THE AMERICAN MATHEMATICAL SOCIETY

2011

"Embrace," by Robert Bosch, Oberlin College, Oberlin, OH
(*see February 2011*)

Calendar of Mathematical Imagery

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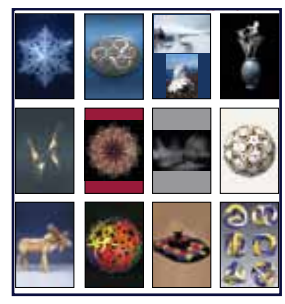
"Snowflake Model 13," by David Griffeath, University of Wisconsin-Madison, and Janko Gravner, University of California, Davis

In nature roughly a quintillion molecules make up every crystal that falls to earth, with the shape dictated by temperature, humidity and other local conditions. How such a seemingly random process produces snowflakes that are at once geometrically simple and incredibly intricate has captivated scientists since the early 1600s. Now we have simulated their 3D growth using a computational model that faithfully emulates both the basic shapes and the fine details and markings of the full range of observed forms. Read about the underlying mathematics at **http://psoup.math.wisc.edu/Snowfakes.htm**. —*David Griffeath*



THIS MATHEMATICAL MONTH

Monthly postings of vignettes on people, publications, and mathematics to inform and entertain. Navigate through the year starting at **www.ams.org/ams/thismathmonth/**.

JANUARY 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Joint Mathematics Meetings **6–9:** Joint Mathematics Meetings, New Orleans, LA						1 New Year's Day
2	3	4 Isaac Newton (1643)	5	6 Joint Mathematics Meetings, New Orleans, LA	7 Joint Mathematics Meetings, New Orleans, LA	8 Joint Mathematics Meetings, New Orleans, LA
9 Joint Mathematics Meetings, New Orleans, LA	10	11	12	13	14	15
16	17 Martin Luther King, Jr. Day (U.S.)	18	19	20	21	22
23 David Hilbert (1862)	24	25 Joseph Louis Lagrange (1736)	26	27	28	29
30	31					

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DECEMBER 2010

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FEBRUARY 2011

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"Embrace," by Robert Bosch, Oberlin College, Oberlin, OH (**www.dominoartwork.com**)
2010 Mathematical Art Exhibition, First Prize

Stainless steel and brass, diameter = 6", thickness = 0.25", 2009. I began by converting a drawing of a two-component link into a symmetric collection of points. By treating the points as the cities of a Traveling Salesman Problem and adding constraints that forced the salesman's tour to be symmetric, I constructed a symmetric simple-closed curve that divides the plane into two pieces: inside and outside. After I get an idea for a piece, I translate the idea into a mathematical optimization problem. I do this out of a love of mathematical optimization—the theory, the algorithms, the numerous applications. —*Robert Bosch*

HEADLINES & DEADLINES FOR STUDENTS provides email notification of mathematics news and of upcoming deadlines. The emails, issued about once a month, link to a web page that's a centralized source for information relevant to students and faculty advisors, at **www.ams.org/news-for-students/**. AMS members may sign up for HEADLINES & DEADLINES, twice-monthly emails that include news, prizewinners, special programs and events, as well as deadlines for fellowship and grant applications, calls for proposals, and meeting registrations, at **www.ams.org/enews.**

FEBRUARY 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
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20	21 Presidents' Day (U.S.)	22	23	24	25	26
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JANUARY 2011

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MARCH 2011

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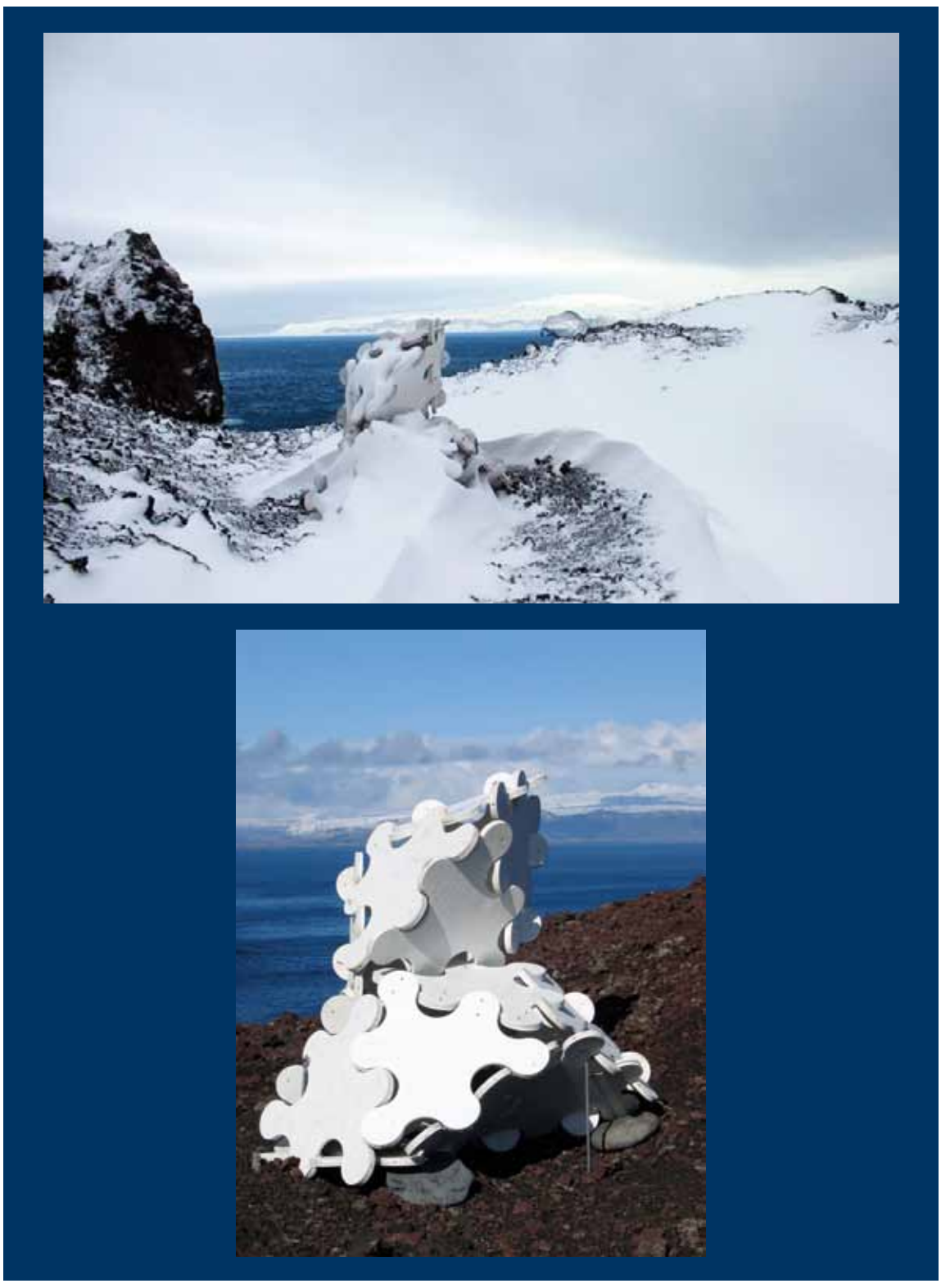

"Sculpture System No. 5 (2009)" by Richard Grimes (**www.richardgrimes.net**) and Edmund Harriss, University of Leicester

Deltahedra are polyhedra where all the faces are regular triangles. "Sculpture System 5" is a system to build any deltahedron using triangular shapes that hinge together. A huge variety of polyhedra can be made using just twenty of these shapes. The sculpture was built by a group of volunteers who also designed the final shape that was actually built. —*Edmund Harriss*

MARCH 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5
6	7	8	9	10	11	12 AMS Sectional Meeting
13 AMS Sectional Meeting	14 Pi Day	15	16	17	18 AMS Sectional Meeting	19 AMS Sectional Meeting
20 AMS Sectional Meeting	21	22	23 Emmy Noether (1882)	24	25	26 AMS Sectional Meeting
27	28	29	30	31 René Descartes (1596)		

AMS Sectional Meetings

12–13: Georgia Southern University, Statesboro (Southeastern)

18–20: University of Iowa, Iowa City (Central)

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FEBRUARY 2011

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APRIL 2011

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"The Vase," by Harry Benke, Visual Impact Analysis LLC, Novato, CA (**www.harrybenke.com**)

2010 Mathematical Art Exhibition, Second Prize

Giclée print, 18" x 14.8", 2009. "The Vase" is composed of a digitally modeled vase with "Lilies" which are Dini's Surfaces. A surface of constant negative curvature obtained by twisting a pseudosphere is known as Dini's Surface. My art attempts to produce a nexus between mathematical beauty and the beauty of the natural world to produce a satisfying aesthetic experience. —*Harry Benke*

MAM 2011

MATHEMATICS AWARENESS MONTH is held each year in April to increase public understanding of mathematics. See **www.mathaware.org** to read the 2011 theme essay, download the poster, and view the related activities of math departments.

APRIL 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
AMS Sectional Meetings **9–10:** College of the Holy Cross, Worcester, MA (Eastern) **30–May 1:** University of Nevada, Las Vegas (Western)					1	2
3	4	5	6	7	8	9 AMS Sectional Meeting
10 AMS Sectional Meeting	11	12	13	14	15 Leonhard Euler (1707)	16
17	18 Passover begins	19	20	21	22	23
24 Easter	25	26	27	28	29 Henri Poincaré (1854)	30 Carl Friedrich Gauss (1777) AMS Sectional Meeting

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MARCH 2011

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MAY 2011

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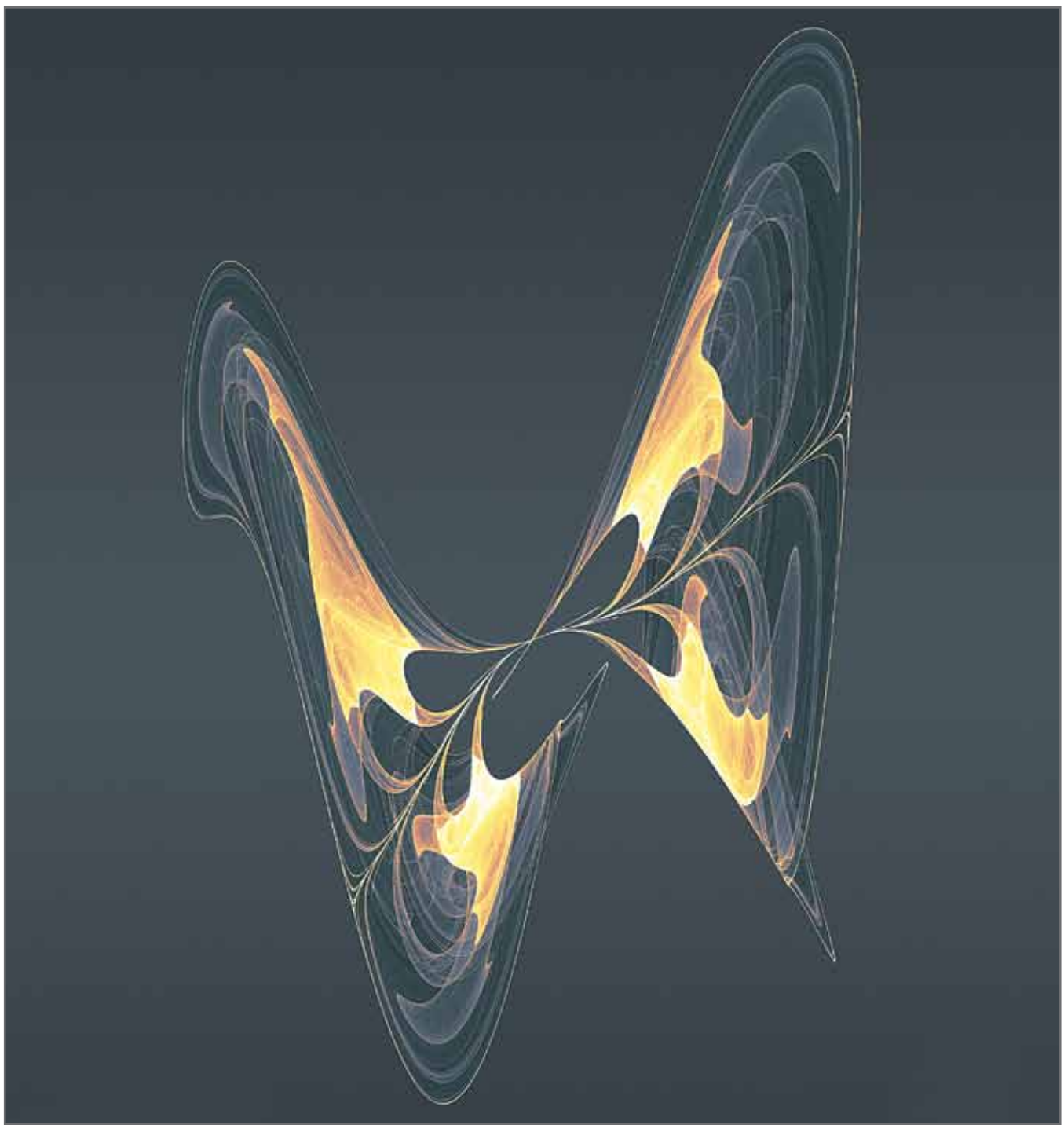

"Butterfly Effect," 2007, by Nathan Selikoff
(**www.nathanselikoff.com**)

The "Butterfly Effect," or more technically the "sensitive dependence on initial conditions," is the essence of chaos. Besides the fact that this attractor looks like an abstract butterfly, the title of the piece is an homage to Edward Lorenz, a pioneer of chaos theory. It's a quick jump from this popular understanding of chaos theory to playing with the Lorenz Attractor and learning a bit more about the math and science behind it. Read more at **http://nathanselikoff.com/236/strange-attractors/butterfly-effect**. — *Nathan Selikoff*

View MATHEMATICAL IMAGERY, mathematics-inspired and mathematically generated works in various media. Send an e-postcard and link to online galleries and articles at **www.ams.org/mathimagery**.

MAY 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 AMS Sectional Meeting	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23 Victoria Day (Canada)	24	25	26	27	28
29	30 Memorial Day (U.S.)	31				

AMS Sectional Meeting
April 30–May 1: University of Nevada, Las Vegas (Western)

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APRIL 2011

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JUNE 2011

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"June wreath," by Anne M. Burns, Long Island University, Brookville, NY

This circle image is made by iterating systems of Möbius Transformations. Read about how this and other circle images are created and view more examples at **www.anneburns.net/circles/unitcircle.html**. *—Anne M. Burns*

Read the FEATURE COLUMN, a series of essays on various mathematical topics—such as surveying, percolation, ancient Peruvian weaving, and rainbows—written by David Austin, Bill Casselman, Joe Malkevitch, and Tony Phillips, at **www.ams.org/featurecolumn.**

JUNE 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Mathematics Research Communities, Snowbird, UT **See conferences and dates at** *www.ams.org/programs/research-communities/mrc*			1	2	3	4
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12	13	14	15	16	17	18
19 Blaise Pascal (1623)	20	21	22	23	24	25
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MAY 2011

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JULY 2011

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"Meditations on $f(x,y) = (x^2)/2 + xy/2 - (y^4)/8$," by Richard Werner, Santa Rosa Junior College, Santa Rosa, CA

2010 Mathematical Art Exhibition, Third Prize

Plastic and wood, two pieces, each 6" x 7" x 7", 1998. The two pieces give alternate views of the same three-dimensional surface. Since the construction is with clear plastic, a myriad of delightful views of intersecting curves can be found allowing the viewer to hypersee the surface. The work that I do now is becoming a blend of my interest in math and my love of nature, with a little bit of steam-punk influence creeping in as well. —*Richard Werner*

JULY 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 Gottfried Wilhelm Leibniz (1646)	2
3	4 Independence Day (U.S.)	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24 31	25	26	27	28	29	30

JUNE 2011

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AUGUST 2011

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"Shells 532," by Chaim Goodman-Strauss, University of Arkansas (**www.mathbun.com/main.php**), ©Chaim Goodman-Strauss

There are seven infinite families, and seven more individual types of discrete symmetrical patterns on the sphere. A pattern of type 532 is shown; there are three kinds of gyration points in the pattern—a 5-fold, a 3-fold, and a 2-fold gyration point are marked. This image is from "The Symmetries of Things," by John H. Conway, Heidi Burgiel and Chaim Goodman-Strauss (AK Peters, 2008). *—Chaim Goodman-Strauss*

The AMS sponsors and cosponsors several EMPLOYMENT SERVICES. The Mathematical Sciences Employment Center, held each January at the Joint Mathematics Meetings, is an interviewing program for Ph.D.-level mathematicians seeking employment and for employers, mainly academic, who wish to conduct brief interviews with them. MathJobs is an automated job application system. Employment Information in the Mathematical Sciences (EIMS) posts classified ads. See all the services at **www.ams.org/employment**.

AUGUST 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 Ramadan begins	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17 Pierre de Fermat (1601)	18	19	20
21 Augustin Louis Cauchy (1789)	22	23	24	25	26	27
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JULY 2011

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SEPTEMBER 2011

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"Bull Moose, opus 413," by Robert J. Lang. Image courtesy of Robert J. Lang (**www.langorigami.com**)

One uncut square of Nepalese lokta, composed and folded in 2002, 6". The intersections between origami, mathematics, and science occur at many levels and include many fields of the latter. Over the past 35 years, I have developed over 480 original origami compositions. About a quarter of these have been published with folding instructions, which, in origami, serve the same purpose that a musical score does: it provides a guide to the performer (in origami, the folder) while allowing the performer to express his or her own personality through interpretation and variation. —*Robert J. Lang*

MATHEMATICAL MOMENTS is a program that promotes appreciation and understanding of the role mathematics plays in science, nature, technology, and human culture. There are over 80 posters on topics in applied mathematics, some including podcasts of interviews with experts in the fields. Several are translated into Spanish, German, French, Chinese, Japanese, Russian, Portuguese, and Polish. See the entire collection at **www.ams.org/mathmoments**.

SEPTEMBER 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
AMS Sectional Meetings **10–11:** Cornell University, Ithaca, NY (Eastern) **24–25:** Wake Forest University, Winston-Salem, NC (Southeastern)				1	2	3
4	5 Labor Day (U.S.)	6	7	8	9	10 AMS Sectional Meeting
11 AMS Sectional Meeting	12	13	14	15	16	17 Bernhard Riemann (1826)
18	19	20	21	22	23	24 AMS Sectional Meeting
25 AMS Sectional Meeting	26	27	28 Rosh Hashanah begins	29	30	

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AUGUST 2011

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OCTOBER 2011

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"Amazing Acrobats," by George Hart, Stony Brook University, Stony Brook, NY (**www.georgehart.com**)

"Amazing Acrobats" is a 3-foot diameter reconstructable sculpture made of sixty plastic components lying in the planes of a pentagonal hexecontahedron—the Catalan polyhedron which is dual to the Archimedean snub cube. The work was designed as a group construction activity for the Museum of Mathematics. After assembly, the components can be unscrewed for later re-use. —*George Hart*

MATH in the MEDIA

Bookmark MATH IN THE MEDIA to keep abreast of math news as reported in newspapers and general science magazines. The monthly magazine includes Tony Phillips' Take on Math in the Media, Math Digest, and Reviews of books, plays, and films with mathematical themes, at **www.ams.org/mathmedia.**

OCTOBER 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
AMS Sectional Meetings **14–16:** University of Nebraska-Lincoln (Central) **22-23:** University of Utah, Salt Lake City (Western)						1
2	3	4	5	6	7 Yom Kippur begins	8
9	10 Columbus Day (U.S.)	11	12	13	14 AMS Sectional Meeting	15 AMS Sectional Meeting
16 AMS Sectional Meeting	17	18	19	20	21	22 AMS Sectional Meeting
23 AMS Sectional Meeting	24	25 Évariste Galois (1811)	26	27	28	29
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SEPTEMBER 2011

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NOVEMBER 2011

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"Tumbling Escher," by Mary Candace Williams. Quilt copyright 2006 by Mary Candace Williams

If you look at the quilt at a perpendicular angle you have a traditional diamond tessellation known as Tumbling Block. From the side, however, it rises up and back into the quilt; thus a nod to Escher's "Reptiles" in which the drawn lizard rises up and out and back into the drawing board. —*Mary Candace Williams*

NOVEMBER 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5
6	7	8	9	10	11 Veterans' Day (Observed) (U.S.)	12
13	14	15	16	17	18	19
20	21	22	23	24 Thanksgiving (U.S.)	25	26
27	28	29 Joint International Meeting	30 Joint International Meeting	**Joint AMS-South African Mathematical Society International Meeting** **Nov. 29–Dec. 3:** Port Elizabeth, South Africa		

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OCTOBER 2011

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DECEMBER 2011

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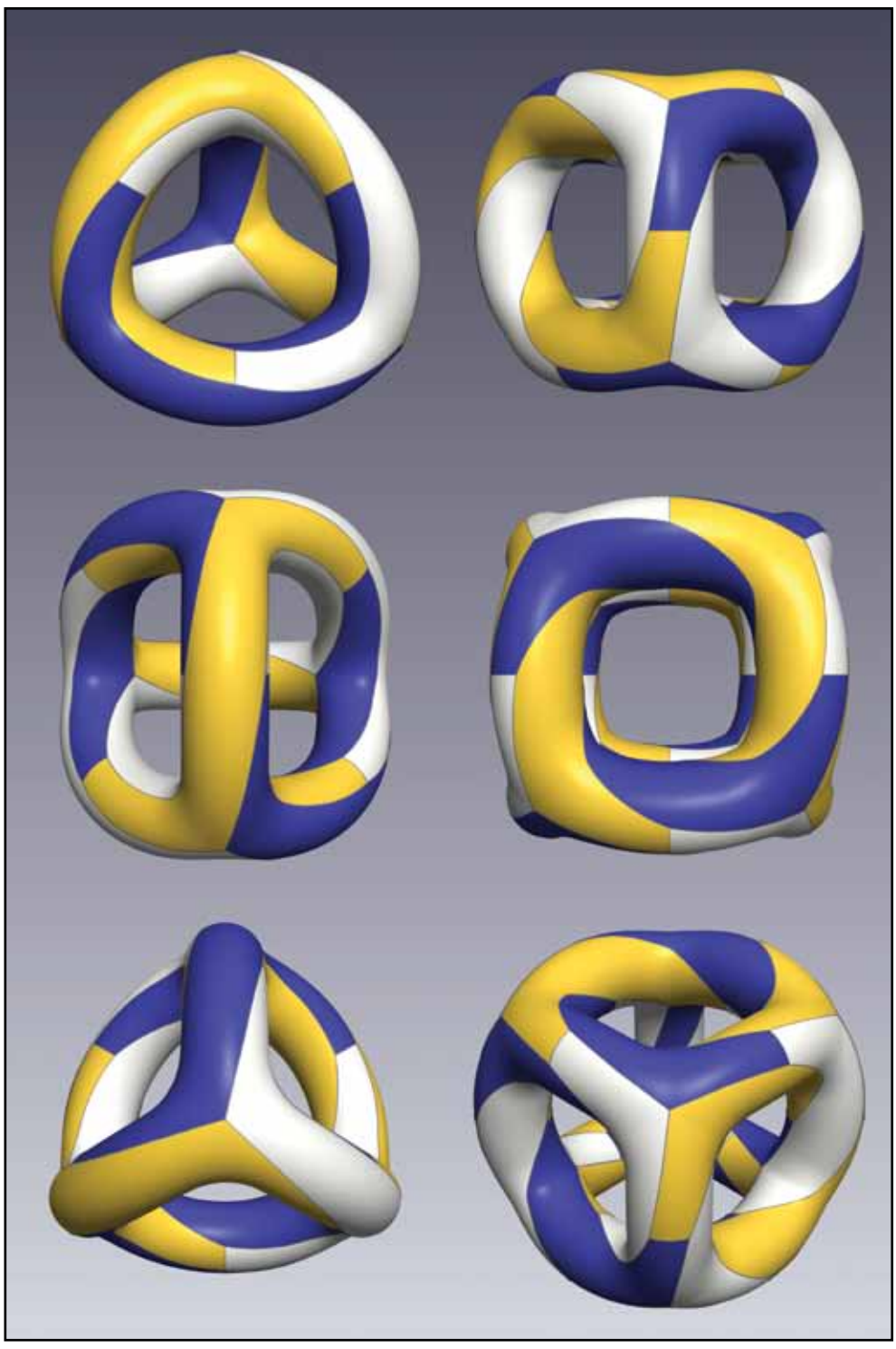

“Space models of regular maps R3.2 and R5.1,” by Jarke J. van Wijk, Eindhoven University of Technology, The Netherlands

Regular maps can be considered as generalizations of Platonic solids: A regular map is a symmetric tesselation of a closed surface, such that the underlying graph is vertex-, face-, and edge-transitive. These objects can be studied from the point of view of group theory, topology, and hyperbolic geometry. And, a fascinating puzzle is to construct space-models of these regular maps.

Here space-models of two regular maps are shown: R3.2 (left) and R5.1 (right). In both cases the surface is tesselated into octagons, 12 and 24 respectively, and at each vertex three octagons meet. For R5.1, all tiles are not only topologically equivalent, they also have the same shape. —*Jarke J. van Wijk*

Mark your 2012 calendar with the following AMS MEETINGS: *Joint Mathematics Meetings* in Boston, MA (January 4–7), and sectional meetings including those held at *University of Hawaii*, Honolulu (March 3–4), *University of South Florida*, Tampa (March 10–11), *George Washington University*, Washington, DC (March 17–18), and *University of Kansas*, Lawrence (March 30–April 1). See the most current information about AMS meetings and conferences at **www.ams.org/meetings**.

DECEMBER 2011

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Joint AMS-South African Mathematical Society International Meeting **Nov. 29–Dec. 3:** Port Elizabeth, South Africa				1 Joint International Meeting	2 Joint International Meeting	3 Joint International Meeting
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20 Hanukkah begins	21	22	23	24
25 Christmas	26 Kwanzaa begins	27	28	29	30	31

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NOVEMBER 2011

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JANUARY 2012

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2011 at a glance

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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JULY

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AUGUST

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SEPTEMBER

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25	26	27	28	29	30	

OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

NOVEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

2012 at a glance

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

FEBRUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29			

MARCH

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

APRIL

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

MAY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

JUNE

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

JULY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

AUGUST

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

SEPTEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

OCTOBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

NOVEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

DECEMBER

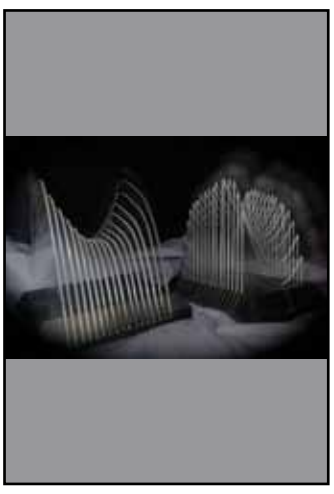
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

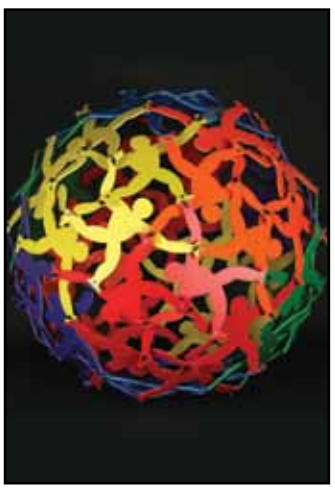
2011 Calendar of Mathematical Imagery









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