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# FOCUS

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*On the cover: an image from the Joint Mathematics Meetings, looking up midway between the Lobby Level and the Ballroom Level of the Hyatt Regency in Atlanta. Plenary talks were held on the Ballroom Level of the Hyatt, and the message board was also located there, as were the doors leading to the Marriott, where many other events were held. Photograph courtesy of Fernando Gouvêa.*

<b>FOCUS Deadlines</b>			
	May/June	August/September	October
Editorial Copy	March 10	June 10	
Display Ads	March 10	June 10	August 12
Employment Ads	March 24	June 17	August 6

## Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service for Mathematics

The MAA's most prestigious award went to Jerry Alexanderson in recognition for his long and distinguished career. The Gung-Hu award is intended to honor service to mathematics that has been widely recognized as extraordinarily successful. Jerry's long record as mathematician, administrator, author, editor, MAA officer, and enthusiast for mathematics fits that description perfectly. Look for an extensive appreciation of Jerry's contributions to mathematics in the March issue of the *American Mathematical Monthly*.



*Jerry Alexanderson*

## Carl Cowen Becomes MAA President

After serving for one year as President-Elect, Carl Cowen officially became the President of the Association at the end of the MAA Business Meeting in Atlanta. The moment was marked by the passing of the ceremonial gavel (which has apparently never actually been *used* by anyone). Cowen will serve a two-year term.

Having completed his two-year term as president, Ron Graham will continue to serve on the Executive Committee for one year, after which he will be replaced by the next President-Elect (to be chosen this spring). Graham will remain on the Board of Governors for several years after that.



*MAA President Ron Graham passes the gavel to MAA President Carl Cowen.*

## Gung-Hu Award Committee Seeks Nominations

The Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics, presented to Gerald Alexanderson in 2005, is the most prestigious award made by the MAA. The selection committee is now seeking nominations for the 2006 prize. There is no special form or format for nominations, but they should be sent as soon as possible (and certainly no later than March 31) to the committee chair, Wayne Roberts, at [wroberts@macalstr.edu](mailto:wroberts@macalstr.edu). See <http://www.maa.org/Awards/gunghu.html> for more information on the award, including a list of past recipients.

## James Arthur Becomes AMS President

The American Mathematical Society (AMS) also has a new president. At the AMS Business Meeting in Atlanta, David Eisenbud passed the job on to James Arthur of the University of Toronto. Arthur will serve a two-year term.

Both AMS and MAA use the system of having a President-Elect who serves a year in that position before becoming President for a two-year term. Eisenbud will serve as "Immediate Past President" during 2005.



*James Arthur and David Eisenbud.*

## The 2005 IAS/Park City Mathematics Institute: Mathematical Biology

By William Barker

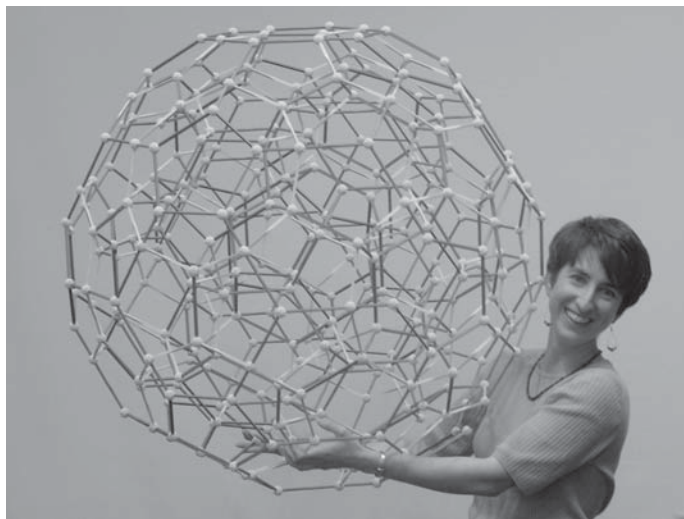
A unique mathematics event takes place each summer in Utah: the Park City Mathematics Institute, sponsored since 1994 by the Institute for Advanced Study in Princeton. For three intense weeks mathematics researchers, scholars, and students at the post-secondary level as well as mathematics educators at the secondary and post-secondary level gather for research and study in Park City, Utah, a setting of breathtaking mountain scenery and abundant hiking and other outdoor opportunities.

This year's PCMI Summer Session will be held from Sunday, June 26, to Saturday, July 16, 2005, with *Mathematical Biology* as the research theme and *The Mathematics Education of Mathematics Teachers* as the education theme. The review of applications for the program begins February 15, 2005.

The central themes of PCMI are developed in six separate but connected programs, each centered on a different component of the mathematics community:

The *research program components* include activities for mathematics researchers (Research Program), graduate students (Graduate Summer School: GSS), and undergraduate students (Undergraduate Summer School: USS). The *education program components* are programs for mathematics education researchers (Mathematics Education Research Program), undergraduate college faculty (Undergraduate Faculty Program: UFP), and high school teachers (High School Teacher Program: HSTP).

At the Summer Session these groups meet simultaneously, each following an individual program of research and study. However, considerable interaction takes place between the groups due to the fundamental structure of PCMI: lectures and courses in each Summer Session program are open to *all* participants and, in addition to the activities specific to each group, there are daily events of general interest designed for the full Institute.



A scene from PCMI 2004: Cathy Kriloff of Idaho State University displays a model of the four-dimensional 120-cell made from Zometool at PCMI 2004. Photograph by James R. King.

Further opportunities for informal and social interaction are also available, ranging from organized cross program activities to informal conversations over meals. Cross-program mentoring is also encouraged and nurtured to further enhance the sense of community among participants.

The rich mathematical experience combined with interaction among groups with different backgrounds and professional concerns results in greatly increased understanding and awareness of the issues confronting contemporary mathematics and mathematics education.

Each of these programs will be attractive and appropriate for many members of the MAA. However, the *Undergraduate Faculty Program* (UFP), with its focus on collegiate mathematicians with a strong interest in undergraduate education, is of relevance to a particularly large portion of the MAA. Co-sponsored by NSF's Chautauqua Program, the UFP offers opportunities for broad professional growth and engagement with the excitement of mathematics by working with peers on new approaches to teaching, tackling research questions, and interact-

ing with the broader mathematical community. This year's UFP theme is **An Introduction to Molecular Cell Biology for Mathematicians**. The workshop leader will be John J. Tyson, University Distinguished Professor of Molecular Cell Biology at Virginia Polytechnic Institute & State University.

Mathematical biology presents myriad challenges, both in applying already known techniques in new contexts, and in developing new techniques. Although the topic can be expected to see significant growth over the coming decades, the current possibilities to study mathematical biology as either an undergraduate student or an undergraduate instructor are rather limited. The Undergraduate Summer School (USS) and the Undergraduate Faculty Program (UFP) will improve the situation through a coordinated plan designed to increase interest in and knowledge of mathematical biology among undergraduates and to increase the capacity of undergraduate teaching faculty to offer courses in mathematical biology.

The centerpiece of the UFP program will be a series of lectures by John Tyson designed to present its participants with the

biological knowledge needed by faculty who plan to offer undergraduate courses in mathematical biology. Centering on molecular cell biology, the only prerequisite for the lectures is basic chemistry. Specific topics will be chosen from among the following: Cell structure: space and time scales in MCB; Informational macromolecules of the cell: proteins, nucleic acids; Bioenergetics: implications of the first and second laws of thermodynamics; Enzyme catalysis, kinetics and regulation; Metabolic pathways: glycolysis in detail, metabolic control theory; Replication, transcription and translation; Regulation of gene expression; Cell cycle regulation and cancer; Membrane structure, function, transport; Membrane potential and electrical signaling in cells; Membrane receptors, ligands and signal transduction pathways; Calcium and cyclic AMP as second messengers; Cytoskeleton, motility and contractility. The reference text to be used for the lecture series is *The World of the Cell*, 5<sup>th</sup> Ed., Wayne Becker et. al.

John Tyson is eminently qualified to organize and deliver these lectures. Having earned his Ph.D. in Chemical Physics from the University of Chicago in 1973, he served as the President of the Society for Mathematical Biology from 1993 to 1995, and was awarded the Bellman Prize in Mathematical Biosciences in 1989. The unifying theme of his research is the problem of spatial and temporal organization in chemical, biochemical, and biological systems. What mechanisms keep time in these various domains? How is spatial information communicated and utilized?

In addition to attending the officially designated UFP activities, many, if not most, of the UFP participants will have a strong interest in the three Undergraduate Summer School courses, designed to offer participants a broad and substantial introduction to contemporary ideas and techniques in mathematical biology. The daily PCMI schedule has been carefully designed to allow such cross program activity. In particular, there will be minimal conflict between the USS courses, the UFP course, and the UFP seminar. The three USS courses are as follows:

**Cancer Modeling with Optimal Control**, an advanced course to be offered by Lisette de Pillis of Harvey Mudd College. This will be a new synthesis of material not offered before at the undergraduate level. The modeling of cancer growth and treatment requires skills from multiple disciplines; it lies at the intersection of biology and medicine, with mathematics at the core.

**Dynamics, Diseases, and Diversity**, an introductory course to be offered by Fred Adler of the University of Utah. This course will present topics in three broad areas: the spread of diseases, studied by the use of differential equations, how consumers interact with biological resources using dynamical systems, how genetic systems maintain diversity using methods from probability theory.

**The Mathematics of Phylogenetic Trees**, an introductory course to be offered jointly by Elizabeth Allman of the University of Southern Maine and John

Rhodes of Bates College. This course will showcase probabilistic and combinatorial methods for dealing with genomics, built around the theme of reconstructing phylogenetic trees. There will be hands-on computer work with both real and simulated data.

In addition to participation in the Undergraduate Summer School courses, many UFP participants like to attend selected lectures in the Graduate Summer School courses. Some also work actively with the High School Teachers program, particularly concerning pedagogical, curricular, or articulation issues.

The Coordinator of PCMI's Undergraduate Faculty Program is Daniel Goroff, Professor of the Practice of Mathematics at Harvard University and Associate Director of the Derek Bok Center for Teaching and Learning. He is a member of the PCMI Steering Committee, chaired by Herb Clemens of the Ohio State University.

For more information and application instructions for the Undergraduate Faculty Program, consult the UFP web page at [http://www.admin.ias.edu/ma/current/program\\_undergradfaculty.php](http://www.admin.ias.edu/ma/current/program_undergradfaculty.php).

Review of applications begins February 15, 2005, and financial support is available for participants in all the programs. For more general information on all aspects of the 2005 Summer Session, consult the PCMI web page at <http://www.admin.ias.edu/ma/>.

## Math & Bio 2010: Linking Undergraduate Disciplines

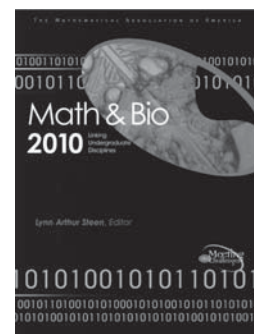
Lynn Arthur Steen, Editor

*Math & Bio 2010: Linking Undergraduate Disciplines* envisages a new educational paradigm in which the disciplines of mathematics and biology, currently quite separate, will be productively linked in the undergraduate science programs of the twenty-first century. As a science, biology depends increasingly on data, algorithms, and models; in virtually every respect, it is becoming more quantitative, more computational and more mathematical. While these trends are related, they are not the same; they represent, rather, three different perspectives on what many are calling the "new biology."

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## Hurricane Season Puts Mathematical Models to the Test

By Taresa LaRock and Tom Struppeck

This year, Florida and other states saw more than their fair share of catastrophes — the hurricane season (beginning at the start of June and ending at the end of November) swept through the U.S. with a vengeance, taking dozens of lives and causing billions of dollars in property damage. Thousands were left homeless. Twenty-one federal disaster areas were declared in thirteen states and Puerto Rico. How did insurance companies prepare for these disasters? With the help of actuaries.

Most hurricane stories start with a family losing their home or their most cherished possessions followed by accounts of desperation and tragedy. But this hurricane story starts with a side not often told — years of planning for a series of events that no one thought could happen. This story starts with the work of actuaries, whose job is to make sure that families who do lose everything have the chance to rebuild.

Actuaries spend their time assessing the chance of future events, designing ways to prevent them from happening, and lessening the impact when events do occur. Of course, actuaries cannot prevent hurricanes, but they do try and lessen their economic impact. While they are often portrayed as back-room “number crunchers” because of their strong analytical skills, actuaries are often at the forefront as key members of their companies’ management teams. Actuarial work spans many fields and industries, with some of the most interesting work being in the property and casualty insurance industry.

One of the key responsibilities of a casualty actuary is to plan for possible catastrophic events. “Our highest concern is solvency, and actuaries provide support for that in several ways,” said Rade Musulin, Vice President of Operations, Public Affairs, and Reinsurance at the Florida Farm Bureau of Insurance Companies. “We analyze output from catastrophe models to evaluate our maximum

loss from one storm and our maximum loss from an accumulation of storms over a season. We then review the companies’ financial resources to see if it can withstand those losses and continue operations. Finally we must create a rate structure that provides sufficient revenue to fund losses and the cost of capital, and work with our regulatory friends to get rates approved. The role of an actuary in this process is to plan for possible events so the system responds as efficiently as possible.”

### Catastrophe Models

The catastrophe models Musulin refers to are computer programs that replicate the effects of natural disasters. They involve elements of meteorology, insurance, and engineering. “They simulate the effects of hurricanes, severe thunderstorms or earthquakes on property,” Musulin said, “then calculate losses payable under insurance contracts. Models are essential to evaluating and pricing catastrophe exposures.”

These models are important variables in planning for the future. Without models, insurance companies may not be able to plan or provide for the public who relies on their coverage. “Hurricane models take over a century of weather records and project the storms of the past on the exposures of the present,” he said. “One cannot look at historical experience for guidance on future losses, because when major storms hit in the past, the population, housing stock, and insurance products were totally different. Models are the best tools we have to evaluate catastrophic risk.”

A typical hurricane loss model will estimate the dollars of loss a certain insurer would have if a hurricane of a certain strength were to hit a certain location. This estimate will depend on the location and value of the houses that the insurer has insured. The estimate will also depend on the strength of the hurricane and its path. Insurers use such models in

different ways, depending on the application. For example, an insurer might be interested in knowing: what is the probability that its hurricane losses next year exceed one billion dollars? In this case, the location and value of the homes that it insures will be largely known. (Only largely known because it might insure some additional houses and some currently insured houses might change insurers. Actuaries can help estimate these changes, too.) On the other hand, we don’t know what hurricanes, if any, will hit next year. One way to deal with this is to use Monte Carlo simulation. Many thousands of possible (virtual) hurricanes are generated, each with a certain probability of being observed next year. The losses conditional on that hurricane occurring are then estimated and these estimates are combined to produce the distribution of expected losses for the coming year. From this it is easy to read off the probability of a loss that exceeds one billion dollars. Confidence intervals can also be obtained this way.

Almost immediately after a hurricane has hit, insurers send teams of insurance adjusters to assess the damage and start to pay claims. Since these adjusters come from all over the country, the insurer needs to know how many adjusters to send. To estimate how many adjusters are needed, the insurer will run the hurricane model again, but this time the storm parameters are known. The loss model can be run with the exact storm parameters specified. In the Monte Carlo simulation the actual storm is unlikely to have been exactly modeled, but there probably was a simulated storm that had similar parameters. By examining the losses from the simulated storm, the insurer can estimate how many extra adjusters should be sent.

Once the losses are cleaned up and paid for, the insurer will know what the storm actually cost. At this point, the modeled losses will be compared to the observed losses and the model might be adjusted appropriately. In the 2004 hurricane sea-

son, four named storms hit the state of Florida. The hurricane models had predicted that this was possible but unlikely. Were the models wrong or was 2004 just an unlucky year for Florida?

This cycle — estimate, observe, reconcile, and re-estimate — is typical of the work that actuaries do.

### Architects of Financial Security

The ultimate test of sufficient planning by insurance companies is the outcome. Do claims get paid? Do homes get rebuilt? Can the insurance company renew policies without rate shock to their consumers? These are indicators of a good plan. “Bad planning contributes to insolvencies, claim settlement problems, abrupt rate changes, and non-renewals,” Musulin said. “While it’s impossible to avoid some fallout from unprecedented disasters, we strive to minimize adverse effects by anticipating what might happen and preparing for it.”

### The Future

Hurricane season 2004 brought many questions to Musulin and other actuaries. “This year we learned what it is like to experience an outlier. We will conduct a thorough investigation of the data from this year’s storms to look at a lot of questions, all of which will affect future premiums,” he said. “They include, do the 2004 storms indicate that long term claim frequency assumptions in the models are wrong? Should actuarial forecasts reflect the point in the long term hurricane cycle we find ourselves in? In other words, is the \$10,000 a year average the right estimate of the expected cost over the next few years?”

This season also brings obstacles to the forefront. “The biggest challenge we face is on resource constraints,” Musulin said. “Even before the storms there were shortages on concrete, plywood, drywall, and contractors. Now we face an unprecedented number of claims and additional

shortages of both building materials and insurance adjusters to settle the claims.”

No doubt there are obstacles, but because of the work of actuaries, there is also hope for the future. With careful planning, accurate projections and meticulous preparation, actuaries and the companies they work for are providing a brighter future and a better chance for the general public to weather whatever Mother Nature brings.

Want to learn more about actuaries and the work they do? Visit the website devoted to actuarial career information: <http://www.BeAnActuary.com>.

*Taresa LaRock is Communications Coordinator at the Casualty Actuarial Society and assists in external communications by promoting actuarial science to the public. Tom Struppeck is the actuary at CIFG, a AAA-rated financial guarantor, where he develops models for risk management and capital management.*

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## The MAA/Tensor Small Grant Program: Ten Years Encouraging Women in Mathematics and Science

By Florence Fasanelli

When 11 small grants were mailed out in the spring of 2004, the letters told the recipients that they were part of the 10<sup>th</sup> class of MAA/Tensor grant awardees. These eleven checks brought the total of awardees to 75; \$500,000 had been generously given by the Tensor Foundation.

MAA/Tensor is a small grants program to encourage women and girls to continue the study of mathematics and science. Each year a solicitation is made available on the MAA web site and every few years the same form is printed in FOCUS. Other organizations pick up and reproduce this form. Thus, every year there is a true variety of proposals from which the final selection is made. The probability of getting funded varies from 15% to 40% in any given year.

In years when there are a large number of proposals, members of the Committee on the Participation of Women (CPW) are asked to be reviewers along with previous grantees. Otherwise, a selection team, consisting of the MAA/Tensor Program Director, three mathematicians experienced in running summer programs, and a trustee of the Tensor Foundation, meets at the MAA Headquarters to review the proposals. All applicants are notified about the decision on the day the team meets so they may begin their work as soon as possible.

CPW provides oversight for the MAA/Tensor Grant Program. In particular they have arranged a venue each year at the Joint Mathematics Meetings for grantees to meet and discuss their programs,

learning from each other, holding poster sessions, and providing the camaraderie so vital for this consuming work usually done in addition to all the other activities required of mathematics faculty members. At the Atlanta Joint Meetings, the poster session was held on Friday, January 7.

The category with the largest number of grants is summer programs, both for pre-college and college students. Each year one or two one-day programs are funded. Some programs at the collegiate level bring groups of women students, graduate and undergraduate, together with female faculty members. Several grants have been given for faculty to design upper level undergraduate courses as well as REU summer programs.

Among the eleven proposals funded in May 2004, two were for one-day mathematics workshops to encourage girls and women to study mathematics. Nassau Community College planned their event to include a mathematics contest as well as career workshops for girls who attend one of the 12 schools who are existing partners of the College. The project director, Theresa Vecchiarelli, included a teacher training workshop after the students had participated in *Y2M: Yes to Mathematics*, to increase the number of high school girls who can be reached in the future.

Another one-day event, *Conversations among Women in Mathematics*, was planned for November 6, 2004, in the Department of Mathematics at the University of Dayton. Female mathematics students from area high schools, current undergraduate and graduate students from allied disciplines, alumnae of the Department of Mathematics, and the women faculty of the Department of Mathematics were invited to attend *Conversations*. Project directors Wiebke Diestelkamp and Aparna Higgins invited participants to return to campus to attend and/or give talks at Undergraduate Mathematics Day to be held in the fall of 2005.

Tensor grants are renewable three times. A renewal grant was made to continue to support the work of Tracey Watkins at Winston Salem State University. *Girls Accessing Mathematical Explorations* (GAME) stimulates girls who have shown potential but little interest in mathematics through an initial Mathematics Career Day held in April. This day works as a recruitment venue for a three-week summer program.

After 20 years of a successful program, SummerMath at Mount Holyoke College will be expanded by SEARCH: *Summer Explorations And Research Collaborations for High School Girls at Mount Holyoke College*. In this four-week program, two high school female teams will research graph coloring or finite geometries. These students will have strong backgrounds in mathematics but may not have seen their full potential. With a taste

of what they might do as mathematics majors and some connection with mathematics students and faculty, it is anticipated that many of these women will decide to reach high in mathematics. James Morrow is project director.

Five one-day events for mothers and daughters will be held on Sunday afternoons at the University of Montana under the direction of Libby Krussel and Sharon O'Hare. The goal is to help the girls learn how to succeed in mathematics while their mothers learn strategies to encourage them.

James Wright and Lynn Ryan conduct a free one-week day camp for middle school girls at Green Mountain College. The theme for 2004 was *Geometry and Art*. In the week following their camp, participants can use their new skills as counselors for elementary grade students who attend a similar camp.

A grant to Borough of Manhattan Community College (BMCC) builds on previous highly successful Tensor funded projects. From 1998 to 2003, participation increased by 55%. Students are attracted to science and mathematics majors and persist in them through experience with individual research projects. The 2004 project funded ten women summer research fellows. BMCC matched the Tensor grant for these students during the academic year. Patricia Wilkinson and Lawrence Sher are project directors.

A grant was made to Chatham College, one of the 64 remaining women's colleges, to organize a math club to enhance undergraduate education in mathematics and encourage programs that highlight the interrelationship between mathematics and the natural and biological sciences. Once started, under the guidance of Japaeth Wood, the club will draw on college funding.

A grant to Sam Houston State University provided travel funds for female members of their MAA student chapter. Several students from this chapter have given presentation or prepared posters for MAA meetings with strong encour-

agement from the two project directors, Jacqueline Jensen and Julie Jones, both of whom were Project NExT fellows. The university covered expenses for both PDs.

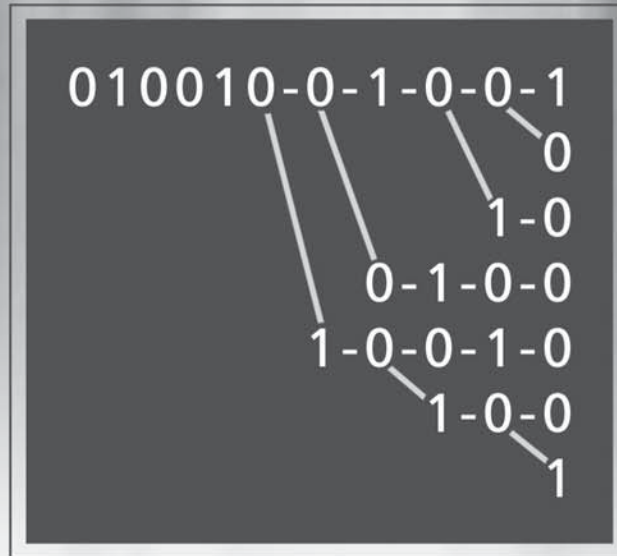
Joanne Peeples and Hamide Dogan are project directors for a unique project at El Paso Community College to bring more women into the study of mathematics at the post-secondary level through exposure to women mathematicians and their work. Mathematics graduates, undergraduates, and high school girls will work in teams researching the lives and mathematics of six famous women, and then write and perform a play depicting these women, as well as a power point presentation of the mathematics. The play will be given at high schools and mathematics meetings in the region.

With funds provided by an NSF grant to the MAA, Southwestern Indian Polytechnic Institute (SIPI) institutionalized mathematics courses specifically designed for paraprofessionals from the surrounding tribal communities. Fifty-six American Indian educational assistants began their studies in 1998. By 2001, 20 women had graduated from the program, receiving a diploma as mathematics specialists. Another 14 women had completed mathematics and science courses. In 2004, 12 of these same women are enrolled in the University of New Mexico or at SIPI. The current grant, a renewal under the direction of Joan Goodman, will help maintain Girl's Mathematics Clubs which meet twice a month in five of the participant pueblos, support Family Math Nights, host a Mathematics Fair on the SIPI campus on May 17, 2005, and provide funds for Educational Assistants to attend the New Mexico State Mathematics Conference.

*Proposals for 2005 should be submitted before February 25<sup>th</sup>.* An application form is posted at [http://www.maa.org/projects/tensor\\_solicitation.html](http://www.maa.org/projects/tensor_solicitation.html). The MAA/ Tensor Small Grants Program Director, Florence Fasanelli, can be reached at 202-966-5591 or at [ffasanelli@juno.com](mailto:ffasanelli@juno.com). Proposers will be notified in early March as to the results of the review.



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## Archives of American Mathematics Spotlight: The George Bruce Halsted Papers

By Kristy Sorensen

The George Bruce Halsted Papers, an important collection at the Center for American History's Archives of American Mathematics, have recently been re-organized with a view to making it easier for researchers to access the collection.

George Bruce Halsted (1853-1922) was a fourth generation Princeton graduate, earning his Bachelor's degree in 1875 and his Master's in 1878. He was J. J. Sylvester's first student at Johns Hopkins University, receiving his Ph.D. in 1879, and also studied with Carl Borchardt in Berlin. After graduation, Halsted served as an instructor in mathematics at Princeton until beginning his post at the University of Texas at Austin in 1884.

Halsted was a member of the University of Texas at Austin Department of Pure and Applied Mathematics (1884-1903) where he taught noted mathematicians R. L. Moore and L. E. Dickson among other students. He explored the foundations of geometry and introduced Non-Euclidean geometry into the United States through his own work and his many important translations. He was later at St. John's College, Annapolis; Kenyon College, Gambier, Ohio (1903-1906); and the Colorado State College of Education, Greeley (1906-1914).

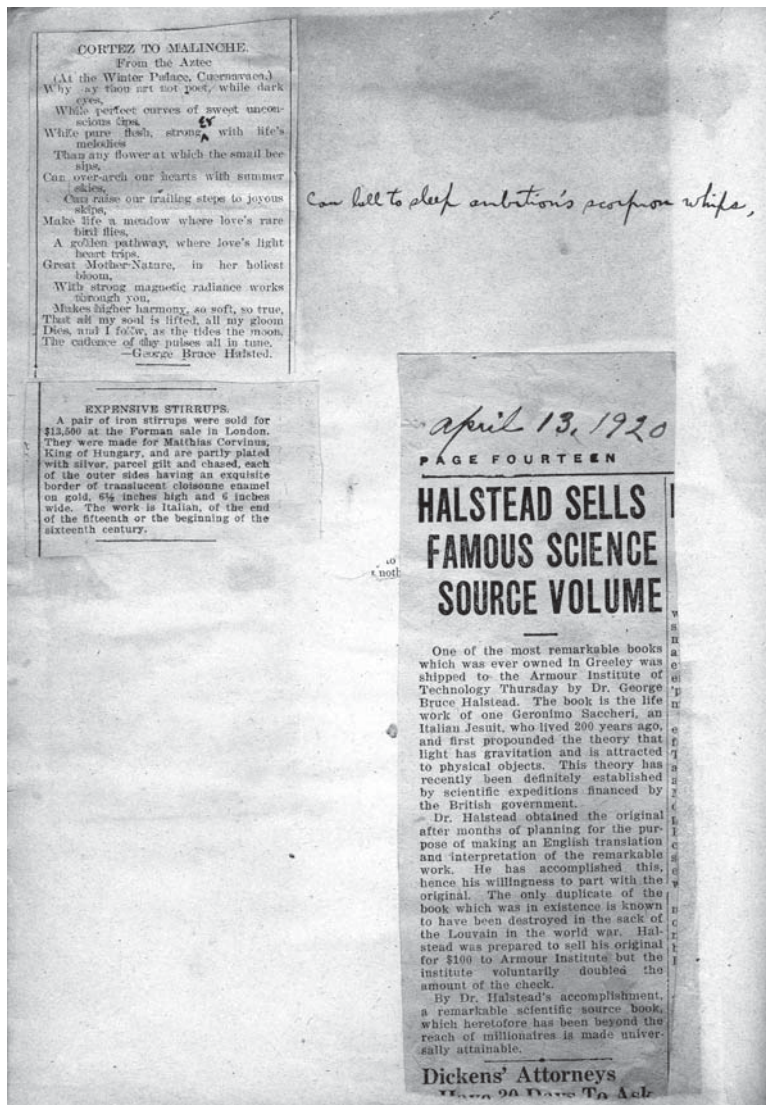
This collection consists of four feet of correspondence, ephemera, printed material, photographs, and publications documenting his life and work. It focuses on his family and genealogy and is particularly strong in correspondence and photographs. Also present are volumes from Halsted's personal library, as well as books by or about Halsted. Many of the items in the collection were donated by Halsted's grandchildren, particularly Bruce C. Halsted, who have done much to enhance the scholarly understanding of their grandfather.



*George Bruce Halsted holding his grandson, Bruce Cushman Halsted, Greeley, Colorado, 1920, From the George Bruce Halsted Papers, Archives of American Mathematics, Center for American History, The University of Texas at Austin.*

In addition to the George Bruce Halsted Papers, researchers should note the extensive correspondence between Halsted and R. L. Moore in the R. L. Moore Papers at the Archives of American Mathematics.

The inventory for the Halsted Papers is available at <http://www.lib.utexas.edu/taro/utcah/00340/cah-00340.html>.



A page [ca. 1920] from George Bruce Halsted's Scrapbook, begun 1871, includes news clippings and documents of interest to Halsted, 1871-1922. From the George Bruce Halsted Papers, Archives of American Mathematics, Center for American History, The University of Texas at Austin.

#### Clipping below the poem:

"EXPENSIVE STIRRUPS. A pair of iron stirrups were sold for \$13,500 at the Forman sale in London. They were made for Matthias Corvinus, King of Hungary, and are partly plated with silver, parcel gilt and chased, each of the outer sides having an exquisite border of translucent cloisonne enamel on gold, 6 1/2 inches high and 6 inches wide. The work is Italian, of the end of the fifteenth or the beginning of the sixteenth century.

#### Clipping at the lower right:

Handwritten date, April 13, 1920  
 HALSTEAD [sp] SELLS FAMOUS SCIENCE SOURCE VOLUME

"One of the most remarkable books which was ever owned in Greeley was shipped to the Armour Institute of Technology Thursday by Dr. George Bruce Halsted. The book is the life work of one Gerolamo Saccheri, an Italian Jesuit, who lived 200 years ago, and first propounded the theory that light has gravitation and is attracted to physical objects. This theory has recently been definitely established by scientific expeditions financed by the British government.

"Dr. Halsted obtained the original after months of planning for the purpose of making an English translation and interpretation of the remarkable work. He

#### Clipping in the upper left corner –

CORTEZ TO MALINCHE.  
 From the Aztec  
 (At the Winter Palace, Cuernavaca.)

Why [s]ay thou art not poet, while dark eyes  
 While perfect curves of sweet unconscious lips  
 While pure flesh, strong[er] with life's melodies  
 Than any flower at which the small bee sips  
 Can over-arch our hearts with summer skies  
 Can raise our trailing steps to joyous kips  
 Make life a meadow where love's rare bird flies  
 A golden pathway, where love's light heart trips  
 Great Mother-Nature, in her holiest bloom,  
 With strong magnetic radiance works through you,  
 Makes higher harmony, so soft, so true  
 That all my soul is lifted, all my gloom  
 Dies, and I follow as the tides the moon.  
 The cadence of day pulses all in tune

—George Bruce Halsted

#### Handwritten line:

"Can lull to sleep ambition's scorpion whips,"

has accomplished this, hence his willingness to part with the original. The only duplicate of the book which was in existence is known to have been destroyed in the sack of the Louvain in the world war. Halsted was prepared to sell his original for \$100 to Armour Institute, but the institute voluntarily doubled the amount of the check.

"By Dr. Halsted's accomplishment, a remarkable scientific source book, which heretofore has been beyond the reach of millionaires is made universally attainable."



## Prizes and Awards at the Atlanta Joint Mathematics Meetings

By Fernando Gouvêa and Joe Gallian

Many prizes and awards were announced at the Joint Prize Session held on Thursday, January 6 at the Atlanta Joint Meetings. With a large audience at hand, the presidents of the MAA, AMS, and AWM announced their prizes and gave the winners the opportunity to respond. In this and the following pages, we present a summary of the session. Citations and responses for the MAA prizes (including the JPBM prize and the Morgan Prize) are available online at <http://www.maa.org/news/>. Information on the AMS prizes is online at <http://www.ams.org/new-in-math/press/>.

### MAA Prizes

#### Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics

**Gerald L. Alexanderson**



Jerry Alexanderson was described as a “master teacher, an inspiration to both students and colleagues,” who has also been “indefatigable” as a writer and editor. The citation noted that he has the reputation of being not only the best teacher in his department, but also one of the most demanding. In his response, Jerry noted that his friendship with Deborah Tepper Haimo made the award still more valuable to him. Jerry was unable to go to the meetings, so Frank Farris accepted the award in his stead. Jerry’s Haimo lecture was not cancelled, however: Frank brought along a DVD so that we could all hear Jerry’s *What Secrets?* talk, a notable moment from which was when Jerry (who teaches at Santa Clara University) explained that he didn’t do “small group activities” because his classes *already were* small groups.

**Deborah Hughes-Hallett**



Deb Hughes Hallett was honored for her “superb skills in the classroom” and for her pioneering work on the curriculum and pedagogy of mathematics courses aimed at wide constituencies, from introductory calculus (in the Harvard-based *Calculus Consortium*) to business mathematics (at the University of Arizona). She has also done extensive work with adult learners. “To Deb, no question is annoying, no student is beyond help.” In her response, she thanked her students for having guided her efforts to understand their thought processes. “I am honored,” she said, “to have watched so many students find their mathematical wings and soar.” Deb *was* in Atlanta, but she missed the Prize Session. Fortunately, she was on hand for the Awards Banquet and was able to give her talk at the Haimo session.

**Aparna Higgins**



Aparna Higgins, “one of the dynamos of the U.S. mathematical community,” was honored for her genuine connection to, and understanding of, students. “She teaches with passion and high expectations.” It is “her love of all things mathematical and the desire to encourage others,” says the citation, that “fuels her charisma, energy, and enthusiasm.” Also noted was her work with the MAA’s *Project NExT*. In her oral response, Aparna said that “The MAA is a fabulous professional organization... and I would say this even if I were not getting this award.” She thanked many people, including in particular several associated with NExT. She also thanked her husband, Bill Higgins, mentioning one important contribution in particular: “How do you balance your professional and your personal life? I don’t know; Bill does that for us.”

Section Certificates of Meritorious Service

**Charles Cable**



The Allegheny Section honored Charles Cable for 30 years of service to the Association. They particularly noted his support for the Student Chapters program and for his work towards making the mathematical community more hospitable to women. In his response, he said “When my initial efforts to form Student Chapters were unsuccessful, I was quite disappointed and I gave up. However, several months later Paul Halmos urged me to try once again saying that sometimes it takes a while to get used to new ideas. I followed his suggestion and found that he was correct. This persistence eventually paid off.”

**Ernie Solheid**



The Southern California-Nevada Section recognized Ernie Solheid for his seven years of work as Meeting Coordinator for the section. Ernie was appointed to the post when Barbara Beechler, who had been Secretary-Treasurer, Meeting Coordinator and Newsletter Editor all at once for many years, stepped down for health reasons. Those were large shoes to fill, but Ernie’s work “has been impeccable.” Barbara herself thought so, telling Mario Martelli that his suggesting Ernie for the job was one of the best services ever done for the section.

**Roy Deal**



The Oklahoma-Arkansas Section honored Roy Deal for his long-term service to the section, which stretches all the way back to 1954 when he first chaired it. According to the citation, Deal has probably given more lectures at section meetings than any other individual, and continues to participate intensely in section activities even after his retirement. In his response, Roy described receiving this award as “a highlight in my long, happy association with the MAA, since Nathan Altshiller Court drove to my house, ten miles out in the country, in December 1939 to talk my parents into giving me my first membership in the MAA for Christmas that year.”



**Barbara Osofsky**

The New Jersey Section chose Barbara Osofsky to receive their Certificate. An MAA member since 1958 (and a life member since 1986), Barbara has been active in many different aspects of the Association, from being Governor of her section to being First Vice President. Along the way she served on (and sometimes chaired) editorial boards, award committees, and program committees. In her response, she said that as she began to attend meetings and participate in committees, she “became more and more in awe of the many MAA visions of what the undergraduate mathematical experience might be, the insights of our members on how to get there, and the incredibly large amounts of time and effort spent by my MAA colleagues to further the goals of the Association. . . . I am very grateful to have had the chance to work with such dedicated people in our common cause.”

**Jon Scott**

The Maryland-DC-Virginia Section honored Jon Scott for his service both to the section and to the Association as a whole. He held several administrative posts within the section, from serving as Governor to managing book sales at section meetings. At the national level, the citation mentioned Jon’s work on the PREP program, his involvement with the just-released *Leading the Mathematical Sciences Department: A Resource for Chairs*, and his work on MAA-NSF-DUE poster sessions at national meetings.

**Beckenbach Book Prize****James S. Tanton**

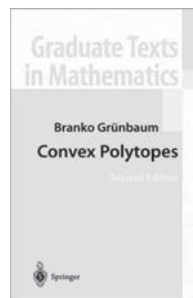
The Beckenbach Book Prize, which honors the author of a distinguished and innovative book published by the MAA, was awarded to James Tanton for his book *Solve This: Math Activities for Students and Clubs*, described as “fresh and different” and as a book that “causes, coerces, and induces the reader to think about mathematics in non-conventional ways.” Tanton was unable to be present at the meeting, but described himself as “flattered and honored.” He expressed the hope that his book would “foster a sense of personal mathematical enquiry and, moreover, encourage adaptability of the mind.” He also mentioned that a sequel, *Solve This Too*, is forthcoming.

**Joint Policy Board for Mathematics Communications Award****Barry Cipra**

The JPBM, whose members are MAA, AMS, SIAM, and ASA, created this award to honor those who have made significant contributions to public understanding of mathematics. Barry Cipra, this year’s winner, is a freelance journalist who writes about mathematics in a very wide range of venues. “Barry Cipra,” says the citation, “has given his readers a greater understanding of the ideas of mathematics, but most importantly he has changed their perception of the nature of mathematics.” Accepting the award, he also demonstrated the importance of good editing by displaying a quote from (he said) a well-known mathematician that could be read as either high praise or a serious put-down. He particularly thanked those editors who had helped improve the quality of his work over the years.

**AMS Prizes****Leroy P. Steele Prize for Mathematical Exposition****Branko Grünbaum**

The Leroy Steele Prize for Exposition went to Branko Grünbaum for his book *Convex Polytopes* (whose second edition, prepared by Volker Kaibel, Victor Klee, and Günter Ziegler, was on sale at the meeting). The book was described as “a standard reference and an inspiration for three and a half decades of research in the theory of polytopes.” Unfortunately, Grünbaum was unable to attend.

**Leroy P. Steele Prize for Lifetime Achievement****Israel M. Gelfand**

Gelfand, who was unable to attend, was honored for a lifetime of work in a huge number of mathematical topics and for his influence on many other mathematicians and students of mathematics. In his response, Gelfand said that “Mathematics for me is a universal and adequate language of the sciences and it is an example of how people of different cultures and backgrounds can communicate and work together.”

**Leroy P. Steele Prize for Seminal Contribution to Research****Robert P. Langlands**

The “Langlands Program” has had a fundamental role in number theory ever since it was first formulated, in “Problems in the Theory of Automorphic Forms,” a paper by Robert Langlands published in 1970. The Steele Prize recognizes the importance of that paper and of the work that followed, which established partial results that confirmed Langland’s amazing vision of where the theory might go. In his written response, Langlands said that “I did not, as I now believe, appreciate until quite recently the real import of these suggestions and the depth one would have to attain to solve the problems posed. Unfortunately, it may now, at least for me, be too late for boldness.” On receiving the award, he repeated this, but then added, “On the other hand, sometimes I feel it’s *not* too late.”



**Ruth Little Sattler Prize in Mathematics**

**Svetlana Jitomirskaya**



The Sattler Prize is awarded every two years to recognize an outstanding contribution to mathematics research by a woman. Jitomirskaya received the prize for “her pioneering work on non-perturbative quasiperiodic localization.” Accepting the award, she noted that it had been awarded in the past to some women whose mathematical work is now very well known and respected and who had, in fact, served as inspiring role models for her. She hoped that the award would inspire her to continue to follow their example.

**Bôcher Memorial Prize**

**Frank Merle**

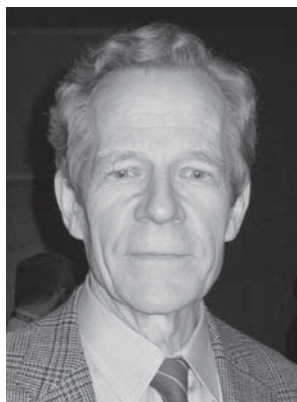


The Bôcher Prize for notable work in Analysis was awarded to Frank Merle of the Université de Cergy-Pontoise for his work on nonlinear dispersive equations. After thanking the Society for the award, Merle also thanked those who got him started on the subject and who influenced him over the years, citing in particular Jean Bourgain, Carlos Kenig, and George Papanicolaou.

**Albert Leon Whiteman Memorial Prize**

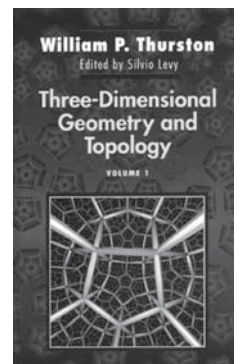
**Harold M. Edwards**

The Whiteman Prize is awarded for notable exposition in the History of Mathematics. Harold M. Edwards received the award as a “tribute to his many publications over several decades that have fostered a greater understanding and appreciation of the history of mathematics, especially of the theory of algebraic numbers. Edwards is particularly well known for his emphasis on “reading the masters” and for his interest in Kronecker’s vision of a constructive approach to mathematics. In his response, Edwards singled out three people for thanks: Raoul Bott, his thesis advisor; Morris Kline, who hired him at NYU and encouraged him in his historical work; and Uta Merzbach, “whose sharing with me of her expertise and experience in historical research was my only education in such work.”



**Book Prize**

**William P. Thurston**



The AMS Book Prize was established in 2003 to recognize a single, relatively recent, outstanding research book. This year’s winner was William Thurston for his book *Three-Dimensional Geometry and Topology* (edited by Sylvio Levy). Based on a set of notes written 20 years ago and circulated in samizdat form for many years, the book is a kind of manifesto for Thurston’s program to understand and classify all three-manifolds that includes the famous Geometrization Conjecture.

**Levi L. Conant Prize**

**Allen Knutson and Terence Tao**

The Levi Conant Prize for the best expository paper in either the *Notices* or the *Bulletin of the AMS* went to Allen Knutson and Terence Tao, for their paper on “Honeycombs and Sums of Hermitian Matrices,” which describes a method for attacking a problem originally due to Hermann Weyl: how do the eigenvalues of the sum of two Hermitian matrices relate to the eigenvalues of the summands? Neither Knutson nor Tao were at the meeting, but both expressed their gratitude and surprise at receiving the award.

*Photographs courtesy of Fernando Gouvêa*



## AWM Prizes

### Louise Hay Award for Contributions to Mathematics Education

**Susanna S. Epp**

The Hay Award was given to Susanna Epp “in recognition of her exemplary and broad range of contributions to mathematics education.” Among others, the citation notes her interest in teaching analytical thinking and proof, her textbooks, her work on the *CUPM Curriculum Guide*, and her work with Project NExT. Accepting the award, Epp said she was gratified by the increasing interest in mathematics education with the community, and noted that about one third of the abstracts of talks at the Joint Meetings dealt with mathematics education.



### Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman

**Melody Chan**

The Association for Women in Mathematics presented the fifteenth annual Alice T. Schafer Prize for excellence in mathematics to Yale senior Melody Chan at the Joint Meeting in Atlanta. The prize selection committee cited her course work at Yale and the Budapest mathematics program and her four professional level research papers written at the REU programs at East Tennessee State University and the University of Minnesota Duluth. Various letter writers called her research “ingenious,” “remarkable,” and “beautiful.” At Yale, Melody received the Hart Lyman Prize and is Vice President of the Phi Beta Kappa chapter.



Melody is an accomplished violinist who has performance on national public television live from the Lincoln Center in New York with Itzhak Perlman. She plans to study mathematics at Cambridge University in 2005-2006 then return to the United States to pursue a Ph. D. in mathematics.

The AWM selection committee named Margaret Doig of Notre Dame and Elena Fuchs of UC Berkeley as runner ups for the prize. Both were cited for their course work and research.

## Blumenthal Trust for the Advancement of Mathematics Prize

Leonard M. and Eleanor B.  
Blumenthal Award for the  
Advancement of Research in  
Pure Mathematics

**Manjul Bhargava**



The Leonard M. and Eleanor B. Blumenthal Trust for the Advancement of Mathematics offers this prize to “the individual who is deemed to have made the most substantial contribution in research in the field of pure mathematics, and who is deemed to have the potential for future production of distinguished research in such field.” The committee has decided to grant the award for the most substantial Ph.D. thesis produced during the last four years. The 2005 award went to Manjul Bhargava of Princeton University for his 2001 dissertation, entitled “Higher Composition Laws.” Bhargava is well known to FOCUS readers, having won the Morgan Prize and various other honors, including his listing as one of *Popular Science* magazine’s “Brilliant 10” in 2002.

## Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate

Reid Barton

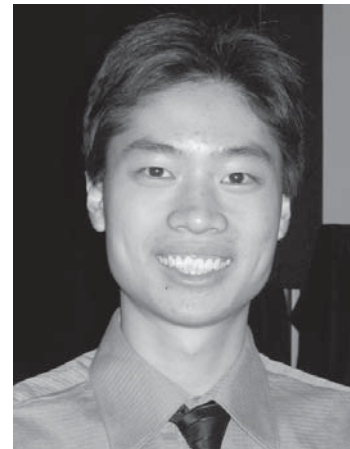
Po-Shen Loh, Honorable Mention

The 2004 Morgan Prize for outstanding research by an undergraduate was awarded to MIT senior Reid Barton at the Joint Meeting in Atlanta in January. The award was given for his paper “Packing densities of patterns,” *Electronic Journal of Combinatorics* 11(1) R80, 2004 (16 pages), which was done at the REU at the University of Minnesota Duluth.

The citation says that “Packing densities were introduced by Herb Wilf in 1992-93. Some of the early questions were settled by Alkes Price, Fred Galvin and Walter Stromquist. Recent contributions were made by M.H. Albert, M.D. Atkinson, C.C. Handley, D.A. Holton, W. Stromquist, A. Burstein, P. Haesto, and T. Mansour. The main goal of Barton’s paper is to extend the theory of packing densities of permutations to that of patterns, i.e. words allowing repetition of letters. After resolving the basic conceptual issues elegantly, Barton delves into the study of packing densities for specific families of layered patterns. He proves several important results, some generalizing earlier results by the above-mentioned authors, some opening up new vistas. Barton also outlines a possible program to tackle open questions, and formulates new conjectures. This is all in all a remarkable debut paper in the area of pattern research in combinatorics, an



Reid Barton gives his Morgan Prize talk. Photograph by Joe Gallian.



Po-Shen Loh

area of considerable current interest. Commentators consider Barton’s paper the best paper so far on packing densities, and praise it for its clarity, new techniques, and new results.”

Reid is well known in the mathematics community for his performance in mathematics competitions. He won four gold medals in the International Mathematics Olympiad including a perfect score in 2001 and should he be a winner in the 2004 Putnam Competition he will be only the sixth person to win that competition four times.

Beyond mathematics, Reid is a world class programmer and an accomplished pianist. For recreation he plays bridge, soccer, hockey, and ultimate frisbee. Reid plans to go to graduate school in mathematics in the fall.

Po-Shen Loh of Caltech was awarded honorable mention for his senior thesis on “Random graphs and the second eigenvalue problem.” He will start to pursue a Ph. D. in mathematics at Princeton in 2005 after finishing a year at Cambridge.

### Joint Meetings Quote

*“It always amazes me how much mathematics is hidden inside Linear Algebra.”*

— Ravi Vakil, with reference to the Grassmanian, in his MAA Invited Lecture

## Atlanta Joint Mathematics Meetings in Pictures



Ron Graham and David Eisenbud playing with scissors.



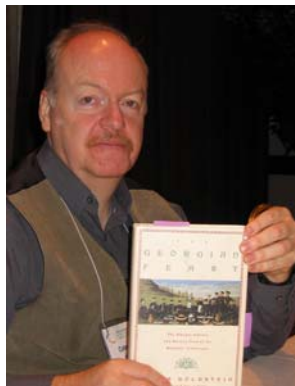
Getting ready for the grand opening of the exhibit area, with a large crowd of people eager to get in.



Allen Schwenk, editor-elect of Mathematics Magazine.



Ron Graham (MAA President) and David Eisenbud (AMS President) cut the ribbon to open the book exhibits.



Colm Mulcahy studies Georgian food (the other Georgia).



Rob Bradley and Annie Selden at the meeting of the FOCUS editorial board.



Tom Banchoff (former MAA President) and Jim Tattersall (MAA Associate Secretary) at the Board of Governors meeting.



Nicer curves, fewer plants: the inside of the Marriott.



Joe Gallian and Richard Guy



The Board of Governors meeting.



MAA's finance team: John Kenelly, Jim Daniel, and Dan Maki.



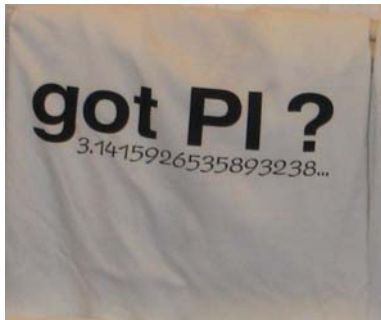
Brian Conrey of the American Institute of Mathematics talks with MAA President Carl Cowen.



A Burger sandwich: David Roberts, Ed Burger, and David Grant.



The editor pontificates, at the meeting of the FOCUS Editorial Board.



T-Shirt on sale at the meeting. No, they don't got it.



Last year, a snowstorm kept them away, but this time Powell's was there.



Cheryl Adams of the MAA displays what she found at the Navajo Jewelry booth.



The start of a family tradition? Stacy Langton and his son Asher.



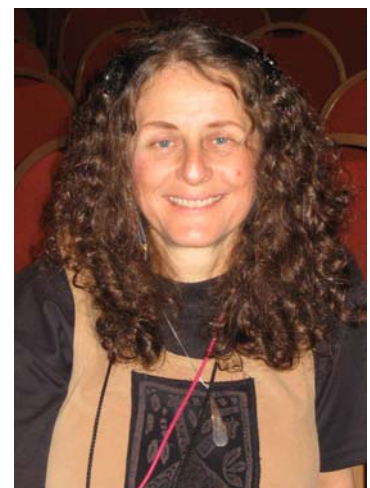
Rachelle Jensen and Steve Dunbar at the American Mathematics Competitions booth.



David Bressoud



The escalator down to the place of hope and pain.



Susan Wildstrom, newly-elected Governor-at-Large representing High School Teachers.



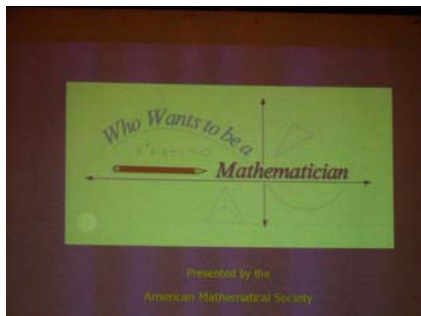
The Association of Christians in the Mathematical Sciences had its annual dinner. Tom Banchoff was the speaker.



Who knew that Directors of Publications had to help carry chairs? (Don Albers getting chairs for the meeting of the Council on Publications.)



One of the oldest traditions of the Joint Meetings: lining up for the email lab. Jones and Bartlett sponsored the event this year.



Opeing screen of the "Who Wants to be a Mathematician?" event. Photo by Colm Mulcahy.



A selection of mathematical art was displayed in the exhibits area.



Bernd Sturmfels talks about Algebraic Statistics.



Carl Cowen holds the gavel. Is he wondering what to do next?



Martha Siegel and Aparna Higgins.



Tom Banchoff plays with an unfolded hypercube during his talk at the ACMS dinner.



The two most exotic booths: "Have More Beautiful Nails" was selling nail-care kits, and John Dunson was selling copies of his book, Keeper of Secrets: Day One. Rumor has it that John sold over 150 copies...



Ron Graham helps Deb Hughes Hallett prepare to give her Haimo talk.



Who knew that Math Horizons editors also had to carry chairs? (Jennifer Quinn helping out.)



The Exhibits area just before final closing time on Saturday: get your last-minute bargains!



Jeanne LaDuke of DePaul University gives a talk on the careers of women mathematicians who received their Ph.D.s before 1940.



Who Wants to be a Mathematician?



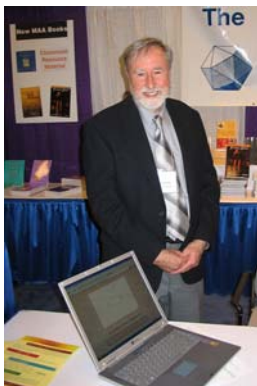
At the awards ceremony: Frank Farris pretending to be Jerry Alexanderson.



Mario Martelli among all the students whose posters received a prize at the Undergraduate Students Poster Session (see page 23). Photograph provided by Mario Martelli.



The Navajo Jewelry booth was right in front of the Texas Instruments booth.



Keith Kendig promotes his forthcoming book on Conics, at the MAA booth.



Ed Burger tries to convince Fernando Gouvêa that he wants his autograph.



All gone. The Exhibits area a couple of hours after closing time on Saturday.

## The Undergraduate Student Poster Session

By Mario Martelli

The Undergraduate Student Poster Session was, for students, judges and visitors, one of the high points of the Joint Meeting of the AMS, MAA, and AWM in Atlanta. The Committee on Undergraduate Student Activities and Chapters (CUSAC) sponsored the event; Dr. Mario Martelli of Claremont McKenna College organized it; the money for the prizes was generously provided by the Legacy of R. L. Moore Foundation, AMS, MAA, SIAM, CUR, and AWM; Dr. Suzanne Lenhart from the University of Tennessee, Knoxville, brought the \$3700 dollars donated by the six organizations. Over 120 teams of students from across the USA and Canada displayed the results of their research, and 150 professional mathematicians evaluated them.

The complete list of all posters recognized with a prize can be found in the student section of the MAA website. The Southern California-Nevada Section of the MAA is well represented in this group with six posters done by undergraduates of four different institutions: California State University San Bernardino, Claremont McKenna College, Harvey Mudd College (3 posters), and Pomona College. Other REU programs received particular recognition. Among them I would like to mention the programs at Trinity University, at Central Michigan University, and at the Rose-Hulman Institute of Technology. High in the judges' evaluation was one poster done at the University of Tennessee, Knoxville, under the guidance of Dr. Suzanne Lenhart, and two posters done at Williams College with Dr. F. Morgan and Dr. A. Pacelli. I was very pleased to notice that two students from Montclair State University were among the presenters and each one received a prize. The advisors of the two posters were Drs. D. Thomas and L. Billings.

However, the best recognition for every undergraduate was to be selected by a professional advisor, and to be accepted by the organizer. To receive one of the prizes is a recognition coveted by many,

and some presenters may have been disappointed by the outcome of the evaluation. These students, and everybody else, should keep in mind that all posters receiving a prize were concentrated in an interval of only seven points and in four cases the secondary evaluation had to be used as a tiebreaker. Let me also share with you that the discrepancies I noticed this year among the

judges' evaluations were definitely more pronounced than the ones I had observed in the past. Close to one third of the posters received either a high evaluation from two judges and a low evaluation from the third, or the other way around. The most dramatic example was a poster that received 27 points (out of 30) from one judge and only 14 from another. Therefore, I want to stress again, and all advisors should do the same, that the most important prize is to have been part of this incredible event, in which so many talented undergraduates had the opportunity to display their work and to talk about their results with professional mathematicians.

I was particularly pleased by the presence of five or more posters from the following REU locations: Arizona State University, California State University San Bernardino, Central Michigan University, Trinity University, and Texas A&M University. Topics in Applied Mathematics, Graph Theory, Knot Theory, Group Theory, Linear Algebra, and Combinatorics were among the subjects more frequently selected by the teams. Some of the results presented have already been published in professional journals or are in the process of being submitted for publication.



Allison Westfahl and Christopher Jones pose with one of the judges next to their poster, entitled "A Non-Smooth Band of a Non-Convex Region." Photograph courtesy of Mario Martelli.

I want to express my sincere appreciation to all judges who donated their time to this worthy cause. Some of them have already done it several times. I will not mention names since I'm afraid I'll miss some. You know how much I value your help. I am so happy when your name appears on the screen of my computer with a "yes" answer to my request for help. I want to express my appreciation to Jim Tattersall, Associate Secretary of the MAA, to Robin Hagan Aguiar and Donna Salter from the AMS, to Michael Pearson and Katarina Briedova from the MAA, to all members of CUSAC, to my Administrative Assistant Patty Castro, to my daughter Lisa, my wife Ann, and my student Allison Westfahl for their invaluable help. Dr. Diana Thomas from Montclair State University coordinated the accommodation of the students. Thank you, Diana. The great success of the Undergraduate Student Poster Session would not have been possible without the collaboration of so many people. Finally, I want to extend a special thank to all advisors who worked hard with the students. They are making a difference in the life of these young kids, and their time and energy could not have been put to a better use. The future of mathematics is in great hands. I hope to see all of you in San Antonio in January 2006!

## Joint Meetings Short Takes

By Fernando Q. Gouvêa, with the help of many others

### Speakers at MathFest

The MAA Board of Governors approved the choice of the main speakers at this year's MathFest, to be held in Albuquerque, NM, on August 4-6. The Hedrick Lecturer will be Jeffrey C. Lagarias of the University of Michigan. The Litzel Lecturer will be William Yslas Velez of the University of Arizona. You can find more about them at their home pages: <http://www.math.lsa.umich.edu/~lagarias/> and <http://math.arizona.edu/~velez/>.

### Image Processing with PDEs

One of the many remarkable talks at the JMM was Andrea Bertozzi's explanation of how partial differential equations related to those used in fluid dynamics can be used for image processing. For example, she demonstrated methods for "inpainting" (filling in pixels that were corrupted) and for handling high-contrast images. She concluded by saying that this is an active area of research at various institutions including her own, the UCLA Computational and Applied Mathematics Program.

### Who Wants to Be a Mathematician?

The popular *Who Wants to Be a Mathematician?* event, sponsored by the AMS, was held once again this year. The event is hosted by Mike Breen of the AMS, with Bill Butterworth of DePaul University and Annette Emerson of the AMS serving as judges. Eight high-school students compete for prizes and a chance to win \$4000 by answering multiple choice questions on pre-calculus mathematics.

This year's event was well attended, and one student even had a cheering section to spur him on. We paid a quick visit to the session, and noted that the person passing out the programs would hum the *Jeopardy* tune when the questions were asked! A more extensive report on this event will appear in a future issue of FOCUS.

### Algebraic Statistics

One of the more remarkable Invited Lectures was Bernd Sturmfels' talk on *Algebraic Statistics*, in which he explained a way of applying techniques from commutative algebra to certain kinds of statistical modeling. It was a lively and interesting talk. Here is Sturmfels' "Executive Summary" of the talk:

**For Statisticians:**  
**Algebra is useful.**  
**For Algebraists:**  
**Statistics is cool.**

It should be fun to watch where these ideas lead!

### It's All in the Numb3rs

On Sunday, January 23, CBS premiered a new drama series called *Numb3rs*, in which an FBI agent recruits his brother, who is a mathematical genius, to help him solve a wide range of crimes. Set in Los Angeles, the show features Rob Morrow as the FBI agent and David Krumholtz as his mathematician brother. During the JMM, one episode of the program aired repeatedly in the closed-circuit hotel channel in both the Hyatt and the Marriott. The episode involved using a statistical model to determine the likely base of a serial rapist based on the locations on the crimes.

Should the series be successful, it could perhaps attract students to mathematics, much as the *CSI* franchise has increased enrollments in courses on Forensic Science. Alas, the reviews so far are mixed. FOCUS will consider running a review of the series after a few episodes have aired.

### One New Committee, One Committee Gone

The Board approved the creation of a new MAA-NCTM Joint Committee on Mutual Concerns. Committee members are yet to be named. At the same time,

the Board agreed, at the committee's request, to dissolve the Joint AMS-MAA Committee on Research in Undergraduate Mathematics Education, whose functions will be absorbed by the SIGMAA on Research in Undergraduate Mathematics Education. Both NCTM and AMS have taken the same actions.

### So How Do I Get on an MAA Committee?

The MAA has over one hundred committees, and volunteers are always welcome. Members who might be interested in being appointed to a committee should contact MAA Secretary Martha Siegel at [MSiegel@towson.edu](mailto:MSiegel@towson.edu).

### Math Awareness Month Theme Announced

This year's Math Awareness Month will have as its theme *Mathematics and the Cosmos*. The MAM poster was available at the meeting and will be distributed as usual. We will have more detailed information and coverage in our March issue. The MAM web site has changed to <http://www.mathaware.org>.

### Simple Things Also Help

It seems like a minor issue, but parking your luggage after you check out on Saturday morning so that you can attend a few talks before heading home can be a big headache. So many attendees welcomed the availability of a Luggage Storage area for JMM participants in the Hyatt. Let's do that again!

### Child Care

The Atlanta meeting was the first joint MAA-AMS meeting to offer child care. We'd like to hear from MAA members who used the service. Did it work well? Was the price reasonable? Should the service be offered at other meetings?

### Current Events in Mathematics

The AMS once again held its special session on *Current Events in Mathematics*, consisting of six hour-long talks on important recent developments and advances. Bryna Kra gave a talk on the Green-Tao theorem on primes in arithmetic progression. Robert McEliece surveyed recent progress in communications theory that make it possible to push



distributed at the session (and was in high demand).

### This Just In...

Regardless of what you may have *thought* you heard, MAA Secretary did not say that Board Parliamentarian Wayne Roberts had to handle many naughty problems. She said the problems were *knotty*.

### Disappointment at the Airport

The bookstore at the Atlanta airport prominently featured a book by Larry McMurtry called *Loop Group*. Alas, it was *not* about “the simplest kind of infinite-dimensional Lie group.” (See *Loop Groups*, by Andrew Pressley and Graeme Segal, published by Oxford University Press.)

### G. Baley Price at 100

Longtime MAA member G. Baley Price, who received the MAA Distinguished Service Award in 1970, will be 100 on March 14th. A celebration will be held at the University of Kansas on March 12th. FOCUS plans to include a report and photos in the May issue. For more on Baley and Cora Price, visit <http://spencer.lib.ku.edu/exhibits/price/>.

### Board Discusses Dues Policy

The Board of Governors approved a routine increase of approximately 3% in MAA dues for 2006, but the governors also began discussing the dues structure as a whole. The current form of the dues matrix has been used for many years and some distortions have crept in. Some of the questions raised were: Is the current rate for members subscribing to one journal fair in comparison to the rate for those who get more than one? Should we create special rates for Adjuncts and other temporary faculty? Should the special rate for retired members be meanstested? Comments on this issue can be sent to Section Governors and other members of the Board, which will resume the discussion at its next meeting.

### Presidential Cross-Membership

We couldn't fail to note that the new President of the MAA, Carl Cowen, is a member of AMS. Alas, the new President of the AMS is not a member of MAA! Both immediate Past Presidents are members of both organizations.

### Strategic Planning and Evaluation

The Board of Governors approved a proposal to engage in a continual planning process, reviewing up to three areas of the Association's activities per year over the next five years. The proposal, which came from the Planning Design Committee, was approved by the Executive Committee and then by the Board after a few amendments. “It reads:

The Executive Committee proposes that the MAA being a continual planning process by choosing at most three areas each year for strategic planning. The President will appoint a working group in each area by March 1. Each group will include representation from the Executive Committee, and will work for 12-18 months to prepare a report illuminating issues, opportunities, and obstacles in each area, as well as recommendations for future action. Initial appointments to the working groups will be for terms of two years. The Executive Committee will give each working group its charge, in consultation with the Executive Director and relevant Associate Directors.

“We will begin by appointing working groups to plan for the following areas: Professional Development, Revenue, and the AMC for 2005/06. Each year in the future the Executive Committee will recommend the new areas of concentration for the next year at their November meeting and submit it for approval at the Board of Governors meeting in January. The President and the Executive Committee will appoint and charge new working groups.”

### Future Meetings

National meetings of the MAA are approved far in advance. Here is the full list of future meetings that have been approved by the Board of Governors. Joint Meetings (in January) are planned further ahead than MathFests (in August).

August 4-6, 2005, in Albuquerque, NM  
January 12-15, 2006, in San Antonio, TX  
August 10-12, 2006, in Knoxville, TN  
January 4-7, 2007, in New Orleans, LA  
August 3-5, 2007, in San Jose, CA  
January 6-9, 2008, in San Diego, CA  
January 7-10, 2009, in Washington, DC  
January 6-9, 2010, in San Francisco, CA  
January 5-8, 2011, in New Orleans, LA

Mark your calendars!

### And Even Further into the Future...

The MAA will celebrate its Centennial in 2015, and planning for the meeting to celebrate has already begun! Deanna Haunsperger and Steve Kennedy are chairing the planning committee for the event. They promise more news about their activities soon.

### High School Connections

The Board elected Susan Schwartz Wildstrom as Governor-at-Large for High School Teachers. She will serve a three-year term replacing Daniel Teague, who served in that role for almost two years. It was largely Teague's persistence and hard work that resulted in the newly formed **SIGMAA for Teachers of Advanced High School Mathematics**. We hope to have more information on the new SIGMAA and its activities in a future issue.

### Changes at the Board of Governors

In addition to the departure of Dan Teague, there have been (or will be) several other changes in the Board of Governors. “Tino” Mendez, one of two Gov

ernors-at-Large Representing Minorities and a long-time member of the MAA, will be leaving the Board. The Board elected Efraim Armendariz of the University of Texas to replace Tino as Governor-at-Large Representing Minorities. But the most notable of those leaving is Gerald L. Alexanderson, Former President, who has served *more than 20 years* on the MAA Board, as Editor of *Mathematics Magazine*, Secretary, President, and finally as Former President.

Although they serve on the Board until June 30, 2005, several section governors have sat through their last Board meeting. They will, of course, still be active members of the Board of Governors un-

til the end of June. They are: John Fuelberth, Nebraska-North Dakota Section; Raymond Greenwell, Metro New York Section; Rodger Hammons, Kentucky Section; Leonard Klosinski, Northern California Section; Lisa Mantini, Oklahoma-Arkansas Section; Roger B. Nelson, Indiana Section; Donald L. Platte, Allegheny Section; Richard L. Poss, Wisconsin Section; Hortensia Soto-Johnson, Rocky Mountain Section.

**Thanks to the Meetings Organizers!**

As you can imagine, national meetings do not just happen. They take careful and imaginative planning. The Atlanta meeting depended on the fine work of the

members of the Program and Local Arrangements Committees and of MAA Associate Secretary Jim Tattersall. The Association's thanks go to the members of the MAA-AMS Program Committee for the Atlanta Meetings: Joseph A. Gallian (MAA), Chair, Richard M. Hain (AMS), Aparna W. Higgins (MAA), Richard C. Randell (AMS). Thanks also to the MAA Program Committee for the Atlanta Meetings: Suzanne Lenhart (Chair), Joshua Leslie, Tristan Needham, Grace Orzech, Allan Rossman, Jean Taylor, Ravi Vakil, Sylvia Wiegand, Lee Zia, James Tattersall (*ex officio*). Finally, special thanks to the Local Arrangements Committee, chaired by Sharon Ross.

**Ten Years of the Carleton Summer Mathematics Program for Women**

Celebrating its tenth program this year, the Carleton Summer Mathematics Program for Women gathered together former participants for dinner in Atlanta. Pictured are former SMP students (in alphabetical order): Jackie Kohles Anderson (grad student, Wisconsin), Abra Brisbin (5th year intern, Carleton), Teena Conklin Carroll (grad student, Georgia Tech), Alissa Crans (Assistant Professor, Loyola Marymount), Angela Desai (grad student, Maryland), Anna Dragonova (grad student, UCLA), Rachel Fonstad (undergrad, Winona State), Andrea Frazier (grad student, Iowa), Jen Froelich (grad student, Iowa), Leslie Goemaat (undergrad, Carleton), Laura Gunn (Assistant Professor, Georgia Southern), Christina Harlow (undergrad, UNC Asheville), Emilie Hogan (undergrad, Wisconsin), Aja Johnson (undergrad, Elon), Jennifer Robin Marshall (undergrad, UNC Asheville), Anna Beckhorn Mummert (grad student, Penn State), Lena Nguyen (undergrad, Cal Tech), Layla Oesper (undergrad, Pomona), Carolyn Otto (undergrad, Wisconsin Eau Claire), Laurel Paget-Seekins (landscaper), Pam Richardson (grad student, Virginia), Liz Stanhope (Assistant Professor, Willamette), Calandra Tate (grad student, Maryland), Sarah Tekansik (undergrad, Mesa State), Annalies Vuong (undergrad, UC Santa Barbara); and SMP faculty and directors: Laura Chihara (Carleton), Katherine Crowley (St. Olaf), Erica Flapan (Pomona), Tina Garrett (Carleton), Deanna Haunsperger (Carleton), and Steve Kennedy (Carleton).



*Photograph provided by Alissa Crans.*

Since students typically attend SMP just after their first or second year of college, women from its first couple of years who decided to go on to graduate school in mathematics are just beginning to finish their PhDs. Here are the full stats: Of the 124 SMP graduates who have finished their undergraduate degrees, 5 have PhDs, 12 have terminal master's degrees, 58 are currently in graduate school working toward PhDs, and 5 of those expect to finish in 2005. Of the 61 not planning to earn their PhDs, 30 have math-related careers, 12 of whom are high school math teachers; others have degrees in philosophy, law, business, and education. For more on the Summer Mathematics Program for Women see the February 2001 issue of FOCUS.

## Call for Papers Contributed Paper Sessions at MathFest 2005

The Mathematical Association of America will hold its annual MathFest, Thursday, August 4, through Saturday, August 6, 2005 in Albuquerque, New Mexico.

The complete meetings program will appear in the April 2005 issue of FOCUS. This announcement is designed to alert participants about the contributed paper sessions and their deadlines. Please note that the days scheduled for these sessions remains tentative.

The organizers listed below, indicated with an (\*), solicit contributed papers pertinent to their sessions. Sessions generally limit presentations to ten or fifteen minutes. Each session room contains an overhead projector and screen. Persons needing additional equipment should contact the organizer of their session as soon as possible, but no later than June 7, 2005.

### Submission Procedures for Contributed Paper Proposals

To submit an abstract for MathFest 2005, go to <http://abstracts.maa.org>, the site will be available March 1. The instructions should be straightforward. You will have the option to save a draft of your abstract and return later to edit, complete, and submit it, or submit it immediately. Once the abstract has been submitted, you will not be able to edit it later, but you will be able to log into the site at any time to preview your submitted abstract. The MAA will publish abstracts for the talks in the contributed paper sessions.

A proposal should not be sent to more than one organizer. If your paper cannot be accommodated in the session it was submitted, unless you indicate otherwise, it will be automatically considered for the general contributed paper session. In scheduling talks in the general contributed paper session, preference will be given to authors who have not had a paper accepted in another ses-

sion. Abstracts must reach the MAA by Tuesday, June 7, 2005. Early submissions are encouraged.

### Contributed Paper Sessions

#### Uses of the World-Wide Web that Enrich and Promote Learning Thursday and Friday Afternoons

This session seeks to highlight uses of the Web and its tools that engage students in the learning process. Tools such as course management systems, digital resources, tutorial systems, and hybrids that combine these functions on the Web can make a difference in student understanding and performance. Talks should demonstrate how these technologies are being integrated into the learning process. The audience will also be interested in some assessment of effectiveness. The session is sponsored by WEB SIGMAA and the MAA Committee on Technology in Mathematics Education (CTiME).

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Roger Nelson, Ball State University

#### Innovative Mathematics Majors in Small/Medium Departments Thursday Afternoon

This session seeks to highlight innovative undergraduate programs in mathematics offered by small-to medium-sized mathematics departments (i.e., 15 or fewer full-time positions in mathematics). The session will provide a forum where ideas concerning the entirety of the mathematics major(s) curriculum can be presented and explored. This is a timely topic in view of the recent release of the work done on the mathematics

curriculum by the MAA's Committee on the Undergraduate Program in Mathematics (CUPM) and its subcommittee on Curriculum Renewal Across the First Two Years (CRAFTY). All talks should describe the structure of the major(s) as well as address the following issues:

- The desired outcomes of the program
- The goals set for the major(s)
- Factors that make the program unique and effective

Presenters will be asked to provide an electronic summary of both their requirements for the major and the reasoning behind it. This summary will be made available after MathFest over the web – possibly via the MAA website.

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Crista Coles, Elon University  
Sylvia Forman, St. Joseph's University  
David Mazur, Western New England College

#### Current Issues in Mathematics Education Courses Thursday Afternoon

This session invites papers dealing with issues in mathematics education courses for both pre-service and in-service teachers at the elementary, middle, and high-school levels. Topics might include: online courses or technology-based activities; new courses; courses for master of arts in teaching programs; assessment; interactions between local universities and school districts; acquiring grants to support mathematics education courses. It is hoped that presentations dealing with a wide range of topics in mathematics education will be offered.

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**Environmental Mathematics**  
 Thursday Afternoon

We seek presentations that deal with all aspects of the pedagogy and the modeling of environmental problems suitable for undergraduate classes, including general education courses. Readers are invited to take up the challenge of searching the natural sciences, as well as economics, environmental science, and environmental education for problems that can be clarified, extended or solved by undergraduate mathematics. We encourage contributions that emphasize computational, visual or qualitative approaches.

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Bill Stone, New Mexico Institute of Mining & Technology

**Nifty Examples in Discrete Mathematics**  
 Friday Afternoon

Good examples are powerful tools for enhancing student understanding of the important connections between the mathematics introduced in discrete mathematics courses and fundamental ideas in computer science. This session invites papers which present examples to illustrate these connections. These examples should be presented in such a way that they can be used as a lecture example, an in-class assignment, a homework assignment or a project by instructors who teach discrete mathematics courses which meet the needs of computer science majors. Examples should be of a type which supplements the material in a standard text (or which presents a topic in a novel way). As a follow-up to this session, particularly interesting examples will be placed on a nifty examples website.

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Brian Hopkins, Saint Peter's College

**Aligning Assessment Methods with Learning and Teaching in Courses for Majors**  
 Friday Afternoon

Course assessments, like departmental program reviews, are ongoing and cyclical processes. The focus of this session is on assessment methods used in courses for mathematics majors that are at the sophomore level or higher. This session invites presenters to contribute to the scholarship of teaching by describing how they aligned their methods of assessment with learning outcomes and pedagogy in one upper-level course for majors given in the last three years. Presenters should describe their student profile and address these questions: What learning outcomes (knowledge, abilities, habits of mind, and ways of knowing) were stated in the course syllabus? What teaching methods and educational experiences or tasks were used to promote each of these learning outcomes? What methods of assessment (e.g., tests, portfolios, collaborative problem-solving, embedded problems, self-assessment and reflection tools, attitudinal or other surveys) were used to measure student achievement of the learning outcomes and why? How do you interpret the results of the assessment? What changes in the course design or assessment would you like to make for the future?

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**Teaching and Learning Proof in Inquiry-Based Courses: Integrating Research and Practice**  
 Friday Afternoon

A growing body of evidence suggests that inquiry-based classroom environments, in which the activity of the class centers around solving problems and discussing these solutions, are effective not only in helping students develop rich, connected understandings of mathematical concepts, but also in facilitating the development of strategies for justification, argumentation, and proof. Undergraduate mathematics courses are typically taught in traditional lecture-based formats and allow for very little discourse between students, or even between teacher and student. This is true for "transition" courses in which students are first introduced to formal proof as well as more abstract upper division courses. Inquiry-based teaching has been prevalent in mathematics courses for teachers for some time, but there is increased recognition that all students benefit from such modes of teaching.

In this session, we invite presenters to contribute papers focusing on 1) research on the effectiveness of inquiry-based teaching in courses emphasizing proof, or 2) issues related to the teaching of mathematical proof in inquiry-based courses. We hope this session will provide an opportunity for mathematics educators and mathematics education researchers to share results, information, and experiences and to begin to build working relationships that will facilitate the integration of research results into practice.

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Jennifer Christian Smith, University of Texas at Austin

### Innovations in Teaching Discrete Mathematics

Saturday Afternoon

Discrete Mathematics is offered in many mathematics departments, at different levels, for different audiences, and with different expectations. This session seeks presentations on novel approaches to the teaching of discrete mathematics. These could be exploratory activities, application projects, interdisciplinary courses, etc. We particularly encourage presentations on the use of technology, as a teaching tool or as a source of interesting problems and applications. Evaluation of the pedagogy is welcome though not mandatory. E-mail submissions are preferred.

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Nancy Hagelgans, Ursinus College

### SIGMAA on RUME Contributed Paper Session (Research-to-Practice)

Saturday Afternoon

The SIGMAA on RUME invites contributions that address research issues concerning the teaching and learning of undergraduate mathematics. This session will be devoted to expositions of research results and uses of research (RUME) in teaching. Priority will be given to proposals that include summaries of research results together with implications for the classroom, or specific examples describing how research results have informed instruction in actual college classrooms. Proposals should clearly describe the research and the classroom aspects of the presentation, as well as the relationship between them.

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Barbara Edwards, Oregon State University

### Advances in Recreational Mathematics

Saturday Afternoon

There have been many recent advances in recreational mathematics, some of which have involved the use of computers. This session is designed to give you an opportunity to explain your recent work in the field. While the organizer encourages submissions that involve computers, that is not essential for consideration. For the purposes of this session, the definition of recreational mathematics will be a broad one. The primary guideline used to determine suitability of subject will be the understandability of the mathematics. For example, if the mathematics in the paper is commonly found in graduate programs, then it would generally be considered unacceptable. Supplemental computer programs can be written in any language, however they must be clean and WELL documented. Any source code used to create the paper must also be submitted for verification. Papers where existing programs such as Mathematica® were used will also be considered.

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### General Contributed Paper Session

Thursday, Friday, and Saturday Afternoon

Papers may be presented on any mathematically related topic. This session is designed for papers that do not fit into one of the other sessions. Papers that fit in into one of the other sessions should be sent to that organizer, not to this session.

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## CALL FOR STUDENT PAPERS

Students who wish to present a paper at MathFest 2005 in Albuquerque, New Mexico must be nominated by a faculty advisor familiar with the work to be presented. To propose a paper for presentation, the student must complete a form and obtain the signature of a faculty sponsor.

Nomination forms for the MAA Student Paper Sessions are located on MAA Online at <http://www.maa.org> under STUDENTS, or from Edward Keppelmann <keppelmann@unr.edu> at University of Nevada Reno (775) 784-6773.

Students who make presentations at the MathFest, and who are also members of MAA Student Chapters, are eligible for partial travel reimbursement. Travel funds are limited this year so early application is encouraged. The deadline for receipt of applications is Friday, June 24, 2005.

Pi Mu Epsilon student speakers must be nominated by their chapter advisors. Application forms for PME student speakers can be found on the PME web site [www.pme.math.org](http://www.pme.math.org) or can be obtained from PME Secretary-Treasurer, Dr. Leo Schneider <leo@jcu.edu>. Students making presentations at the Annual Meeting of PME are eligible for partial travel reimbursement. The deadline for receipt of abstracts is Friday, June 24, 2005