



MINI-FOCUS

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William Fisher Wins Section Teaching Award

William Fisher of California State University, Chico was the winner of the Section Award for Distinguished College or University Teaching of Mathematics for the year 2007. The award was presented at the annual section meeting held at West Valley College on February 24. The following is taken from the citation presented to Professor Fisher:

“Professor William Fisher, with a new Ph.D. degree from the University of Oregon, joined the faculty of the Department of Mathematics of California State University, Chico, more than thirty years ago. One representative of Fisher’s many students sums up his experiences thus: “Dr. Fisher’s class is one of my most interesting and involving math classes ever. He has a manner of teaching that excites the students about the subject. I have always liked math, but this class is one I actually eagerly await. It is also obvious that the entire class is equally involved. I appreciate his ability to present material in such an exciting and interesting way.” Excerpts from other student comments are: “He tried to break the barriers that currently stand in my way of liking math. . . I no longer think negatively [about the subject].” “He didn’t just give problems and have you solve them. He really tried to teach the concepts.” “He is the best math teacher I ever had.” Clearly he inspires his students.



From his colleagues we hear: “His seemingly infinite energy, ideas and accomplishments have had a major positive effect on the University and K-12 communities.” “Bill is a master teacher.”

Professor Fisher’s influence extends well beyond the confines of his own campus. Though concentrating on the northern part of the state, with his co-founding the Mt. Lassen Mathematics Council, for example, and serving as its first president, he provides professional development for mathematics teachers in the region. He has also served in roles having statewide and even national impact.

He has published widely and has a distinguished record of speaking at meetings of professional societies. To enhance pre-service and in-service education he has received roughly three million dollars in grants. He is co-director of Project MATH, a FIPSE-funded program for mathematics majors in mathematics education and is co-director of the Chico Mathematics Project, one of nineteen sites of the California Mathematics Project. For many years he was director of his campus’s Center for Mathematics and Science Education.

With the help of the Exxon-Mobil Foundation he established a Teacher-in-Residence program in which elementary school teachers work half-time for the Chico department, teaching future elementary school teachers. This program also supports the creation of his department’s mathematics education seminar at which elementary, secondary, community college and university teachers meet (sometimes via satellite) to discuss issues in mathematics education.

We are proud to present this year’s Section Award for Distinguished College or University Teaching of Mathematics to Bill Fisher.

Leonard Klosinski Receives Certificate of Meritorious Service

At the January 2008 Joint Mathematics Meetings in San Diego, Leonard F. Klosinski was awarded a Certificate of Meritorious Service for the Northern California-Nevada-Hawaii Section. Here is part of the citation:



Leonard F. Klosinski

“Secretaries of organizations traditionally serve for long terms—much longer than presidents and other officers—and they often provide institutional memory to assist other officers throughout their terms. But most do not serve as long as Leonard Klosinski who was secretary-treasurer of the Northern California-Nevada-Hawaii Section for 21 years. This was followed by a three year stint (2000-2003) as vice chair (in this section, chair-elect), chair, and program chair. Following that he was elected Section Governor, representing the Section on the national Board of Governors. He also chaired the Section’s Teaching Awards Committee for three years and, before that, directed the secondary school visiting lecturer program. Over much of that time he has been managing editor of the Section newsletter (*Mini-Focus*) from issue number 3 in 1977 up to the present. In 1988, having been part of the history of the Section for over 15 years, he published a Section history. A second volume appeared in 2001 to bring that history up to date. On the national scene in 2000 he won the MAA’s Haimo Award for Distinguished College or University Teaching of Mathematics, after having been awarded the Section’s teaching award earlier.

“He is known to fanciers of problems as the national director of an important MAA activity: the William Lowell Putnam Mathematical Competition. There too he has set records for longevity having been director for roughly 30 years, much longer than any previous director.”

Mathfest 2007

MathFest took place in San José this past year, and photos from this very successful event are available at www.maa.org/daily/. Participants enjoyed the San José location, the talks, and the closing banquet at Santa Clara University featuring a talk by Frank Farris.

2006 Putnam Competition

In the Putnam Competition this was Stanford’s year. The Stanford team ranked in the top ten again, with team members Serin Hong (Stanford), Robert D. Hough (Midland, MI), and Kiat Chuan Tan (Stanford), and among individuals Hong and Tan received honorable mention. Theodore Johnson Freyd (Eugene, OR) ranked among the top 26 participants and, in addition, Christopher Breaux (San Mateo), Daniel Le (Princeton Junction, NJ), Nathan Pflueger (Stanford), and Meng Hsuan Wu (Taipai, Taiwan) were given honorable mention as individuals. Young Hun Jung (Stanford) ranked among the top 100. Stanford stood out this year. No other participant attending a college or university in our Section ranked in the top 100 this year.

Some students from the Section, attending college in other parts of the country, did well. Tiankai Liu of Saratoga was a Putnam Fellow (top 5), Richi V. Gupta of Cupertino received honorable mention, and Yi Sun of San José placed among the top 100. All three attend Harvard.

Report on the 2007 Meeting at West Valley

Exactly 364 days after the Stanford gathering and 370 days before the Sacramento State meeting, the Northern California, Nevada, and Hawaii section convened on February 24, 2007 at the extraordinarily beautiful campus of West Valley Community College in Saratoga, California. (In appreciation of Carl Pomerance’s talk, note that $3702007224364 = 2^2 \cdot 925501806091$, and the latter factor is prime.) West Valley is home to one of the most impressive nature reserves of any college campus. All in all, 174 were in attendance, including 30 students.

Organizer Julie Glass (CSU East Bay) once again assembled a delectable array of student poster presentations:

* Michael Casolary (U. of Pacific) used linear programming to analyze the art of healing allies in the popular video game World of Warcraft.

* Annie Chase (St. Mary's College of California) optimized baseball swing parameters (the undercut distance between the center of the bat and the ball and the undercut angle) for maximum hitting distance as a function of pitch and swing speed in little league, high school, and college games.

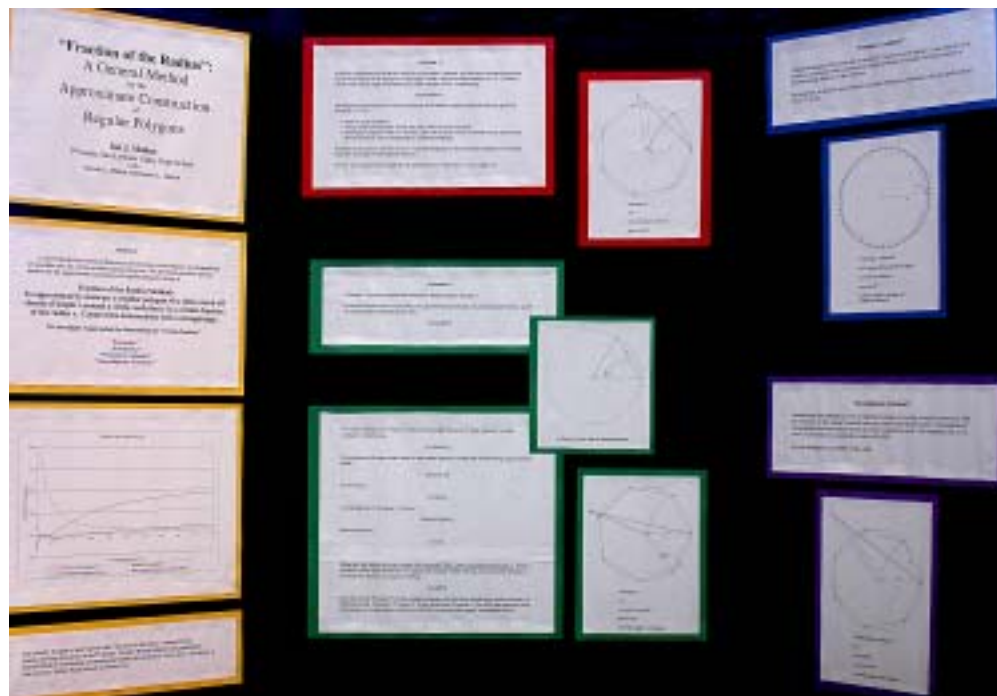
* Gabe Becker of Cal Poly San Luis Obispo extended current research on optimal boarding procedures for small aircraft to large aircraft and to deplaning all aircraft.

* Martin Harrison and Jay Hann of Cal Poly San Luis Obispo used graph theory to analyze shape complexity, constructing hypothetical state congressional districts from actual US census data and comparing them with current district boundaries.

* Katherine Shelly of San José State University analyzed small Matchwebs in graph theory. A Matchweb is a connected normalized matching bipartite graph with the property that no edge removals can produce a connected subgraph that is also normalized matching.

* Even though we know that exact constructions of most polygons with compass and straightedge are impossible, Ian J. Mallet from the ninth-grade class of San Lorenzo Valley High School presented a method for the practical approximate construction of regular polygons.

* Juliet Portillo and Trevor Blackstone of San Francisco State University used the BFACF algorithm to analyze the writhe of polygons in the simple cubic lattice.

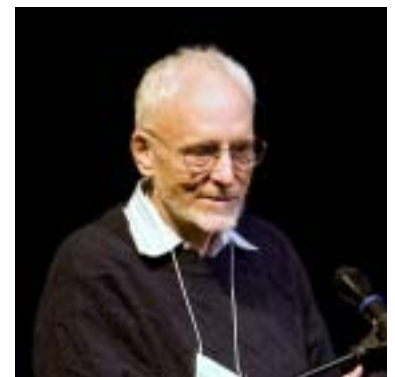


* Ryan Hake of CSU Chico studied the Intrinsic Knotting of Partite graphs. This included a theorem on how edges must be removed from a complete graph to keep it IK and a new example from the complete graph on 5 vertices which is non-IK

I don't know about you, but when I was an undergraduate, extra work outside of class usually meant attempting some starred problems at the back of our textbooks. We are enormously proud of the contributions of our undergraduates to mathematics and the world! Until our 2008 meeting, see abstracts for the posters above at

<http://wolfweb.unr.edu/homepage/keppelma/posters2007.pdf>.

Of course the meeting also included wonderful faculty presentations. Elwyn Berlekamp of UC Berkeley took us on an intriguing tour of the "Dots and Boxes Game" we played as children. He showed us how the shape of the grid as well as the strategy of your opponent makes all the difference in your attempts to win. Theorems abound in this setting and there is strong evidence to support the notion that for every $n > 0$ those who know and use n theorems when they play will always beat those who use only $n-1$ theorems.



Elwyn Berlekamp

Carl Pomerance of Dartmouth College presented a groundbreaking 2002 algorithm by Agarwal, Kayal, and Saxena for primality testing. This algorithm, with a polynomial time bound within a fixed power of the number of digits input, was the senior project of Kayal and Saxena and is yet another tribute to our amazing undergraduate community. Carl's talk mixed deep results with very entertaining and humorous insights.

Don Albers has had an incredible career as editor for a variety of MAA publications. In fact the face of the MAA as an expositor of mathematics would not be nearly what it is today without his energy, dedication, and huge resource of great ideas. Don gave a very entertaining luncheon talk on the great and not so great manuscripts that have crossed his desk to be considered for publication over the years.

Erica Flapan of Pomona College used ideas from knot theory to look at the intrinsic properties of graphs. These are properties which are retained by all embeddings of the graph in \mathbb{R}^3 . She even stretched our imaginations by suggesting that Tait's table of knot crossings might be a way to describe the ether of empty space!



Erica Flapan

Helen Moore, an applied mathematician from Genentech, closed out the day with a very interesting analysis of drug use protocols for incurable diseases. She gave us a glimpse into how mathematical modeling using calculus and statistics can give optimal therapies for patients with HIV and cancer. She reminds us of rewarding careers that await our students outside academia and of previously untapped potential of subjects as elementary as calculus for making huge advances in medical care.

—Ed Keppelmann, Secretary-Treasurer

News from the Departments

American River College: Ted Ridgway and Sandy McKaig have gained attention for development of our department's self-placement program. An initial study of this program by the National Center for Public Policy and Higher Education is available at www.highereducation.org/reports/arc/index.shtml. The International Teacher Assistance Program, founded by ARC mathematics professors Walt Deckert and Andrew Halseth, plans to expand to other countries, such as Malawi, Cambodia, and Nepal. ITAP's initial efforts have focused on Vanuatu. This year ITAP also sponsored an award for instructors who enhance the educational access of students with disabilities; the first \$200 annual prize went to English professor John Hess of ARC. Paul Andre heads our Math Teacher Preparation Program under an NSF grant for recruitment and training. A new course, Exploratory Field Experience in Mathematics, offers students a chance to spend 54 hours assisting in a high school or middle school mathematics classroom.

California State University, Chico: In the spring we installed a chapter of Pi Mu Epsilon National Mathematics Honor Society. The NSF has renewed funding for our REU RET summer research program. We accept applications from undergraduates and K-12 teachers interested in spending six weeks doing research in mathematics and mathematics education. For details see www.csuchico.edu/math/REUT.shtml.

Humboldt State University: We have undergone several administrative changes in the last year, mostly dictated by budget problems our university faces. We offer pre calculus courses in a new, larger format with an enrollment cap of 130 students. Each week students attend three lectures and meet once in a smaller discussion section. We are assessing the new format and exploring online sources to aid the class. We now share administrative support with the Department of Computing Science and hope for an increasing number of collaborations. We have moved to the newly completed Behavioral and Social Sciences Building, with beautiful views over Humboldt Bay and a new student computer lab. Martin Flashman chairs the Philosophy of Mathematics Special Interest Group of the MAA.

Los Medanos College: We have opened a new location, the Brentwood Education and Technology Center. Scholarships to students taking mathematics classes at the Brentwood Center have exceeded \$4,500, and enrollment at the center has grown 16% over fall 2006. As the center grows, we anticipate more full time faculty. Currently we have six full time professors and seventy adjuncts (some of whom are professors at the main campus, teaching one class at the new location). One of our Math Lab tutors, Guadalupe Maya, is president of the newly formed community service club Rotoract, a student version of the Rotary Club.

San Francisco State University: Arek Goetz and Eric Hsu lead a new CSU sponsored project to develop Internet based calculus instruction. Goetz develops streaming video techniques, and Hsu emphasizes personal and psychological aspects of calculus instruction and teacher training. NIH has awarded Javier Arsuaga and Mariel Vasquez new three year grants for DNA related biomathematics research projects, including interdisciplinary undergraduate research. Yitwah Cheung, Joseph Gubeladze, and Shidong Li have received new three year grants from NSF for research in ergodic and number theory, algebraic combinatorics, and wavelet theory, respectively.

Santa Clara University: At the January 2008 Joint Mathematics Meetings in San Diego, Gerald L. Alexanderson was awarded membership in the Icosahedron Society of the MAA for "significant contributions to the Association." It was the fourteenth time that awarding of membership has occurred since the Society was set up in the year 2000. Nicholas Tran

has received third-year funding from NSF of \$42,104 to support “A Complexity Theoretic Foundation for Digital Image Watermarking Systems.” The paper “An Optimization Framework for Polynomial Zerofinders” by Aaron Melman of SCU and Bill Gragg of the Naval Postgraduate School in Monterey appeared in the November 2006 issue of the *American Mathematical Monthly*. The Department of Applied Mathematics now offers a concentration in mathematical finance in its master’s degree program.

Sonoma State University: Sunil Tiwari received the campus Excellence in Teaching Award, which is awarded to only two faculty members each year. Marybeth Hull, the Mathematics Department Academic Coordinator, won the annual campus Staff Excellence Award. Izabela Kanaana is teaching a new upper-division course in classical and modern cryptography from a mathematical point of view. Rick Luttmann is piloting an experimental general education course in mathematics and biology, based on Bonner’s abridged version of Thompson’s classic *On Growth and Form*. At the Math Club’s Fashion Show fund-raiser on May 9, Luttmann modeled ten of his favorite outfits. Club president Aaron Donahue, who served as master of ceremonies for the show, has headed to San Diego for graduate study. The mathematics education group planned a lesson on place value, concentrating on expected student responses to activities and instructor prompts. After observing and videotaping each others’ classes, members of the group met to debrief, share ideas, and alter plans for subsequent classes. They spoke about this activity at the Joint Meetings in January.

University of Hawaii: Tom Craven serves as Interim Dean of the College of Natural Sciences.

University of the Pacific: We recognize Huimei Lin, our 2007 Outstanding Graduating Senior in Mathematics; Michael Casolary, our 2007 Outstanding Graduating Senior in Applied Mathematics; and Damien Mondragon and Alan Kelly, Outstanding Students in Mathematics. Michael presented a talk entitled “Optimizing Healing in a World of Warcraft Using Linear Programming” at the Northern California Undergraduate Mathematics Conference at Sonoma State in April 2007. Huimei, Michael, and Alan, as well as mathematics minor Juan Flores, were inducted into Pacific’s new chapter of the national honor society Phi Beta Kappa.

University of San Francisco: John Stillwell’s paper “Galois Theory for Beginners” is fifth on the MAA JSTOR All Stars list of most accessed papers from the *American Mathematical Monthly* online. For details consult www.maa.org/news/082807jstor.html.

Northern California Undergraduate Mathematics Conference

The Sonoma State University Mathematics Department hosted the third annual Northern California Undergraduate Mathematics Conference on April 21, 2007. Students and faculty from 18 colleges and universities in Northern California and Southern Oregon participated. In the morning, undergraduate students spoke in two parallel sessions on topics including the history of mathematics, graph theory, linear algebra, and cryptography. New this year was a career discussion featuring four mathematicians from industry, research, and teaching. After lunch, students spoke on topics such as knot theory and mathematical modeling. The conference concluded with a fascinating keynote talk “Visual Geometry” by Frank Farris of Santa Clara University. At next year’s conference, scheduled for April 19, 2008, keynote speaker Juan C. Meza from Lawrence Berkeley National Laboratory will talk about the role of mathematics in amplifying science research. For details see www.sonoma.edu/math/nocalumc.

Pacific Coast Undergraduate Mathematics Conference

The third annual Pacific Coast Undergraduate Mathematics Conference takes place at Loyola Marymount University in Los Angeles on April 5, 2008. In addition to free registration and lunch, the conference features talks by undergraduates, including special sessions for freshmen and sophomores, discussions of career options and undergraduate research, a keynote speaker, and numerous prizes. Talks are encouraged on research projects, historical and biographical topics, and interesting solutions of math club problems. Travel support for students is available (up to \$250 for speakers and \$150 for others). Further information appears at www.pcumc.math.org. The conference receives generous support from the NSA and from NSF Grant DMS 0241090 through the MAA Regional Undergraduate Mathematics Conference program (see www.maa.org/rumc).

Carl Pomerance
Speaker at Section Meeting,
West Valley College



**Call for Nominations
for the
2009 Mathematical Association of America
Distinguished College or University Teaching Award**

Each year the MAA identifies outstanding teachers of college mathematics and recognizes their achievements in the sections and at the national level. Initial nominations for the Section Distinguished Teaching Award are due in early November 2008.

In past years the work of preparing nomination documents (letters of recommendation, teaching evaluations, etc.) inhibited some potential nominators. To ease that burden, the award committee introduced a simpler, two-stage approach and was rewarded with a dramatic increase in the number of nominees. Initial nominations, consisting of a simple form and a statement by the nominator, are due in early November 2008. After reviewing these preliminary nominations, the award committee will ask submitters of clearly competitive nominations to complete additional documentation for the Section Award and for consideration for a National Award.

The formal Call for Nominations and the Nomination Form files, both in pdf format, are available at the web site <http://unr.edu/homepage/keppelma/maanc.html>. These files describe the award, eligibility requirements, and the timeline for review. The Nomination Form and statement by the nominator can be submitted via the postal system or electronically to either of the addresses listed at the bottom of the Nomination Form. An e-mail acknowledgment will be sent upon receipt of the nomination package.

Thank you for your assistance in this important effort. Please direct questions to Gerald L. Alexanderson, chair of the award committee, at the address below.

Professor Gerald L. Alexanderson, Department of Mathematics and Computer Science, Santa Clara University, Santa Clara, CA 95050, 408-554-6894, galexand@math.scu.edu

Previous Winners – An asterisk denotes winners of the Haimo Award

1992 G. D. Chakerian, University of California, Davis	2000 *EVELYN SILVIA, University of California, Davis
1993 *PAUL R. HALMOS, Santa Clara University	2001 Wade Ellis, Jr., West Valley College
1994 Jane Day, San Jose State University	2002 *PAUL ZEITZ, University of San Francisco
1995 *EDWARD M. LANDESMAN, University of California, Santa Cruz	2003 Peter Tannenbaum, California State University, Fresno
1996 G. Thomas Sallee, University of California, Davis	2004 *GERALD L. ALEXANDERSON, Santa Clara University
1997 Jean J. Pedersen, Santa Clara University	2005 Russell Merris, California State University, East Bay
1998 Donald C. Pfaff, University of Nevada, Reno	2006 Tatiana Shubin, San Jose State University
1999 *LEONARD F. KLOSINSKI, Santa Clara University	2007 William Fisher, California State University, Chico

FACING PAGE: some winners of the Section Teaching Award. (left to right) Tatiana Shubin, Jane Day, William Fisher, Wade Ellis, Jr., Gerald Alexanderson, Jean Pedersen

**Call for Student Posters
for the
2008 Mathematical Association of America
Northern California, Nevada and Hawaii Section Meeting**

When: Saturday, March 1, 2008

Where: Sacramento State University in Sacramento, California

What: Presentations of research results, new approaches to old problems, solutions to problems from mathematics journals, results of classroom projects or mathematical modeling contests, historical investigations in pure and applied mathematics, mathematical topics outside the standard curriculum, or mathematical investigations arising from internship experiences

Who: All undergraduate and graduate mathematics students

Why: The meeting provides a great opportunity to learn about interesting and entertaining areas of mathematics as well as to network with other students and professors. Student presenters receive **complimentary registration and Saturday luncheon**, plus a **free one-year membership in the MAA** or (to those who are already members) **a free book**.

Details: All student posters should be typed, illustrated, and displayed on a poster board that is 3 feet high and 4 feet wide. Posters will be on view throughout the meeting, including during a scheduled poster session.

What to do: If you would like to participate or have any questions (*e.g.*, whether your idea is appropriate for presentation, what size font to use on your poster, or where to get the best burger in Sacramento), please contact Julie Glass, the poster coordinator, at the address below. Participants are encouraged to have an e-mail address, possibly through a faculty mentor, where they can be contacted. Submit your name and abstract (2 to 5 sentences), including poster title, name of institution, and name of faculty advisor (if applicable), to Dr. Glass, preferably by e-mail, by Friday, February 22, 2008.

Dr. Julie Glass, Department of Mathematics, California State University, East Bay, Hayward, CA 94542, (510) 885-3997 (Office), (510) 885-4724 (Fax), julie.glass@csueastbay.edu



Directions to Sacramento State University

From I-80 east: Head towards Sacramento. Keeping left on I-80, take US-50 east towards Sacramento and South Lake Tahoe. Exit at Power Inn Road/Howe Avenue, staying to the far right. Follow the CSUS ramp to loop under the freeway onto Hornet Drive. At the stop light, turn left onto College Town Drive. After about half a mile, turn right onto State University Drive East.

From other highways: Consult the web site www.csus.edu/pa/directions.html

From the link above, one can also find hotel and other local information.

Campus map web site: www.csus.edu/pa/pdf/campusmap1005.pdf

Parking

Parking is free in lots 4, 6, and 7 if a copy of the permit on page 11 is on one's dashboard. The University Union is adjacent to parking lots 4 and 6. Do not park in the multilevel parking structures.

State of Jefferson Mathematical Congress

The 36th annual State of Jefferson Mathematical Congress took place from October 5 to 7, 2006 at the Dry Creek Group Campground on the shores of Whiskeytown Lake just west of Redding. Attending with their families were faculty members and students from CSU campuses in Chico, Humboldt, San Francisco, and Sonoma, as well as Southern Oregon University. Participants enjoyed excellent presentations on "Number Theory and Trees" by Ben Levitt of Chico State University, "Definitions and Non-definability in Euclidean Geometry" by Jim Smith of San Francisco State University, and "What Can We Learn by Generating Examples?" by Marianna Bogomolny of Southern Oregon University.

Section Executive Committee Meetings

The Executive Committee of the Section meets in April and October each year. If you have ideas or questions, please contact Ed Keppelmann at keppelma@unr.edu for the dates and locations of these meetings.

New Department Chairs

American River College: Ted Ridgway
 Los Medanos College: Jill DeStefano, Brentwood
 Center Non-Departmental Division
 Humboldt State University: Dale Oliver
 Notre Dame de Namur University: Eugen Radian
 San Francisco State University: David Bao
 University of Hawaii: Wayne Smith



Lunch at West Valley College

**MATHEMATICAL ASSOCIATION OF AMERICA
NORTHERN CALIFORNIA, NEVADA, AND HAWAII SECTION
Saturday, March 1, 2008
Sacramento State University
University Union
Ballroom I unless specified otherwise**

PROGRAM

- 9:00—10:00 Registration, Coffee Hour, Book Sales — Lobby Suite
Registration Fee: \$10 (\$5 for retirees; \$1 for students and unemployed)
- 10:00—10:50 **KEVIN McCURLEY**, Google Research
“Random Walks on Graphs and Their Applications”
Presider: **TBA**
- 10:50—11:00 **MAA Section Business Meeting**
Presider: **Tatiana Shubin**, San Jose State University; Section Chair
- 11:00—11:30 **Student Poster Session**
- 11:30—12:20 **SUSAN HOLMES**, Stanford University
“The Mathematics of Flipping a Coin”
Presider: **Tatiana Shubin**, San Jose State University; Section Chair
- 12:30—1:30 **Luncheon* – Redwood Room**
- 1:30—2:00 Presentation of the 2008 Section Award for Distinguished
College or University Teaching of Mathematics
DEANNA HAUNSPERGER, Carleton College: MAA Second Vice President
“A Glimpse at the Horizon”
Presider: **Ed Keppelmann**, University of Nevada, Reno; Section Secretary-Treasurer
- 2:10—3:00 **JESÚS DE LOERA**, University of California, Davis
“Volume: A Hard-to-Get Straightforward Number”
Presider: **Kathy Hann**, California State University, East Bay; Section Governor
- 3:10—4:00 **ROBERT J. LANG**, Robert J. Lang Origami; Editor-in-Chief, *IEEE Journal of Quantum Electronics*
“From Flapping Birds to Space Telescopes: The Modern Science of Origami”
Presider: **Stan Isaacs**, College of San Mateo; Section Program Chair

***Advance reservation for luncheon required — \$20.00. Seating is limited so tickets are available on a first come – first served basis.**

Section web site:

<http://wolfweb.unr.edu/homepage/keppelma/maanc.html>

Program Abstracts

KEVIN MCCURLEY, Google Research, “Random Walks on Graphs and Their Applications”

Abstract: The concept that first catapulted the Google search engine to prominence was that of PageRank. This arises from thinking of the World Wide Web as a directed graph, and ordering pages by the probability that they would be visited during a random walk on this graph. In reality the PageRank algorithm has many nuances associated with it, and the paradigm of random walks on massive graphs has implications for other real world graphs. In this talk I'll highlight some of the mathematics, and what it has to say about the information revolution that has taken us by storm in the last decade.

SUSAN HOLMES, Stanford University, “The Mathematics of Flipping a Coin”

Abstract: We analyze the natural process of flipping a coin which is caught in the hand. We prove that vigorously flipped coins are biased to come up the same way they started. In joint work with Persi Diaconis and Richard Montgomery, we show that the amount of bias depends on a single parameter, the angle between the normal to the coin and the angular momentum vector. Measurements of this parameter based on high-speed photography will be reported. For natural flips, the chance of coming up as started is about 0.51.

DEANNA HAUNSPERGER, Carleton College, MAA Second Vice President, “A Glimpse at the Horizon”

Abstract: What do a square-wheeled bicycle, a 17th-century French painting, and the Indiana legislature all have in common? They appear among the many bright stars on the mathematical horizon, or perhaps, more correctly, in *Math Horizons*. *Math Horizons*, the undergraduate magazine started by the MAA in 1994, publishes articles to introduce students to the world of mathematics outside the classroom. Some of mathematics' best expositors have written for *MH* over the years; here is a glimpse back at the first ten years of *Horizons*.

JESÚS DE LOERA, University of California, Davis, “Volume: A Hard-to-Get Straightforward Number”

Abstract: The volume of an object is perhaps the most fundamental and basic concept in the history of geometry. Already ancient civilizations worried about it (*e.g.*, Egypt, Babylon). In particular volumes of convex bodies appear everywhere in mathematics as an important invariant or property to be computed. So, how does one go about actually computing the volume of a convex solid? In this talk we survey why volume computation is relevant in everyone's life, what is currently known about efficient computation of the volume of convex bodies, and we end by describing recent new results in the area.

ROBERT J. LANG, Robert J. Lang Origami, Editor-in-Chief, *IEEE Journal of Quantum Electronics*, “From Flapping Birds to Space Telescopes: The Modern Science of Origami”

Abstract: The last decade of this past century has been witness to a revolution in the development and application of mathematical techniques to *origami*, the centuries-old Japanese art of paper-folding. The techniques used in mathematical origami design range from the abstruse to the highly approachable. In this talk, I will describe how geometric concepts led to the solution of a broad class of origami folding problems—specifically, the problem of efficiently folding a shape with an arbitrary number and arrangement of flaps—and along the way, enabled origami designs of mind-blowing complexity and realism, some of which you'll see, too. As often happens in mathematics, theory originally developed for its own sake has led to some surprising practical applications. The algorithms and theorems of origami design have shed light on long-standing mathematical questions and have solved practical engineering problems. I will discuss examples of how origami has enabled safer airbags, Brobdingnagian space telescopes, and more.

Mathematical Association
of America
Santa Clara University
Santa Clara, CA 95053-0290

**Annual Program
Announcement is
included**

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