



**FOR IMMEDIATE RELEASE**  
May 27, 2009

**MATRIX:MIDLAND presents:**

**What: "From Flapping Birds to Space Telescopes:  
The Modern Science of Origami"**

**When:** Monday, June 1 @ 7:30 p.m.

**Where:** Midland Center for the Arts, 1801 W. St. Andrews Rd., Midland, MI 48640

**Tickets:** \$27 adult, \$17 student

**Information:** Call Ticket Office at (989) 631-8250 or (800) 523-7649 or [www.mcfta.org](http://www.mcfta.org)

MIDLAND – Unfold the secrets of an ancient art form when MATRIX:MIDLAND Festival presents **"From Flapping Birds to Space Telescopes: The Modern Science of Origami" by Robert J. Lang** on **Monday, June 1 at 7:30 p.m.** at **Midland Center for the Arts**, 1801 W. St. Andrews Rd., Midland, MI. Recognized as one of the world's foremost origami artists, Lang is a pioneer in a new kind of origami – using math and engineering principles to fold mind-blowing intricate designs that are beautiful and, sometimes very useful. He will demonstrate his art, some of the most complex and difficult origami in the world and will describe how his work in this ancient art holds solutions to problems in fields as diverse as automobile safety, space science, architecture, robotics, manufacturing and medicine. Tickets cost \$27 for adults and \$17 for students and are available online at [www.mcfta.org](http://www.mcfta.org) or by calling 800-523-7649.

The Japanese have been folding paper recreationally for at least 400 years. For centuries, origami patterns were limited to at most 30 steps, yielding a few basic shapes: boxes, boats, hats, cranes. Folded insects and crustaceans were still an origami impossibility, as no one had yet solved the problem of how to fold paper into figures with fat bodies and skinny appendages. Then a few people around the globe had the idea that paper folding, besides being a pleasant diversion, might also have properties that could be analyzed and codified. A revolution occurred in the 1990s leading to the development and application of mathematical techniques to origami. As often happens in mathematics, theory originally developed for its own sake led to some surprising practical applications. Now, origami patterns could have hundreds of folds. Consequently, scientists began applying these folding techniques to anything – medical, electrical, optical, or nanotechnical devices, even strands of DNA – that had a fixed size and shape but needed to be packed tightly and in an orderly way. Enter Robert J. Lang.

Lang's enthusiasm started early. As a first-grader, he proved far too clever for elementary mathematics and quickly became bored, prompting his teacher to give him a book on origami in the hope it would keep him entertained during math class. He was smitten. A teenager in the 1970s, he invented an origami Jimmy Carter, a Darth Vader, a nun, an inflatable bunny, and an Arnold the Pig. His acuity for mathematics led him to a Ph.D. in applied physics and work at the California Institute of Technology, for NASA/Jet Propulsion

Laboratory, Spectra Diode Laboratories, and JDS Uniphase. In 2001 he left the traditional science workforce to devote himself full time to his origami pursuits.

Lang has created more than 495 intricate new origami models, some requiring years to develop and several days to make the hundreds of folds required: turtles with patterned shells, a raptor with textured feathers, a rattlesnake with 1,000 scales and a tick the size of a popcorn kernel. His masterpiece, first created in 1987, is a life-size, 15-inch-tall Black Forest cuckoo clock, complete with pendulum, pinecones and stag's head. It is so complex that Lang was asked to demonstrate its folding on Japanese television – a task that took five hours.

How does he do it? By combining a deep appreciation for traditional aesthetics with advanced mathematics and computer modeling. It's a sub-discipline he calls "computational origami," a relatively esoteric field that requires artistic as well as computational, mathematical and engineering skills. Each work is the result of "TreeMaker," software he pioneered that manipulates thousands of mathematical calculations in the production of a "folding map" for a single figure.

Making the jump from artistic diversion to real-life scientific application was natural for the artist. Imagine a lens one quarter the size of a football field for the gigantic "Eyeglass" diffractive telescope that the Lawrence Livermore National Laboratory wanted to put into space, allowing scientists to probe the edges of the universe. Lang was called in and came up with a flower-like design, with each "petal" representing a glass panel attached to the central area by means of hinges. The whole thing folds down into a fraction of its original size for the rocket ride and can be re-expanded into a continuous flat disc once in space. He also designed the folding pattern for a medical implant, used in patients with congestive heart failure that unfolds in the body and wraps around the heart, preventing it from swelling.

Still, many of Lang's commissions are less technical. He has designed toilet-paper origami animals for a Febreze commercial, created an origami world – forest, fields, deer, Victorian Houses, a dragon – for a 30-second Mitsubishi spot and was hired to create a life-size Drew Carey for "The Drew Carey Show." His favorite commission was to fold an endangered Salt Creek tiger beetle for an entomologist who collects Salt Creek tiger beetle art. "For me, that commission was like manna from Heaven," he said. "I'll never be done with bugs."

Lang's work has been featured in exhibitions in Paris, New York, Boston, San Diego, and Tokyo, among others. He has been an invited guest at international origami conventions around the world and in 1992 was the first Westerner invited to address the Nippon (Japan) Origami Association's annual meeting. He is a full-time artist and consultant on origami and its applications to engineering problems, but moonlights as the Editor-in-Chief of the *IEEE Journal of Quantum Electronics*. He has authored or co-authored over 80 papers and 45 patents in lasers and optoelectronics, as well as eight books and a CD-ROM on origami. His books on origami will be available for purchase during the event. To see his work and learn more, visit [www.langorigami.com](http://www.langorigami.com).

Lang will host two sessions of his origami workshop "**Learning to Fold Artistically**" in the Garden Room at Midland Center for the Arts. Dates are **Sunday, May 31 at 1:00 p.m. and Monday, June 1 at 10 a.m.** Each participant will go home with an origami figure and techniques that they can apply to their own origami folds in the future. No prior experience in origami is required. Cost is \$16 and includes all materials needed during the workshop. Each workshop is limited to 24 participants.

The 2009 MATRIX:MIDLAND Festival is sponsored by The Dow Chemical Company, Dow Corning Corporation, MidMichigan Medical Center – Midland, William Blair & Company, Tri-Star Trust Bank and MATRIX:MIDLAND Lecture Series Support Fund. MATRIX:MIDLAND presents professional, world-class entertainment to the mid-Michigan region. Now in its 31st season, Matrix hosts an extraordinary schedule of cutting-edge entertainment including cinema, music, comedy, family programs, world-renowned authors and more.

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Contact:  
Kristen Wuerfel  
Marketing and Media Relations Manager  
(989) 631-5930 x 1274  
wuerfel@mcfta.org

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Midland Center for the Arts • 1801 W. St. Andrews Rd. • Midland, MI 48640 • (989) 631-5930 • (989) 631-7890 fax • [www.mcfta.org](http://www.mcfta.org)