of Environmental Design, I became fascinated by grids, latticework, tensile structures, strut and cable construction and other such architectural and engineering assemblages. I learned how to solidify a structure by cross-bracing and the principles of intersecting lines. I discovered that I could distort grids extensively to create the shapes I want to make provided I maintain adequate strength in the bracing relationships. The myriad intersections result in a diverse array of angles, which also allow for some flexibility so that the forms are semi-rigid and can withstand movement and support weight…I think this idea is used in some earthquake resistant structures.

Crossing Borders

The works in Figures 1-4 above indicate that Gyöngy Laky's art works cross borders, as succinctly stated as follows.

She is first and foremost a sculptor who happens to cross borders between art, craft, design, engineering, architecture, and agriculture very comfortably. (J. Dugdale, Baseline Magazine, 2000)

Although Laky initially worked in fiber arts, she later started creating sculptures with wooden tree limb cutoffs. This came about because she commuted from San Francisco to UC Davis and noted the pruning and burning, which took place in winter in orchards between the two cities. She began to collect the pruned tree limbs and this eventually led her to constructed sculpture.

This change in direction probably was influenced by the fact that from the age of two, Laky's favorite place was the family vineyard, where she had close contact with nature.

In particular, there must have been a strong attraction to the piles of discarded limbs as sculptural material. In the Hungarian countryside of her childhood, there were, at the time, mud and wattle bronze age style farm buildings still in use for hay storage and animals. Farm fences were also made of branches, joining the limbs by weaving and tying. Today Laky uses screws, nails, or "bullets for building" (as the drywall screws she likes are, ironically, called) to keep the limbs together in her complex structures. The construction of the sculptures can be labor intensive as the method used is akin to doweling with each connection being made by first drilling a hole and then inserting the nail or screw – thus avoiding splitting the wood.

We also note that Laky has traveled very extensively so crossing borders also applies in this sense. In particular, she spent a year living in France in the mid-1960's and in 1971-72 she did post-graduate studies in India and traveled thru Afghanistan, Greece, Israel, and

Figure 4. Surroundings, 1994, Site specific installation at the Art Gallery, California State University, Chico, CA, Photo: Cathy Murphy

Figure 5. Q with no A, 2007, 29" h x 25" w x 2.5" d, Ash branches, paint, bullets for building, Photo Ben Blackwell

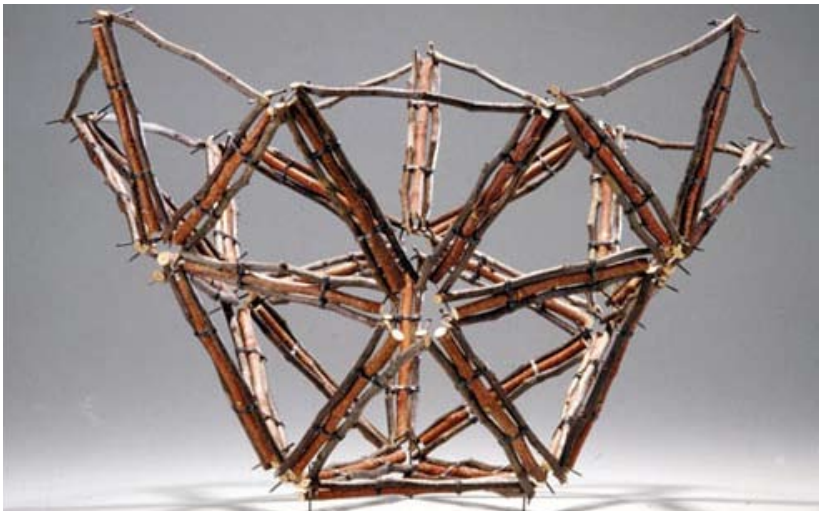


Figure 6. For BF, 2000, 14"h x 23" diam., Plum and apple prunings, steel wire, nails. Photo: M. Lee Fatheree

Figure 8. Apricot Orb, 2000, Apricot prunings, hand painted dowels, 19" h x 22"diam. Collection of Joseph Azrack and Abigail Congdon, Photo: M. Lee Fatheree

Poland. She returned to India in 1977 and presented a seminar to the National Institute of Design, Ahmedabad, Gujarat, India. She has had solo exhibitions in Copenhagen, Barcelona and Manchester, UK. The contacts she made during her early travels led her to organize a Fiberworks' International Symposium in 1978 on Contemporary Textile Art, with over 475 attendees from the US, Canada, and several European countries. The eminent Polish artist Magdalena Abakanowicz was her houseguest and keynote speaker.

Works

Words, letters, and numbers are familiar objects in contemporary art. In particular, numbers and letters can be seen as given geometric designs and it is up to the artist to present them in an original and impressive manner. Here is a quote from the catalog for her 2007 exhibition Intersections.

"In Laky's artistic imagination, words assume a dimension of physicality, they become entities beyond simple vocabulary much as with concrete poets for whom form, arrangement, dimensionality, texture and pattern enhanced, expanded and engaged broader meaning through their words' visual presence. Laky's words, let-

Figure 9. Protest: Naught for Naught, 2000, 48" x 48" x 16" (N prone) and 120" x 120" x 36" (O standing) Organic orchard prunings, screws

Figure 7. Traveler, 2003, 10"h x 6.5" diam., Eucalyptus, manzanita with bullets for building. Collection of Nancy and Steve Selvin, Berkeley, CA, photo: M. Lee Fatheree

Figure 10. Laura's Quilt, 2007, 50.5" x 50.5" x 3", Apple, vinyl coated nails. Photo: Ben Blackwell

Figure 11. Time, 2001, 22" x 22" x 1", Apple prunings, copper finish brads. Collection of Jill Butler, Connecticut

Figure 12. Yellow Piece, 1984, approximately 100' x 125', Surveyor's tape

Figure 13. Forms for Language, 1989, A site-specific work commissioned for the international conference, Landscape and Sculpture, Projects Environment and Manchester Polytechnic, Manchester, England

ters, and symbols bring into play additional concerns that are about potency, the context for use and of location, as well as conceptual underpinnings. Individual words are less about simple denotation of meaning than complex layered connotation that is by turn ostensive, contrary, and seductive. An illustrative series is Laky's artistic engagement with the ampersand (&) sign, which interrogates as well as reifies the popular symbol in works such as "GO and…." and "Estuary" – each derived from a traditional print font that she alters to suit he r broader purposes." (M.Lee, Intersections catalog, 2007)

Big Question and Q but no A

The large size of the wall sculpture Big Question in Figure 1 gives it a strong sculptural presence as an abstract shape. The title reminds us that it is the letter Q. The power of the work is in the construction, which contrasts the very precise clean outline of the work with the irregular overlay of the cutoffs. This can also be seen in the related wall sculpture Q with no A in Figure 5. Here the difference is in size of elements and the density of the cutoffs compared to Big Question where the cutoffs appear more "lacy".

One and One

One and One in Figure 2 is a statement in a clever configuration. It goes beyond the usual trivial presentation of a statement simply spelled out in the usual way, which I have a hard time appreciating as art. Here Laky introduces some real ingenuity. A horizontal 2 is drawn out as a one and one. Of course this opens up a whole range of arithmetic possibilities for sculptures. Laky comments further as follows.

For many years… 10 or 15 at least…I have been planning to make number sculptures. The talk I gave at AM98 mentioned above spurred my interest in numerals, but I did not make any numbers until this piece.

I decided language would again be my best tool. There was something sweet and graceful about the form so I was moved to make it small and intimate as opposed to my other language pieces. I wanted to make it more like a symbol than a word and liked how the shape seemed to function that way…as if it is some sort of mathematical sign or musical symbol.

Vessels

A vessel is an ancient classic shape and everyday, hundreds must be

Figure 14. Into Africa, 2000, Approximately 15" diameter, Plum prunings with telephone wire, private collection

Figure 15. Every Red Cent, 2007, 42”h x 33.5”w x 4”d, Commercial wood, paint, bullets for building. Photo: Ben Blackwell

made by ceramic students and wood turners. An example of a minimal open vessel is shown in Figure 3. Here minimal refers to the minimal number of twigs used to construct the work so that it is recognized as a vessel. In this case, less is more.

A geometric configuration of an open vessel is shown in Figure 6. Here we have an example of a vessel constructed from approximately equilateral triangles. An interesting polyhedron would result if this vessel was considered the lower half of a polyhedron with a corresponding top half joined above. The title For BF refers to Buckminster Fuller and a reference to his work on geodesic domes.

A third vessel is shown in Figure 7. The diameters of the limbs are relatively thick resulting in a strong construction. The lighter cross sections displaying the circular growth rings contrast nicely with the darker surfaces of the limbs.

Laky has made many different vessels and we will only discuss a small number here. One more example is shown in Figure 8. Here the shape is spherical and the construction uses curved cut-offs.

Architectural Works

We now cross a border from relatively intimate vessels to large architectural works. In Figure 4 we have a series of arches forming a large enclosure. There is a circular entrance at the far end of a diminishing curving arch walkway. Each arch was progressively larger funneling outward from the oval opening. Laky employed relatively few cross-bracings to make the point to the students working with her that the arch ,itself , is a strong architectural form even if composed of thin branches.

In Figure 9 we have a large circular construction created for the international sculpture exhibition, Kunst in der Landschaft, V, located in an organic farming valley, not far from Vienna, Austria. On the ground lies a smaller “N” to complete a quietly protesting “no” allowing the standing “O” to represent ought or naught as in nothing, destruction, ruin or complete failure (carried further, even wicked, improper or obscene as in “naughty”) referencing the ascendance of an ultra right-wing politician, to prominence in Austria earlier that year almost derailing Laky’s intention to participate in the exhibition.

Squares and Grids

Laky has also constructed a series of works based on square and grid motifs. I can’t resist starting with the minimal work in Figure 10, which reminds me so much of the beginning of a Suduko puzzle.

Laky admits to enjoying games of Suduko when taking a break in the studio. She is also intrigued by cross word puzzles and has used the basic square configuration for a variety of word constructions. One example is shown in Fig-

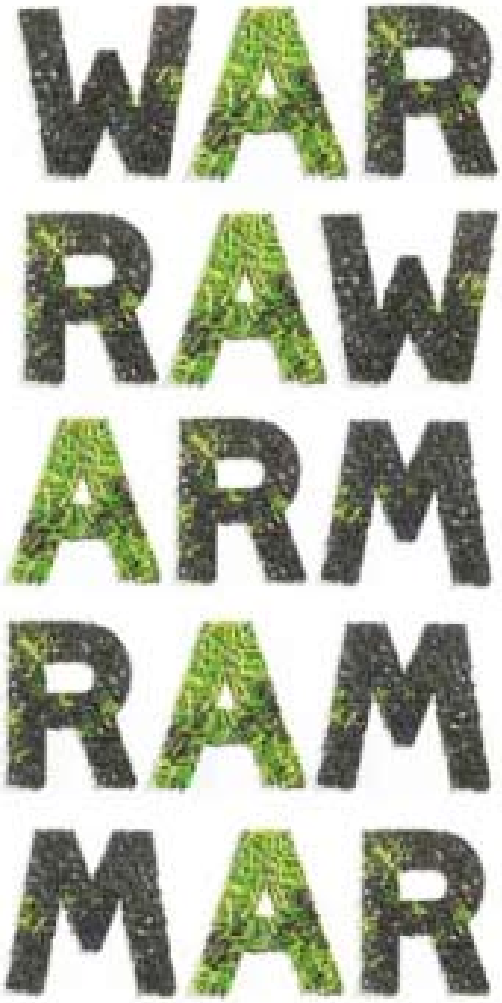


Figure 16. Globalization II: Homogenization, 2004, 32”w x 97”h x 4”d, Apple, commercial wood, plastic soldiers, sheet rock screws and bullets for building. Photo: Tom Grotta. Collection of Eric and Barbara Dobkin, New York

ure 11. This small piece allowed Laky to play with two languages at once in that it can be read in Spanish as "you" and "me" or in English as "time". This word also explores minimalism in that the least number of sticks possible make up each letter. A repetition of the "T" shape, however, in the "E", is achieved by a simple left rotation of the same linear layout.

A monumental grid construction as an environmental work is shown in Figure 12. This work was commissioned by the inauguration of the Headlands Center for the Arts, just north of the Golden Gate Bridge in the Golden Gate National Recreation Area. Three plastic grids were created with surveyor's flagging tape, each describing a different aspect of the land; one red, one blue, and this one in yellow followed the shapes and contours of the land. The Yellow Piece suggests a computer assimilation, as the lines move to reveal the shape beneath.

"Both the grid organization and the surveyor's material itself have been used to regularizing nature, and thus call to mind the contrary aspects of the American relationship to the land – civilizing on one hand, despoiling on the other." *J.Koplos, Portfolio Collection: Gyöngy Laky, 2003.*

Other Borders

Gyöngy Laky has also constructed sculptures that cross other borders. One example is the knot sculpture shown in Figure 13. Here the tree is given and the idea is to construct an impressive sculpture exploiting the branching trunks. The paper rope is about 4 inches in diameter. It was hand plied, on-site with recycled paper from the end roll remainders of a local printing shop. It was then wound on the tree. This was one component of a series of rope sculptures presented throughout All Saints Park in central Manchester.

Forms for Language can be seen as a dense sphere. Another dense sphere is Into Africa shown in Figure 14. This work was created by wet-molding plum cut-offs into circles and then allowing them to dry as rings. Because the branches are varying diameters and lengths, these rings resulted in a variety of finished circles, small to large, allowing for a dense ball to be formed from tiny circles, not more than an inch in diameter, to the final 15 inch diameter wound sphere.

The symbolic sculpture Every Red Cent is shown in Figure 15. Every Red Cent is an attempt to mischievously play with our concept of money. According to Edmund Moy, Mint Director, the yearly production of 8 billion pennies, worth 80 million dollars, costs us $134 million to make. This does not seem to make cents/sense!

We close with the permutation sculpture shown in Figure 16. The anagrammatic forms of the word "WAR" allow Laky to extend meaning and play with intentions. Figure 17 is a detail image showing the plastic soldiers in the branches.

For additional information and images, we refer the reader to the following websites.

http://gyongylaky.com

http://www.braunsteinquay.com/archive/index_2007.html

http://www.artbusiness.com/1open/111707.html

Figure 17. Globalization II: Homogenization, detail

PHILIPPE RIPS: FLEXIBLE GEOMETRY AND KNOTS

CLAUDE BRUTER

Figure 1. Regular tepees

Figure 2. Regular tepee

Introduction

In March, 2007, the Université Paris 12 welcomed an exhibition "Mathématiques et Arts" (see http://hermay.org/ARPAM/text/activ.html). The exhibition included works by Philippe Rips. Philippe's interests are focused on regular polyhedra and tensegrity. Some of his works are rigid but many of them can be described as flexible geometry.

A first series of these flexible works could be named "regular tepees". They consist of rods with ends joined by threads or coiled springs. The lower ends of the rods lie on the vertices of a regular polygon in a horizontal base plane. The upper ends of the rods lie on the vertices of a similar regular polygon in a horizontal plane above the base plane. The rods may be rigid, as when they are made of wood or metal, or flexible when they are made of bamboo or also metal. Examples are shown in Figures 1 and 2.

Most of these objects can be completely flattened, as shown in Figures 3 and 4. When the tepee is flattened, the bamboo flexes.

Internal Edges

An internal edge of a polyhedron is a line segment joining two vertices of the polyhedron and located inside the convex hull of the polyhedron. Rips has paid a lot of attention to internal edges.

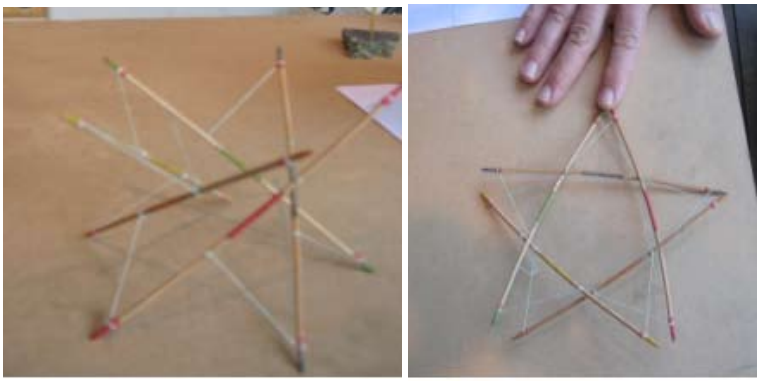


Figure 3. Flattening a regular tepee with rods

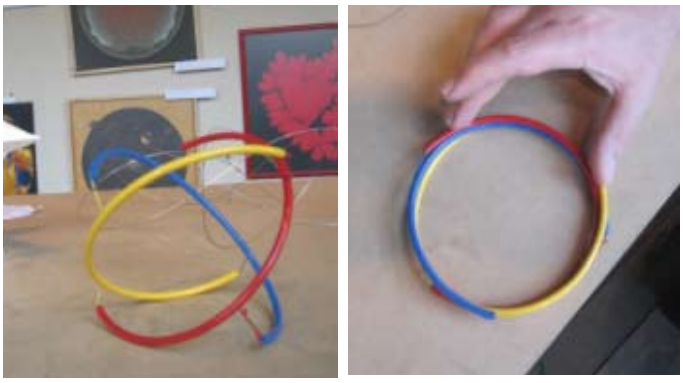


Figure 4. Flattening a regular tepee with arcs

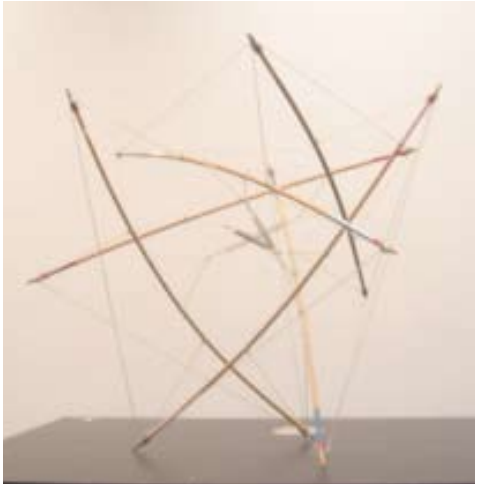


Figure 5. A regular n-foil

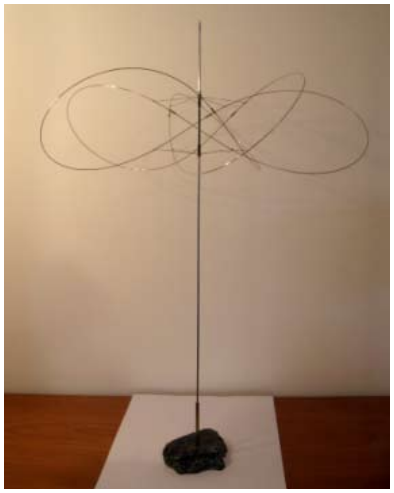


Figure 6. Pentafoil knot

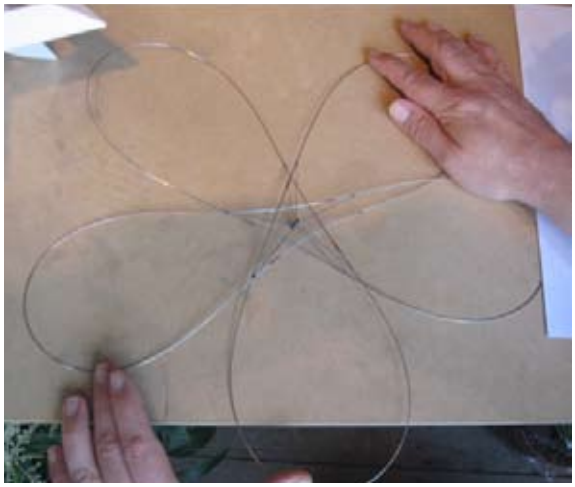


Figure 7. Pentafoil knot flattened

By connecting the ends of internal edges, Rips has created perfectly regular knots that we shall call regular n-foils. An example is shown in Figure 5.

The geometry of the underlying polyhedron is the main guide for fixing the positions of the rods and connectors. Since all the rods and all the connectors are the same, the symmetries of the interacting forces of the tepee agree with the symmetries of the underlying polyhedra. The icosohedron is one of Rip's favorite polyhedra.

Knots

Rips has also made knots out of flexible wire so that the knot can be flattened. A pentafoil knot is shown in Figure 6 and flattened in Figure 7. The frame from which the pentafoil knot was made is shown in Figure 8.

An internal icosahedron can be seen in the middle of the frame in Figure 8. The five horizontal axes of symmetry of the knot are also five horizontal axes of symmetry of the icosahedron through its center. This regular pentafoil knot and the icosohedron share the same symmetry group.

There is also a beautiful sculpture by Rips based on the cuboctahedron, which is shown Figure 9. This sculpture is constructed from the internal edges of the cuboctahedron.

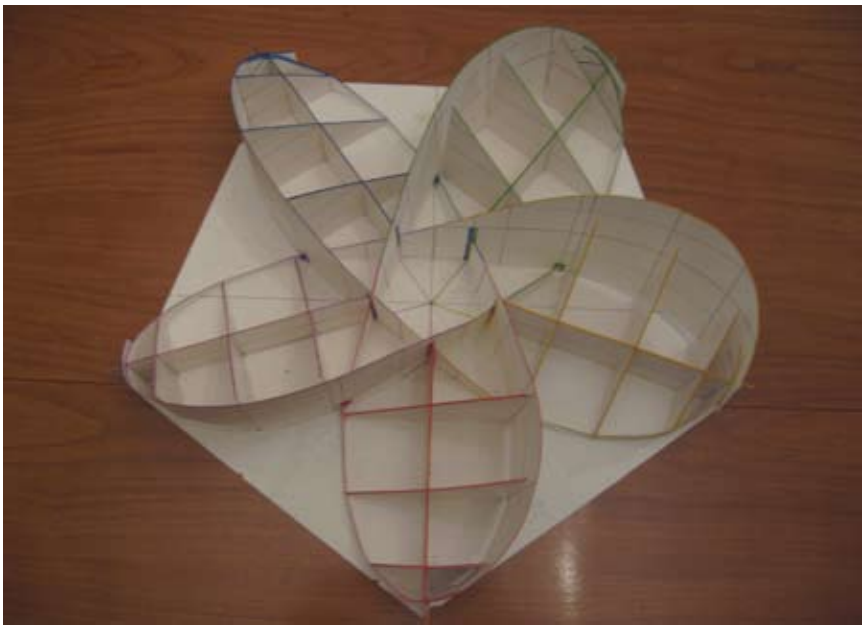


Figure 8. Frame for making a pentafoil knot

Figure 9. Sculpture based on the cuboctahedron

NEWS

JMM Art Exhibit 2008

The Mathematical Art Exhibit at the 2008 Joint Mathematics Meeting (JMM) held in San Diego, CA, January 6-10, 2008, was the best JMM exhibit ever. There were works presented by forty-four artists. The exhibit was organized by Robert Fathauer and Web Page design was by Anne Burns. The Jurors were Rinus Roelofs, Robert Fathauer, Anne Burns, Nat Friedman and Reza Sarhangi.

This year's exhibition was dedicated to Magnus Wenninger OSB, a pioneer in the mathematical art community, whose models of polyhedra have inspired a new generation of mathematical artists. The Lifetime Achievement Award below was given to Magnus Wenninger by the Special Interest Group on Mathematics and the Arts of the Mathematical Association of America (SIGMAA-ARTS).

The Mathematical Association of America
Special Interest Group on Mathematics and the Arts
is proud to present a

Lifetime Achievement Award

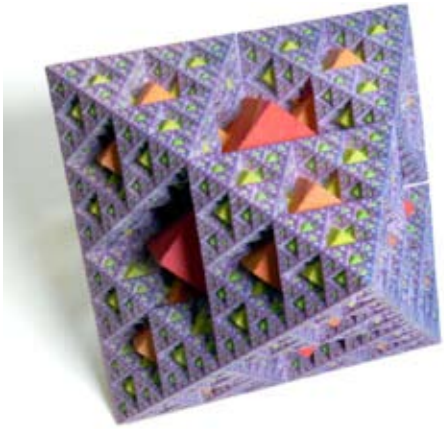
To

Magnus Wenninger, OSB

This award recognizes a lifetime of work in developing methods of construction of a variety of paper models of polyhedra, and sharing insights with teachers, mathematicians, and artists through demonstrations and publications. For generations of mathematicians, Magnus Wenninger's meticulous work has provided an introduction to making polyhedra models and has led to significant sculptures. Magnus Wenninger is honored as an important pioneer in relating mathematics and art.

Nathaniel A. Friedman,
Chair, SIGMAA - ARTS.
January 6, 2008.

Donna Loraine Contractor, Chinese Pythagorean Proof, Hand woven, hand dyed fully reversible wool tapestry on cotton warp, 2006, 20" x 20"

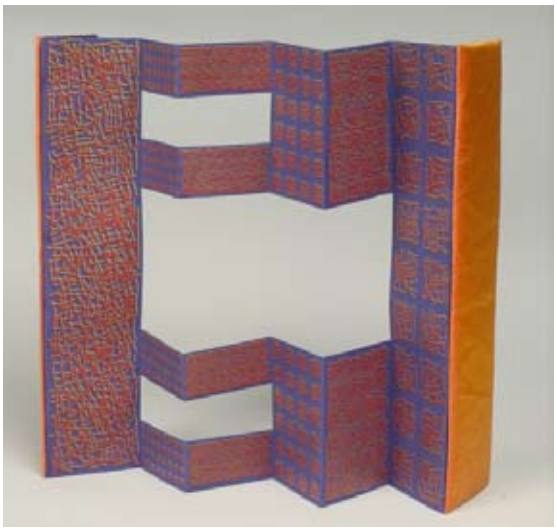


Robert Fathauer, Nicolas Duchnowski, & Hank Kaczmarski, Fractal Crystal No. 1, 2007, Sculpture created using a zCorp color 3-D printer, 8" x 8" x 8"

Nat Friedman, Fractal Torso III, 2007, granite, 12" x 9" x 1.5"

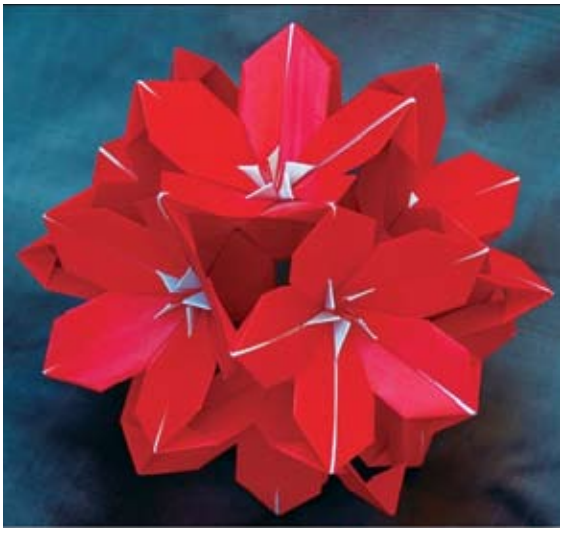
ARTISTS

The art works in the 2008 exhibit were by Sarah-Marie Belcastro, Robert Bosch, Harriet Brisson, Vladimir Bulatov, Douglas Burkholder, Anne Burns, Donna Loraine Contractor, Roland de Jong Orlando, Jeffrey S. Ely, Robert Fathauer, Robert Fathauer with Nicholas Duchnowski and Hank Kaczmarski, Michael Field, Larry Frazier, Nat Friedman, Chaim Goodman-Strauss, Gary Greenfield, Susan Happersett, Thomas Hull, Slavik Jablan, Andy Lomas, Kaz Maslanka, Susan McBurney, Douglas McKenna, Kerry Mitchell, Artemis Moroni, Meenakshi Mukerji, Jo Niemeyer, Curtis Lane Palmer, Andrew Pike, Dominique Ribault, Reza Sarhangi and Robert Fathauer, Radmila Sazdanovic, Carlo Séquin, Laura Shea, Clifford Singer, Mark Stock, Michael Sussna, Keti Tenenblat, Briony Thomas, Magnus Wenninger, Carolyn Yackel, and Kristina H.Yu.



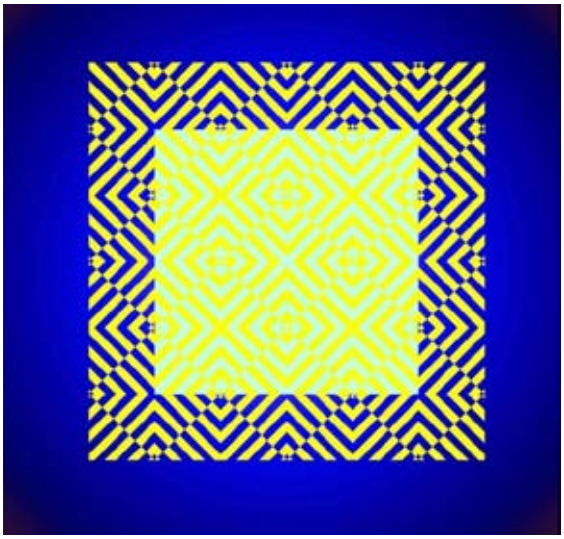
Susan Happersett, Infinity Remove, 2004, Letterpress ink on paper and silk, 15” x 9.5” x 2”

Thomas C. Hull, Hexagonal Wrap (Eulerian Cycle on an Octahedron), 2005, Canson paper, 9” x 14” x 14”

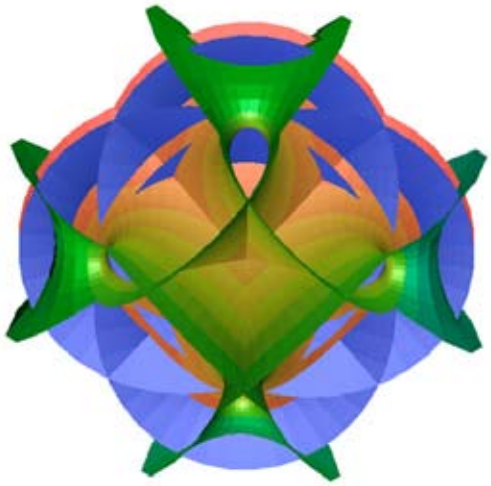


Meenakashi Mukerji, Poinsettia Floral Ball, 2003, Kami paper

Reza Sarhangi and Robert Fathauer, Buzjani’s Heptagon, 2007, Digital print, 13” x 13”



Slavik Jablan, Op, 2007, Printed graphic, 24” x 24”



Keti Tenenblat, A Minimal Surface Associated to a Catenoid, 2003, Digital print on photographic paper, 20” x 20”

Magnus Wenninger OSB, Polytopes, paper

Briony Thomas, Hall of the Abbassadors 3, 2007, Acrylic, 17 cm x 15 cm x 17 cm

A selection of works are presented above. For details on these works as well as the complete exhibition, see :
www.bridgesmathart.org/
art-exhibits/jmm08/index.html.

Carolyn Yackel, Plato's Hoedown, 2005, Thread, Pearl Cotton, Styrofoam, Copper, 16" x 20"

SPLENDEUR DES MATHEMATIQUES

Centre Culturel Christiane Peugeot
Paris, France
January 21-29, 2008

Introduction by Claude Bruter

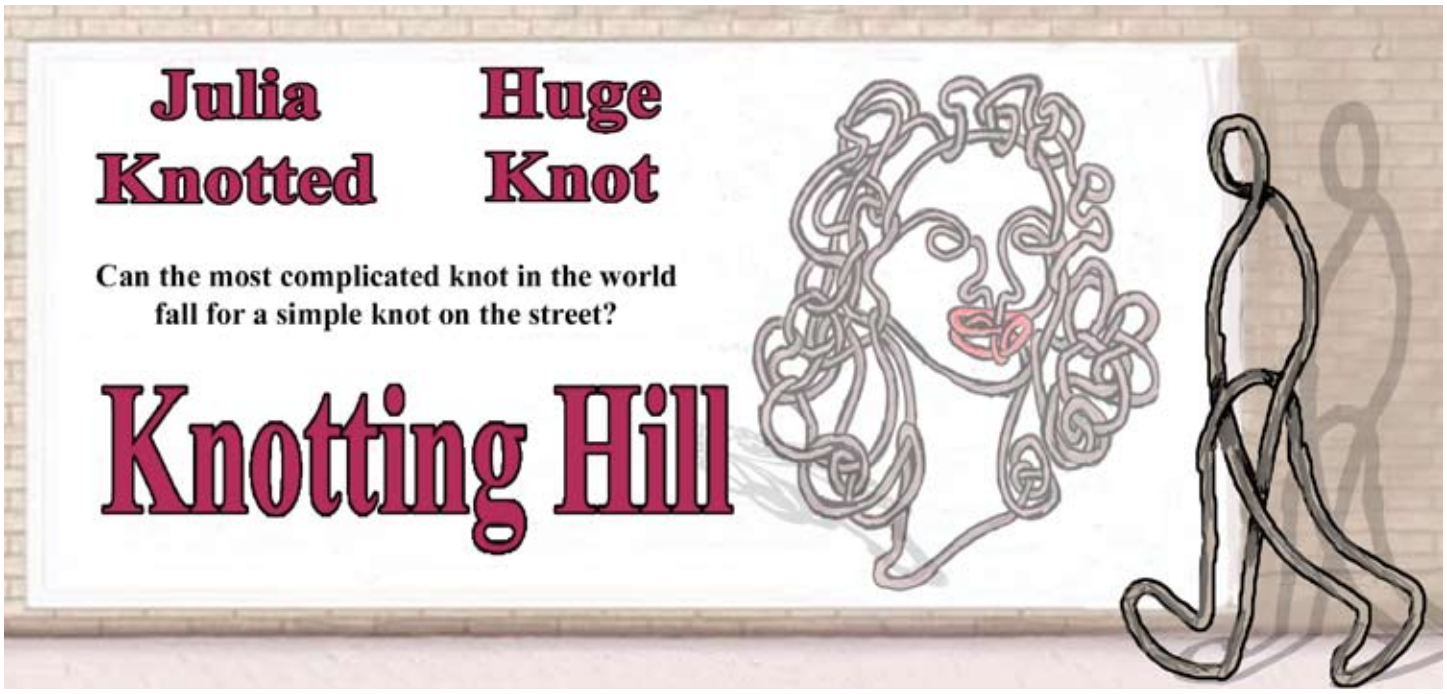
Francois Tard, a member of the Peugeot "Atelier-Z", discovered the Arpam exhibit when visiting the last salon des jeux et de la culture mathematique, and suggested to Christiane Peugeot and to me to show the exhibit. The display is based on the artistic and mathematical backgrounds of the participants. There are five essential mathematical backgrounds with deep links between each other: dynamical systems, equations, fractals, geometry (polyhedra, minimal surfaces, representations of spheres), and tilings. The exhibit can be seen at :

http://hermay.org/ARPAM/text/activ.html

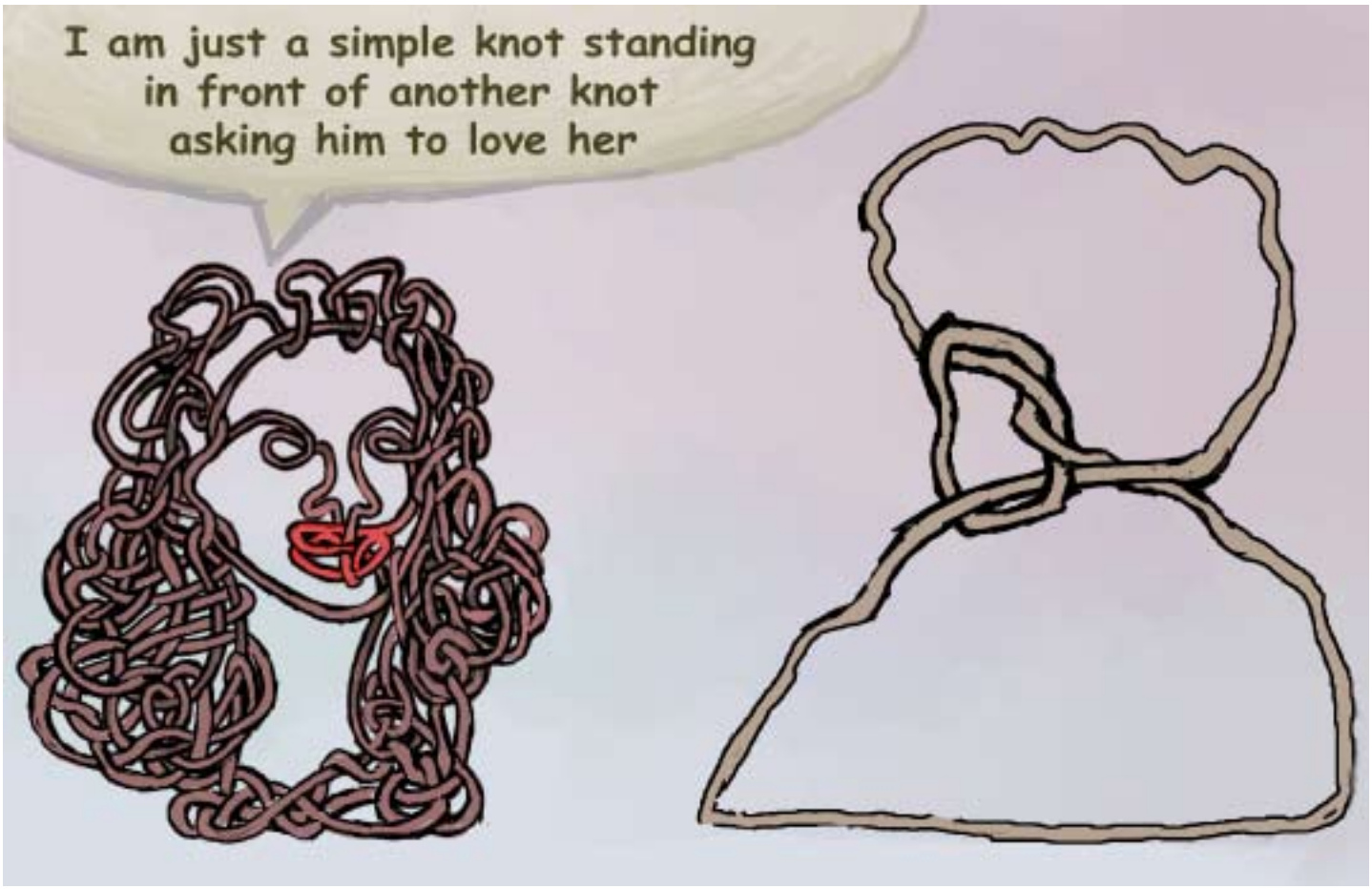
ILLUSTRATIONS **ROBERT KAUFFMANN**

KNOT THEORETICAL MOVIES

ERGUN AKLEMAN



A Poster of `Knotting Hill'



A Scene from `Knotting Hill'

BOOK REVIEWS

Paul Calter, Squaring the Circle: Geometry in Art and Architecture, 2008, Key College Publishing.

This is an excellent text that covers both geometry, art, and architecture extensively. Each chapter introduces basic geometric concepts and then relates them to art and architecture. There are many excellent exercises.

A SAMPLE OF WEB RESOURCES

[1] www.kimwilliamsbooks.com
Kim Williams website for previous Nexus publications on architecture and mathematics.

[2] www.mathartfun.com
Robert Fathauer's website for art-math products including previous issues of Bridges.

[3] www.mi.sanu.ac.yu/vismath/
The electronic journal Vismath, edited by Slavik Jablan, is a rich source of interesting articles, exhibits, and information.

[4] www.isama.org
A rich source of links to a variety of works.

[5] www.kennethsnelson.com
Kenneth Snelson's website which is rich in information. In particular, the discussion in the section Structure and Tensegrity is excellent.

[6] www.wholemovement.com/
Bradfrod Hansen-Smith's webpage on circle folding.

[7] http://www.bridgesmathart.org/
The new webpage of Bridges.

[8] www-viz.tamu.edu/faculty/ergun/research/topology. Topological mesh modeling page. You can download TopMod.

[9] www.georgehart.com
George Hart's Webpage. One of the best resources.

[10] www.cs.berkeley.edu/
Carlo Sequin's webpage on various subjects related to Art, Geometry and Sculpture.

[11] www.ics.uci.edu/~eppstein/junkyard/
Geometry Junkyard: David Eppstein's webpage anything about geometry.

[12] www.npar.org/
Web Site for the International Symposium on Non-Photorealistic Animation and Rendering

[13] www.siggraph.org/
Website of ACM Siggraph.

JOURNAL OF MATHEMATICS AND THE ARTS

The Journal of Mathematics and the Arts is a peer reviewed journal that focuses on connections between mathematics and the arts. It publishes articles of interest for readers who are engaged in using mathematics in the creation of works of art, who seek to understand art arising from mathematical or scientific endeavors, or who strive to explore the mathematical implications of artistic works. The term ”art” is intended to include, but not be limited to, two and three dimensional visual art, architecture, drama (stage, screen, or television), prose, poetry, and music. The Journal welcomes mathematics and arts contributions where technology or electronic media serve as a primary means of expression or are integral in the analysis or synthesis of artistic works. The following list, while not exhaustive, indicates a range of topics that fall within the scope of the Journal:

• Artist’s descriptions providing mathematical context, analysis, or insight about their work.
• The exposition of mathematics intended for interdisciplinary mathematics and arts educators and classroom use.
• Mathematical techniques and methodologies of interest to practice-based artists.
• Critical analysis or insight concerning mathematics and art in historical and cultural settings.

The Journal also features exhibition reviews, book reviews, and correspondence relevant to mathematics and the arts.
Papers for consideration should be sent to the Editor at the address below:

Gary Greenfield - Mathematics & Computer Science, University of Richmond, Richmond VA 23173, USA; Email: ggreenfi@richmond.edu.

For information, see www.tandf.co.uk/journals/titles/17513472.asp

BRIDGES LEEUWARDEN 2008

Celebrate the 110th Birth Year of M.C. Escher in His Birthplace during the 11th Annual Bridges Conference
July 24-28, 2008 (Excursion on Saturday July 26)
July 29 Mathematical Art Public Activity Day
Five days of Bridges Conference activities (July 24-28)
including an Escher Day on July 28, are followed by a Family Math/Art Day (July 29).

Bridges 2008 will be held July 24-28 in Leeuwarden, The Netherlands, the birthplace of M.C. Escher. It includes presentations, workshops, a visual art exhibit, a musical event, an excursion, and a special Escher day. Detailed information is available at http://www.bridgesmathart.org

The Bridges Conferences, running annually since 1998, brings together practicing mathematicians, scientists, artists, educators, musicians, writers, computer scientists, sculptors, dancers, weavers, model builders in a lively atmosphere of exchange and mutual encouragement. Important components of these conferences, in addition to formal presentations, are hands-on workshops, gallery displays of visual art, working sessions with artists who are crossing the mathematics-arts boundaries, and musical/theatrical events in the evening.

ISAMA VALENCIA 2008

JUNE 16-20, 2008, UNIVERSIDAD POLITÉCNICA DE VALENCIA

CONFERENCE

ISAMA'08 will be held at **Universidad Politécnica de Valencia**, in Valencia, Spain. The purpose of ISAMA'08 is to provide a forum for the dissemination of new mathematical ideas related to the arts and architecture. We welcome teachers, artists, mathematicians, architects, scientists, and engineers, as well as all other interested persons. As in previous conferences, the objective is to share information and discuss common interests. We have seen that new ideas and partnerships emerge which can enrich interdisciplinary research and education.

IMPORTANT DATES

Jan.15, 2008 Submission system open
Mar. 1, 2008 Paper and short paper submission deadline
Apr. 1, 2008 Notification of acceptance or rejection
May. 1, 2008 Deadline for camera-ready copies

SUBMISSION

Authors are requested to submit papers in PDF format, not exceeding 10 MB. Papers should be set in ISAMA Conference Paper Format and should not exceed 10 pages. LaTeX and Word style files will be available. The papers will be published as the Proceedings of ISAMA'08.

RELATED EVENTS

Exhibition: There will be an exhibit whose general objective is to show the usage of mathematics in creating art and architecture. Instructions on how to participate will be posted on the conference website.
Workshops: There will be workshops. Instructions on how to participate will be posted on the conference website.

CALL FOR PAPERS

Paper submissions are encouraged in arts, mathematics and architecture. In particular, we specify the following and related topics that either explicitly or implicitly refer to mathematics: Painting, Drawing, Animation, Sculpture, Storytelling, Musical Analysis and Synthesis, Photography, Knitting and Weaving, Garment Design, Film Making, Dance and Visualization. Art forms may relate to topology, dynamical systems, algebra, differential equations, approximation theory, statistics, probability, graph theory, discrete math, fractals, chaos, algorithmic methods, and visualization.

The Hemispheric by Santiago Calatrava at the Ciutat de les Arts i les Ciències in Valencia, Spain.
Photograph taken by **David Iliff** with a Canon 5D and 85mm f/1.8 lens. This is a 2x6 segment panorama created by **David Iliff**. From http://commons.wikimedia.org/wiki/Image:Hemispheric_-_Valencia%2C_Spain_-_Jan_2007.jpg

Details of ISAMA VALENCIA 2008 are at www.isama.org.