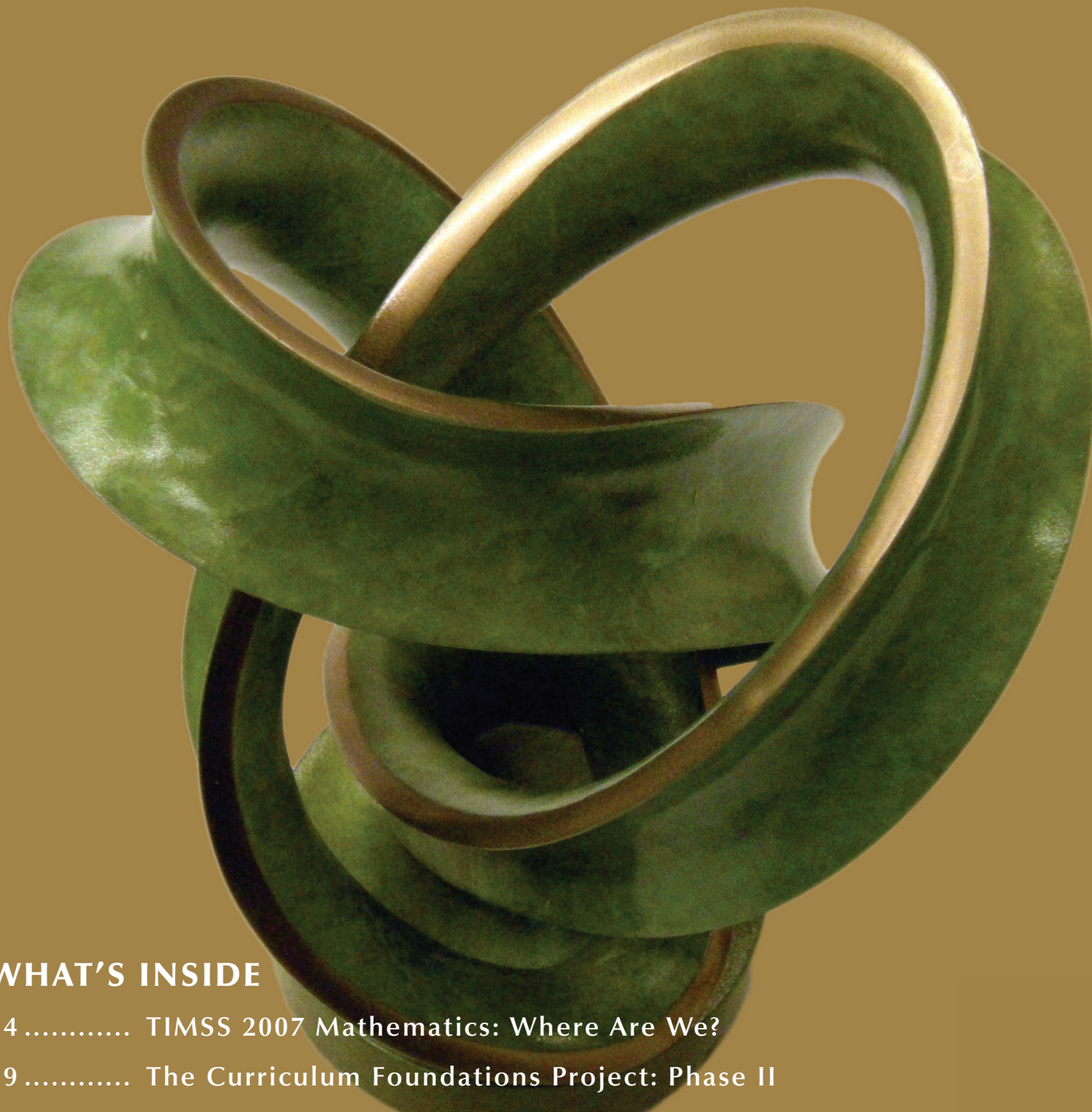# MAA FOCUS

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On the cover: "Figure-8 Knot, 2007" by Carlo Séquin (University of California at Berkeley) won second prize at this year's mathematical art show at the Joint Mathematics Meetings. See page 26. Photograph by Ivars Peterson.

A Peaceful Transition

At the conclusion of the Joint Mathematics Meetings, Joe Gallian completed his two years as President of the Association and passed the baton to David Bressoud. Gallian will serve on the Executive Committee as Past-President for one more year, after which he will be replaced by a new President-Elect to be chosen this year. (See page 12.) We ran an interview with Bressoud in our January issue, which also contained the first in a regular series of columns he will contribute to MAA FOCUS during his time as President. See page 8 for this issue's column.

Transfer of power: David Bressoud, MAA President, and Joe Gallian, MAA Past President. Photograph by Fernando Q. Gouvêa.

Get a Closer Look at the MAA on YouTube

Ryan Miller

MAA Video, the MAA's YouTube channel, has found itself to be a popular part of the Association's web presence among members. Only six months after its inception, MAA Video is home to 15 original videos and has more than 20 subscribers.

The MAA Video channel (http://www.youtube.com/maavideo) has original videos from events such as Carriage House lectures, the 2009 Joint Mathematics Meetings, and a brick laying at the Halmos Commemorative Walk. The most recent video shows Bud Brown preparing homemade biscuits to promote his new book with Art Benjamin, *Biscuits of Number Theory,* during the Joint Meetings. In two weeks it has been viewed over 400 times. Videos of speakers such as Andrew Granville, Rebecca Goldin, and Martin Golubitsky have been viewed well over 500 times.

The channel's homepage also has a collection of favorite mathematical videos, such as clips from the *Hard Problems* documentary and the recent IBM "Smarter Math" commercial.
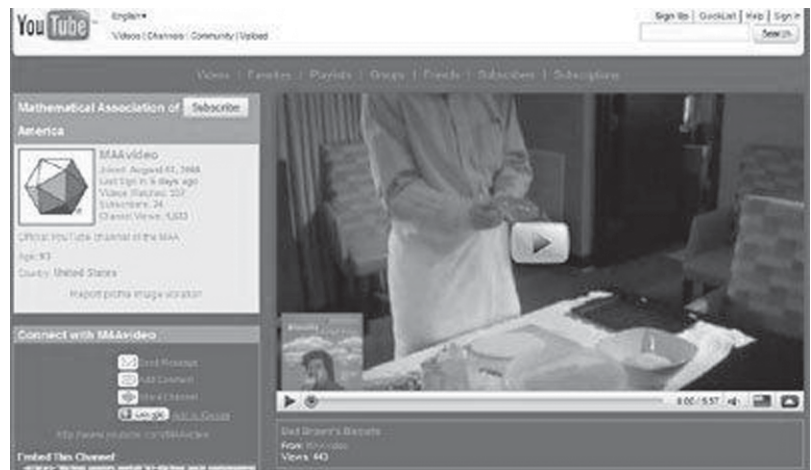
Bud Brown demonstrates baking biscuits on MAA's YouTube. Video by Ryan Miller.

The MAA Video site allows for comments and encourages interaction and feedback from viewers. To subscribe to the MAA Video channel, go to http://www.youtube.com/maavideo and click on the "subscribe" button at the top of the page. Subscribers will be notified each time the channel adds a new original video or discovers another math related video on YouTube.

TIMSS 2007 Mathematics: Where Are We?

Jeremy Kilpatrick

In early December 2008, the results of the 2007 Trends in International Mathematics and Science Study (TIMSS) were released. The news media reported that the U.S. results in mathematics were better than before, with much less change in science. U.S. fourth and eighth graders exceeded the international average in mathematics achievement, significantly improved their performance over 1995, and improved their standing in the international "horse race" rankings (see the table on this page). The average score for U.S. fourth graders was higher than those of fourth graders in 23 of the 35 other countries, lower than those in eight countries (all Asian or European), and not significantly different from those in the other four countries. For U.S. eighth graders, the average score was higher than those of eighth graders in 37 of the 47 other countries, lower than those in five countries (all Asian), and not significantly different from those in the remaining five countries.

Quoted in the *Christian Science Monitor,* the U.S. co-ordinator for TIMSS at the Department of Education, Patrick Gonzales, said, "The message for the country is that we're improving in mathematics, particularly at the tenth percentile [the lowest-performing students]." In a press release from the National Council of Teachers of Mathematics, NCTM President Hank Kepner attributed "the strides our students are making" to local, state, and federal efforts to improve school mathematics (while simultaneously noting "an unacceptable disparity" in U.S. students' performance in TIMSS across racial, ethnic, and socioeconomic lines).

In contrast, former Assistant Secretary of Education Diane Ravitch, writing in the Fordham University blog *Flypaper,* dismissed the gains in mathematics performance as "actually small." Unlike commentators who had attributed the 2007 U.S. results in TIMSS to effects of the No Child Left Behind (NCLB) legislation, Ravitch

pointed out that gains by U.S. students in mathematics had been at least as large during the period prior to the implementation of NCLB. Jerry Bracey, in the *Huffington Post* online newsletter, criticized the whole enterprise of looking at average test scores as unrelated "to anything important to a national economy" or to global competitiveness. Bracey argued that although the United States may not excel in international comparisons like TIMSS, "we shine on innovation" and, citing Robert Sternberg of Tufts, noted that "our obsession with standardized testing has produced one of the best instruments in the nation's history for stifling creativity."

Who Else?

The horse race metaphor for TIMSS performance is badly chosen, in part because it assumes that mathematics achievement in a given country can be reduced to an estimate of how a statistical abstraction, the "average student," would perform on an arbitrary collection of test items relative to the average students from a collection of other countries. But the metaphor is also inappropriate for looking at performance in TIMSS over time. As the varying numbers of countries in TIMSS 1995, 1999, 2003, and 2007 suggest, the competition keeps shifting. Countries such as Belgium, France, Ireland, Portugal, Spain, and Switzerland, which participated in TIMSS 1995, no longer take part, and Austria and Germany now participate at grade four only. Their places have been taken by an increasing variety of other countries such as Algeria, Botswana, El Salvador, Ghana, Lebanon, Qatar, and Ukraine. Mark Schneider, former U.S.

Performance of U.S. Students in TIMSS Mathematics

	1995	1999	2003	2007
Grade 4				
Average Score	518	—	518	529
No. of countries	26	—	25	36
U.S. Rank	7	—	12	11
Grade 8				
Average Score	492	502	504	508
No. of countries	40	38	45	48
U.S. rank	18	19	15	9

Note. Counts of countries do not include so-called benchmarking participants such as U.S. states, Canadian provinces, and other regional entities. The TIMSS 1999 test was administered at Grade 8 only.

Commissioner of Education Statistics, maintains that there are too many countries now participating in TIMSS that are neither our trading partners nor our competitors. "Including these low-performing countries in the calculation of the international average," says Schneider, "drives down that average, improving the relative performance of our students."

Schneider argues that a fairer comparison of cross-national performance in mathematics is offered by PISA, in which the performance of U.S. 15-year-olds is compared with that of 15-year-olds in other OECD countries. He points to the relatively low average of U.S. students in PISA 2006 (24 points below the average mathematics score). Although it would have been 11th among the 27 PISA "partner countries" not in the OECD, the United States ranked only 25th among the 30 OECD countries.

What Mathematics?

Using an arbitrary framework devised by experts to structure TIMSS mathematics assessments amounts to proposing a virtual international curriculum for school mathematics; that is, a hypothetical construction that does not correspond to the curriculum of any one country but that permits the use of a common set of assessment items across national borders. For example, on the 2007 TIMSS test at grade eight, 31% of the items were classified as number and operations, 14% as measurement, 11% as geometry, 15% as data analysis and probability, and 30% as algebra. It is most unlikely that the curriculum for every student in any country had exactly that distribution of content, let alone included the specific topics assessed in each category. Certainly that distribution does not fit the United States, where students taking algebra in the eighth grade encounter a curriculum far different from those taking an eighth-grade arithmetic course.

Revisions to the TIMSS mathematics framework have made interpretations of differences and changes in performance even more problematic. For example, in the 1995 TIMSS for grade eight only 18% of the items were classified as algebra. Did the relative weight of the middle-school algebra curriculum in any TIMSS country increase by 67% from 1995 to 2007?

The better a curriculum fits the TIMSS framework, the better the test scores are likely to be. Minnesota, which participated in the 2007 TIMSS as a separate "benchmarking" entity, saw its fourth-grade scores increase dramatically — a function, according to Minnesota educators, of spending more class time on mathematics and adopting better state

What is TIMSS?

TIMSS began as the Third International Mathematics and Science Study, but after part of the original study in 1995 was repeated four years later, the International Association for the Evaluation of Educational Achievement (IEA) changed "Third" to "Trends in" to reflect the study's periodicity. In the original administration, achievement tests in mathematics (and science) were administered in more than 40 countries to students in five grades (the third, fourth, seventh, and eighth grades, and the final year of secondary school). The tests at grade eight were readministered in 1999, and then at four-year intervals repeated at grades four and eight. For TIMSS 2003, the mathematics framework and item specifications were revised and the total number of items increased. For TIMSS 2007, the framework and specifications were updated again, although not as much.

So that TIMSS mathematics achievement scores will be comparable over time and across countries and to adjust for the sampling of items across students, the scores are put on a common scale using a two- or three-parameter model from item response theory. The scale ranges from 0 to 1000, with a mean of 500 and a standard deviation of 100.

To participate in TIMSS, a country has to meet some rather complicated sampling criteria. They boil down roughly to either an 85% response rate, without replacement, for both schools and students, or a product of 75% for the two rates. Countries meeting those criteria are put into Category 1. They go into Category 2 (annotated in the tables of data) essentially if they can meet the criteria only by including replacement schools and into Category 3 (in a separate section of the tables) if they cannot meet the criteria even by including replacement schools.

standards. As Bill Schmidt points out, however, Minnesota's eighth graders did not improve their mathematics performance internationally. They were at the same level as rest of the United States even though Minnesota is one of the top-performing states on the National

Assessment of Educational Progress (NAEP). "Being number one in the U.S.," Schmidt notes, "does not result in achievement significantly better than the U.S. as a whole on the TIMSS test." He attributes the middling achievement of Minnesota's eighth graders on TIMSS to the lack of a coherent, focused curriculum in middle school, thwarted in part by tracking into algebra.

In TIMSS, idiosyncrasies of local curriculum conditions are pushed aside so that an international measuring stick ("world class curriculum") can be applied. Over 30 years ago, the Dutch mathematician Hans Freudenthal noted that the IEA had not solved the problem of constructing assessments that are internationally equivalent yet take local circumstances, including language differences, into account. That judgment is equally valid today.

Why Bother?

In the 2003 TIMSS, the United States was a Category 2 country (see TIMSS sidebar) at both grades four and eight. At grade eight, in fact, the product of the response rates even after replacement was only 73%, but instead of placement in Category 3, a special annotation was used. In the 2007 TIMSS, the United States (this time along with Minnesota) again fell into Category 2 at both grades. The need to find replacement schools (before replacement, only 53% of the Minnesota schools, and 70% of the U.S. schools, had agreed to participate in the 2007 fourth-grade sample) suggests how difficult it has become to convince U.S. school people that they need to devote additional class time to a test that has no significant consequences for them or their students. The same difficulty occurs when drawing samples of U.S. schools for PISA and NAEP.

Beyond the reluctance of U.S. schools to administer tests for outsiders is a reluctance of U.S. students to devote much energy to taking such tests. TIMSS 1995 included a background questionnaire that asked students more than 100 questions about their home environments, school experiences, and attitudes. The writer Malcolm Gladwell cites a study in which a country's ranking on TIMSS mathematics was, he claims, the same as the average number of items its students answered on the questionnaire (as I read the study the correlation was not perfect, but certainly persistence in the questionnaire was a very strong predictor of

What is PISA?

PISA (the Program for International Student Assessment), conducted by the Organization for Economic Cooperation and Development (OECD), provides education indicators that can be used to compare countries on such dimensions as graduation rates, participation in courses, expenditures, and achievement. The focus is on the 30 OECD countries, but almost as many non-OECD countries participated in the most recent PISA in 2006. There are about three fourths as many U.S. 15-year-olds participating in PISA as there are in TIMSS at each grade. Unlike the TIMSS tests, the PISA tests are administered in a three-year cycle, are not tied to the school curriculum, and measure 15-year-old students' literacy in mathematics, reading, science, and problem solving. In each cycle, one of the four areas is emphasized; mathematics literacy was emphasized in 2003. PISA mathematics literacy items focus on the application of knowledge and skills to novel problems, most with a realistic context, to assess how well prepared students are for life beyond the classroom. Typical items contain considerable prose and ask multiple complex questions. Only about a third of the PISA items are multiple choice, in contrast to roughly two thirds of the TIMSS items. The PISA score scale, which uses a one-parameter model from item response theory, is like that for TIMSS, and the sampling criteria are similar, too.

mathematics performance in a country). "Countries whose students are willing to concentrate and sit still long enough and focus on answering every single question in an endless questionnaire," says Gladwell, "are the same countries whose students do the best job of solving math problems." American culture, however, does not generally encourage persistence by students in labors with no obvious payoff.

Conclusion

TIMSS 2007 is a technically sophisticated and expensive endeavor, demanding considerable effort by many dedicated, talented people. It provides, however, only a partial answer to the complex question of where the United States

stands internationally in mathematics education. At best, TIMSS is but a piece of the global positioning system we need to get school mathematics moving in the right direction. ◗

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Mind the Gap

David M. Bressoud

"Mind the Gap" is an appropriate metaphor for one of the greatest challenges facing undergraduate mathematics education today. There is a significant gap between students' experience of mathematics in high school and the expectations they face on entering college, and there are troubling signs that this gap may be widening. There are serious problems in K–12 mathematics education, but college faculty also need to look to their own house and think about the first-year experience of their own students.

In my article "Is the Sky Still Falling?" (2009), I observed that four-year college mathematics enrollments at the level of calculus and above declined from 1985 to 1995 and have since recovered to slightly below the 1990 numbers. Two-year colleges saw calculus enrollments rise in the early '90s, then fall to well below the 1990 number, while the number of their students requiring remedial mathematics exactly doubled. In percentages, the picture is dismal. For four-year undergraduate programs, calculus and advanced mathematics enrollments dropped from 10.05% of all students in 1985 to 6.36% in 2005.

This happened while high school students were taking ever more mathematics at ever higher levels. In 1982, only 44.5% of high school graduates had completed mathematics at the level of Algebra II or higher. By 2004, this had risen to 76.7%. In 1982, 10.7% had completed precalculus. By 2004, it was 33.0%, over a million high school graduates arriving in college ready — at least in theory — to begin or continue the study of calculus. Yet over the years 1985–2005, Fall term enrollments in Calculus I dropped from 264,000 to 252,000.

Admittedly, many more students today arrive at college already having earned credit for Calculus I, but they have not produced larger enrollments for Calculus II. Over these same 20 years, Fall term enrollments in Calculus II dropped from 115,000 to 104,000. Across the board, students are arriving in college and failing to take what should be a next course in their mathematical progression.

The college community is not blameless. Too many good students are turned off by their initial college experience in mathematics. Too often, first-year courses are large and impersonal, instructors — especially adjunct faculty and graduate teaching assistants — are under-prepared, and little thought has gone into implementing appropriate pedagogies. Moreover, a common complaint that I hear from high school teachers is that colleges focus exclusively on what students do *not* know, with the result that many students find themselves assigned to classes they find stultifying.

This last is a tricky issue. The answer cannot be that colleges lower their expectations of what it means to know algebra or calculus. It does mean that colleges need to rethink how to get students from where they are as they enter college to where they need to be. It does mean offering more routes into good mathematics and restructuring existing courses so that they acknowledge and build upon what students do know while remaining mindful of and addressing the gaps in this knowledge. Especially when a student needs to relearn a topic that appears familiar, we must ensure that the course is structured so that it provides fresh challenges that entice students to keep moving forward.

We have learned a lot about teaching undergraduates in the past 20 years. There are proven programs for bridging the gap. The Emerging Scholars Program is one. Stretching Calculus I over two terms with precalculus topics treated on a just-in-time basis is another. But there are no magic bullets. Each college and university must examine what others have done and adapt to its own situation those programs that are most appropriate. 🔶

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For additional data and data sources, see the February, 2009 *Launchings* column at http://www.maa.org/columns/launchings/launchings_02_09.html.

David M. Bressoud is President of the Association.

The Curriculum Foundations Project: Phase II

Susan L. Ganter

The MAA Committee on the Undergraduate Program in Mathematics (CUPM) initiated a major analysis of the undergraduate mathematics curriculum in 1999. As the subcommittee of CUPM concerned with the first two years of the college mathematics program, CRAFTY (Curriculum Renewal Across the First Two Years) has had a major role in analyzing and formulating recommendations concerning the foundational years in mathematics instruction. Moreover, given the growing impact of mathematics instruction on the sciences, social sciences, and humanities — especially instruction during the first two years — there is a need for significant input from these partner disciplines regarding the current mathematical needs of their students.

CRAFTY gathered much of this necessary information for the "mathematics intensive" disciplines (e.g., physics, chemistry, engineering) from 1999–2001 through a series of 17 disciplinary workshops, culminating in a curriculum conference to analyze and synthesize the workshop findings. These findings were published by MAA in the report *Voices of the Partner Disciplines* (Ganter and Barker, 2004) and contributed to MAA's report on the undergraduate program in mathematics, *CUPM Curriculum Guide 2004* (CUPM, 2004). CRAFTY and CUPM's subcommittee on Mathematics Across the Disciplines (MAD) are now conducting a second series of disciplinary workshops, focused on the social sciences and humanities. Results from these workshops will be published in a second *Voices* volume and will inform continuing revisions of the *CUPM Curriculum Guide*.

The major purpose of the Curriculum Foundations (CF) Project is to generate foundational materials, based heavily on the needs of partner disciplines, from which appropriate curricula for the first two years of college mathematics can be constructed. The foundational materials primarily describe expectations about the nature and desired outcomes of the first two years of undergraduate mathematics instruction. They include expectations regarding the *skills* to be attained at the end of the first two years; lists of *problems* that can be solved at the end of the first two years; the nature of *technology and assessment tools* that should be employed; and, the *learning environments* in which students should work. Examples of how these expectations can be met, primarily in the form of possible courses and course sequences, also are being developed.

The workshops for the second phase of the Curriculum Foundations Project (CF II) each have 20 to 30 invited participants, the majority chosen from the discipline under consideration, with the remainder chosen from mathematics. At least some members of CRAFTY, MAD, or the CF planning committee are among the workshop participants. Each workshop results in a report, addressing a series of common questions specified at the outset of the workshop and developed by the CF II planning committee. Although the basic set of questions provided to each workshop is the same, some discipline-specific questions usually are added for each meeting.

There are, of course, differences between the workshops, reflecting the specific needs of the disciplines involved and the desires of the workshop organizers. The local workshop organizers, in consultation with the CF II planning committee, determine which disciplinary participant(s) write the final report for each workshop. Each report is widely circulated within the specific discipline, in order to solicit a wide range of comments.

Although the CF II Planning Committee has secured a small grant from the Calculus Consortium for Higher Education to provide partial funding for some of the workshops, a unique (and amazing) part of the CF Project is that the workshops are funded primarily by the host institutions. Such commitment from the higher education community illustrates the importance and need for such discussions across disciplines.

To date, there have been five national disciplinary workshops during CF II, including economics, the arts, meteorology, agriculture, and social science. CRAFTY and MAD are interested in hosting additional workshops over the next year, with possible disciplines including history and political science, psychology and sociology, English and literature, languages, journalism and communications, and education and teacher preparation. If you are interested in hosting a CF II workshop at your institution, please contact the author.

The article that follows is the first in a series of brief reports from each of the CF II workshops to be published by *MAA FOCUS* in 2009. The CF II planning committee welcomes your comments and input. ◆

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Susan L. Ganter is Associate Professor of Mathematical Sciences at Clemson University. She is a member of MAD and a former Chair of CRAFTY, serving as Co-PI for both phases of the Curriculum Foundations Project. She can be reached at sganter@clemson.edu.

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The Curriculum Foundations Workshop on Economics

Sheldon P. Gordon and Richard Vogel

Farmingdale State College recently organized and hosted the Curriculum Foundations II workshop on mathematics and economics. This invitational workshop brought together 15 leading economics educators from around the country to develop a set of recommendations to the national mathematics community on the current mathematical needs of the one million undergraduate students nationally who take economics and related courses each year. The results of these discussions will be used to promote the development of new courses and programs that will better serve the needs of economics students in an increasingly quantitative world.

Economics, finance, and business-related professions are becoming increasingly mathematical, and both the undergraduates majoring in these disciplines and the vast numbers of students who take the introductory courses in these fields need
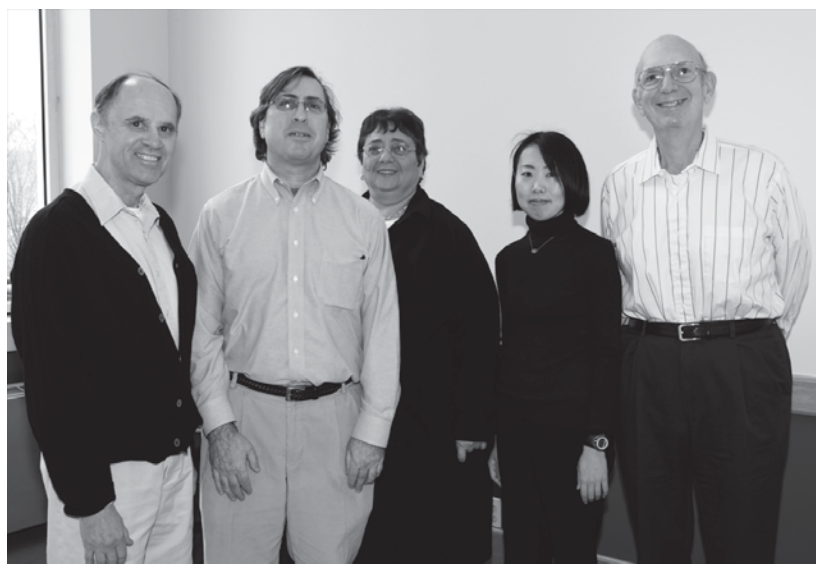
Participants at the Curriculum Foundations Workshop: Jack Winn (Math), Richard Vogel (Econ), Eleanor Fapohunda (Econ), Natsuko Iwasaki (Econ), and Sheldon Gordon (Math).

a deeper — and different — kind of mathematical preparation than has been the case historically. According to the economists at the workshop, their students need much more emphasis on understanding fundamental mathematical concepts than on developing a broad collection of algebraic skills. They also need to see realistic applications in their math classes that mirror the way that mathematics is used in business and economics classes. The economists welcomed the invitation to communicate these needs to the mathematics community, so that they will be able to produce graduates who are better equipped to function effectively both in modern economics programs in college and in careers that are a part of an expanding global economy.

Although the intended focus in the workshop was to be on the mathematical needs of undergraduate economics majors, the participants found it impossible to separate those issues from the related ones for the huge numbers of students who take only an introductory economics course (i.e., macroeconomics and microeconomics). Fully 98% of all economics enrollments are in these courses, and they are the foundation for all the intermediate and advanced economics offerings that are taken by the economics majors and by those students in related fields.

Many of the specific details brought up by the economists tend to be somewhat subtle points, certainly for students and possibly for many mathematics faculty members. For instance, although they talk about students needing partial derivatives, it is not so much a matter of calculating the partial derivative of a given function (they rarely have explicit functions to differentiate), but rather to interpret the economic significance of the *sign* of the partial derivative — meaning, as each of the parameters increases or decreases, what is the effect on the function?
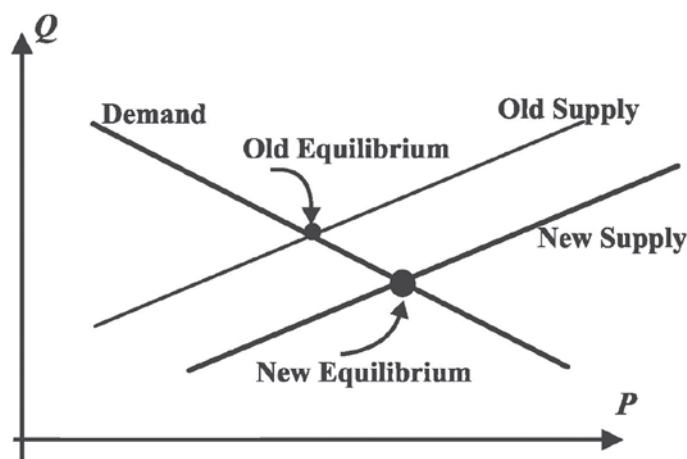

Figure 1: Moving *Along* a Curve

Also, a major theme that pervades the introductory and intermediate courses is the Law of Supply and Demand. Here, economists study the price, P, and the quantity, Q, of a product, but the historical convention is to place Q on the vertical axis and P on the horizontal axis, even though P is the dependent variable. One of their complaints is that most students are uncomfortable with variables other than x and y, and the reversal of the axes is something that certainly contributes to the confusion. Moreover, while the economists talk about the supply and demand *curves* in introductory courses, they actually use *lines* that are still referred to as curves. However, the mathematical description of the behavior of curves in terms of concavity changes dramatically from that shift in the dependent/independent variable depiction. Another major issue is the notion of "moving along a curve" in the sense that a change in either the demand or the supply curve produces a different (albeit parallel) line (see Figure 1). Again, this gets into the concept of the effects of changes on the parameters and the resulting change in the equilibrium (the point where the lines, or curves, cross).

The final draft of the report and other details about the workshop can be found at http://snyfarvc.cc.farmingdale.edu/~gordonsp/CurrentProjects/CFWorkshop.html.

Sheldon Gordon is Distinguished Teaching Professor at Farmingdale State College of SUNY. He is a member of CRAFTY and takes its name, Curriculum Renewal Across the First Two Years, very seriously. Richard Vogel is Professor of Economics and Chair of the Department of History, Economics and Politics at Farmingdale State College of SUNY. He is treasurer of the Academy of Economics and Finance and a member of the board of directors of the New York State Economics Association. Gordon and Vogel were co-chairs of the workshop.

Becoming Aware of Mathematics and the Climate

April is Mathematics Awareness Month, and this year's theme will be *Mathematics and the Climate*. The announcement highlights the many mathematical challenges that are involved in modeling the climate and trying to detect long-term changes:

"Calculus, differential equations, numerical analysis, probability, and statistics are just some of the areas of mathematics used to understand the oceans, atmosphere, and polar ice caps, and the complex interactions among these vast systems. Indeed, analyzing feedback effects is a crucial component of global climate modeling and often a significant factor in long-term predictions. For example, warmer temperatures cause ice to melt, exposing more land and water, so that more sunlight is absorbed-instead of being reflected, in turn leading to more warming."

As usual, several essays on the theme are available at http://www.mathaware.org. This year, they are supplemented by audio segments in mp3 format in which the authors talk about the topics discussed in more detail in their essays. Colleges and universities are encouraged to organize events related to the MAM theme, and to that end the web site provides several resources, including tips on how to get media coverage for your event. There is also a page that allows you to share your ideas for events.

Mathematics Awareness Month, held every year in April, is a project of JPBM, the Joint Policy Board for Mathematics, whose members are the American

Mathematical Society, the Society for Industrial and Applied Mathematics, the American Statistical Association, and the MAA. The goal is to increase public understanding and visibility of mathematics in the "public square." Each year's theme is chosen to highlight the power and fascination of mathematics.

George Andrews Becomes President of AMS

At the end of January George Andrews became the new president of the American Mathematical Society, replacing James Glimm. Andrews is a Evan Pugh Professor of Mathematics at Pennsylvania State University. Number theory is his main area of research specifically the theory of partitions and related areas.

Photograph of George Andrews courtesy of the American Mathematical Society.

Teaching Time Savers: The List of Grievances and Special Requests

Amy N. Myers

Although I currently teach at an institution that hires math majors to grade homework for required courses, I have had enough experience providing this service to students myself to know how much of an inconvenience it is to mark late work. I efficiently grade on-time papers collected in class, but work that straggles in late takes an unreasonable amount of time to manage. I have to refresh my memory concerning the various correct solutions and equivalent responses, and take time to consult the grading rubric. (Was it 1 point for the correct integrand or 2 points? Did I give students 1 point for including the *dx* and the *+C* this time, or not — or was it 1 point each?) When I grade on-time papers, I soon have the rubric in my head. For a late assignment, I have to consult the rubric for each point. One late paper easily takes five times as long to mark as one that arrives on time. Since I don't want to burden my busy paper graders (who are limited to a set number of hours per week) with this chore, I deal with late homework myself.

I used to try to avoid the late homework time drain by dropping each student's two lowest homework scores each semester. This policy seems reasonable, but students with legitimate emergencies that prevent them from turning in homework on time find it unfair. Why should some students be allowed to drop the most difficult or time-consuming assignments, or the one that was due on the same day as their big project for another course, while they were forced to use both of their "free" homework scores to attend their grandmother's funeral, or suffer through an unplanned hospital stay?

With large numbers of students in introductory courses, I accommodate large numbers of emergencies each semester, many of which I learn about through the dean or health service and believe are legitimate. To avoid having

Illustration by John Johnson

to judge the validity of each emergency myself, and to keep the time spent dealing with late homework to a minimum, I ask each student to keep her own *List of Grievances and Special Requests*. Students make a "special request" when they ask that their late homework be counted for credit. They make a "grievance" when they complain that their homework was not graded properly (since the paper graders are themselves students, the grievances are often legitimate as well).

When a student approaches me with a late homework assignment and an excuse for missing the deadline, I ask her to grade the assignment herself during my office hours using the scoring rubric and the solutions manual, and record the points she should have received as a "special request" on her *List*. (I do other work while she determines whether or not she has the right integrand, the *dx* and the *+C*, and so on.) When a student complains that her solution to a particular homework exercise is equivalent to the one in the solutions manual, but the paper grader didn't give her credit for it, I ask the student to record the number of points she should have earned as a "grievance" on her *List*.

At the end of the semester I ask each student to determine whether or not the points accumulated on her *List of Grievances and Special Requests* are enough to result in a higher letter grade (this information is available via the course website). I then collect the *List* from those students who feel they need the extra points.

Since I teach at an institution where students care deeply about earning top grades, the *List* policy saves me a lot of time hearing excuses and complaints (whether significant or petty), and managing the adjustments they require. Students share the inconvenience created by their grievances and special requests, and feel that their concerns are taken seriously and acted upon. Having students grade their own work also provides the side benefit of making them more tolerant of mistakes made by the paper graders since they experience the difficulty of evaluating their own work by means of the grading rubric and the solutions manual.

Time Spent: One hour at the end of the semester updating the grade book.

Time Saved: One hour per week of grading, recording, and emailing/meeting with students to evaluate excuses and complaints. ⬡

Amy N. Myers is the Program Coordinator for the Mathematics Department at Bryn Mawr College.

Teaching Time Savers are articles designed to share easy-to-implement activities for streamlining the day-to-day tasks of faculty members everywhere. If you would like to share your favorite time savers with the readers of MAA FOCUS, then send a separate email description of each activity to Michael Orrison at orrison@hmc.edu. Make sure to include a comment on "time spent" and "time saved" for each activity, and to include pictures and/or figures if at all possible.

Aparna Higgins to Become Director of Project NExT

Aparna Higgins will be the new director of MAA's Project NExT in August 2009, replacing T. Christine Stevens. After fifteen years on the job, Chris Stevens decided that it was time to pass the baton and asked that she be allowed to step down. The Board of Governors acknowledged Stevens' amazing work over the last 15 years and voted to appoint Higgins to a five-year term beginning on August 16, 2009.

Aparna Higgins will take over as the NExT director for Project NExT. Photograph by Fernando Gouvêa.

Higgins has been deeply involved with Project NExT for many years now, which makes her a natural choice for Stevens' successor. Supporting her on the job will be Joseph Gallian, Gavin Larose, and Judith Covington.

Project NExT (New Experiences in Teaching) is the MAA's professional development project for new and recent PhDs in the mathematical sciences. Over the span of a couple of years, NExT Fellows receive intensive guidance and support as they start their careers as professional mathematicians, with workshops and sessions on how to manage the complex blend of research, teaching, and service that make up the everyday life of college and university faculty. Fellows then remain connected with their mentors and which each other, providing them a network of professional connections that will last for many years. There are 1085 current and past Fellows, and 80 new Fellows are accepted every year. Many NExT Fellows are now among the leaders of the profession and of the MAA.

For more information on Project NExT and the many other professional development activities of the MAA, visit http://www.maa.org and click on the "Professional Development" tab. ⬡

Richard Good: Remembrance with Gratitude

Fernando Q. Gouvêa

Richard A. Good left the MAA a very generous gift after his death on November 24, 2008: a $400,000 bequest toward the support of Project NExT. Good was 91 when he died. He received his undergraduate degree from Ashland College in 1939 and his PhD from the University of Wisconsin in 1945. He had been a member of the Association since 1944.

Good had a history of generosity toward the MAA and was made a member of the Icosahedron Society, which publicly recognizes the MAA's largest donors, in 2007. Over the years, he became an enthusiastic supporter of Project NExT, and that support culminated in his generous bequest.

In the MAA office, Good was known for always sending handsomely typed letters or making phone calls — never email. He even typed his annual donation checks to the MAA. He always asked that these donations be listed as "anonymous."

Richard Good taught at the University of Maryland for 43 years and was known for his sense of humor, his innovative teaching methods, and his interest in mathematics education. Good's humor was perhaps best described by his son-in-law, William Harman, in a eulogy he gave at the memorial service: "A bit of fun and a touch of whimsy seemed for him a requirement for doing anything, even mathematics, and he communicated that light touch without surrendering his sense that humor is always possible no matter how serious the endeavor. Let me offer my own rather memorable first example of encountering this.

"In 1971 Dick and Jo's daughter Mary and I decided that we wanted to get married. I agreed, with much hesitation, to broach the topic with Mary's father, whom I barely knew and presumed at first to be a rather stern figure. During the planned dinner in the Good home I awkwardly procrastinated bringing up the matter until the very end of the meal. Nervously, and as formally as I thought appropriate, I summoned my courage to say 'Dr. Good, I would be honored and pleased to have your approval in receiving your daughter's hand in marriage.' After one of those long periods of silence with which he was always more comfortable than just about anybody else, Dick looked at me severely and then with an imp-

ish smile, he said, 'Only her hand? Wouldn't it be better to marry all of her?' That was my first introduction to a wit I had not, to that point, anticipated. But it was by no means the last I saw of his delightfully disarming playfulness."

In 1975, Good became Secretary-Treasurer of Pi Mu Epsilon and served in that capacity until 1987. Good then served as Councillor from 1987 until 1993. Robert Sefton Smith, Pi Mu Epsilon President between 2002 and 2005, remembers that Good continued to be active in the Society and attend Council Meetings into his late 80s in the self-described capacity of "old fogey."

Good's colleague at Maryland, Jim Fey, writes that "There is a saying attributed to Abraham Lincoln that it is better to remain silent and let people think you a fool than to open your mouth and prove it. For those who knew and worked with Dick Good, one of the striking memories will certainly be the way that he responded to any substantial question with a very long silent pause before answering. However, when he did respond it was invariably with a coherent and insightful piece of advice. If the question was mathematical, Dick's response always showed that he had thought through the fundamental concepts and methods of our subject to arrive at deep understanding of critical issues."

"I had the good fortune to benefit from Dick Good's mathematical knowledge and gracious personal style for over 20 years. He was a professional mentor and a collaborator on several mathematics education projects. Like hundreds of high school mathematics teachers whom he and Stan Jackson taught in NSF institute programs, I learned things about mathematics and teaching from Dick that influenced my own work in profound ways. Of course we'll also remember the seemingly endless collection of flamboyant square dance shirts that Dick wore during each semester of teaching. But the outstanding memory will be of a wise and thoughtful colleague on whom we depended so much."

Jonathan Rosenberg, another colleague, describes Good as "a fixture in the department, easily recognizable by his famous collection of one-of-a-kind Hawaiian-style shirts, until his retirement in 1988.

Laurie Heyer (Davidson College) who is a 2000–2001 Project NExT Fellow, remembers Richard Good's interaction with her: "I met Dick Good in the exhibit area at the national meetings, when he asked me about my Project NExT

gold dot. He had seen other dots and was curious what it was all about. I was still overflowing with excitement about my new friends, new strategies, and new job, and I think it was less of a conversation than it was me bubbling over with excitement and him letting me ramble on. Along the way, somewhat analytically, he asked some questions about how Project NExT would help me, how the program worked, what we had learned in our workshops, and exactly why I thought it was all so great. I recall him being very warm in his response, thanking me for explaining, and saying how nice it was to talk to me and learn about this program. And I remember the twinkle in his eye! He seemed to get a kick out of my joy, like a grandfather would out of hearing all about a grandchild's first day of school."

Christine Stevens, director of Project NExT, comments that "Richard Good's extremely generous bequest will advance us several steps towards the goal of making Project NExT a permanent, self-sustaining program of the MAA. His gift builds upon the substantial annual contributions that he had been making to Project NExT, which have sponsored a total of 24 Fellows over the last six years. Dick Good was a smart, gentle, and self-effacing man, and I am grateful not only for his generosity, but also for the faith that he displayed in Project NExT."

"I think it was at a summer MAA meeting in 2002 that I first met Dick and talked with him about Project NExT. He opened the conversation by wondering, in a low-key way that took me by surprise, whether the program stood in need of additional support. After we had talked about the goals of Project NExT and how it pursues them, I outlined the benefits that donors derive from sponsoring Project NExT Fellows, such as receiving the names of 'their' Fellows and periodic reports on their activities. In a manner that I would later realize was characteristic, Dick waved these considerations aside, saying that he wanted no personal involvement and no public acknowledgement, but simply the opportunity to support a program that he deemed of importance to the future of the mathematical community.

"Dick's bequest will support eight Fellows each year for many years to come. It is deeply appreciated by the MAA and the leadership of Project NExT, as well as the Project NExT Fellows whose careers he is helping to launch."

Finally, Aparna Higgins, who will become Director of Project NExT this August, also shares her memories of Richard Good:

"Curiosity, courtesy, and an enthusiastic support for the younger members of our profession are the things I remember about Richard Good. I met Dick about 20 years ago, at the student paper sessions of Pi Mu Epsilon and the MAA at national summer meetings. Dick listened to student presentations with interest and often talked to the presenter afterwards, offering helpful insights and complimenting the student's work. At the PME banquet at summer meetings, I always tried to sit at his table. He was genuinely interested in what his dinner companions were doing in their classes or with their students or with the MAA. That interest, combined with his warm smile and sense of humor and twinkling eyes, made everyone feel very appreciated."

"After Dick retired, he came less frequently to mathematics meetings, so I was pleasantly surprised to see him at the winter meetings some time in the early 2000's. By this time, I had become a co-director of Project NExT. As always, Dick asked about what I was doing, and when I mentioned Project NExT, he asked questions that dug deeper than the initial casual interest that a person might show in someone else's activities. Since it was from our mutual interest in activities for undergraduates that I knew Dick, I remember clarifying that Project NExT was a program for new *faculty*, not for students. Dick said he understood that, and continued to ask about how the program was run, how many people it served, and what the benefits were for the participants and the department and the mathematical community. Then he told me that he had met some of the Project NExT Fellows and asked them about the dots on their badges. They had spoken enthusiastically about the program — the Project NExT Fellows are its best ambassadors — and he was determined to find out more about it. Later, I introduced Dick to Chris Stevens, the Director of Project NExT."

"The result was Dick's generous support of Project NExT, sufficient to support four Fellows annually, beginning in 2003. Characteristic of Dick's modesty, he declined to draw attention to himself and didn't want his donation publicized. I was impressed by Dick's conviction in supporting the future of mathematics, and I realized that this was entirely in keeping with his interests in promoting the participation of undergraduate students in the larger mathematical community."

"We were saddened by the news of Dick's death and deeply touched by his generous bequest to Project NExT. I miss his delightful presence at the mathematics meetings."

FOCUS on the 2009 Joint Mathematics Meetings

With over 6,000 people in attendance the 2009 Joint Mathematics Meetings were the largest ever. Washington, DC, turned out to be a convenient and attractive location for the meetings despite being a little cold. For the MAA, there was the extra benefit of being "at home," providing MAA members the chance to visit MAA Headquarters and the MAA Carriage House. As always, there were more talks, panels, and special events than anyone could count (much less take in). The next few pages collect reports on some events, photographs, and other news items from JMM 2009.

JMM 2009 Short Takes

Fernando Q. Gouvêa

Pushing the Wiki

As has happened for the last several meetings, a "wiki" was set up online to provide the latest information on the meeting, ranging from last-minute changes in the program to the inside scoop on which restaurants were good. So what's a "wiki?" It's basically a web site with information, and visitors can sign in to add their own input. We were asked to "push the wiki" as the best resource for up-to-date meeting information. To see what it was like, visit http://jointmathmeetings.pbwiki.com. A similar site for the 2009 MathFest will be set up at http://mathfest.pbwiki.com soon.

Illustration by Brad Fitzpatrick

Mathematics Awareness Month

As everyone knows, April is Mathematics Awareness Month. This year's MAM is coordinated by the AMS; the theme is *Mathematics and Climate*; see page 13 and http://www.mathaware.org for more. Next year's MAM will be coordinated by MAA, and, in a bold and unprecedented move, the theme has already been announced: *Mathematics and Sports*. Joe Gallian will be the point man on that one.

The Penn State Takeover

There were people worrying aloud about this. . . . Douglas Arnold, President of SIAM, taught at Penn State for ten years before moving to the University of Minnesota. David Bressoud, who became President of MAA at the end of the Joint Meetings, also taught there before moving to Macalester College (which is also in Minnesota!). And George Andrews, who became President of AMS at the end of January 2009, is Evan Pugh Professor of Mathematics at Penn State. It's a good thing, we think, that the presidents of the three largest mathematics societies in the United States are all good friends. But if Andrews moves to Minnesota, there might be reason to worry.

Who Are These Crazies?

Bob Anastasio, MAA Director of Membership, presented to the Board of Governors an interesting report with data about the members of the Association. One of the nuggets to be found in the report is that only 27 of the MAA's 20,000 or so members subscribe not only to all three journals (*American Mathematical Monthly*, *Mathematics Magazine*, and *College Mathematics Journal*), but also to *Math Horizons*. As a member of that group, I think we should found the *One Thousandth Club* and hold celebratory meetings during which we can pat each other on the back.

State by State

The membership data also gives the number of members from each state. California is the state with the most members, which isn't really surprising because it's also the state with the largest population. One fairer way to look at this is to compare a state's MAA membership rank to its overall population rank. Using that measure, the winners are Maryland (19th in population, 10th in MAA members), Connecticut (29th in population, 20th in MAA members), and Vermont (49th in population, 40th in MAA members). It should be noted that this ranking of states by population doesn't include the District of Columbia. If it did, DC would be the winner by far. ◑

Washington, DC Joint Mathematics Meetings

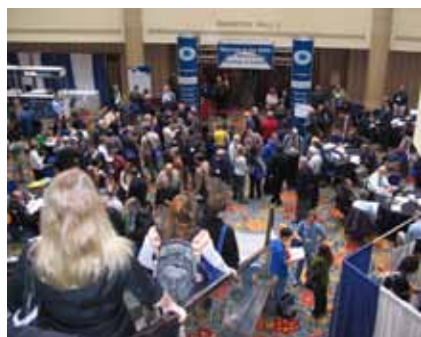*Before the storm: the entrance to the exhibits area early on Monday.*

Martha Abell, Georgia Southern University.

Yvonne Lai, University of Michigan.

Students play Rush Hour *in the Student Hospitality Suite. Photograph by Ryan Miller.*

Ready? Around noon, lots of people converged to the entrance for the Grand Opening, scheduled for 12:15.

Their last meeting as presidents: Joe Gallian, Past President of MAA, and James Glimm, Past President of AMS.

Bud (Ezra) Brown of Virginia Tech, before he made the biscuits.

Helaman Ferguson's sculpture was one of the attractions in the exhibit hall.

Email aisle, always an attraction.

John Cullinan, Bard College.

Leon Woodson gives the NAM Cox-Talbot Address.

Sheldon Axler, San Francisco State University. Above and to the right, with the grey cover, is his new precalculus book.

Radicals have no chance with Robin "Mathgirl" Wilke, University of Vermont.

The MAA's Board of Governors meets in Washington, DC.

Victor Miller, Center for Communications Research.

Robin Wilson, of the Open University, and Marlow Anderson, of Colorado College.

Our nominee for biggest waste of white chocolate.

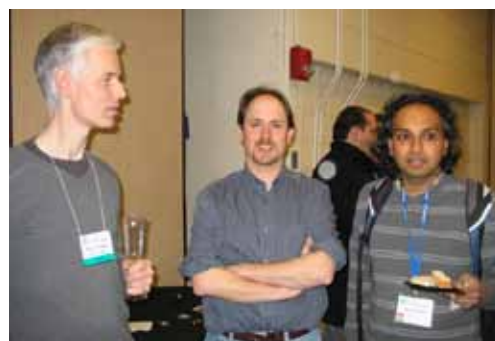No, not that Ted Turner. Or at least we don't think so.

There's always something sweet at the MAA booth: Lisa Kolbe serves cake.

Penny Pina, AMS Director of Meetings, is part of the behind-the-scenes crowd that makes the Joint Meetings work.

A toroidal trefoil knot at Hans Schepker's Glass Geometry booth.

Tim Gowers (Cambridge), Matt Emerton (Northwestern), and Kiran Kedlaya (MIT), at the Princeton University Press reception celebrating the publication of The Princeton Companion to Mathematics, edited by Gowers.

Ken Ono (University of Wisconsin Madison) answers a question after his talk on "Unearthing the Visions of a Master: The Web of Ramanujan's Mock Theta Functions."

Gayle Ward (left), Dean of Students of Richard J. Daley College, where Vali Siadat (right), winner of a Haimo Award, teaches.

Worth holding on to: a close-up of one of Vladimir Bulatov's mathematical scuptures.

It was raining outside, so places that sold food and were inside the hotel had long lines.

One of the interview areas at the Employment Center.

Deborah Hughes Hallett speaks to an admirer.

The NSA booth in the Exhibit Area.

Mathematicians who sing! A capella singing was one of many informal activities that went on in the evening.

Kathryn DeZur (SUNY Technical College at Dlhi) reads her poem "Fibonacci Numbers" at the reading of Poetry of Love and Mathematics.

Ready for the Grand Opening: Robert Daverman, AMS Secretary, Jim Tattersall, MAA Associate Secretary, Tina Straley, Executive Director of MAA, James Glimm, President of AMS, Joe Gallian, President of MAA, John Ewing, Executive Director of AMS, and Martha Siegel, MAA Secretary.

Vladimir Bulatov, http://bulatov.org, displays one of his mathematical sculptures.

Jeff Suzuki, Brooklyn College, and Fred Rickey, US Military Academy.
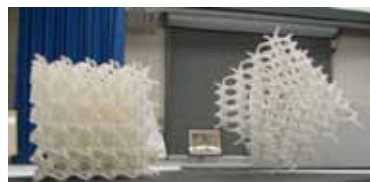
Nylon: a sculptural interpretation of a crystal latice by George Hart, Stony Brook University.

Wade Ellis, West Valley Community College, and Wayne Roberts, Macalester College, wearing their ribbon bowties at the Tattersall luncheon.

Justin Sukiennik, about to get his PhD from the University of Rochester, was one of many job-seekers at the Joint Meetings.

Students working on puzzles in the Student Hospitality Suite. Photograph by Ryan Miller.

Christine Stevens (St. Louis University, Director of Project NExT) gives a talk.

As usual, the Employment Center was one of the busiest parts of the meeting.

Genevieve Knight, Coppin State University (ret), is one of many MAA members who continue active — and coming to meetings — after retirement.

Math Horizons *Editors past and present got together. Deanna Haunsperger, Steve Kennedy, Art Benjamin, Jenny Quinn, Steve Abbot, and Bruce Torrance. Photograph by Ivars Peterson.*

Joyati Debnath of Winona State University, waiting for the Grand Opening of the exhibit hall.

A group of hopefuls at the Employment Center: Tom Edgar, Bonnie Smith, Logan Axon, Chrissy Maher, Sara Quinn, and Stacy Hoehn.
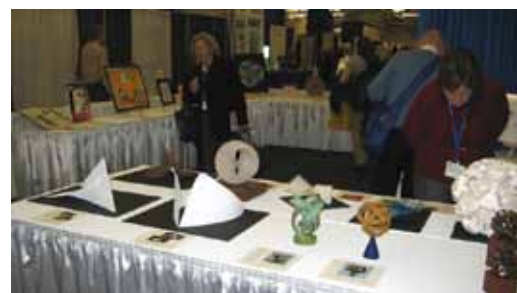
We never realized that Michael McAsey and Woody Dudley were that tall!

Murli Gupta, George Washington University.

Barbara Burke Hubbard at the Matrix Editions booth, one of several "new ventures" appearing at JMM for the first time. Visit http://matrixeditions.com.

Once again there was a display of mathematical art at the Joint Meetings. The new feature this year is that there were prizes for the best pieces. See page 26.

Paul Zorn, chair of the MAA Council on Publications and Ivars Peterson, Director of Publications for Journals and Publications.

David Richeson (Dickinson College) displays a copy of his book, Euler's Gem: The Polyhedron Formula and the Birth of Topology.

Hortensia Soto-Johnson, University of Northern Colorado.

Maria Chudnovsky presenting her talk on "Perfect graphs—Structure and recognition." Photograph by Robert Anastasio.

Matt Emerton (Northwestern University) speaks on "Three-manifolds and the Langlands Program" at the AMS Current Events session.

All photographs courtesy of Fernando Q. Gouvêa unless otherwise noted.

Prizes and Awards at the 2009 Joint Mathematics Meetings

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

Michael Bardzell
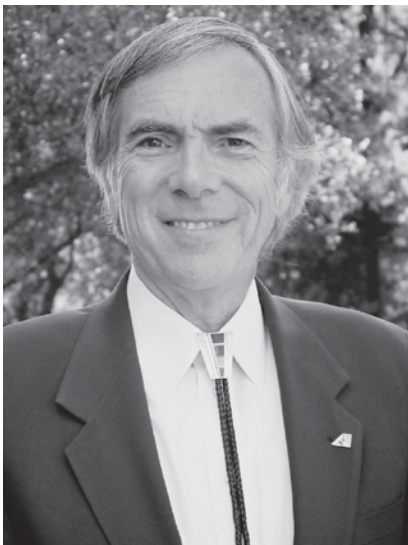*Salisbury State University*

David Pengelley
New Mexico State University

Vali Siadat
City College of Chicago
Richard J. Daley Campus

Yueh-Gin Ging and Dr. Charles Y. Hu Distinguished Service to Mathematics

Chauvenet Prize

"Reflections on the Arbelos," *American Mathematical Monthly,* 113 (2006), no. 3, pp.236–249.

Euler Book Prize

King of Infinite Space: Donald Coxeter, the Man Who Saved Geometry, Walker and Company, New York, 2006.

Robert Megginson

Harold P. Boas

Siobhan Roberts

Certificates of Meritorious Service

Indiana Section

Carl Cowen

Ohio Section

John R. Michael

Georgia Section

David R. Stone

Louisiana/Mississippi Section

Richard D. Anderson
Posthumously

Nebraska/Southeast South Dakota Section

John Fuelberth

American Mathematical Society Prizes and Awards

George David Birkhoff Prize in Applied Mathematics

Joel Smoller

Albert Leon Whiteman Prize

Jeremy Gray

Leroy P. Steele Prize for Lifetime Achievement

Luis Caffarelli

Frank Nelson Cole Prize in Algebra

Christopher Hacon   James McKernan

Leroy P. Steele Prize for Seminal Contribution to Research

Richard Hamilton

Leroy P. Steele Prize for Mathematical Exposition

I. G. Macdonald

Levi L. Conant Prize

John W. Morgan

The Ruth Lyttle Satter Prize in Mathematics

Laure Saint-Raymond

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

Maryam Mirzakhani

Joint Policy Board for Mathematics Commmmunications Award

George Csicsery

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

Aaron Pixton
University of Cambridge

Association for Women in Mathematics Prizes

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

Maria Monks
Massachusetts Institute of Technology

Louise Hay Prize for Contributions to Mathematics Education

Deborah Ball
University of Michigan

Job Postings We'd Like to See...

Posting date: April 1st, 2009
California Institute of Science

The Department of Math, Physics, and Astronomy, under the leadership of Dr. Mildred Finch, announces a tenure-track assistant professor position opening. Consulting opportunities with the FBI, CIA, NSA, LAPD, and [redacted] abound. We are particularly looking for specialists in Furrier series. Ability to obtain and maintain security clearance despite repeated security violations is required. Applicants must have a highly photogenic appearance with an awkward, stumbling love life, a messy office, and externally visible mathematical hallucinations (please include photos of each). Send CV, papers, and 3.14 reference letters to:

Profs. C. Eppes, A. Ramanujan, and L. Fleinhardt
Co-chairs, S3arch Committee
Dept. of Math3matics, 9hysics, and A5tronomy
California Institute of Sci3nce
E01 Platt Boul3vard

(*Thanks to Andrew Ross, Eastern Michigan University*)

Mathematics and Art at JMM

Ryan Miller

A number of different styles were on display at the 2009 Mathematical Art Exhibition at the Joint Mathematics Meetings in Washington, D.C. as 36 artists presented their best works of mathematical art. While this was not the first Mathematical Art Exhibit at the Joint Meetings, this was the first time prizes were awarded to the top three pieces.

Four judges, two appointed by the MAA and two by the American Mathematical Society, were faced with the difficult challenge of selecting three works of art that stood above the rest.

Arizona State Professor Goran Konjevod was awarded first prize and $500 for his origami piece titled, "Wave (32), 2006." The work, which was folded from a square sheet of paper,

First place winner "Wave (32), 2006" by Professor Goran Konjevod.
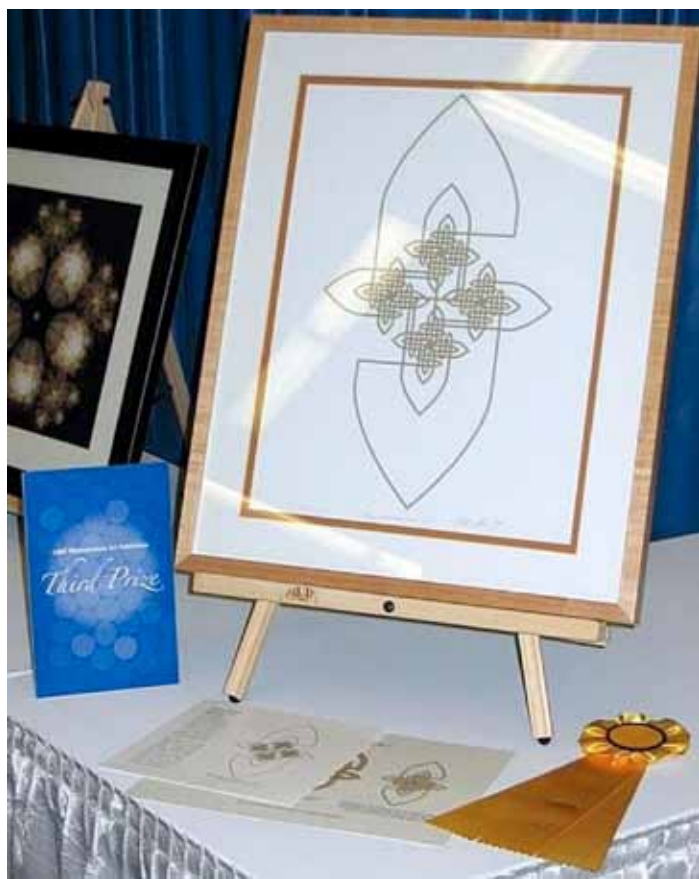
Third place winner "Twice Iterated Knot No. 1, 2008" by Robert Fathauer.

is a pleat tessellation with a peculiar symmetry and tension created by locking the edges to cause the corners to bulge in opposite directions.

University of California, Berkeley Professor Carlo Séquin's "Figure-8 Knot, 2007," on the cover of this issue of MAA FOCUS, was awarded the $300 second prize. The knot is the second simplest which can be drawn in the plane with as few as four crossings. Séquin's particular realization has been modeled as a B-spline along which a crescent-shaped cross section has been swept.

Third place and $200 was awarded to Robert Fathauer for his piece, "Twice Iterated Knot No. 1, 2008." His knot starts with a nine-crossing knot that has been carefully arranged to allow for seamless iteration. The end result was a complex knot possessing self similarity.

The prizes "for aesthetically pleasing works that combine mathematics and art" were established in 2008 through an endowment provided to the AMS by an anonymous donor who wished to acknowledge those whose work demonstrate the beauty and elegance of mathematics expressed in a visual art form.

BIG Events at JMM 2009

Phil Gustafson

The Business, Industry, and Government Special Interest Group of the MAA (BIG SIGMAA) helps to build partnerships and to increase awareness of opportunities for mathematicians in business, industry, government, and academia. The BIG SIGMAA has an active listserv and organizes events every year at the Joint Mathematics Meetings of the AMS and MAA. At the recent JMM in Washington D.C., the BIG SIGMAA hosted a paper session, an invited lecture, and a catered reception. These events were open to all conference participants, and all were very well attended.

Dan Kalman was the speaker for the BIG SIGMAA Invited Lecture, Mathematics in Orbit.

The BIG SIGMAA paper session featured outstanding presentations covering a diverse field of topics. The speakers and their topics are listed below.

- John Gray, U.S. Navy, *The Doppler Effect in Radar as a Source of Mathematics*
- Edmond Nadler, Eastern Michigan University, *Mathematical Surface Modeling Problems in Industry*
- William Fox, Naval Postgraduate School, *Dynamical Systems Modeling in Iraq*
- Joni Baker, Wagner Associates, *Automated Torpedo Classification and Alerting Using Bayesian Methods*
- Travis Cogdill, University of North Texas, *Least Cost Check Routing*
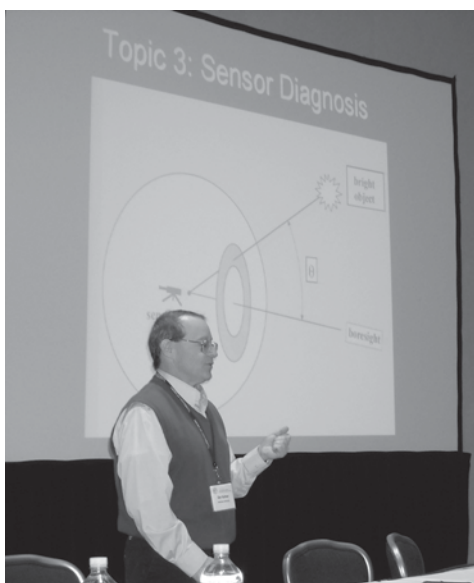- David Joyner, U.S. Naval Academy, *A Short BIG Introduction to Sage*

- Paul Schuette, FDA, *A Mathematical Consideration of the Rule of Three*
- Richard Jarvinen, Winona State University, *Reliability as a Field in Aerospace: A NASA Application*
- James Fife, Educational Testing Service, *A Measure of Inter-Rater Reliability When One Rater is Rating on a Continuous Scale*
- George Woodrow, *Effective Use of Controls in the Clinical Laboratory: Analysis of Traditional and New Algorithms*
- Mike O'Leary, Towson University, *Determining an Optimal Search Area for a Serial Criminal*

Intersecting light-cones are at the heart of space-time triangulation(from Dan Kalman's BIG SIGMAA Invited Lecture, Mathematics in Orbit*).*

This year's BIG SIGMAA Lecture was given by Dan Kalman, who worked in the aerospace industry for eight years before joining the faculty of American University in 1993. His entertaining presentation, "Mathematics in Orbit," highlighted satellite system related problems that can be analyzed using methods of undergraduate mathematics, including ge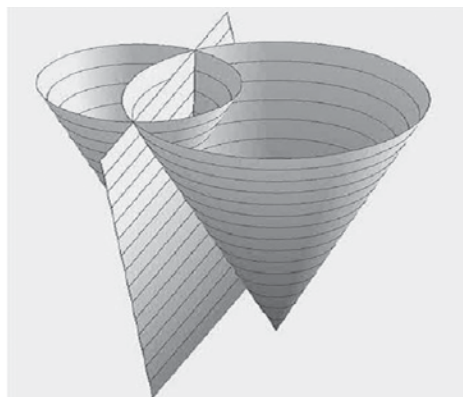ometry, linear algebra, vector calculus, and graph theory. For example, he explained how the GPS system uses a process of space-time triangulation to obtain both a receiver's location and clock time. They are determined by a system of quadratic equations, which can be reduced to a single quadratic equation using standard methods of linear algebra.

MAA members interested in learning more about mathematics in business, industry, and government should look for BIG SIGMAA events at next year's JMM. You can also find out more about BIG SIGMAA, and of course the other SIGMAAs, at the MAA website. ◈

Phil Gustafson is Professor of Mathematics at Mesa State College in Grand Junction, CO, and is Vice Chair for Programs for BIG SIGMAA.

Secretary's Report

Martha J. Siegel, Secretary of the MAA

I am pleased to report that in general the MAA is doing well. Although membership is down slightly, retention is fairly high and the activity level of our core members has been outstanding. The programs and activities at the Carriage House continue to be of the highest quality and many are available to all via the internet.

The MAA Board of Governors met on January 4th and spent quite a bit of time discussing budgetary issues. The economic situation in the country has affected the MAA. Our investments lost money but less than many others did. We are strong, but in this environment we need to consider carefully what our priorities are. The 2008 budget shows a deficit, but the deficit will be about $100,000 less than we had budgeted. The staff worked with the Budget Committee, chaired by Richard Cleary, to find ways to reduce the deficit that had been anticipated when the 2009 budget was presented to the Executive Committee in May 2008. Cleary and MAA Treasurer, John Kenelly, gave reports to the Board. The Treasurer's report is available on the MAA website at http://www.maa.org/treasurer/.

The Board approved a modest increase in dues for 2010, while keeping student dues at the same level as 2009. Members may recall that there was no increase in dues from 2008 to 2009. In a recent change announced by the staff, *gratis* memberships to students who have presented their research at section meetings will no longer be offered. Sections are urged to offer their own incentives to students who give talks at meetings.

As we speak of priorities, it is important to note that we are still engaged in what we hope will be a continuous strategic planning process. New groups now are actively working on Cycle III in the areas of STEM issues, periodicals and communications, meetings, and sections. In every case, we have kept the working groups small but we have tried to involve the membership and the leadership in focus groups to help in charting the course for the Association. Now more than ever, we are using these reports to help us set priorities for the Association.

Those recommendations of the Working Group on Governance that were approved by the Board and that did not require Bylaws changes have now been implemented. The council and committee structure have changed somewhat. Members should consult the MAA web site (under Organization) for the specifics. The *ad hoc* Committee on the MAA Bylaws, chaired by Wayne Roberts, is working on revising the Bylaws to reflect changes in governance as well as to simplify and streamline the document. The membership will be advised and consulted regularly on the recommended changes.

One motion approved by the Board was somewhat bittersweet. Chris Stevens asked that she be allowed to step

Leaders of the BOG: Martha J. Siegel, Secretary, Joe Gallian, President, Tina Straley, Executive Director, and Wayne Roberts, Parlimentarian. Photograph by Fernando Gouvêa.

down as Director of Project NExT in August 2009, after 15 years on the job. The Board acknowledged Stevens' accomplishments and enthusiastically supported the appointment of Aparna Higgins to a five-year term as Director beginning August 16, 2009. Many thanks were expressed for Stevens' work over these last 15 years. It was noted that we now have about 1085 NExT Fellows and are accepting almost 80 new Fellows a year. Stevens, Higgins, Joseph Gallian, Gavin Larose, and Judith Covington all merit our collective and individual thanks. Gallian, Larose, and Covington are expected to continue with Higgins in NExT leadership roles.

Jim Tattersall. Photograph by Fernando Gouvêa.

The MAA Board also voted approval of the 2009 Henry L. Alder Awards recognizing exceptional teachers in the first years of their professional careers. The three winners will be delivering talks at MathFest in Portland, OR. To be congratulated are: Jennifer McLoud-Mann of the University of Texas at Tyler, Scott Annin of California State University at Fullerton, and Sommer Gentry of the United States Naval Academy. See http://www.maa.org/awards/alder.html for information on the Alder Awards. Members are encouraged to nominate exceptional young teachers for this award.

After these meetings, David Bressoud assumes the position of President. Joe Gallian will be Past-President. It is hard to believe that Joe's two-year term as President is drawing to a close. Even in such a short time, his leadership and energy have left a very positive mark on the MAA. Gallian continues on the Executive Committee for another year, and on the Board of Governors for six more years.

Our Associate Secretary for the past 11 years, Jim Tattersall, stepped down at the end of these meetings. Gerard Venema of Calvin College has had a year of serving as Associate Secretary-Elect, and we welcome him to the Board of Governors and to his new position. I want to thank Jim for everything he has done as Associate Secretary. The past years of MathFest and the Joint Meetings have been ones of growth in attendance as well as in the vitality and breadth of programming. Always willing to work with members to provide the best programs and the best facilities, Tattersall, in his characteristic bow tie, smiled through it all and managed to make it all run smoothly. We are truly grateful for having had the opportunity to work with him and we expect to take advantage of his expertise and good humor for a long time.

Rotating off the Executive Committee, Nancy Hagelgans steps down after six years (two terms) as a most meticulous and dedicated chair of the Committee on Sections. We welcome Rick Gillman in that position. We welcome Paul Zorn, chair of the Council on Publications, to the Executive Committee and the Board as a representative of publications. At these meetings, Michael Henle, the new editor of the *College Math Journal* joined the Board. Lowell Beineke left the *Journal* in excellent shape and we thank him for his additional service as publications representative to the Executive Committee for several years. To Art Benjamin and Jenny Quinn, we extend our thanks for all they have contributed as editors of *Math Horizons*. And we welcome new editors Bruce Torrence and Stephen Abbott. We also welcome Walter Stromquist, who begins a one-year term as the Editor-elect of *Mathematics Magazine*.

After these meetings, new Governors-at Large join the Board: Judith Covington will serve as Governor-at-Large for Teacher Education, replacing Jeremy Kilpatrick, and Gregory Coxson will serve as Governor-at Large for Mathematicians in Business, Industry, and Government replacing Peter Stanek.

Since some section governors cycle off the Board at the end of June, this has been their last Board meeting. We are truly grateful for the service of the past governors-at–large and those who have served as section governors and look forward to having them continue to serve on committees of the MAA. Section Governors with terms expiring June 30, 2009: Andrew Bennett (Kansas Section), Yungchen Cheng (Missouri Section), Patricia Kenschaft (New Jersey Section), Ockle Johnson (Northeastern Section), Judy Palagallo (Ohio Section), Nancy Neudauer (Pacific Northwest Section), Robert Rogers (Seaway Section), Ellen Kirkman (Southeastern Section), and Janet McShane (Southwestern Section).

We are preparing for national elections this spring. I know that seems crazy… our new President has been in the position for only a week as I write this! The Board of Governors voted several years ago that the Association

At the Board of Governors meeting: Gerard Venema, incoming MAA Associate Secretary, Robert Vallin, Associate Director for Student Programs, and Steven Dunbar, Director of Competitions. Photograph by Fernando Q. Gouvêa.

should progress to electronic elections. The 2009 ballots will be sent by email. If MAA does not have an email address for you, be sure to inform us. Directions are posted at maa.org. Members who cannot vote by email can request a paper ballot. Many thanks go to the Nominating Committee: Jean Bee Chan, Carl C. Cowen, Chair Barbara Faires, Ronald Graham, and Deanna Haunsperger for selecting very strong candidates.

The first MAA-AMS-SIAM Judith and Gerald Porter Public Lecture was scheduled for January 8. Unfortunately, speaker Steven Strogatz took ill and the lecture was cancelled. We are grateful to the Porters for providing the support for this outreach effort and we look forward to hearing Steve Strogatz at the rescheduled lecture at next year's Joint Meetings in San Francisco.

We urge members to consult the MAA website for a schedule of future meetings. Some dates have been changed since originally announced, so it is a good idea to look to the web. We also encourage members to look for the various web-based sources of meeting information, which are always up-to-date and contain lots of useful information. Start at http://www.maa.org/mathfest.

Another innovation at these meetings were the AMS–MAA Awards for Mathematical Art, given for the first time in Washington. Thanks to an anonymous donor, there will be annual prizes (1st, 2nd, and 3rd place) for art work shown in the Joint Meetings Art Exhibit. The winning works will be highlighted on our website. This

year, the MAA judges were Tom Banchoff and Annalisa Crannell. See the article on page 26 for more information on this year's winners.

These meetings cannot take place without the dedicated work of volunteers and MAA staff. Since the meetings were in DC, there was more interaction with MAA staff at the hotel and at headquarters facilities. We thank Tina Straley, Michael Pearson, Bryan Lane, the Directors, and all the MAA staff for their support and hospitality. As always, thanks to Jim Tattersall and Gerard Venema, the chairs of the many meetings committees for providing the scientific program.

The MAA Program Committee for these Joint Math Meetings was: Art Benjamin, Manjul Bhargava, Carl Cowen, Joseph Gallian, Jeffrey Lagarias, Jennifer Quinn, Carol Schumacher, John Stillwell, Jim Tattersall (*ex off.*), (Chair) Daniel Ullman, and Gerard Venema (*ex off.*). Those MAA representatives to the AMS-MAA Joint Program Committee for JMM 2009 in Washington, DC were Joseph Gallian and Daniel Ullman.

The MAA Business Meeting was typically brief. Of particular note is that the MAA Board of Governors signed a letter of thanks to John Ewing as he leaves the position of Executive Director of the American Mathematical Society. Ewing is the new Director of Math for America.

My term as Secretary expires next January and I hope to welcome a Secretary-Elect within a few months. Any successes I have had in this position are due primarily to the spirit and dedication of the many MAA volunteers who are willing to do so much to advance the profession. We have an Association of talented, generous, and scholarly colleagues. Many are among my most treasured friends. I owe a tremendous debt to the outstanding staff in Washington, DC and Lincoln Nebraska, and to my assistant, Denise Raspa. Without the continued support of Towson University and the Mathematics Department, none of this could have been possible. Many thanks to all as we begin the transition to a new Secretary! 🔶

The Undergraduate Poster Session

Diana M. Thomas

It has been just over ten years since my first student presented a poster at the Joint Mathematics Meetings. I remember him dressed in his West Point cadet uniform standing in a small room with thirteen other poster presenters. Over the past ten years, the growth of the session has been tremendous. This year was no exception. We had over 220 posters and close to 300 presenters from institutions all over the country. As the poster session grows, the need for professional mathematicians to judge the session also increases. Every year, Project NeXT fellows and judges from previous sessions continue to fill this need by volunteering their time and providing meaningful feedback to students on their work. Without their support, the session would not be the unique experience it has come to be.

The size of the session has required more structure and organization to make sure that the day runs smoothly. There were over 200 advisors and almost 250 mathematicians who served as judges. I wish to mention the specific advisors who volunteered to register students, monitor the ballrooms and enter scores this year: many thanks to Chad Westphal, Theirry Zell, Frank Morgan, Joyati Debnath, Narayan Debnath, Michele Intermont, Lester Caudill, Roger Thelwell, Kristin Camenga, Lisa Clark, and Sarah Day. Many other advisors and judges simply signed up on the day of the session after hearing from colleagues that help was needed. As in the past, Michael O'Leary from Towson State University

Madiha Aslam (Rockhurst University) explains her work to a judge.

developed an electronic scheme to enter scores quickly, Mario Martelli from Claremont Graduate University entered session scores, and Suzanne Lenhart from University of Tennessee, Knoxville organized the prizes for the session. I want to express a special thank you to our own Montclair State University students, Stewart Hegevold, Andrew Huth, Christina Gratale and Leslie Chetyan, who spent the entire time at the session running numerous errands and helping students with poster setup. The support of our community to make the session a success is well appreciated.

This year's session had a unique element in that the students were able to meet electronically before the actual day of the session to organize social events and offer each other advice. Students helped each other prepare posters by providing LaTeX and design tips. Luis Suazo from University of Central Arkansas had been a poster session prize winner for three consecutive years and provided his perspective to future student participants in a short article which can be found on *Facebook*'s "MAA Undergradate Poster Session" group. Several students worked out in the morning by participating in running groups, some got together for a musical jam session, and a crowd even went swing dancing the evening before the session. At lunch the day after the event, the students remarked how the poster session really brought them together as a community.

There were 33 prize winners this year. The prize winning posters covered a wide breadth of topics, including mathematical pedagogy, voting theory, discrete math, mathematical biology, and number theory. The prizewinning poster

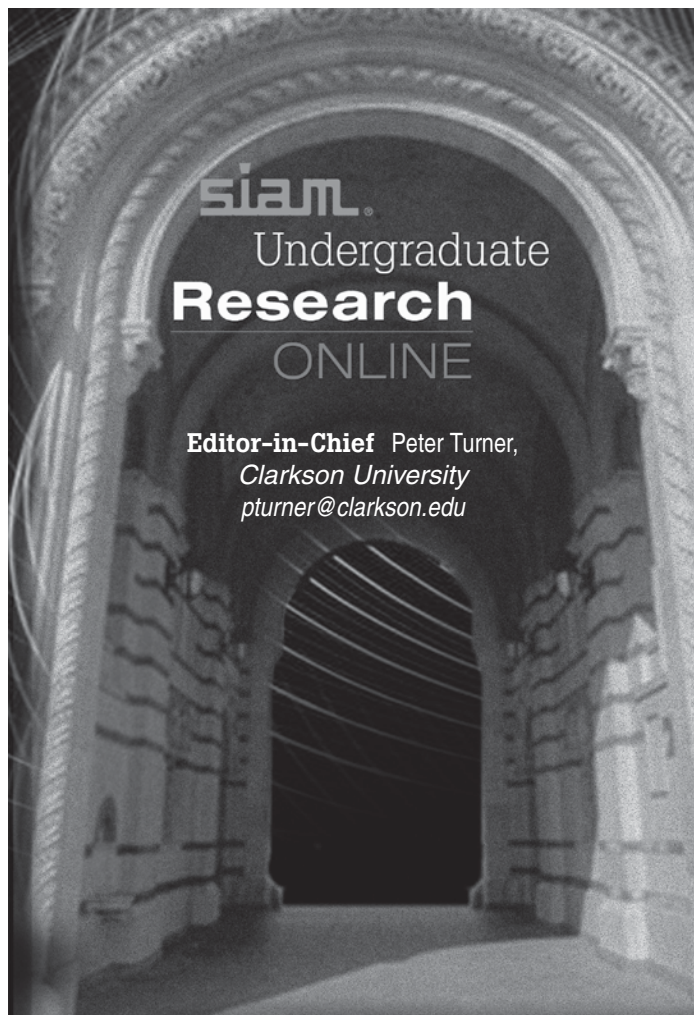*Musician Rob Schneider prepares his poster.*
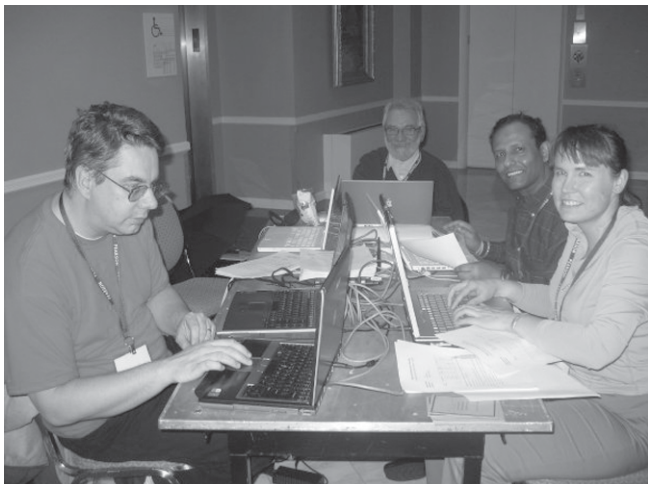
The judges enter scores into an interconnected database.

The MAA 2009 Undergraduate Poster Session Prize Winners.

presenters came from home institutions that ranged from small liberal art colleges to tier one research institutions. A list of prize winners can be found at http://www.maa.org/students/undergrad/pastwinners.html. The

poster session is the experience it is because of all of those involved; students, advisors, judges, volunteers, and the poster audience. I hope to see everyone back again at JMM 2010 in San Francisco! 🖐

PMET's Park City Workshops Help Re-engage Mathematicians in School Mathematics

Alan Tucker

For the past five summers, groups of research mathematicians interested in school mathematics have met at the Park City Mathematics Institute for three-day workshops including input from teachers and mathematics educators. The first meeting was funded by an individual NSF grant. Subsequent meetings were spart of the MAA's Preparing Mathematicians to Educate Teachers (PMET) program, directed by Alan Tucker and Bernie Madison and also funded by NSF.
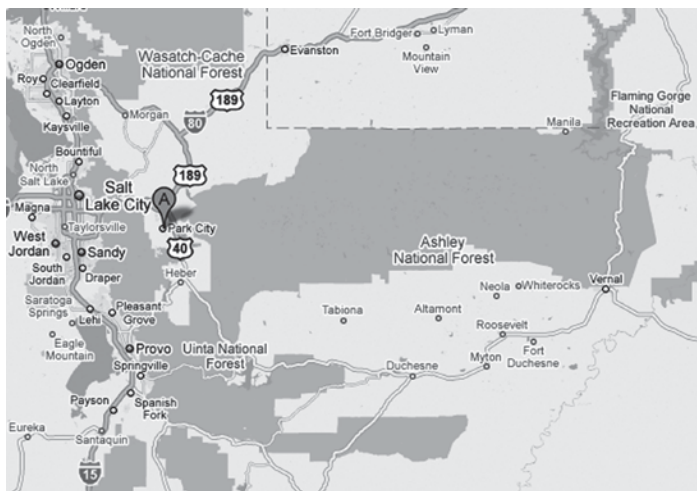
Alan Tucker and Roger Howe organized the workshops, focusing first on key mathematical concepts in elementary school (2004, 2005) and then on key concepts in middle school, especially fractions (2006, 2007, 2008). In the first two years, the workshops consisted only of mathematicians, who interacted to some extent with a group of mathematics educators and teachers also meeting at Park City. Each following year an increasing number of mathematics educators and teachers were included. Six working papers have emerged from these workshops; they can be read at the PMET website, http://www.maa.org/pmet. Also there is a detailed summary of the 2007 workshop discussions that highlighted the difficulties that arise when mathematicians and mathematics educators discuss instruction about fractions. The 2008 working paper, *Thinking about Fractions*, shows how these difficulties were resolved.

The primary activity of the PMET grant was running summer workshops for faculty who teach prospective teachers. Each PMET workshop had as guest speakers mathematicians with interesting views about school mathematics. However, workshop participants expressed some frustration that there existed no collective statements by mathematicians comparable to NCTM's *Principles and Standards of School Mathematics*. The Park City workshops were sponsored by PMET in order to produce essays that could serve as first steps at creating such collective statements. The workshop working papers are also meant to be a resource for pre- and in-service professional development for teachers.

Since their publication in 1989, the NCTM *Standards* have served as the basis for most school mathematics standards, curricula, and textbooks, as well as for the accreditation of teacher preparation programs. In initial efforts to reform school mathematics, many mathematicians felt like frustrated bystanders. However, mathematicians are now being asked to play a major role in creating standards and curricula in some states and in national efforts, such as Achieve. Many of the mathematicians involved in such efforts participated in the Park City workshops and are drawing upon the Park City discussions and working papers in their work.

The discussions from which the working papers evolved were as important as the papers. They illustrated the challenges and opportunities that arise when mathematicians with diverse viewpoints try to find common ground among themselves about school mathematics. Discussions between the mathematicians and mathematics educators stimulated as much disagreement between individual mathematicians as between mathematicians and mathematics educators. At the same time, the mathematicians were eager to learn about research by mathematics educators that clarified the sequence of steps by which young children learn key mathematical concepts.

The Park City workshops developed ties with the Common Ground initiative of Richard Schaar, who headed a Business Roundtable task force on the mathematical skills of the workforce. Schaar had been working to end the "Math Wars" in order to focus the energies of all the

"warriors" on improving U.S. school mathematics educa-tion. The PCMI workshops and the resulting essays were responsible for much of the groundwork that set the stage for harmonious proceedings at Schaar's 2006 Common Ground conference (funded by a supplement to the PMET grant) and the cordial reception later that year of the NCTM *Curriculum Focal Points* report, a preview of which was the focus of the Common Ground conference.

We believe that the cumulative impact of PMET efforts to give forums to mathematicians to talk and write and discuss school mathematics has gone a long ways towards re-engag-ing mathematicians in school math instruction. Historically,

that long-standing engagement was destroyed with the demise of the 1960s "New Math." While mathematicians were missing in the development of the 1989 NCTM *Standards* and had limited input to the 2000 revision, today they are an integral part of the NCTM *Curriculum Focal Points* initiative, Achieve's American Diploma Proj-ect, and similar efforts at the national and state levels.

Alan Tucker is Distinguished Teaching Professor at the Depart-ment of Applied Mathematics and Statistics at the State Univer-sity of New York at Stony Brook.

North Central Section to Host a "Tope-Notch" Summer Seminar

Jason Douma

What might we expect to find in the interface of classi-cal subject matter and contemporary computational methods? What lies at the intersection of depth and simplic-ity? How many secrets can a convex polytope reveal in one short week? Participants in the MAA North Central Section's 2009 Summer Seminar will soon find out, as they embark on a tour of combinatorial geometry.

The MAA North Central Section continues its tradition of eclectic biennial summer seminars with this year's upcom-ing installment, titled ACTUALLY DOING IT! A Hands-On Approach to Computational Combinatorial Geometry. The week-long event will feature as principal lecturer Professor Jesús De Loera from the University of California, Davis.

Professor De Loera will guide participants through this beautiful area of geometry, which deals with geometric struc-tures composed of finitely many elements, including convex polytopes, hyperplane arrangements, and point configura-tions. Participants will encounter fascinating computational problems that are at once profoundly deep and important, yet beautiful and simple to understand. Sessions will include daily hands-on laboratories using software specifically geared toward these structures.

De Loera's interests in discrete and computational geometry have afforded him regular crossover contact as a member of the graduate groups in both applied mathematics and com-

puter science at UC Davis. Prior to his current role in the University of California system, Professor De Loera held positions at the Geometry Center at the University of Minnesota, the Swiss Federal Technology Institute, the Mathematical Sciences Institute at Berke-ley (where he organized a special semester on Discrete and Computational Geometry), and the Universität Magdeburg in Germany. Dr. De Loera's research has been recognized through an Alexander von Humboldt Award. His excellence in teaching and his service to students have been widely recognized through a num-ber of institutional awards.

The 2009 MAA-NCS Summer Seminar will take place on the picturesque campus of St. John's University in Collegeville, Minnesota, during the week of July 19-24. Affordable on-campus room and board arrangements will be available to participants who are interested in taking in the full retreat experience. Curious mathe-matical minds from all backgrounds and locations are invited to attend. Additional information, including registration details, may be found at the MAA-NCS Summer Seminar website (http://pages.usiouxfalls.edu/maa/summersem.htm) or by contacting Professor Jennifer Galovich (jgalovich@csbsju.edu) of St. John's University.

Call For Papers: Contributed Paper Sessions at MathFest 2009

The Mathematical Association of America will hold its eighty-seventh summer meeting Thursday, August 6, through Saturday, August 8, in Portland, Oregon. The complete program will appear in the March/April 2009 issue of MAA FOCUS. This announcement is designed to alert participants to contributed paper sessions and their deadlines. Please note that the scheduling of the sessions remains tentative and could change.

The organizers listed below solicit contributed papers pertinent to their sessions. Sessions generally limit presentations to 15 minutes. Presentations in the general session will be limited to ten minutes. Each session room will be equipped with a standard overhead projector, a computer projector, and a screen. Speakers are encouraged to make use of the computer projector but must provide their own laptop computer or have access to one.

Contributed Paper Sessions

Effective Use of Dynamic Mathematical Software in the Classroom
Murphy Waggoner, Simpson College
Thursday morning

The History and Philosophy of Mathematics, and Their Uses in the Classroom
Bonnie Gold, Monmouth University
Amy Shell-Gellasch, Pacific Lutheran University
Janet Beery, University of Redlands
Charlotte Simmons, University of Central Oklahoma
Friday afternoon

Graph Theory and Applications
Ralucca Gera, Naval Postgraduate School
Saturday afternoon

Advances in Recreational Mathematics
Paul R. Coe, Dominican University
Kristen Schemmerhorn, Dominican University
Thursday afternoon

Fascinating Examples from Combinatorics, Number Theory, and Discrete Mathematics
Pallavi Jayawant, Bates College
Todd Cadwallader Olsker, California State University, Fullerton
Friday morning

Resources for Teaching Math and the Arts
Douglas Norton, Villanova University
Thursday afternoon

Active and Innovative Learning Approaches for Pre-service Mathematics Teachers at the K–12 and University Levels
Elizabeth Burroughs, Montana State University
Cheryl Beaver, Western Oregon University
Laurie Burton, Western Oregon University
Jessica Deshler, West Virginia University
Klay Kruczek, Western Oregon University
Friday afternoon

Biomathematics in the Undergraduate Curriculum
Timothy D. Comar, Benedictine University
Saturday afternoon

Getting Students Involved in Writing Proofs
Rachel Schwell, Central Connecticut State University
Jennifer M. Franko, The University of Scranton
Aliza Steurer, Dominican University
Saturday morning

Effective Ways to Teach Upper Level Mathematics Courses for Secondary Mathematics Education Majors
Joyati Debnath, Winona State University
Friday afternoon

Teaching Numerical Methods
Kyle Riley, South Dakota School of Mines & Technology
Friday afternoon

Current Research in Mathematics Education for In-service Teachers
Nancy Leveille, University of Houston-Downtown
Carol Vobach, University of Houston-Downtown
Thursday afternoon

General Contributed Paper Session
Sarah Mabrouk, Framingham State College
Thursday, Friday, and Saturday mornings and afternoons

Submission Procedures for Contributed Paper Abstracts

To submit an abstract for MathFest 2009, go to http://www.maa.org/abstracts and follow the instructions found there. 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.

An abstract should not be submitted to more than one session. Each participant may submit at most two contributed paper session abstracts. If your paper cannot be accommodated in the session for which it was submitted, it will be automatically considered for the general contributed paper session, unless you indicate otherwise. In scheduling talks in the general contributed paper session, preference will be given to authors who have not had a paper accepted in another session. Speakers will be limited to at most one presentation in any given session. Abstracts must reach the MAA by Friday, May 1, 2009. Early submissions are encouraged.

Call for Student Papers

The deadline for receipt of applications for student papers is Friday, June 12, 2009. Students may not apply for funding from both MAA and PME. Every student paper session room will be equipped with a standard overhead projector, a computer projector (presenters must provide their own lap-

tops or have access to one), and a screen. Each student talk is 15 minutes in length.

MAA Sessions

Students who wish to present at the MAA Student Paper Sessions at MathFest 2009 in Portland, Oregon, must be sponsored by a faculty advisor familiar with the work to be presented. Some funding to cover costs (up to $600) for student presenters is available. At most one student from each institution or REU can receive full funding; additional such students may be funded at a lower rate. All presenters are expected to take full part in the meeting and attend indicated activities sponsored for students on all three days of the conference. Nomination forms and more detailed information for the MAA Student Paper Sessions will be available at http://www.maa.org/students/undergrad/ by mid February, 2009.

Pi Mu Epsilon Sessions

Pi Mu Epsilon student speakers must be nominated by their chapter advisors. Application forms for PME student speakers will be available by March 1, 2009 on the PME web site http://www.pme-math.org or can be obtained from PME SecretaryTreasurer Leo Schneider, who can be reached by email at leo@jcu.edu. A PME student speaker who attends all the Pi Mu Epsilon activities is eligible for transportation reimbursement up to $600, and up to five speakers per Chapter may be eligible for full or partial reimbursement.

SIGMAA on Circles

A new Special Interest Group within the MAA has been approved: the SIGMAA on Mathematics Circles for Students and Teachers. It will be known as the "SIGMAA on Circles."

The new SIGMAA's charter defines a *math circle* as "an informal or semi-formal educational enrichment experience that complements the pre-collegiate mathematical instruction by bringing mathematicians and mathematical scientists in direct contact with pre-college students and/or their teachers in order to explore over an extended period of time mathematical themes, problems, and topics beyond the typical K–12 curriculum. Although the styles of math circles vary considerably, the goal of any math circle is to foster passion and excitement for mathematics." Many such circles, for both students and teachers, now exist, and the new SIGMAA "will support MAA members who share an interest in

developing, supporting and running math circles and will facilitate vertical integration of elementary, middle and high school students, their teachers, undergraduate and graduate students, and faculty up through high-level research mathematicians."

Jim Tanton has been appointed as chair of the SIGMAA on Circles for 2009, with Tatiana Shubin serving as chair-elect. Ted Courant will be the first Program Coordinator, Josh Zucker will fulfill the role of Secretary-Treasurer, and James Taylor will serve as the Newsletter/Web Page Editor. Members interested in joining the new SIGMAA should contact Tatiana Shubin at: shubin@math.sjsu.edu.

To the Editor

Working for a Semester

Bill Fenton's article "Working for a Week," in the December 2008 MAA FOCUS, was interesting to me. I usually "work for the entire semester!" Every early-August and mid-December I browse through any new text, departmental syllabus, and homework problems, then get to work on my lecture notes, usually finishing or almost finishing them for the semester. I spend an hour or two per day on this, depending, and take off weekends or any other days I like. All this has the same advantages described in Bill Fenton's article, such as better overview, more continuity from one lecture to the next, and having to get focused fewer times.

Other advantages are: On the first day of class I have a very clear idea of what the course will be and therefore can summarize the course to the class and answer questions that students might have. During the term I can concentrate on making up quizzes and tests, grading, xeroxing, meeting with students, and my own pursuits.

I've been working this way ever since I began teaching. It makes me feel more relaxed; like Bill Fenton, I never have that deadline feeling, and I feel more in control. Also, during the weeks before a new semester I'm not doing my preparation simultaneously with teaching, grading, or traveling to and from work.

True, many teachers don't want to give up their breaks. But many also tend to feel nervous during the weeks before a new semester. For those teachers, preparation can help offset nervousness and besides, if we're going to spend a month feeling nervous, we might as well get some work done.

Of course, during the semester, I also do some amount of "work for a day." For example, just before each class I read over my lecture notes, sometimes making changes and additions (or, in my case, writing helpful jingles and limericks in they occur to me). But this "work for a day" is minimal, and it's nice to know that it's also optional.

Marion D. Cohen
Arcadia University

The Farris Window and the Kline Tattoo

I was very interested in Frank Farris's article "A Window on the Fifth Dimension" in the November 2008 issue of MAA FOCUS. At the end of the summer, I had decided to get a

tattoo and settled on a design that I came up with in collaboration with the tattoo artist. There were three elements that I wanted to be incorporated into the design: A fractal, a star, and a lily.

I have my personal reasons for the second and third aspects of the design, but I wanted it to resemble a fractal to incorporate my passion for mathematics and the huge role it has played in my life, much like Farris's reason for having the stained glass window created. I knew a full fractal would not be practical, though, for a tattoo, so I just wanted it to resemble one.

When I saw Farris's window on the cover of the MAA FOCUS, I was thrilled. Our designs are very similar, though we came about them in two very different ways. For me it was more a matter of doodling and playing around with different angles and considering various designs with repetitive natures. It was fantastic to read the article and learn another way to think about the design that I had chosen. If I have learned one thing by being a math student, it's that any particular mathematical truth can and will show up in many areas of math and in life itself.

I have attached a picture of my tattoo. It's on my left shoulder and I decided to have it done in brown, with the color fading into my skin color in the center.

Jessica Kline
Virginia Tech

Election for Section Governors in 2009

Voting for the 2009 Section Governors is now underway. Ballots were sent out in early February for the following sections:

Kansas

Missouri

New Jersey

Northeastern

Ohio

Pacific Northwest
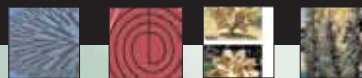
Seaway

Southeastern

Southwestern

Members can vote in two ways: using the reply envelope enclosed in their ballot or online. Please go to www.maa.org/voting/sg to vote online. All ballots must be received or cast no later than 12:00 noon EST March 11, 2009. We encourage everyone to vote!

MAA FOCUS Deadlines (new schedule)

	August/Sept	*Oct/Nov*	*Dec/Jan*
Editorial Copy	June 16	August 15	October 14
Display Ads	June 23	August 28	October 27
Employment Ads	June 16	August 15	October 14
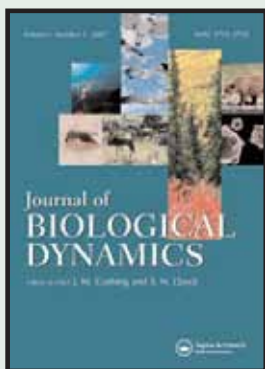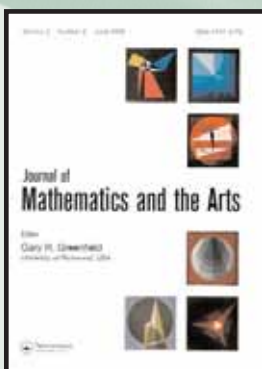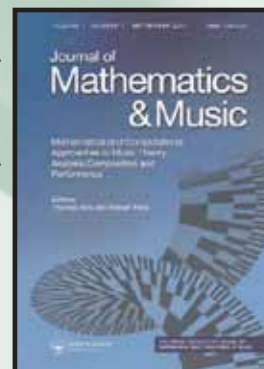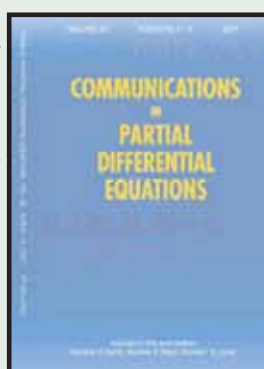
Calculus Deconstructed:
A Second Course in First-Year Calculus
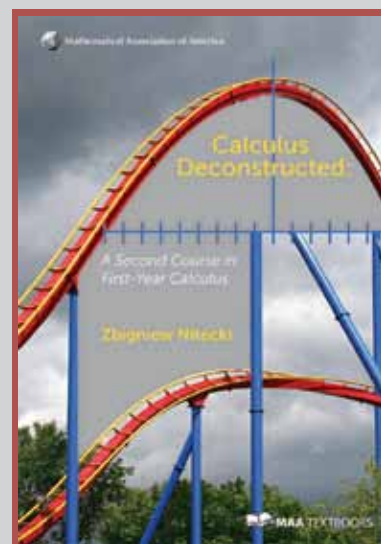
Zbigniew H. Nitecki

A thorough and mathematically rigorous exposition of single-variable calculus for readers with some previous exposure to calculus techniques but not to methods of proof, this book is appropriate for a beginning Honors Calculus course assuming high school calculus or a "bridge course" using basic analysis to motivate and illustrate mathematical rigor. It can serve as a combination textbook and reference book for individual self-study. Standard topics and techniques in single-variable calculus are presented in the context of a coherent logical structure, building on familiar properties of real numbers and teaching methods of proof by example along the way. Numerous examples reinforce both practical and theoretical understanding, and extensive historical notes explore the arguments of the originators of the subject.

No previous experience with mathematical proof is assumed: rhetorical strategies and techniques of proof (reductio ad absurdum, induction, contrapositives, etc.) are introduced by example along the way. Between the text and the exercises, proofs are available for all the basic results of calculus for functions of one real variable.

650 pp., Hardbound 2009
ISBN: 978-0-88385-756-4
List: $72.50
MAA Member: $57.95
Catalog Code: CDE

Can be used for the first semester of the (freshman) Honors Calculus course for students with high school calculus background. Also suitable for a "bridge" course using basic analysis.

Also available with a Solutions Manual:

Instructors who adopt the book for a course will receive a Solutions Manual that contains solutions to all of the problems contained in the book.

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