

2010 Bridges Pécs

Mathematics, Music, Art, Architecture, Culture

Bridges Math Art Short Movie Festival

More artists and educators than ever are using movies, videos, and animations for different purposes ranging from education, industry, and art. To further the Bridges Organization objective of introducing participants to innovative and integrative techniques that promote interdisciplinary work in the fields of mathematics and art, we would like to announce a new feature of the conference: The Bridges Math Art Short Movie Festival!

The year of 2010 will be the beginning for this new activity. The expectation is that the Festival will grow throughout the years.

Bartók Hall
Hotel Palatinus
Pécs, Hungary

Saturday July 24, 2010
8:00 PM

Technical Support: Hamed Khodaparasti
Moderators: Nathan and Amy Selikoff

**1
A
R
T
I
S
T**

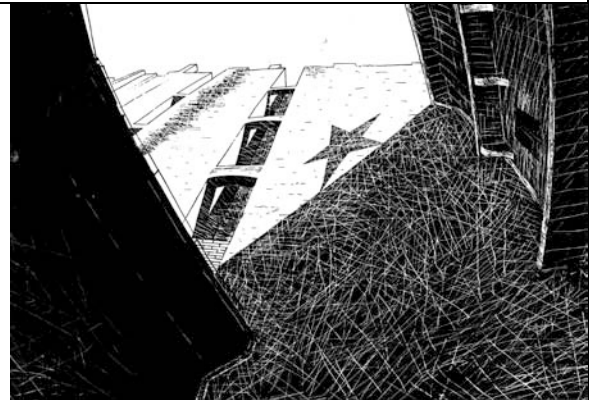
István Orosz
Sopron University (West Hungarian University)
Budakeszi, Hungary
utisz@t-online.hu
<http://web.axelero.hu/utisz/page.htm>

Themes of the natural sciences, especially of geometry and optics appear in most of my works. They are often related to postmodernism by archaic forms, art historical references, stylistic quotations and playful self-reflection. I like to experiment with the extremes, paradoxes of the representation of the perspective to create the illusion of space. I also experiment to renew the techniques of anamorphosis when I distort the pictures in such a way that it can only be seen from a particular aspect or in such a way that its new layer of meaning only reveals by the interposition of reflective surfaces.

**M
O
V
I
E
O
N
E**

Mind the Steps! (Vigyázat, lépcső!)
1989. Pannonia Film, Budapest,
Hungary
Length: 6 minutes

Is there any way to go out? A geometrical paradox and an East European political parable at the same time.




**M
O
V
I
E
T
W
O**


Mazes (Útvesztők)
2008. Pannonia Film, Budapest,
Hungary
Length: 8 minutes


"All things are numbers".

Everything somehow can be explained in mathematical terms. Following this famous quotation by Pythagoras and with the help of this short animated film I wanted to express that Life is Math. The labyrinths of human existence from birth to death are numbers.



<p style="text-align: center;">2 A R T I S T</p>	<p>Richard Phillips Freelance Badsey Publications Badsey, England www.richardphillips.org.uk</p> <p>My interest is in the way that photographs can support the teaching of mathematics at any level. I have published a series of CD-ROMs called Problem Pictures which are designed to bring mathematics to life with photographs. These two videos are montages of photographs with a music soundtrack. They were designed as introductions to two of the <i>Problem Pictures</i> discs. For further information see the Problem Pictures website - www.problempictures.co.uk and my paper at the 2006 Bridges conference - Phillips, R. J. (2006) <i>Photography and the Understanding of Mathematics</i>, Sarhangi, R. & Sharp, J. (eds) Bridges London Conference Proceedings, Tarquin.</p>
<p style="text-align: center;">M O V I E O N E</p>	<p>Problem Pictures Themes 2005, Badsey, England Length: 4 minutes Photographs by Richard Phillips Music: Digital Workshop and Q-Music</p> <p>A video montage of images from the real world created as an introduction to the Problem Pictures Themes CD-ROM.</p> <p>The author would like to thank everyone who has lent objects to photograph and contributed suggestions.</p> 
<p style="text-align: center;">M O V I E T W O</p>	<p>Problem Pictures Numbers 2010, Badsey, England Length: 3 minutes Photographs by Richard Phillips Music: Cut to the Beat</p> <p>A video montage of images from the real world created as an introduction to the Problem Pictures Numbers CD-ROM.</p> <p>The author would like to thank everyone who has lent objects to photograph and contributed suggestions.</p> 

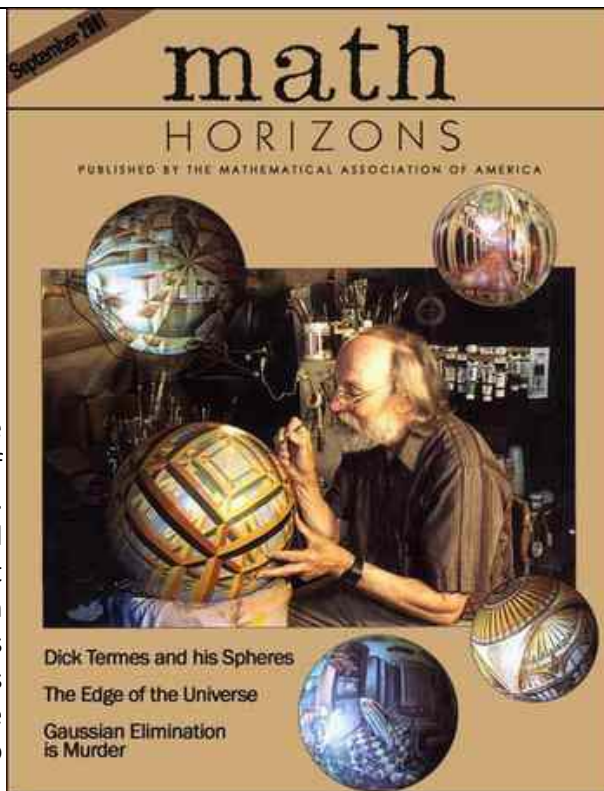
<p style="text-align: center;">3</p> <p style="text-align: center;">A</p> <p style="text-align: center;">R</p> <p style="text-align: center;">T</p> <p style="text-align: center;">I</p> <p style="text-align: center;">S</p> <p style="text-align: center;">T</p>	<p>Matjuska Teja Krasek Artist Ljubljana, Slovenia t.krasek@gmail.com http://tejakrasek.tripod.com</p> <p>Krasek's theoretical as well as practical work is especially focused on symmetry as a linking concept between art and science, on filling a plane with geometrical shapes, especially those constituting Penrose tilings (rhombs, kites, and darts). The artworks among others illustrate certain properties as golden mean relations, self-similarity, five-fold symmetry, Fibonacci sequence, inward infinity and perceptual ambiguity...</p> <p>Krasek's work concentrates on melding art, science, mathematics and technology. She employs contemporary computer technology as well as classical painting techniques. Her artworks and articles are exhibited and published internationally.</p> <p>Krasek's artworks are among the winners of the 2nd, 3rd and 4th International NanoArt online competition. With her mathematical movies (video-animations) she wants to present the beauty of mathematics to young population in an unconventional and fun way.</p>
<p style="text-align: center;">M</p> <p style="text-align: center;">O</p> <p style="text-align: center;">V</p> <p style="text-align: center;">I</p> <p style="text-align: center;">E</p> <p style="text-align: center;">ONE</p>	<p>Ninedala 2009, Ljubljana, Slovenia Length: 4 : 08 Minutes Music: Jean Michel Jarre</p> <p>Ninedala features a nonagonal geometrical entity that undergoes modifications and changes with time - as if the music (Jean Michel Jarre's Chronologies 4) is causing them.</p> <div data-bbox="932 919 1442 1331" style="text-align: center;">  </div>
<p style="text-align: center;">4</p> <p style="text-align: center;">A</p> <p style="text-align: center;">R</p> <p style="text-align: center;">T</p> <p style="text-align: center;">I</p> <p style="text-align: center;">S</p> <p style="text-align: center;">T</p>	<p>Mehrdad Garousi Freelance fractal artist, painter and photographer Hamadan, Iran</p> <p>Being interested in all art-math areas of creating aesthetical 2D and 3D works of art, my significant field of activity is fractal image and animation making. Fractals often contain undiscovered aspects of which exposures usually blow the mind. The novelty and unexpectedness of presented forms in fractal pieces are intensively odd to the eyes of the viewers. They introduce the observer to a world with completely bizarre rules, forms, environments, and concepts. A world which despite its bizarreness is the mathematical representation of Nature's simultaneously chaotic and ordered behaviors. Fractal images only show still features of such worlds while fractal animations leading the observer inside the fractals, provide a detailed survey of the yielded environments inside them. Animations actively provide more tangible senses of properties like self-similarity, magnification and scalability of fractals.</p>

<p style="text-align: center;">M O V I E O N E</p>	<p>Mandelbrot Yantra 2010, Hamadan, Iran Length: 4 : 36 Minutes Music track “The Inmost Feeling Ripples” from Kitaro’s album “Impressions Of The West Lake”</p>  <p>My animation “Mandelbrot Yantra” is a kind of Mandelbrot fractal zoom animation, but from a bit different point of view. It starts by zooming out of the border of a standard Mandelbrot fractal. Afterwards, it is figured out that the main plan of our pattern is composed of five Mandelbrot fractals centralized at their tips. After some changes in the parameters centralizing five same figures at the common central point, the inner areas of Mandelbrot patterns disappear. What is of importance it is the situation of the common central point. Initially, it seems as if these five line-like tips of Mandelbrot fractals touch each other at the center. But, we should remember that we are looking at a fractal, not a linear Euclidean form. By magnifying the joint area of the tips, it gets clear that these lines perform like five parallels. But how? The only possibility is the existence of some kind of depth. However, from the front view point all shapes and forms look usually out of any perspective witnessing such a depth. The key to this phenomenon is the scalability and fractional dimension of fractality. We enter the continual tunnel and survey the inside of the fractal environment constructed by a pentagonal Euclidean joint. Thus, throughout the path, experiencing fractal properties like self-similarity, we see that everything is pentagonal and the five-fold symmetry continuously survives. However, after a survey with a magnification of 2.74×10^{18} we stop stepping more ahead. At this magnification suddenly the five-fold symmetry is changed to a twelve-fold one and we start zooming out. We pass the whole behind way again conversely in a dodecahedral symmetry and at last depart the tunnel towards the infinity behind us. This journey somehow reminds me of some kind of realized Yantric journey in the eastern traditions. Additionally, throughout the path we encounter shapes very similar to Lotuses as iconic symbols of astral projection and meditation.</p> <p>This animation is totally created in Ultra Fractal and the music is a track entitled “The Inmost Feeling Ripples” from Kitaro. Also, post-manipulations and bit adjustments like adding titles and changing the contrast have been done in Adobe Premiere Pro.</p>
<p style="text-align: center;">5 A R T I S T</p>	<p>Dick A. Termes Freelance artist Spearfish, South Dakota, USA</p> <p>Much of my art work grows from geometric concepts. When looking at the geometry I like to figure out what human experiences are similar to the geometry. Ideas that come from this process are many times results I don't expect. Another area that is of interest to me is perspective. I use a six point perspective. The six points are equal distant on the sphere or the vertices of the octahedron. This perspective grows from the Renaissance perspective of the past but when it gets to six points and onto the sphere it is much more precise and mathematical than their one and two point perspective of the past. When drawing cubical objects around us, this spherical perspective tightly organizes it. If the cubical space is a cathedral like St Denis in Paris, all the parallel lines go to three sets of points, a north to south and east to west and up to down. Every line drawn is a greater circle. This system shows a wonderful geometry to the visual space around us.</p>

**M
O
V
I
E
ONE**

Thinking in the Round
A 50 Piece Termesphere Show
The Dahl Arts Center
Rapid City, South Dakota, USA
Length: 6 : 41 Minutes
Film and Production: Asio Studio
Music: Bears Bouncing by Lang
Terms

This is the opening of Thinking in the Round, a 50 piece showing of Termespheres at the Dahl Arts Center. Dick Termes is an incredible artist as well as an exceptional human being. What makes Termes unique is that he paints on spheres, and is the proud possessor of his own illusion known as the Termes illusion. If you ever get the chance to see one of these masterpieces in person, do so... you won't regret it.




**M
O
V
I
E
TWO**

Reflecting Through
2009, South Dakota, USA
Length: 2 Minutes

This spherical painting called a *Termesphere* shows a room with many other rooms off of it. On the walls of the rooms are many mirrors. These mirrors are really clear rectangles so you can see through the ball and see the back side of the ball. This works like a true mirror in that the image you are seeing on the back side of the sphere is behind and that is what a mirror is suppose to reflect. The only thing missing from the mirror is you. Look close inside and outside at the boy and the vase and also at the man in the couch.

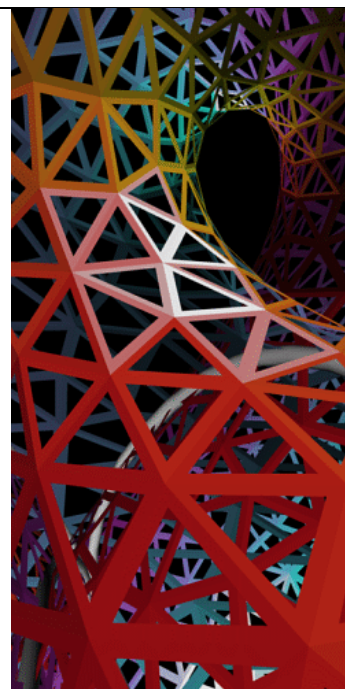


<p>6 A R T I S T</p>	<p>Robert Fathauer Tessellations Company Phoenix, Arizona www.tessellations.com</p> <p>I'm fascinated by certain aspects of our world, including symmetry, chaos, and infinity. The creation of art inspired by mathematics allows me to explore these topics. I like to observe the natural world and to look at things in different ways. Lately, I've done some exploring with mirrored and glass spheres, which is what led to "Ant Orb".</p>
<p>M O V I E ONE</p>	<p>Ant Orb 2008, Phoenix, Arizona, USA Length: 5 Minutes</p> <p>This movie explores what happens when ants encounter a glass sphere. The ants appear very differently depending on whether they are on top of, directly underneath, or near the sides of the sphere. The optical effects, particularly magnification and reflection, create distortions and double images. The movie is very much in the spirit of M.C. Escher, who liked to juxtapose different ways of looking at an object or scene. His prints show a fascination with reflecting and other types of spheres, as well as with insects.</p> 
<p>7 A R T I S T</p>	<p>John M. Sullivan Professor of Mathematics Technische Universität Berlin Berlin, Germany http://www.isama.org/jms</p> <p>My art is an outgrowth of my work as a mathematician. My research studies curves and surfaces whose shape is determined by optimization principles or minimization of energy. A classical example is a soap bubble which is round because it minimizes its area while enclosing a fixed volume.</p> <p>Like most research mathematicians, I find beauty in the elegant structure of mathematical proofs, and I feel that this elegance is discovered, not invented, by humans. I am fortunate that my own work also leads to visually appealing shapes, which can present a kind of beauty more accessible to the public.</p>

**M
O
V
I
E
ONE**

The Optiverse
1998, Urbana, Illinois, USA
Length: 6:40 Minutes
John M. Sullivan, George Francis and Stuart Levy
With original score by Camille Goudeseune

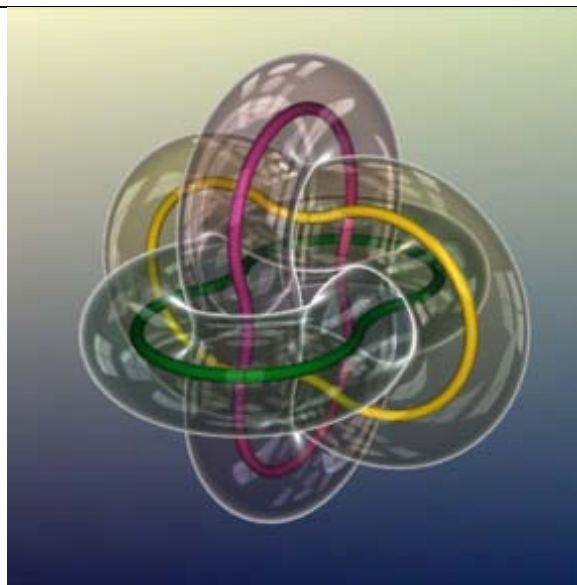
It was a surprising consequence of an abstract mathematical theorem of Steve Smale that a spherical surface can be turned inside out without tearing or creasing, if we do allow the surface to pass through itself. We have computed a family of sphere eversions which have rotational symmetry of different orders and are computed automatically by minimizing an elastic bending energy for surfaces in space. We start with a complicated self-intersecting sphere, which has the desired rotational symmetry, and is also halfway inside-out in the sense of having its inside and outside equally exposed. This halfway model is a saddle critical point for the Willmore energy. When we push off the saddle in two opposite directions and then flow downhill in energy to the ordinary round sphere, it is inside-out in one direction, but not in the other. "The Optiverse", premiered at ICM 1998, shows the first few eversions in our family, with 2-, 3-, 4-, and 5-fold symmetry.



**M
O
V
I
E
TWO**

The Borromean Rings
2006, Berlin, Germany
Length 4:45 Minutes
Charles Gunn and John M. Sullivan

This video, premiered at ICM 2006, explains the mathematics behind the new IMU logo. The logo depicts the Borromean rings (three linked rings with the property that no pair is linked) in the form they have when tied tight. This tight configuration has pyritohedral symmetry, with the rings lying in orthogonal planes. The video starts with an exploration of this symmetry group, featuring Fuller's "jitterbug". A five-coloring of the icosahedron edges shows how the pyritohedral group fits into the icosahedral group. The Borromean rings then appear as three golden rectangles, with pyritohedral symmetry. After an interlude showing how the rings have been used in many cultures as a symbol of interconnectedness, the video depicts a tightening process. It preserves the symmetry and leads to the tight configuration, which is explored with various rendering styles, including bubble-like transparency and woven-rope textures.



**8
A
R
T
I
S
T**

Harlan Brothers
Director of Technology
The Country School
Madison, Connecticut, USA
www.brotherstechnology.com

My primary interest is in researching the many ways in which power-laws can arise in music. While I also explore experimental approaches to the graphical representation of mathematical relationships, the illustration of power-laws using log-log plots is not inherently artful or entertaining for most people.

This animation project therefore presented an interesting new challenge: how to complement the emotional effect of a piece of fractal music using visual stimulus that shares no direct mathematical correlation with its audio counterpart. As is often the case in the arts, improvisation and intuition proved to be indispensable tools.

As an artist, it is precisely the process of improvisation that resonates with me. It represents an acknowledgement of the fundamentally dynamic, random, and often serendipitous essence of the natural world. When transparently and effectively expressed, the results are particularly rewarding. It is a phenomenon familiar to me as a jazz musician, but more difficult to capture as a mathematician.

Interestingly, although he is typically thought of as a composer, Bach was known to be a great improviser. Inventing a way to merge his *Art of Fugue* with images of the Mandelbrot set afforded me a wonderful means for weaving together my own multiple interests.

**M
O
V
I
E
O
N
E**



Mandel-Bach Journey
2009, East Haven, CT, USA
Length: 3:11 Minutes
Music sequencing: Jeffrey Hall
Zoom consultation: Jos Leys
Bach zoom concept: Michael Lawrence



This film represents my first effort at animation design and production. It was inspired by my serendipitous involvement in Michael Lawrence's beautiful new music documentary *BACH & Friends*.

There is a poetic connection between the music of Bach and the famous fractal known as the Mandelbrot set. Bach's compositions represented the height of Baroque sensibilities; intricacy, nested levels of adornment, and the suggestion of infinite space were compelling structural properties in the art and architecture of his day.

Fans of Bach often refer to a sense of endless spirals or wave-like circles-within-circles. Such descriptions are reminiscent of the infinite, Baroque-like detail of the Mandelbrot set. It is striking to see how the sense of motion we experience in this fractal animation presents a perfect counterpoint to the unfolding of Bach's Contrapunctus IX.

<p style="text-align: center;">9</p> <p style="text-align: center;">A</p> <p style="text-align: center;">R</p> <p style="text-align: center;">T</p> <p style="text-align: center;">I</p> <p style="text-align: center;">S</p> <p style="text-align: center;">T</p>	<p>Curtis Palmer Edmonton, Alberta Canada clpalmer@telus.net</p> <p>The success of computation is evidence of the existence of platonic forms. My movies are an aid to seeing in the 'spaces between' where change is the norm and entropy rules.</p>
<p style="text-align: center;">M</p> <p style="text-align: center;">O</p> <p style="text-align: center;">V</p> <p style="text-align: center;">I</p> <p style="text-align: center;">E</p> <p style="text-align: center;">ONE</p>	<p>J.K. in Transit of the Jitterbug 2010, Edmonton, Canada Length: 1:18 Minutes Curtis L. Palmer: animator; musician</p> <div style="display: flex; justify-content: space-around;">   </div> <p>The movie is homage to a personal influence in my life's path. Mr. Knighton, Jim, opened my eyes to the world. He introduced me to Buckminster Fuller, computers and indirectly to my wife. We shared a passion for R. B. Fuller's 'Geoscope' concept that Jim actualized in a career that took him to the Jet Propulsion Laboratory in Pasadena where he produced the first cloudless map of the Earth at 4 km. resolution. His maps have appeared in magazines: National Geographic, Scientific American and Discover and in movies: "The Amazon", "Mysteries of Egypt" and "Chain Reaction". Currently the Buckminster Fuller Institute uses his map for their Earthscope.org project.</p>
<p style="text-align: center;">10</p> <p style="text-align: center;">A</p> <p style="text-align: center;">R</p> <p style="text-align: center;">T</p> <p style="text-align: center;">I</p> <p style="text-align: center;">S</p> <p style="text-align: center;">T</p>	<p>Kazmier Maslanka San Diego, California USA kazmandu@aol.com http://www.kazmaslanka.com</p> <p>As an artist, my interest in correlating experience through language spawned my desire to study mathematics and physics. I am currently pursuing my interest in using mathematics as a language for art. I serve the concept of polyaesthetics and mathematical poetry by viewing mathematical equations and the variables within the equations as capable of providing the structure for metaphors. This freedom transforms equations for uses other than scientific by freeing equations from the boundaries of denotation and opens up a new world in the realms of connotation. Mixing poetics in the structure of mathematic equations enables me to blend the aesthetics of poetry, science and mathematics. With phrases embedded in the mathematic equations, one can construct relationships between the phrases that can bring a linguistic richness to subjects that normally not use mathematics as a language, e.g. cultural, spiritual, etc."</p>

**M
O
V
I
E
O
N
E**

A Spectrum of Jewels
2010, New York City, USA
Length: 2:30 Minutes
Lab Gallery, New York



This video clip was created by the Lab Gallery in New York City where the art *installation a spectrum of Jewels* was exhibited in March of 2010. The piece was three planes describing a Cartesian Coordinate System made of small spheres. Each axis represented concepts in space which enabled me to create twelve mathematical poems in space. The work is an extension on my past work concerning verbogeometry. (Mixing poetic metaphors with analytic geometry.)

**T
H
E
E
N
D**

See You Next Year in the 2011 Bridges Math Art Short Movie Festival!

