

AWM

ASSOCIATION
FOR WOMEN IN
MATHEMATICS

Volume 37, Number 2

NEWSLETTER

March–April 2007

President's Report

To AWM Members: Greetings!

I have the pleasure of announcing the following:

- Rebecca Goldin is the first Michler Prize winner. The Michler Prize provides a fellowship for the awardee to spend a semester in the Mathematics Department of Cornell University without teaching obligations, thanks to the generosity of the Michler family.
- In May, Lai-Sang Young will give the Kovalevsky Lecture at the Applied Dynamical Systems Activity Group meeting in Snowbird, Utah.
- In July, Pauline van den Driessche will give the first Olga Tausky Todd Lecture at the International Council for Industrial and Applied Mathematics Congress in Zurich. This lecture is organized by AWM and European Women in Mathematics.
- At the same meeting, Nancy Kopell will give the John von Neumann Lecture.

At this year's Joint Mathematics Meetings in New Orleans, there were AWM events each day. The AWM panel "Women Advancing to Leadership: When and How" was organized by our now past president Barbara Keyfitz. The topic of this panel seems very fitting for someone who is a leader twice over, as president of AWM and as director of the Fields Institute. The panelists were: Lisa Fauci, professor of mathematics at Tulane University, also founder and associate director of the Center for Computation at Tulane and Xavier; Joan Leitzel, president emeritus of the University of New Hampshire; Carolyn Mahoney, president of Lincoln University; Johanna Levelt Sengers, National Institute of Standards and Technology; and myself.

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The purpose of the Association for Women in Mathematics is

- to encourage women and girls to study and to have active careers in the mathematical sciences, and
- to promote equal opportunity and the equal treatment of women and girls in the mathematical sciences.

AWM was founded in 1971 at the Joint Meetings in Atlantic City.

The *Newsletter* is published bi-monthly. Articles, letters to the editor, and announcements are welcome.

Circulation: 3500. © 2007, AWM

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I will describe just one aspect of this very interesting panel. Johanna Sengers is a physicist, winner of the L'Oréal–UNESCO Award, and a co-chair of the panel that wrote “Women for Science: An Advisory Report.” Barbara has summarized this report in her President’s Report for September 2006. I will reiterate just one of its recommendations: Change needs to occur at the academy level; that is, national scientific bodies need to attend to the “good management practices” advocated by the report. “Essential features of good management practice are commitment by the top tiers of the organization, creation of an open and transparent management structure, regular review of all policies and procedures for their gender implications, leadership training and mentoring, and routine monitoring of progress.” Note that the report was commissioned by the Interacademy Council, which was created “to mobilize the best scientists and engineers worldwide to provide high quality advice to international bodies—such as the United Nations and the World Bank—as well as to other institutions.”

Prior to the panel, the Schafer Prize winners were honored. Ana Cariani of Princeton received the Schafer Prize (I was pleased to see that this was announced on the Princeton mathematics department website). The runners-up were Tamara Broderick and Yaim Cooper. Alyson Deines received an honorable mention.

After the panel, the “passing of the silver bowl” ceremony and the AWM business meeting were held.

The Noether Lecture, “Automorphisms of Free Groups, Outer Space, and Beyond,” was given by Karen Vogtmann and followed by lunch with the lecturer.

In conjunction with this splendid lecture, three sessions on geometric group theory were organized by Vogtmann and Ruth Charney.



Former AWM President Barbara Keyfitz passes the silver bowl to incoming president Cathy Kessel.

In the afternoon was the prize session. Among the honors:

- AWM Executive Director Jenny Quinn received a Haimo Award for Distinguished Teaching. (Note that she won the Beckenbach Book Prize last year!)
- Ginger Warfield received AWM’s Louise Hay Award for contributions to mathematics education.
- Claire Voisin received AMS’s Ruth Lyttle Satter Prize for an outstanding contribution to mathematics research during the previous five years.

- Karen Uhlenbeck received the AMS's Steele Prize for a seminal contribution to mathematical research.
- Donna Beers, Janet Barnett, Sister Jo Ann Fellin, and Marilyn Repsher received Certificates of Meritorious Service from the MAA.
- Lee Lorch received the MAA's Gung and Hu Award for distinguished service to mathematics.

That evening, those attending the Gibbs Lecture spilled into the hall for the AWM reception. The next evening, I had the pleasure of meeting the mentors, graduate students, and post-docs for AWM workshop, and the next day, seeing some of the mentees' posters and talks. The workshop included a panel on "Critical Career Decision Stages: Research and Funding Opportunities." Moderator Claudia Polini and panelists Michelle Wagner, Valentina Harizanov, Barbara Keyfitz, and Kathy O'Hara discussed topics that ranged from research program considerations to timing of children. Many thanks to the mentors and to the workshop organizers, Claudia Polini, Jeanne Clelland, and Moira McDermott, for giving their time and energy so generously. Thanks also to the workshop funders, the Office of Naval Research and The National Security Agency. Many thanks also to Jenny Quinn, Jennifer Lewis, and Bettye Anne Case for their work in making the AWM events happen.

Finally, I wish to acknowledge the accomplishments of my predecessor Barbara Keyfitz. I believe that each AWM president enriches AWM in her own way. In addition to the usual activities of AWM presidents, Barbara has overseen AWM's transition to STAT, our association management company, and the hiring of Jenny Quinn as our executive director. I feel very fortunate in becoming president after this transition. Jenny Quinn and Jennifer Lewis, our managing director, are now familiar with the intricacies of AWM and its many programs—and form a remarkably harmonious and effective team.

As each president does, I come to AWM with my own particular concerns and connections. I intend to put most effort into continuing the implementation of our strategic plan and smooth functioning of our current programs.

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues (Membership runs from Oct. 1 to Sept. 30)

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Contributing: \$125	First year, retired, part-time: \$30
Student, unemployed, developing nations: \$20	
Friend: \$1000	Benefactor: \$2500

All foreign memberships: \$10 additional for postage

Dues in excess of \$15 and all contributions are deductible from federal taxable income when itemizing.

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Level 1: \$300
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See www.awm-math.org for details on free ads, free student memberships, and ad discounts.

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Subscriptions and back orders

All members except family members receive a subscription to the newsletter as a privilege of membership. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for \$55/year (\$65 foreign). Back orders are \$10/issue plus shipping/handling (\$5 minimum).

Payment

Payment is by check (drawn on a bank with a US branch), US money order, or international postal order. Visa and MasterCard are also accepted.

Newsletter ad information

AWM will accept advertisements for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Managing Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the Newsletter must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is \$100 for a basic four-line ad. Additional lines are \$12 each. See the AWM website for *Newsletter* display ad rates.

Newsletter deadlines

Editorial: 24th of January, March, May, July, September, November

Ad: 1st of February, April, June, August, October, December

Addresses

Send all **Newsletter** material **except ads and book review material** to Anne Leggett, Department of Mathematics and Statistics, Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; e-mail: leggett@member.ams.org; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Bayer, Department of Mathematics, University of Kansas, 405 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523; e-mail: bayer@math.ku.edu; fax: 785-864-5255. Send everything else, **including ads and address changes**, to AWM, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030; phone: 703-934-0163; fax: 703-359-7562; e-mail: awm@awm-math.org.

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Website and Online Forums

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To subscribe, send mail to awm-net-request@cs.umd.edu and include your e-mail address; AWM members only.

AWM DEADLINES

NSF-AWM Travel Grant:
 May 1, 2007 and October 1, 2007

Louise Hay Award: April 30, 2007

Sonia Kovalevsky High School Mathematics
 Days: August 3, 2007

AWM Workshop: August 31, 2007

AWM Essay Contest: November 2, 2007

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At the same time, I hope that AWM can reach out a little more. As Ginger Warfield's column on non-standard careers has documented, women don't always follow a standard career path. That non-standardness sometimes includes time to Ph.D., and I hope that we can do a little more to welcome and support those who have followed such paths.

This is a time of great public interest in mathematics education. I hope that it may afford us new opportunities to improve public understanding of mathematics—and the careers of women in mathematics.



Cathy Kessel
 Berkeley, CA
 February 4, 2007



From the Past President

It has become traditional for an AWM president to end her term by giving a summary of the activities that took place during her tenure. The report I gave to the Executive Committee on January 5, 2007 follows. Again, many thanks to all who helped during my presidency.

I am pleased to present this report on the "State of the Association." Within a few weeks, I will be concluding my term as president, and Cathy Kessel will become the President of AWM. Let me begin by thanking the membership for giving me this opportunity to work for the Association. It has been a wonderful experience. One of the things that have made it so has been the maturing of our relationship with our Association Management Company, STAT. Jennifer Lewis has pulled my chestnuts out of the fire more times than I would care to recall, and in this and many other ways is living up to the promise that was made at the beginning of our contract: that STAT would take care of our infrastructure so that we could spend our time advancing AWM's mission. Jenny Quinn has now been working as a "part-time" executive director for over a year and has surpassed expectations in every respect, including working with a large number of volunteers, communicating with STAT to produce a seamless headquarters operation, and writing everything from proposals to press releases.

Infrastructure: The changes members had begun to see last year have continued. The membership database continues to improve. This year we have introduced an on-line application process for travel grants, and I hope we will be able to extend it to all our competitions. We have also recently moved to a new EC listserve, and we have hired a student worker to help Jenny keep the AWM Web pages up to date. The bi-monthly EC telephone meetings seem to have become institutionalized, and I hope Cathy will continue this.

We have just completed a piece of unfinished business: a brochure about Louise Hay that will now be distributed along with the profile of each year's winner of the Hay award. It is a special pleasure that this year's winner, Ginger Warfield, was recently a member of the AWM EC. In our participation in the Joint Committee on Women, we seem to be taking better advantage of this opportunity to communicate with the other mathematical societies about issues of interest to women and to AWM members. Ellen Maycock at AMS has made the smooth functioning of this committee a special concern of hers. Our current representatives are Judy Green and Maura Mast.

Finally, I have enjoyed the opportunity given to the AWM president to organize a panel discussion at the Joint Math Meetings. Last year's topic, "Laurence Summers, One Year Later," led to an interesting, lively and well-attended session. This year we have really taken it to a higher level, with a panel discussion on "Women Advancing to Leadership," to which we invited Johanna Levelt Sengers, co-author of the 2006 Interacademy Council report on "Women for Science." She will be joined by two university presidents—Carolyn Mahoney and Joan Leitzel—and by Cathy Kessel and Lisa Fauci. That will be this afternoon, and I hope everyone will join us.

Advances in Activities: I am pleased to list a number of ongoing activities that have made strides in the past year. One is the "Teacher Partnership," on which you will read a report by Suzanne Lenhart. Another is a "women in math" poster project. This is a mostly decentralized initiative that provides templates for people to produce posters featuring women mathematicians "to order." An AWM advisory committee monitors quality, accuracy and appropriateness of the

sketches featured. The Mentor Network, started by Rachel Kuske in 2001, is about to enter a new phase, as AWM was able to secure funding for it by getting most of the US and Canadian Mathematics Research Institutes (11 in all) to contribute a small amount annually to employ part-time clerical help for its database. The Mentor Network, by the way, has been very successful in connecting girls and women at all career stages, from high school students through full professors, with mentors. Up to 100 pairs are active at any time. However, this initiative is currently in need of intellectual renewal and will be looking for new leadership soon. As a first step, we are seeking volunteers to serve on the Mentor Network committee. A newer initiative is the Student Chapters program. There are a number of chapters already formed, and some new applications are currently being reviewed. It is a pleasure to report that we have just formed a committee, recruited by Tasha Inniss, who has been in charge of the Student Chapters program, consisting of Tara Brendle, Carla Cotwright, Misha Kilmer and Jillian McLeod. This committee will be responsible for approving applications, but we expect them to do a good deal more than that.

The other regular activity that took a little extra effort this year was the AWM-SIAM workshop for 2007. Because SIAM has cancelled its regular summer meeting for 2007, there were a number of choices for the workshop, and we decided to run it at the Applied Dynamical Systems meeting in Snowbird, Utah at the end of May. The Kovalevsky lecture will be given there, by Lai-Sang Young. (This may become a new AWM tradition. Young was a recent Noether lecturer, and another recent lecturer, Ingrid Daubechies, also gave both the Noether and the Kovalevsky lectures—in Ingrid's case, the same year.) We encourage all with interests in dynamical systems to attend the Snowbird meeting, and especially to attend the AWM mini-symposia at that meeting.

New Activities, Other Initiatives: Finally, let me report on some special events and some new initiatives. As announced last year, AWM ran a workshop at MSRI in May 2006: "Women in Mathematics: The Legacy of Ladyzhenskaya and Oleinik," jointly sponsored by the Mathematical Sciences Research Institute (MSRI), and generously funded by NSA. Bettye Anne Case organized a "Women in Mathematics" panel discussion at the ICM in Madrid in August.

This has been a banner year for prizes. Of course the Noether lecture series continues. The 2007 speaker, Karen Vogtmann, will give her talk tomorrow, and the 2008 speaker has just been announced: it will be Audrey Terras of UCSD (who has already noted that travel costs will not be a problem, since the meeting is in San Diego). I already mentioned the Kovalevsky lecture. In addition, there is an Emmy Noether lecture that was given at the ICM by Yvonne Choquet-Bruhat. The idea for this series was encouraged by AWM, but the program is administered directly by the IMU. Last year's discussion of a series at the ICIAM (International Congress of Industrial and Applied Mathematics) quadrennial congresses has now become a reality. AWM and EWM are jointly running the first Olga Taussky Todd lecture at ICIAM 07 in Zurich. The project was brought to life by Fern Hunt, who rounded up a committee with the help of EWM, and Joyce McLaughlin, who chaired a committee that set up procedures and criteria. Finally, I had the honour to chair an international selection committee that has just chosen Pauline van den Driessche of the University of Victoria to be the first winner. At the moment, this is a one-time event (which has also received one-time funding from Google), but the ICIAM Council will propose that it be made permanent when it next meets in July.

The other new prize is the Ruth I. Michler Prize. This is a major award, funded by an endowment to Cornell University from Gerhard and Waltraut Michler in memory of their daughter. For technical reasons, the money was given to Cornell, but AWM administers the award, which makes a grant of over \$40,000 to a woman who has recently received tenure and would like to spend a semester visiting the Cornell Mathematics Department. We spent the spring setting up the mechanics of the award and have just concluded the first competition, which will fund a visit during the 2007–2008 academic year. It is delightful to report that there was tremendous interest in the prize, and several excellent applications were received. The first award will go to Rebecca Goldin of George Mason University. I just learned yesterday that the arrangements have reached the stage that she has definitely accepted, and we will be making a more detailed announcement shortly.

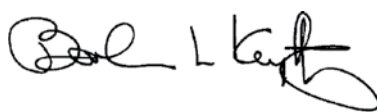
There may be yet one more award on the horizon: Carol Wood has approached AWM about setting up an award for

undergraduate teaching in memory and honour of one of her own undergraduate teachers, Gwen Humphreys.

I will close by mentioning three projects dear to my heart. The first is an implementation of an idea that came from the Policy and Advocacy Committee. Upon request, the AWM president will now send a letter to the organizer of a conference, workshop or similar event that has been delinquent in inviting women speakers. When speaker lists are published, if there are no women on a respectably long list of speakers, and this is pointed out to the president of AWM, then we fire off a polite letter, pointing out the virtues of diversity, noting that it is probably too late for their event but making constructive suggestions for finding more women speakers. So far, I've sent three of these, and will be happy to send more if other candidates are brought to my attention. (AWM does not actively monitor conference Web sites to find examples.)

A second area where AWM has taken action concerns the petition drive to point out the unsuitability of Camilla Benbow for the "Math Panel." We mounted a petition on a national site, and it has obtained over 1,000 signatures. (It did not succeed in getting Benbow removed from the panel, but we hope it drew attention to the problems surrounding her scholarship.)

Finally, a number of AWM members participated in the five-day workshop at Banff in September 2006. There were about 34 participants, from the US, Canada and Mexico, including several men. The workshop focused on obstructions to women's success in academia and came up with a long list of constructive interventions. We are now preparing a report. I had hoped there would be a draft in time for this meeting, but I have only a pre-draft and expect that it will be another month before we will be ready to circulate anything. It is our intention to ask a number of groups—including AWM, the AMS and so on—to endorse the report, and to circulate it widely.



Barbara L. Keyfitz
Toronto, Canada



AWM at the New Orleans Joint Mathematics Meetings

AWM Noether Lecture

The 2007 Noether Lecture, “Automorphisms of Free Groups, Outer Space and Beyond,” was delivered by Karen Vogtmann, Cornell University. She was introduced by Barbara Keyfitz, AWM President.

Abstract: Outer Space was introduced in the mid-1980s as a tool for studying the group $\text{Out}(F_n)$ of outer automorphisms of a finitely generated free group. The basic philosophy is that one should think of an automorphism of a free group as a topological object, either as a homotopy equivalence of a finite graph or as a diffeomorphism of a suitable three-manifold with free fundamental group. There are compelling analogies between the action of $\text{Out}(F_n)$ on Outer Space and the action of an arithmetic group on a homogeneous space or the action of the mapping class group of a surface on the associated Teichmüller space. In this talk I will first describe Outer Space and explain how it is used to obtain algebraic information about $\text{Out}(F_n)$. I will then indicate how Outer Space is related to other areas, from infinite-dimensional Lie algebras to the mathematics of phylogenetic trees, and how ideas from Outer Space are currently expanding in new directions.

Biographical Information

Inspired to pursue mathematics by an NSF summer program for high school students at the University of California, Berkeley, Karen Vogtmann received both her undergraduate and graduate degrees from Berkeley, investigating algebraic K-theory with Jack Wagoner. After wandering the academic world from Michigan to Brandeis, Columbia to the Institute for Advanced Studies and back, she settled at Cornell University where she has been for the last twenty years. A profound mathematician, she has authored numerous articles, mentored eight Ph.D. students, and averaged ten invited talks a year. Vogtmann has served as Vice President of the American Mathematical Society and on scientific advisory boards of the American Institute of Mathematics, the Mathematical Sciences Research Insti-



Karen Vogtmann

tute, the arXiv advisory board, the National Academy of Sciences Delegation to the International Mathematical Union General Assembly, and the Vietnam Education Foundation Panel for mathematics.

Vogtmann’s research views groups as symmetries of geometric objects. By understanding the geometry and topology of suitably chosen objects, she deduces algebraic information about the groups acting on them. Her work investigates orthogonal and symplectic groups, $SL(2)$ of rings of imaginary quadratic integers, groups of automorphisms of free groups, and mapping class groups of surfaces. Vogtmann’s recent focus has been on the group of outer automorphisms of a free group where the appropriate geometric object is called Outer Space. This space turns out to have surprising connections with other areas of mathematics, for example with certain infinite-dimensional Lie algebras and even with the study of phylogenetic trees in biology.

The Association for Women in Mathematics is grateful to the American Mathematical Society and the Mathematical Association of America for their efforts on behalf of all the AWM activities at the JMM. AWM also wishes to thank all the members who volunteered their time and expertise for these meeting events, and the staff of the New Orleans Marriott for all their assistance.

AWM at the New Orleans Joint Mathematics Meetings



Rebecca Herb (AWM Treasurer), Jennifer Lewis (AWM Managing Director), and Sylvia Wiegand (AWM past president)



Johanna Sevelt Sengers and Barbara Lee Keyfitz



Left to right: Cathy Kessel, Johanna Sevelt Sengers, Joan Leitzel, Carolyn Mahoney, and Lisa Fauci



Sharon Garthwaite, Alissa Crans, Sarah Witherspoon, Alessandra Pantano, and Angela Barnhill at the Workshop dinner



Joan Leitzel

AWM Prizes

Louise Hay Award for Contributions to Mathematics Education

In 1990, the Executive Committee of the Association for Women in Mathematics (AWM) established the annual Louise Hay Award for Contributions to Mathematics Education. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. While Louise Hay was widely recognized for her contributions to mathematical logic and for her strong leadership as Head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, her devotion to students and her lifelong commitment to nurturing the talent of young women and men secure her reputation as a consummate educator. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

Citation for Virginia McShane Warfield

In recognition of her wide range of contributions to mathematics education at all levels, the Association for Women in Mathematics (AWM) presents the Louise Hay Award to Virginia McShane Warfield of the Department of Mathematics at the University of Washington.

Virginia Warfield received her doctorate from Brown University in 1971 under the direction of Wendell Fleming and continued to contribute to the field of stochastic analysis for several years. At the same time she became increasingly absorbed by problems



Virginia McShane Warfield

of mathematics education through her work with Project SEED, a highly regarded mathematics program whose goal was to promote sense-making mathematical activities for fourth- through sixth-grade students.

Her work with Project SEED led to her becoming the leader of the University

of Washington mathematics department's entry-level mathematics courses, which she restructured in ways that have stood the test of time and which she continues to oversee. Eventually, teacher preparation and enhancement, both of K–12 teachers and mathematics graduate students, became a major focus of her activity. She significantly revised the courses for future elementary teachers and has served as a mentor for graduate students throughout her years at the university.

From 1994 to 2001, she was project director for “Preparing Future Faculty” in which, among other things, she arranged for graduate students to spend time at local community or four-year colleges, took them to conferences on educational issues, and arranged conferences with guest speakers. She also began a series of “brown bag lunches” for faculty and graduate students to talk over issues related to their teaching, and since 1994 she has posted electronic newsletters based on those discussions. A letter written jointly by eight recent students states: “Her vision of education and her sense of optimistic possibility have encouraged us to reflect upon our development as teachers of mathematics and to seek ways in which we might contribute to a stronger, more effective mathematics education. Most important, though, is our recognition that Ginger has been instrumental in fostering a supportive and exciting environment in which to investigate and explore the many dimensions of mathematics education.”

In the broader community she was instrumental in creating Washington Teachers of Teachers of Mathematics (WAToToM), at which members of departments of mathematics and mathematics education from around the state get together for a weekend of conversation and idea-sharing. Vaughn Foster-Grahler of Evergreen State College wrote that “it has been her leadership that has kept [WAToToM] a vibrant and integral component of math education in Washington State...Ginger is a tireless advocate for strengthening the level of preparation of K–12 math teachers and supporting the types of pedagogies that lead to success for all students.”

During the past ten years she has played a leading role in three major NSF-funded teacher enhancement projects: Creating a Community of Mathematics Learners, Extending the Community of Mathematics Learners, and Graduate Teaching Fellows in K–12 Education (GK–12), all of which

partner University of Washington faculty and graduate students with in-service teachers of mathematics. Warfield is described as a master in integrating various levels of math learners—creating relationships between grade school teachers and mathematicians—and as having special concern for students from economically disadvantaged backgrounds and underrepresented groups. At one GK–12 elementary school the percentage of students who passed the state mathematics standard rose in two years from under 10% to about 55%, which is above the state average. Currently, she is Co-PI of a new project, Teaching for the Environment: Active Mathematics on the Olympic Peninsula. In discussing the impact of her work, Selim Tuncel, chair of the University of Washington mathematics department, praised “her commitment to improving mathematics education at all educational levels, her clear vision of the key elements for achieving this goal, her gentle persistence, and her ability to work effectively within a research department as well as in collaboration with the K–16 education communities.”

Warfield has also made significant contributions to mathematics education research through her collaboration with the French mathematician Guy Brousseau, a pioneer in the “didactics of mathematics,” the scientific study of issues in mathematics teaching and learning. This collaboration has led to publication of several articles, translation and co-editorship of a book, and, most recently, a monograph about Brousseau’s work and the nature of didactics.

Among her many professional activities, Warfield has

been a member of the National Faculty (by election), of Sigma Xi, of the Association pour Recherche en Didactiques des Mathématiques, and of the Mathematical Association of America’s committees on Professional Development and Mathematical Education of Teachers. For the Association for Women in Mathematics she has served in several capacities: Chair of the Education Committee, Member of the Association Review Group for the revision of the NCTM Standards, Member-at-large of the Executive Committee, and Education Column Editor for the *AWM Newsletter*.

To describe her work, Janet P. Ray, professor emeritus from the Seattle Central Community College, wrote: “It would be difficult to overstate the contributions Ginger has made to mathematics education. Whether through the organizations she has founded, the events she’s sponsored, or the connections she’s forged, Ginger’s work has had a huge impact. She has also made a difference in more subtle, though no less profound, ways—through example and through innumerable small acts of kindness.”

AWM is proud to honor Virginia M. Warfield for her contributions to education through her teaching, graduate student training and mentoring, work on the didactics of mathematics, and outreach and collaborations with K–16 communities.

Response from Warfield

I am deeply honored and very much moved by this award. With it, the AWM has spoken very directly to the

Call for Nominations: 2008 Louise Hay Award

The Executive Committee of the Association for Women in Mathematics has established the Louise Hay Award for Contributions to Mathematics Education, to be awarded annually to a woman at the Joint Prize Session at the Joint Mathematics Meetings in January. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee’s work. *Five* complete copies of nomination materials for this award should be sent to: The Hay Award Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. Nominations must be received by **April 30, 2007** and will be kept active for three years. For more information, phone (703) 934-0163, e-mail awm@awm-math.org or visit www.awm-math.org. Nominations via e-mail or fax will not be accepted.

concerns and issues that have been most basic in my mathematical life and has told me that some, at least, of my decisions have had the impact I hoped for.

My first efforts to articulate my gratitude left me somewhat overwhelmed. It started with my parents and siblings, whose lives and conversations made it clear that the only reasonable thing for an adult to be was a mathematician and that of course I could be one. Less explicit was the message that the only reasonable person to marry was a mathematician, but I picked it up anyway and did that. His enduring support both of my mathematics and of my growing interest in issues of education set me firmly on the route I wound up traveling. After his death, the confidence and trust of our three children not only kept me from falling apart but also made it possible for me to gain momentum in the direction we had set for me and sustain it through many solo years. And in the past few years, my new husband has given me a new kind of support by providing the perspective of a pediatrician and the interest of a lifelong learner.

That didn't extend far enough, though, because an essential ingredient has been the support I have had from my department: a succession of chairs who were sometimes nonplussed by my suggestions but never nonsupportive, and a collection of colleagues whose help ranged from cheering on the sidelines to being right there in the midst of projects. I valued every one of those forms of help. And that still wasn't far enough, because my interests have led me off campus and out of Seattle and out of the U.S., and everywhere I have found helpful and wonderful people.

As I said, that line of thinking became overwhelming, so I decided to be a little more focused. What one person or set of people made me veer away from the image I had grown up with of sitting around proving theorems and giving erudite lectures? The answer was clear: Bill Johntz and the 1971–72 fourth grade at Colman Elementary School. Project SEED was Bill's brainchild, and it is what took a whole bunch of university mathematicians into inner-city elementary schools to teach algebra by group discovery. I got to visit all the Seattle classes, and I also got to choose which one I taught. Never one for halfway measures, I chose the class with the lowest scores in the city on standardized tests and watched them soak up exponents and variables and linear equations. There's no way after that year that anyone could

tell me that low-scoring children lacked intellectual capacity. Nor could I be told that elementary school teachers have an easy job. And never since that time has there been any doubt in my mind that the people who have the most influence on the future of mathematics are the elementary school teachers—a career-shaping conviction indeed!

So I thank that whole cloud of people, and I thank the AWM. I promise that this award and what I have learned about Louise Hay herself will inspire me to keep going in as many of the directions you cited as I possibly can!

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

In 1990, the Executive Committee of the Association for Women in Mathematics (AWM) established the annual Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. The prize is named for former AWM president and one of its founding members, Alice T. Schafer (Professor Emerita from Wellesley College), who has contributed a great deal to women in mathematics throughout her career. The criteria for selection include, but are not limited to, the quality of the nominees' performance in mathematics courses and special programs, an exhibition of real interest in mathematics, the ability to do independent work, and if applicable, performance in mathematical competitions.

AWM is pleased to present the seventeenth annual Alice T. Schafer Prize to Ana Caraiani, Princeton University. Also, Tamara Broderick, Princeton University, and Yaim Cooper, Massachusetts Institute of Technology, were recognized as runners-up and Alyson Deines, Kansas State University, as the honorable mention recipient.

Citation for Ana Caraiani

Ana Caraiani is a senior at Princeton University, and she is already conducting professional-level mathematical research. In the summers of 2005 and 2006, Caraiani participated in the REU program at the University of Minnesota at Duluth. She worked independently on a project on semigroups of rational numbers related to the $3x + 1$ problem. Her work on this problem is highly praised. The resulting paper, "On wild semigroups," introduces new ideas that exhibit significant ingenuity.

Caraiani's coursework at Princeton has been remarkable. She has done very well in extremely difficult classes and is noted for her independence and mathematical sophistication. One professor has said that her work "made you think that it was a professional mathematician who was answering the problems." Another professor rates her among the top undergraduate mathematics majors in fifty years at Princeton.



Ana Caraiani

Caraiani has won the William Lowell Putnam competition twice, scoring among the top five competitors in both her freshman and sophomore years, and is the only woman ever to have done so. The Princeton math department awarded her the Class of 1861 Prize her sophomore year and the Andrew H. Brown prize for outstanding juniors. She is expected to become a major mathematical figure and a world class research mathematician.

Response from Caraiani

I am extremely honored to receive the Alice T. Schafer Prize and to be recognized along with so many distinguished women in mathematics. I would like to thank the Association for Women in Mathematics for inspiring women to excel in math. This award has certainly encouraged me to aim higher and to set new standards for my work in the hope that I would live up to the expectations associated with such an honor.

I would not have made it this far without the support of many people over the last several years. I would first like to thank my math teacher, Liana Manu, for nurturing my interest in math before and throughout high school. I am also very grateful to Joe Gallian for inviting me to his REU in Duluth, finding the best-suited problem for me, and believing in my abilities even more than I did. The Princeton math department has provided the best environment I could have asked for in which to learn math. I am especially grateful to Robert Gunning for introducing me to an amazing new field and letting me share in his enthusiasm for its elegance. I would like to extend my deepest thanks to Andrew Wiles for entrusting me with a senior

thesis problem and for all of his support and guidance in approaching it. I am also indebted to John Conway for suggesting an exciting problem for my junior paper and to William Browder for a challenging yet rewarding reading course. There are many other professors at Princeton whose excellent teaching and encouragement have been indispensable, and I thank them all.

Citation for Tamara Broderick

Tamara Broderick is a senior at Princeton University. A Goldwater scholar, Broderick was awarded the George B. Wood Legacy Sophomore Prize for her exceptional achievements during her sophomore year and the Princeton Class of 1939 Prize at the end of her junior year for achieving the highest standing in all preceding college work at Princeton. She is described by her professors as "one of the very, very best," "extraordinarily talented and intelligent," "bursting with drive, energy and an unquenchable thirst for knowledge."

For her junior paper at Princeton, Broderick developed a mathematical model of animal movement based on radio telemetry data, and she is currently engaged in research on drifting games.

In the summers of her sophomore and junior years, Broderick participated in the Director's Summer Program at the National Security Agency and worked on problems involving cryptanalysis, data mining, combinatorics, statistics and numerical analysis. She quickly emerged as a team leader in each problem she attacked, and as a result she published two internal classified papers each summer at NSA. Being the outstanding problem solver amongst all participants, Broderick was selected, after her first summer at NSA, to represent the United States during the following summer at a student exchange program with the GCHQ, an intelligence and security organization in the United Kingdom. A correspondent from GCHQ comments that Broderick's work "will no doubt shape further work by GCHQ analysts."

In addition to being an outstanding mathematician, Broderick serves as a leader in numerous math-related activities at Princeton; amongst others she is the current president of the Math Club. Broderick's professors predict she will have an extraordinary career arc in mathematics.

Response from Broderick

I am honored and excited to be selected as a runner-up for the Alice T. Schafer Prize. My thanks go first and foremost to the AWM not only for their recognition but also for their wonderful encouragement of women in mathematics by means of concrete and far-reaching initiatives.

I was lucky enough to have female mathematicians showing me the ropes from the very beginning. My gratitude goes out to my middle school math teacher Ms. Vega for seeing early potential, to Ellen Stenson for coming to my high school and giving us a multivariable calculus class, to Ingrid Daubechies for agreeing to be our Princeton Math Club faculty adviser, and to countless other female mentors and role models. I would also like to thank Reza Beigi and Jeanne Stephens for their unfailing encouragement of my pursuit of mathematics though their fields are, respectively, physics and English, Elias Stein for his amazing and beloved analysis series at Princeton, and all of the good mathematics teachers from whom I have had the pleasure of learning. Finally, I am deeply grateful to Robert Schapire for his clear and thoughtful classroom instruction, endless research guidance, and boundless support for this aspiring mathematician.

I've always had the sense that there was something both magical and powerful to mathematics, and I am lucky to have so many people and opportunities to regularly refresh my sense of wonder at the field.

Citation for Yaim Cooper

Yaim Cooper is a senior at the Massachusetts Institute of Technology. Her outstanding success in a vast array of both undergraduate and graduate mathematics courses has been augmented by her research at the Louisiana State University and the University of Wisconsin REUs. Cooper's "exceptional vigor and zeal" for mathematics becomes apparent with her achievements.

At the LSU REU, Cooper investigated the Ihara zeta function of a graph. Impressively, under a non-partiteness condition, she gave an elementary proof of a theorem due to Bass and generalized an important example appearing in a doctoral dissertation. She has submitted her results for publication in a major combinatorics journal. Showing her breadth, Cooper's research at the Wisconsin REU focussed on the completely different mathematical area of modular

forms. Her REU team was asked to generalize a theorem of Serre on congruence properties of the classical j -function. Led by Cooper they "nicely obtained what is surely the best generalization." Their significant joint paper is expected to appear in an international number theory journal. Cooper is also active in the undergraduate math club and has started two new lecture series at MIT.



Yaim Cooper

Response from Cooper

I am honored to have been selected as a runner-up for the Alice T. Schafer prize. However, much of the recognition should be directed at the people who have helped me along the way. First, I thank my parents, for giving me so many opportunities. I'd like to also thank Professor Lee Stout, who helped me far beyond what was required of him, and helped me learn and love math during my critical high school years. I was lucky to spend two wonderful summers doing math research, and am grateful to Professors Robert Perlis and Ken Ono for giving me a delightful introduction to math research, and the interesting topics they guided me to. I also must thank my peers at both REUs, in particular my co-authors from last summer, Nick Wage and Irena Wang. At MIT, Professor Pavel Etingof has been a wonderful advisor, and I thank Professor Steven Kleiman for introducing me to commutative algebra and algebraic geometry, in such a way that has made me want to learn a lot more of it!

Citation for Alyson Deines

Alyson Deines is a senior math major at Kansas State University. Her mathematical maturity, talent, energy, and initiative have been demonstrated by the many activities and research projects in which she has participated and excelled.

In 2005, Deines participated in the Budapest Semesters in Math program and in the REU program at the University of Nebraska. Her team of three students at the Nebraska REU worked on a mathematical biology problem involving the population dynamics of peregrine falcons. This work has been submitted to a journal on ecology and has been presented at several meetings. In 2006, Deines took part in the Director's

Summer Program at the National Security Agency. In this program, she was the leader of a group of students working on a problem of statistical regression of real-time streaming data. Her team developed an extremely robust model in the stream environment, making a major improvement in this important problem. Their work has been published internally at NSA.

Deines is currently a Goldwater scholar, and she is also the recipient of a Clare Boothe Luce Scholarship from the Women in Engineering and Science program at Kansas State. She has excelled in a rigorous program of both undergraduate and graduate level courses. She is the president of the Kansas State Math Club and has demonstrated great enthusiasm and energy for mathematics as well as focus and drive. In the words of one recommender, she is “well started on a promising mathematics career.”

Response from Deines

I am thrilled to be recognized as honorable mention for this year’s Alice T. Schafer prize. I would like to thank the Association for Women in Mathematics for all the encouragement they give females in mathematics. The encouragement and advice of female mathematicians has been crucial to discovering my passion for mathematics. I am grateful that this association provides such strong support and creates positive experiences for other women in the field. Specifically, I would like to thank my advisor, Marianne Korten of Kansas State University. She gives solid advice and encouragement to me and other females in the Kansas State University Math Department. I would also like to thank Richard Rebarber, from the University of Nebraska-Lincoln, and Joe McCloskey, who have enthusiastically guided me through my summer research projects. Furthermore, I would like to thank Todd Cochrane, of Kansas State University, my current research advisor, for introducing me to number theory and guiding me through research in this area. Many other professors at Kansas State University have also given me invaluable support. Finally, I must thank my parents for the encouragement they have given and will always give me to pursue my interests.



Alyson Deines

AWM Workshop

The workshop talks, poster session and panel were open to the entire math community attending the Meetings. Selected graduate students and recent Ph.D.’s presented and discussed their research and met with other mathematicians. Thanks to Claudia Polini, Chair (University of Notre Dame), Jeanne Clelland (University of Colorado) and Moira McDermott (Gustavus Adolphus College and Hobart & William Smith Colleges) for organizing this successful workshop and to ONR and NSA for their support of the AWM workshop program. Thanks also to the volunteers who served as mentors, discussion group leaders and panelists.

Research talks by recent women Ph.D.’s were:

Angela K. Barnhill, Ohio State University
“Nonpositively Curved Decompositions of Coxeter Groups”

Julia Bergner, Kansas State University
“Thirteen Ways of Looking at a Topological Group”

Alissa S. Crans, University of Michigan
“Categorical Self-Distributivity”

Wandi Ding, University of Tennessee-Knoxville
“Optimal Harvesting of a Semilinear Elliptic Fishery Model”

Mary K. Flagg, University of Houston
“The Jacobson Radical and an Isomorphism Theorem by Wolfson”

Amy B. Moore, Alma College
“Diffusion Flame Stability”

Alessandra Pantano, Cornell University
“Petite K-types and Unitary Representations”

Sarah G. Raynor, Wake Forest University
“Nonvariational Methods for Semilinear Elliptic Equations of Critical Growth”

The graduate students who presented posters are listed next.

Yekaterina Epshteyn, University of Pittsburgh
“High Order Fully Coupled Discontinuous Finite Element Methods for Two-Phase Flow”

Jennifer M. Franko, Indiana University
 “Representations of the Braid Group via
 the Yang Baxter Equation”

Fumiko Futamura, Vanderbilt University
 “Localized Operators and its Use in Determining
 Boundedness and the Construction
 of Localized Frames”

Sharon Anne Garthwaite, University of Wisconsin-Madison
 “Ramanujan’s ‘Very Interesting Functions’: Mock Theta
 Functions and Vector-valued Maass-Poincaré Series”

Daniela Genova, University of South Florida
 “Topological Properties of a DNA Computing Model”

Rachael Hageman, Case Western Reserve University
 “Large Scale Bayesian Parameter Estimation for the
 Cardiac Metabolism during Ischemia”

Yanina Landa, University of California, Los Angeles
 “Visibility of Point Clouds and Application to
 Mapping of Unknown Environment”

Grace Lyo, University of California, Berkeley
 “Galois Representations and Descent in K-theory”

Katharine A. Ott, University of Virginia
 “Transmission Boundary Value Problems in
 Non-smooth Domains”

Elizabeth A. Sell, University of North Carolina
 at Chapel Hill
 “Universal Abelian Covers of Normal Surface Singularities
 of the Form $z^n = f(x, y)$ ”

Anna Skripka, University of Missouri-Columbia
 “Spectral Averaging in von Neumann Algebras”

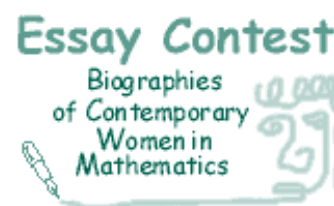
Paula A. Vasquez, University of Delaware
 “Mathematical Modeling of Wormlike Micellar Solutions”

The workshop panel discussion was “Critical Career Decision Stages: Research and Funding Opportunities.” The moderator was Claudia Polini, University of Notre Dame; the panelists were Valentina S. Harizanov, George Washington University; Kathleen O’Hara, Mathematical Sciences Research Institute; Barbara Lee Keyfitz, Fields Institute and University of Houston; and Michelle D. Wagner, National Security Agency.

More next issue

Citations and responses for prizes and awards given by other societies at the JMM will appear next time, as will photos from the workshop.

To increase awareness of women’s ongoing contributions to the mathematical sciences, the AWM is (*pending funding*) sponsoring an essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. The essays will be based primarily on an interview with a woman currently working in a mathematical career. This contest is open to students in the following categories: **grades 6–8**, **grades 9–12**, and **undergraduate**.



At least one winning entry will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM Web site. Additionally, a grand prize winner will have his or her entry published in the AWM *Newsletter*. For more information, contact Dr. Victoria Howle (the contest organizer) at vehowle@sandia.gov or see the contest Web page: www.awm-math.org/biographies/contest.html. The deadline for receipt of entries is **November 2, 2007**. (*To volunteer as an interview subject, contact Howle at the e-mail address given.*)

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



Barbara Lee Keyfitz (left) with Shafer prizewinners.
Left to right: Alyson Deines, Shafer honorable mention
winner; Yaim Cooper, Shafer runner-up; and
Ana Caraiani, Shafer winner



Schafer winner Ana Caraiani and her REU mentor, Joe Gallian



Alyson Deines, Schafer honorable mention winner,
with her advisor, Marianne Kortén



Right: Yaim Cooper, Schafer runner-up winner,
with her REU mentor, Ken Ono

AWM Workshop for Women Graduate Students and Recent Ph.D.'s

supported by the Office of Naval Research, the National Security Agency,
and the Association for Women in Mathematics

Over the past seventeen years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent Ph.D.'s in conjunction with major mathematics meetings.

WHEN: The next AWM Workshop is scheduled to be held in conjunction with the Joint Mathematics Meetings in San Diego, CA, January 6–9, 2008 (Sunday–Wednesday). The Workshop is scheduled to be held on Wednesday, January 9, with an introductory dinner/discussion group on Tuesday evening, January 8.

FORMAT: Twenty women will be selected in advance of the workshop to present their work; the graduate students will present posters and the recent Ph.D.'s will give 20-minute talks. AWM will offer funding for travel and two days subsistence for the selected participants. The workshop will also include a panel discussion on areas of career development, a luncheon and a dinner with a discussion period. Participants will have the opportunity to meet with other women mathematicians at all stages of their careers. All mathematicians (female and male) are invited to attend the program. Departments are urged to help graduate students and recent Ph.D.'s who do not receive funding to obtain some institutional support to attend the workshop presentations and the associated meetings.

MENTORS: We also seek volunteers to lead discussion groups and to act as mentors for workshop participants. If you are interested in volunteering, please contact the AWM office.

ELIGIBILITY: Applications are welcome from graduate students who have made substantial progress toward their theses and from women who have received their Ph.D.'s within approximately the last five years, whether or not they currently hold a postdoctoral or other academic position. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address. All applications should include a cover letter and at least one letter of recommendation from a faculty member or research mathematician who knows the applicant's work. In particular, a graduate student should include a letter of recommendation from her thesis advisor. Nominations by other mathematicians (along with the information listed above) are also welcome. For some advice on the application process from some of the conference organizers, see the AWM Web site.

Send **five** complete copies of the application materials (including the cover letter) to:

Workshop Selection Committee
11240 Waples Mill Road, Suite 200
Fairfax, VA 22030

Phone: 703-934-0163

E-mail: awm@awm-math.org

URL: www.awm-math.org

APPLICATION DEADLINE

Applications must be received by **August 31, 2007**. Applications via e-mail or fax will not be accepted.

Women Mathematicians at 2006 ICM Madrid: Part I

Betty Anne Case, Florida State University

Near the postal station—*Congresso* stamps and cancellations available—and just around the corner from the main Madrid Convention Center lobby, there were pictures from and related to past ICMs. This beautifully displayed archival collection was a popular feature and subject of conversations. The paucity of women participants was obvious as one walked from one panel to another ... still not having seen any women ... and finally one finds that the first woman to be a plenary speaker was Emmy Noether, in 1932. The next was 58 years later, 1990, Karen Uhlenbeck. The display for 1994, with two plenary women pictured, is a visible encouragement—and more women appear in the subsequent pictures displayed.

This year, one woman was an invited plenary lecturer: Michelle Vergne, “Applications of equivariant cohomology”; since Vergne has been an inspiration and a mentor to many and is well known in the U.S.A. as well as Europe, this is good ... but should there have been more? Women sectional speakers were numerous enough—around 15—to be barely visible, but were well below 10% of the total invited speakers. Should there have been more?

One interesting people-observation was that both Karen Vogtmann (the AWM Noether Lecturer at the USA Joint Mathematics Meetings in January 2007) and her student Martin Bridson were invited sectional speakers. It would be interesting to know how many major professor/student combinations of speakers there were. Three invited sectional speakers, Bryna Kra, Linda Rothschild and Chuu Lian Terng, were on a Madrid women mathematician’s panel discussion, a part of the “ICM women’s activities” which are a proud tradition which grew out of protest about the few women speakers involved in ICMs. In 1974 in Vancouver, there was discussion about the few women invited speakers, and there have been special activities organized at each ICM since—in 1978 in Helsinki there were over 500 women and men participants at a session. [See [1] for four articles giving background of women’s ICM participations, pp. 121–148.]

The Emmy Noether mathematical lecture series began in 1994 in Zurich through arrangements of AWM and EWM members and other women colleagues. For the first time in

2006 the lecture was organized under IMU auspices, and Yvonne Choquet-Bruhat was selected by their distinguished committee to deliver that lecture. Professor Choquet-Bruhat spoke on “Mathematical problems in General Relativity” in a plenary time slot, in the main Lecture Hall A.

There were two adjunct programs about women in mathematics: Capi Corrales (Universidad Complutense de Madrid) gave current data and context and showed the moving EWM film “Women and Mathematics across Cultures.” The now-traditional panel presentation, followed by discussion, was entitled “Moving (Mostly) Forward: Women in Mathematics,” Betty Anne Case (USA) organizer and moderator. Remarks and pictures of three of the panelists are given in this report; others who will be represented in Part II are Zahra Afsharjad (Mashhad University, Iran), Marjo Lipponen (University of Turku, Finland), Sylvie Paycha (Université Blaise Pascal, Aubière, France), Eddy Pariguan (Universidad Central, Caracas, Venezuela), and Chuu-Lian Terng (University of California, Irvine, USA).

In the tradition of the planning for most ICM special programs, a large planning group for these activities corresponded. Beginning early in 2004, this included most of the panelists and presenters and many other colleagues, each



Marta Sanz-Solé (Spain) and Betty Anne Case (USA)

pointing to others in an outward spiral of information; some of these mathematicians were Maryam Mirzakhani (Iran/USA), Marjatta Nääätänen (Finland), Rubí Rodríguez (Chile), Laura Tedeschini-Lalli (Italy), Kety Tenenblat (Brazil), Doreen Thomas (S. Africa/Australia), Michèle Vergne (École Polytechnique, Palaiseau, France and Institut de Mathématiques de Jussieu, Paris), and Mary Gray and Anne Leggett (USA). The organizing group for these activities is much indebted to Marta Sanz-Solé (Universitat de Barcelona) of the ICM Executive Committee who made all the program and scheduling arrangements, as Chair of the Local Program Committee; she quite literally made a good time and place for our programs and handled the unbelievable overall detail of managing the meeting with elegance and efficiency. If this is, as likely, the first time a woman has been in this responsible position, then another door is firmly opened.

Beyond 2006: After the panel at ICM Zurich '94, I was handed the announcement transparencies used that day and told to “organize something” for ICM Berlin '98 (and, with Bhama Srinivasan and Christine Bessenrodt, did as instructed). Packing for Madrid, I ran across those 1994 transparencies and brought them as a sort of talisman for another successful meeting. The '06 after-the-session enthusiasm led to forming a loose group to “pass the torch” and to join with women colleagues in India to plan for Hyderabad 2010; Jacqui Rammage and Kathy Horadam (Australia), Monica Vazirani and Bhama Srinivasan (U.S.A.) are involved. With great pride the group notes the award of the Ramanujan Prize for 2006 to an Indian woman mathematician, Ramdorai Sujatha. [3]

Bryna Kra (Northwestern University, Evanston, IL, USA)

The statistics on women in mathematics in the United States are well known. About half of undergraduate math majors are women and about 30% earning Ph.D.'s are women; there are fewer women in postdoctoral positions, still fewer in tenure track positions and very few full professors. I will not attempt to explain the many reasons behind the dearth of women in higher ranked positions, but instead offer some personal reflections on what has made a difference to me.

Perhaps the main reason it has been possible for me to succeed has been support from family, friends

and colleagues. As an example, for years my husband and I commuted between two houses, looking for a solution to our “two body” problem. It took a bit of luck to end up with two jobs in the same city, but it also took a lot of persistence. One can not underestimate the importance of a partner who supports and sustains decisions that require compromise.



Bryna Kra

Success in mathematics means serious work in research. Of course, sometimes life intervenes, and it is not always possible to devote enough time to research. Even when research is on the back burner, it is important to keep up with the field and attend conferences. Not only do meetings offer the opportunity to hear talks and learn new math, they also provide possibilities for new collaborations and make others aware of one's presence in the field. As a corollary, it is essential to accept invitations to speak at conferences and in seminars. A friend once turned down an invitation to speak, since she was convinced that everyone at the conference had already heard what she had to say. Midway through the meeting, she realized that she had sold herself short: she had previously heard some version of many of the talks and yet was still getting a lot out of them. Finding a way to attend conferences, even if this necessitates creative solutions, is crucial. One can bring a babysitter, mother-in-law or partner to the meeting to watch the kids, ask the conference or home university to share costs of daycare, or leave at dawn and return in the middle of the night for a short trip.

As important as it is to accept invitations, it is even more important to limit the things one does. Women are asked to be on many committees in the department, in the university, and in the math community. One can not accept all of these (occasionally very tempting) invitations and still maintain time for research. While it is important to be an active and good citizen, it is equally important to remember that other people can do the work as well. So pick and choose among the service activities, doing those in which a contribution would be especially

crucial and would aid other women in the profession.

The most common problem for women in math is the reluctance to ask for things that might help. Unfortunately, without asking, it will not happen. This might be as simple as rearranging a meeting time or shifting teaching a course from one semester to another, or as complicated as extra funding for travel or a semester of teaching relief.

When I was pregnant with my first child, there was no maternity leave policy at my university. When I asked about the possibility of a semester without teaching, my chair told me that it had not been done before. This seemed to be the end of the conversation. I pursued the matter with the Dean, who immediately agreed to a semester of teaching relief. A year later he did ask for something in return, and I chaired a committee for the college on maternity leave. Within another year, the entire university passed the maternity policy recommended by my committee, including a semester of teaching relief. Some time later, I had an invitation to speak at a conference, but was told that there was no housing available for my infant son and babysitter. I told them that unfortunately, unless they reconsidered the housing problem, this lack of accommodation made it impossible for me to attend. Within a few days a wonderful apartment, funded by the meeting for all three of us, became available.

Even on a smaller level, a modest change can have a large effect. Seminars in my department were always held at 4 p.m., making it difficult for faculty (usually mothers!) to get home before the babysitter was scheduled to leave. No harm has been done by moving the seminars to 3 p.m., and I no longer feel compelled to leave every talk early. To summarize: ASK! [4]

Sofia Castro (Universidade do Porto, Porto, Portugal)

Coming from Portugal—a country where the fact that a woman is also a mathematician surprises nobody—my first contact with the woman/mathematician duality occurred when I arrived at the University of Warwick (UK) as a post-graduate student. I have to stress that this issue came as a big surprise and, until I started talking to students from countries where the duality is felt, I did not take it very seriously.

I believe that the position and acceptance of women in mathematics cannot be disconnected from those of women in society. Since that would take me too far afield, I shall address only three points.

When asked to participate in the panel “Moving (Mostly) Forward: Women Mathematicians” and, after having survived being a woman, wife, mother of two and mathematician for over a decade, I tried to understand what makes the co-existence I enjoy possible and why it is more common in Latin countries (or at least in Portugal). This is, without disguise, a biased exposition.

Are women so different from men? One of the strongest reasons I heard against the capability women have for doing mathematics is that women do not have the required characteristics. Even though I am a mathematician in a country where women mathematicians are not scarce, I hold a position at a school of economics—typically a male environment. After 15 years of being taken seriously and listened to, I was told that when I first arrived, I came across as a rather aggressive person (which I believe was due to shyness!). Aggressiveness and assertiveness are allegedly male attributes, lacking in females (or so it is said), and maybe some dose of each encourages the community to listen to your ideas. But mathematics requires brains more than social skills so, perhaps it is rather that society is not tuned to female characteristics (if such a distinction exists) than that women are less capable of doing mathematics.

What is the social status of mathematics? I have enjoyed being a mathematician in three countries: Portugal, England and Denmark. In both England and Denmark I have only experienced awe and respect when my profession became known. In Portugal I have more than once heard “Oh, I’ve also taught some math classes myself once” as a reaction to my being a mathematician, and “How horrible!” is a typical response. So, not only do people not know what being a mathematician is about, but they also do not think it worthwhile finding out. As a result, mathematics has a rather low social status, unlike in England or Denmark, and



Sofia Castro

therefore it is not an unsuitable occupation for a woman. I should add that professions with a higher social status, such as engineering or economics, are not so common for women.

Is there someone behind (women) mathematicians?

The saying goes “Behind a great man, there is a great woman.” Looking at (great) male mathematicians, I saw that they were, generally, even though exceptions are known, either alone (a circumstance I shall not address for lack of experience) or had a partner without a career—hence, the mathematician had no worries outside the office and could enjoy the family life while not at work. Explicitly or implicitly many societies expect a family and a home to be a woman’s concern.

Something that distinguishes doing mathematics from doing other sciences is, I believe, the level of concentration and the need for long periods of undisturbed concentration required: something incompatible with the need to cook dinner at a given time or the presence of children.

In Portugal, geographic mobility is not so common—for my generation and those before me, a job in academia was offered just after the first degree, in the same university, and the Ph.D. was done while on leave from that job—so that a woman/mathematician has parents nearby to help looking after children or provide a good meal when required. Also, getting help with household tasks such as cooking and cleaning is cheap and easily available.

Having the good fortune of being married to a mathematician who insists on sharing the caring for and sorting out of both family and home, I like to believe that our achievements are hardly ever exclusively our own. Hence, if “behind a great person, there is another great person,” then we can hope that (male) social evolution will soon allow that first person to be a woman and a mathematician.

Linda Rothschild (University of California, San Diego, USA)

My name is Linda Preiss Rothschild. I am a Distinguished Professor of Mathematics at the University of California, San Diego (UCSD). I earned my bachelor’s degree from the University of Pennsylvania in 1966 and my Ph.D. from MIT in 1970. I held postdoctoral positions at Tufts, Columbia, Princeton, and the Institute for Advanced Study, as well as a tenured professorship at the University of Wisconsin, Madison, before joining the faculty at UCSD. To put my observations into perspective, I will use my own

experience to compare the situation of women in mathematics in the ’60s and early ’70s to that of young women today.

I learned very early in my life that opportunities for girls at that time were not the same as those for boys. The leading academic high school, Central High, in Philadelphia was only for boys. There was an academic high school for girls that was separate, but far from equal. (In the mid ’70s the U.S. Supreme Court ordered Central High to admit girls.) The Girls High graduates had a much poorer record of attending elite colleges and universities. This was not so surprising, since many of those universities, such as Princeton, Dartmouth and Yale, did not admit women students at all. Even those that did admit women, such as Harvard, often did so in a low ratio, say six or more males to every female. At that time high school counselors warned female students away from math, science, and engineering. This was sensible, given all the barriers women would encounter. Most graduate programs in mathematics admitted few women, justifying this by observing that women were more likely to be unsuccessful.

However, some young women like me at that time did go into mathematics, confident that our work would be judged impartially and that we would be so rewarded. When I received my Ph.D. from MIT in 1970, U.S. universities were cutting back on hiring, and my future seemed very uncertain. “I hope the men get the jobs,” an older female acquaintance scolded me. “They are the ones that really need the money. You can do whatever you like.” It was hard not to notice that almost none of the top mathematics departments had any women faculty at all. From my own mixed experiences and those of other women mathematicians I saw, I understood that women needed support from each other. I joined with other women mathematicians in the Boston area, and eventually we became part of the first group that comprised the Association for Women in Mathematics (AWM).



Linda Rothschild

Now let me fast-forward to the present. Has the situation improved? Definitely!

1. Overt discrimination is largely a thing of the past.
2. The percentage of women among math Ph.D.'s in the U.S. increased from about 10% to over 30%. [See note [5], added after the Madrid ICM.]
3. A mathematics department with no women, or even just one, on the faculty is relatively rare.
4. Meetings of the American Math. Society generally have women speakers and organizers of special sessions.
5. AWM always has a program for women at national AMS meetings, including a panel and a lunch.
6. Women serve in good numbers on AMS committees and on panels of the NSF.
7. Women are regularly recipients of prestigious awards, such as the Sloan Foundation Fellowship and the Young Presidential Career Award.
8. Graduate programs actively seek women students, and math departments announce that they are eagerly seeking to hire women for their faculty.

So what's wrong? Well, the situation for women in mathematics in the U.S. is much better, but still disappointing. Furthermore, I'm not sure that more progress will be made. With the perception that women have had too many advantages already, we are seeing some backlash. By a recent California law (Proposition 209), it is illegal for state universities to show any preference for women in hiring or even in graduate admissions. Women themselves are choosing to drop out of rigorous mathematical study. At UCSD there were no women students remaining in the third quarter of our most serious undergraduate analysis course last spring. As director of my department's graduate program a couple of years ago, I was very disappointed to see two of the most promising women students drop out at the end of their first year.

What to do? I have no easy answers, but I hope that we can all keep our optimism, as well as an honest perspective, in facing the future.

Notes

- [1] B.A. Case and A.M. Leggett, *Complexities: Women in Mathematics*, Princeton University Press 2005, ISBN 0-691-11462-5
- [2] B.A. Case, "Will You Join Us in Madrid?" *AWM Newsletter* 36:4 (2006), p. 8.
- [3] "Sujatha Receives Ramanujan Prize for 2006," *AWM Newsletter* 37:1 (2007), p. 19.
- [4] Moderator's note: As the applause for Kra's talk ended, the moderator showed the book cover for *Women Don't Ask* on the overhead screen and read from that book's website: "When Linda Babcock asked why so many male graduate students were teaching their own courses and most female students were assigned as assistants, her dean said: 'More men ask. The women just don't ask.' It turns out that whether they want higher salaries or more help at home, women often find it hard to ask. Sometimes they don't know that change is possible—they don't know that they can ask. Sometimes they fear that asking may damage a relationship. And sometimes they don't ask because they've learned that society can react badly to women asserting their own needs and desires."
Also: "By neglecting to negotiate her starting salary for her first job, a woman may sacrifice over half a million dollars in lost earnings by the end of her career." <http://press.princeton.edu/titles/7575.html> (accessed 1/31/2007). L. Babcock and S. Laschever. *Women Don't Ask: Negotiation and the Gender Divide*, Princeton University Press 2004, ISBN: 978-0-691-08940-9
- [5] Note added by moderator 1/31/2007 with agreement of author: The *AMS Notices* 53:7, August 2006, describes a disturbing and apparently downward trend to the previously optimistic data about the percentage of Ph.D.'s awarded to women. (See "2005 Annual Survey of the Mathematical Sciences in the United States" pp. 775–786.) "Females totaled 359 (29% of all new doctoral recipients), up in number and down in percentage from 333 (31%) last year. Of the 496 U.S. citizen new doctoral recipients, 141 are female (28%), down in number and percent from last year. The highest percentage of females among the annual counts of doctoral recipients was 34%, reported for 1998–1999."

“Moving (Mostly) Forward: Women in Mathematics” Panel



*During the panel:
Zarah Afsharjad (Iran) and
Linda Rothschild (USA)*



*During the panel:
Chuu-Lian Terng (USA)*



*During the panel: Bryna Kra (USA), Marjo Lipponen (Finland),
Eddy Pariguan (Venezuela), and Sylvia Paycha (France)*



*Above and right: Audience members
joined the discussion*



Questions for the panelists

Book Review

Book Review Editor: Margaret Bayer, University of Kansas, Lawrence, KS 66045-7523, bayer@math.ku.edu

To Talk of Many Things. An Autobiography, Dame Kathleen Ollerenshaw, Manchester University Press, 2004, ISBN 0-7190-6987-4, xiv+269 pp.

Reviewer: Margaret Bayer, University of Kansas

Now this woman is an inspiration!

Dame Kathleen Ollerenshaw was born in 1912. Her long list of accomplishments include second place in the British Pairs Ice-Skating Championship of 1939, a doctorate in mathematics from Oxford University in 1945, election to the Manchester City Council 1956–81 (serving 1975–76 as Lord Mayor), Dame Commander of the Order of the British Empire in 1971, presidency of the Institute of Mathematics and Its Applications (UK) 1978–79, vice presidency of Manchester Institute of Science and Technology 1983–86, and many publications, including 21 research papers and a 152-page research monograph in mathematics.

Oh, and she was deaf, having lost her hearing at age 8. She regained partial hearing with hearing aids only in her late 30s. If this story were a novel, I would dismiss it as preposterous.

Chronology

Kathleen Timpson attended Somerville College at Oxford University where she studied mathematics (1931–34). After graduation, she got a job as an applied mathematician and statistician at the Shirley Institute, a research institute for the cotton industry. At the beginning of the war (September 1939), she married Robert Ollerenshaw. Kathleen and Robert had two children, Charles, born in 1941, and Florence, born in 1946. In 1945 Kathleen had completed her doctorate in mathematics at Oxford. In 1972 Florence died of cancer, at the age of 26. Robert died in 1986, and Charles died in 1999.

Involvement in Education

In the early 1950s Kathleen became very involved in educational development and reform. She became a member

of the governing body of her secondary school and served on the Association of Governing Bodies of Girls' Public Schools. She was appointed to the Manchester Education Committee. Soon after, she was elected to the Manchester City Council and continued to serve on the Manchester Education Committee with enhanced status. She was a major force in reorganization and expansion of the government-supported school system in Manchester, in the years when the school-leaving age was rising, the secondary education system was evolving from the three-tiered system of grammar, technical and modern schools to the comprehensive schools, and when disparities in education for girls and boys were being addressed. Of course, mathematics education was a special interest, and Kathleen worked to increase the competence of mathematics teachers.

Kathleen always put a priority on higher education. The 1970s and 1980s saw a great reorganization of higher education in Manchester. There was a flurry of mergers, ultimately resulting in three institutions with university status: Manchester Metropolitan University, University of Manchester Institute of Science and Technology (UMIST), and Victoria University of Manchester. The latter two merged in 2004. Kathleen was involved in much of this. She was First Chairman of Manchester Polytechnic (precursor to Manchester Metropolitan University) 1967–71, Member of Court of Victoria University of Manchester 1964–99, Deputy President of UMIST 1979–86, and on governing bodies of Salford (1954–86) and Lancaster (1975–91) Universities. She was chair of the committee that set up the Royal Northern College of Music and served as chair of the governing body of that institution for 18 years. The list goes on....

Mathematics

Kathleen says that the only period of her life when she was not doing mathematics was 1967–71, when the demands of her public life were too great. Her publication history falls into three periods. From 1944 to 1953 she published 12 papers on lattices and convex bodies. Her next publication was not until 1978. From 1978 to 1980 she published five more research papers, generally in discrete geometry and combinatorics. Then she got hooked on magic squares. From 1982 to 1998 (when she was 87 years old), she published a 90-page paper presenting the history of 4-by-4 magic squares and giving a new analytical construction and classification of them

(with Bondi), three papers on pandiagonal magic squares (two coauthored with Bree), and a 152-page monograph on “most-perfect” pandiagonal magic squares (with Bree).

In the 1990s she pursued a long-standing interest in astronomy. She acquired her own telescope and became a skilled amateur astronomer, mastering the use of the computer for guiding the telescope. She donated a telescope to Lancaster University, which built the Dame Kathleen Ollerenshaw Observatory to house it.

Deafness

Kathleen suffered from sensori-neural deafness, brought on by a viral infection at age 8, compounded by genetic otosclerosis. She learned lip-reading, not sign language, which was considered detrimental to functioning in society. She attributes her propensity for mathematics partially to her deafness, because learning math is not so dependent on hearing as learning other subjects.

After elementary school in a small Montessori school and secondary school in a boarding school, she applied to Oxford and Cambridge. The process included entrance exams taken at her school and interviews on campus. She did not tell either university that she was deaf. At Cambridge she was unable to lip-read an interviewer, and the committee learned of her deafness. At Oxford she managed to get through the interview without revealing her secret. In any case, she was admitted to both universities. As in her interviews at Oxford and Cambridge, Kathleen hid her deafness when facing the Conservative Party selection committee for nomination to the Manchester City Council. In general she used the “need-to-know” criterion. When she traveled, she told her hosts of her deafness and warned them that she would sleep without hearing aids and thus be unable to hear fire alarms and such. When giving public speeches, she asked the moderator to repeat all questions for her. For the most part, however, she hid her deafness and got by with lip-reading and many other strategies (mentioned in the book) for coping with her deafness. She even extols the advantage that deafness provides for sleeping while traveling.

Gender Issues

Kathleen Ollerenshaw says little about discrimination in her life, but her choices were clearly limited by her

gender. She was required to leave her wartime research position when her first child was born. Her own expectations, and those of her husband, were that she would be a housewife and support his career. But her intelligence, interests, and commitment to public service led her to so many more roles. There was never a possibility of holding a regular faculty position, because of both her gender and her deafness. (She was a part-time lecturer at Manchester University, however.) Her lifelong involvement in educational development and reform, at both school and university levels, began when a friend recruited her into the National Council of Women.

In 1965 Kathleen was selected for the Winifred Cullis Lecture Fellowship (which she describes as being “unique in giving women equal opportunities” [p. 150]) to make a three-month lecture tour in the US. On her trip she was shocked by the male/female divide in the US. She felt that “women’s struggle in the UK had mainly been fought, and largely won, immediately before and during the First World War.” [pp. 159–160] In America she found social integration of men and women decades behind that in Britain. This observation jarred me, because I spent 1972–73 in England as a teenager and had exactly the opposite impression.

In the early 1970s, Kathleen headed a research project at Lancaster University. The goal was “to explore possibilities of attracting more married women trained teachers to return to teaching after an interval out of school bringing up their young children.” [p. 127] Kathleen and a graduate assistant surveyed and interviewed several thousand women, and published a report with statistical analysis and recommendations for action. She notes that their report was “widely read and acted on.” [p. 130]

Husband’s Attitudes

Kathleen Timpson was engaged to childhood friend Robert Ollerenshaw in 1931, during her first term at Oxford. She says this decreased her incentive to study, as she saw herself becoming a traditional housewife. In fact, Kathleen and Robert did not marry until September 1939, at the beginning of the British involvement in World War II.

Kathleen reports that while the children were growing up, Robert expected her to be a homemaker. He was content with her doing mathematics at home and accepted her

part-time lecturing at the university and her volunteer work on education committees. However, when Kathleen was first asked to run for Manchester City Council, in 1955, Robert said, "If you say Yes, I shall walk out on you." She indicates that "I accepted his reaction without demur," [p. 90] regarding it as part of the marriage contract. His stance softened quickly after that. A year later, Kathleen and Robert were approached at a civic reception with the suggestion that she run for City Council. Perhaps social pressure induced him to acquiesce.

In the first years Kathleen was on City Council, Robert's attitude was one of "tolerant acceptance." [p. 113] When she rose to be chair of the education committee, she got more media attention (not always positive), and this irritated Robert. Over time, however, Robert's and Kathleen's

public work connected somewhat, and he perhaps came to see Kathleen as a teammate in the public sphere. In addition, as an accomplished medical illustrator, Robert helped Kathleen with illustrations for at least one of her mathematical papers.

Conclusion

Dame Kathleen Ollerenshaw has led, and continues to lead, a remarkable life. For her, mathematics and public service have always been paramount. Reading her autobiography, you feel as though you are sitting in her living room, listening to her reminisce. If you are frustrated that you cannot ask her questions while she reminisces, you will at least find an excellent index. I highly recommend this autobiography.

Education Column

Mathematicians/Mathematics Educators WANTED for Teacher Partnership Program

Pao-sheng Hsu, Suzanne Lenhart, and Erica Voolich

The AWM Teacher Partnership Program was started in August 2006 to link teachers of mathematics in schools with mathematicians/mathematics educators working in colleges, universities, business, and industry. This program intends to pair a teacher with a mathematician/mathematics educator according to their interests. In addition to electronic communications, partners may visit each other's classroom, collaborate in teaching projects, or cooperate in writing grant proposals.

From requests received recently, we see that a lot of teachers are looking for people who can inform them (and their students) about accessible applications of mathematics. They also mention as topics of interest: gender and culture

issues, improving teacher preparation and professional development, and the possibility of doing some research in mathematics education. Note that males and females are welcome in this new program.

Persons interested in more details about a match should visit the Web page <http://www.awm-math.org/teacherpartnership.html>. Our guidelines are there, and there is a Request a Partner Form that collects information about interests/needs and preferences for possible matches.

Since August we have received 57 requests, of which 19 were from mathematicians and 38 were from teachers. So far, 19 matches have been made.

We are asking individuals from the mathematics/mathematics education community to consider becoming involved in this program. Judging by our initial requests, we have more interested teachers than mathematicians/mathematics educators! We need more mathematicians/mathematics educators who are willing to participate. Please visit our Web page and consider this opportunity for collaboration.

**Renew your membership
or join AWM online at**

www.awm-math.org

Opportunities

PROMYS

PROMYS offers a lively mathematical environment in which ambitious high school students explore the creative world of mathematics. Through their intensive efforts to solve a large assortment of unusually challenging problems in Number Theory, the participants practice the art of mathematical discovery: numerical exploration, formulation and critique of conjectures, and techniques of proof and generalization. More experienced participants may also study

abstract algebra, geometry and symmetry, and analysis in arithmetic. Problem sets are accompanied by daily lectures given by research mathematicians. In addition, a highly competent staff of 18 college-aged counselors live in the dormitories and are always available to discuss mathematics with students. Each participant will meet with professional mathematicians several times per week for problem-solving and open-ended explorations. Special lectures by outside speakers offer a broad view of mathematics and its role in the sciences.

For information on admission criteria and the application process, visit the program Web site at <http://www.promys.org>.

Sonia Kovalevsky High School Mathematics Days

Through a grant from Elizabeth City State University (ECSU) and the National Security Agency (NSA), the Association for Women in Mathematics expects to support Sonia Kovalevsky High School Mathematics Days at colleges and universities throughout the country. Sonia Kovalevsky Days have been organized by AWM and institutions around the country since 1985, when AWM sponsored a symposium on Sonia Kovalevsky. They consist of a program of workshops, talks, and problem-solving competitions for high school women students and their teachers, both women and men. The purposes are to encourage young women to continue their study of mathematics, to assist them with the sometimes difficult transition between high school and college mathematics, to assist the teachers of women mathematics students, and to encourage colleges and universities to develop more extensive cooperation with high schools in their area.

AWM anticipates awarding 12 to 20 grants ranging on average from \$1500 to \$2200 each (\$3000 maximum) to universities and colleges; more grants may be awarded if additional funds become available. Historically Black Colleges and Universities were particularly encouraged to apply. Programs targeted toward inner city or rural high schools are especially welcome.

Applications, not to exceed six pages, should include: a) a cover letter including the proposed date of the SK Day, expected number of attendees (with breakdown of ethnic background, if known), grade level the program is aimed toward (e.g., 9th and 10th grade only), total amount requested, and organizer(s) contact information; b) plans for activities, including specific speakers to the extent known; c) qualifications of the person(s) to be in charge; d) plans for recruitment, including the securing of diversity among participants; e) detailed budget (i.e., food, room rental, advertising, copying, supplies, student giveaways, etc. Honoraria for speakers should be reasonable and should not, in total, exceed 20% of the overall budget. Stipends and personnel costs are not permitted for organizers. The grant does not permit reimbursement for indirect costs or fringe benefits. Please itemize direct costs in budget.); f) local resources in support of the project, if any; and g) tentative follow-up and evaluation plans.

The decision on funding will be made in late August. The high school days are to be held in Fall 2007 and Spring 2008. If selected, the organizers must submit a report of the event along with receipts (originals or copies) for reimbursement to AWM within 30 days of the event or by May 15, 2008, whichever comes first. Reimbursements will be made in one disbursement; no funds will be disbursed prior to the event date. An additional selection cycle will be held February 4, 2008 for Spring 2008 *only if* funds remain after the August 2007 selection cycle.

Send *five* complete copies of the application materials to: Sonia Kovalevsky Days Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. For further information: phone 703-934-0163, e-mail awm@awm-math.org, or visit www.awm-math.org. Applications must be received by **August 3, 2007**; applications via e-mail or fax will not be accepted.

HRUMC XIV

The 14th annual Hudson River Undergraduate Mathematics Conference will be held at Siena College in Loudonville, New York on April 21, 2007. The conference includes presentations on mathematics by both faculty and students, and both are encouraged to participate. Conference sessions are designed so that some presentations are accessible to undergraduates in their first years of study, and others are accessible to third or fourth year undergraduate mathematics majors.

The keynote speaker for this year will be Georgia Benkart, Professor of Mathematics at the University of Wisconsin at Madison. You can find out more about HRUMC by visiting the conference Web site <http://www.skidmore.edu/academics/mcs/pages/hrumc.htm>.

CAS Trust Scholarship

The Casualty Actuarial Society is once again accepting applications for its scholarship program for college students pursuing a career in actuarial science. The CAS Trust Scholarship program, funded by donations to the CAS Trust, will award up to three \$1,500 scholarships to deserving students for the 2007–2008 academic year. Information and applications are available online at http://www.casact.org/academic/index.cfm?fa=scholar_apply. Applications are due by **May 1, 2007**, and winners will be notified in July.

See classified ads, page 30, for the **2007 Cornell Topography Festival** and the **2007 Project NExT program**.

NSF-AWM Travel Grants for Women

The objective of the NSF-AWM Travel Grants program is to enable women researchers in mathematics or in mathematics education to attend research conferences in their fields, thereby providing a valuable opportunity to advance their research activities and their visibility in the research community. By having more women attend such meetings, we also increase the size of the pool from which speakers at subsequent meetings may be drawn and thus address the persistent problem of the absence of women speakers at some research conferences. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM.

Travel Grants. These grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization. A maximum of \$1000 for domestic travel and of \$2000 for foreign travel will be applied. For foreign travel, U.S. air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

Eligibility. These travel funds are provided by the Division of Mathematical Sciences (DMS) and the Division of Research, Evaluation and Communication (REC) of the NSF. The conference or the applicant's research must be in an area supported by DMS. Applicants must be women holding a doctorate (or equivalent experience) and with a work address in the USA (or home address, in case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years is ineligible. Anyone receiving a significant amount of external governmental funding (more than \$2,000 yearly) for travel is ineligible. Partial travel support from the applicant's institution or from a non-governmental agency does not, however, make the applicant ineligible.

Applications. An applicant should send *five* copies of 1) the AWM Travel Grant Form, where conference name, conference dates and location (city/state/country), and amount of support requested should be provided, 2) a cover letter, 3) a description of her current research and of how the proposed travel would benefit her research program, 4) her curriculum vitae, 5) a budget for the proposed travel, and 6) a list of all current and pending travel funding (governmental and non-governmental) and the amounts available for your proposed trip to: Travel Grant Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. If you have questions, contact AWM by phone at 703-934-0163 or by e-mail at awm@awm-math.org. Applications via e-mail or fax will not be accepted. There are three award periods per year. The next two deadlines for receipt of applications are **May 1, 2007** and **October 1, 2007**.

OHIO UNIVERSITY

Endowed Chair in Mathematics Education

The Morton Chair: The Ohio University College of Education invites nominations and applications for the Robert L. Morton Chair for Mathematics Education. This esteemed position is a tenured faculty appointment at Full Professor rank. Substantial discretionary funds are provided to support research and other professional activities. The Morton Chair appointee will also inherit Dr. Morton's legacy of scholarship, dedication and innovation in mathematics education.

Robert L. Morton, an influential mathematics scholar, endowed this full-time professorship to promote research and outstanding contributions in the field of mathematics education. Dr. Morton was a Distinguished Professor, the premier honor for Ohio University faculty, and received the Ohio University Board of Trustees' highest citation for exceptional service to the institution.

The College currently features two funded research projects that aim to strengthen the infrastructure and elevate the prominence and visibility of mathematics education in southeastern Ohio, a mission that receives financial support from the state of Ohio.

Ohio University is categorized as a Carnegie RU/H: Research University (high research activity). The chair will benefit from strong alliances with the College of Arts and Sciences' Department of Mathematics and an active mathematics education student organization.

Responsibilities: The Mathematics Education Program offers immense potential for conducting research and building capacity. The appointee will have the resources and freedom to build and shape the program within a vigorous College of Education.

The appointee will help to advance the College's accredited programs in mathematics education; maintain a strong record of scholarship, preferably with an emphasis on rural Appalachian mathematics education with its unique challenges and meaningful rewards; and teach and advise graduate students.

Required Qualifications: The successful candidate must satisfy the qualifications for appointment as a Full Professor in the Department of Teacher Education. Those qualifications include: a terminal degree from an accredited university in mathematics education or a related area; experience teaching mathematics in K-12 schools; national recognition for teaching and leadership in mathematics education at the university level; and an exceptional record of scholarship in the field.

Application Details: Applicants should fully describe their qualifications and related experience via a current vita, detailed cover letter, the names and contact information (addresses, phone numbers and email addresses) of at least three professional references, and any additional supporting materials the candidate deems appropriate.

Credentials will be evaluated on the applicant's demonstrated productivity and success in scholarship, teaching and professional activities.

Applicants who are not U.S. citizens must state their current visa and residency status.

Review of materials will begin immediately and continue until the position is filled. The desired position start date is **September 1, 2007**.

Send application materials to: **Dr. Ralph Martin, Search Committee Chair, Ohio University, College of Education, McCracken Hall 246, Athens, OH 45701-2979.**

Ohio University & the College of Education: Established in 1804, Ohio University is the oldest public institution of higher learning in the historic Northwest Territory and the state of Ohio. As a comprehensive, national research university, it offers distinctive, high-quality education. Nestled in the foothills of the Appalachian Mountains, Athens' natural beauty provides a picturesque backdrop for a quintessential college town that boasts a vibrant community of 21,000.

The College of Education serves 1,500 undergraduates and well over 500 graduate students. The College has a proud history, spanning 120 years. Our influence is felt both locally and globally. We were the first public teacher preparation program in Ohio. Today, the College employs more than 75 outstanding faculty with expertise and experience that extends across four continents. By forging trademark partnerships that address the social, economic and educational issues affecting public school children's ability to learn, the College of Education continues to have a profound impact on the state of education in our region and the nation.

For more information about Ohio University, please visit the University website at www.ohio.edu

For additional information about the College of Education, visit our website at www.coe.ohiou.edu



Ohio University is an Affirmative Action/Equal Opportunity employer committed to excellence through diversity. The University offers spousal hire opportunities, an excellent retirement system and a guaranteed summer salary option. Women and minorities are encouraged to apply.



New Directions Short Course
Compressive Sampling and Frontiers in Signal Processing
 June 4 -15, 2007

Instructors: **Emmanuel J. Candes** (Caltech),
Ronald DeVore (U. South Carolina), and
Richard Baraniuk (Rice University)

From June 4-15, 2007 the IMA will host an intensive short course on the emerging field of Compressive Sampling which overturns conventional wisdom to enable recovery of signals and images from what appears to be highly incomplete data. The course will efficiently provide researchers in math and related disciplines the basic knowledge prerequisite to undertake research in this exciting new area, which has many beautiful connections to diverse branches of mathematics including probability, optimization, Banach spaces, information theory, coding and statistics. The course limited to 25 participants, typically mathematics faculty, selected by application. All successful applicants will be funded for travel and local expenses.

For more information and to apply:
www.ima.umn.edu/2006-2007/ND6.4-15.07

Application deadline: April 1, 2007



The IMA is an NSF funded institute



UNIVERSITY OF MINNESOTA

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CATEGORY 2a (includes 3 student memberships; 1 free ad; 10% off additional Newsletter & online ads)	\$175
CATEGORY 2b (includes 6 student membership; 10% off Newsletter & online ads)	\$150

For further information or to join at these levels, see www.awm-math.org.

ADVERTISEMENTS

2007 CORNELL TOPOLOGY FESTIVAL — Cornell University, Ithaca, NY, 21–24 May, 2007. Speakers: Danny Calegari, Ralph Cohen, Cornelia Drutu, Alex Eskin, Mark Feighn, Ilya Kapovich, Christopher Leininger, Tim Riley, Juan Souto, Gang Tian. This year's Festival includes a number of talks in group theory and low-dimensional topology. There will be two introductory workshops in those areas as well as a more general panel discussion. Financial support is available—young researchers are especially encouraged to apply. For registration and further details see the Festival web page: <http://www.math.cornell.edu/~festival/>.

2007 PROJECT NExT PROGRAM — Project NExT (New Experiences in Teaching) is a professional development program for new and recent Ph.D.s in the mathematical sciences (including pure and applied mathematics, statistics, operations research, and mathematics education). It addresses all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, and participating in professional activities. It also provides the participants with a network of peers and mentors as they assume these responsibilities. Each year, about sixty faculty members from colleges and universities throughout the country are selected to participate in a workshop preceding the Mathematical Association of America (MAA) summer meeting, in activities during the summer MAA meetings and the Joint Mathematics Meetings in January, and in an electronic discussion network. Faculty for whom the 2007–2008 academic year will be the first or second year of full-time teaching (post-Ph.D.) at the college or university level are invited to apply to become Project NExT Fellows. The application deadline is **April 16, 2007**. For more information, see the Project NExT website, <http://archives.math.utk.edu/projnext/>. Project NExT is a program of the MAA. It receives major funding from the ExxonMobil Foundation, with additional funding from the Dolciani-Halloran Foundation, the Educational Advancement Foundation, the American Mathematical Society, the American Institute of Mathematics, the American Statistical Association, the National Council of Teachers of Mathematics, Texas Instruments, the Association of Mathematics Teacher Educators, the Association for Symbolic Logic, the W.H. Freeman Publishing Company, Maplesoft, MAA Sections, and the Greater MAA Fund.

EAST TENNESSEE STATE UNIVERSITY — Howard Hughes Medical Institute Visiting Professorship, Integrating the First Year Mathematics and Biology Curricula — The Departments of Mathematics and Biological Sciences at East Tennessee State University invite applications for visiting positions for our program “SYMBIOSIS: An Introductory Integrated Mathematics and Biology Curriculum for the 21st Century.” This project is supported by a four year \$1.7M Howard Hughes Medical Institute grant and is an exciting endeavor to reconfigure, unify, and integrate the 3 semester introductory biology sequence, the first semester of the calculus sequence, and an introductory statistics course. We invite applications from experienced colleagues who would like to lend their expertise to our exciting curriculum development efforts. The position would be ideal for a senior person on sabbatical leave, but applications are invited from candidates at all ranks. Duties include (but are not restricted to) writing and publishing teaching materials with an interdisciplinary team; participating in teaching and organizing the labs for the course; disseminating the course material through the web and in workshops. To apply send a letter of interest and a curriculum vitae, and arrange to have two letters of reference sent to Jeff Knisley, Box 70663, Dept. of Mathematics, East Tennessee State University, Johnson City, TN 37614-0663. Electronic application packets are welcome and may be sent to knisleyj@etsu.edu. Review of applications will begin immediately and continue till the position is filled. Information about our departments may be found at www.etsu.edu/math/math.htm and www.etsu.edu/biology. AA/EOE. For more information about the position or institution/company: <http://www.etsu.edu>.

HARVEY MUDD COLLEGE — Harvey Mudd College invites applications for a Teaching & Research Postdoctoral Fellowship in the Mathematical Sciences. Excellence in teaching is essential, as is evidence of a strong and ongoing research program. The fellow will teach a course per semester and participate in the department's experiential/inquiry-based learning programs. Further information available at <http://www.math.hmc.edu/jobs/>. Preference given to applications received by **February 15, 2007**.

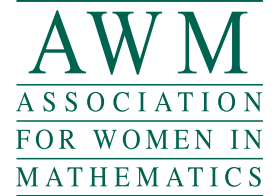
MICHIGAN STATE UNIVERSITY — Teaching Specialist — The Department of Statistics and Probability at Michigan State University invites applications for a teaching specialist position to begin August 16, 2007. Excellence in classroom teaching and leadership in developing and improving introductory undergraduate curricula are expected of the applicant. Duties will include teaching large undergraduate lecture courses. Interest in pedagogical research is desirable and is encouraged but not essential for initial appointment and reappointments. The successful candidate is likely to have both a PhD and substantial experience in teaching of statistics and probability. MS or PhD in Statistics is required. Good communication skill is essential. Experience in the use of technology in teaching is desirable. The position is an academic year (9 months) position, but summer teaching is often available for extra pay. Salary will be commensurate with qualifications of the candidate chosen. Teaching load will depend on the candidate chosen, but will involve two to three courses per semester, some of which may be at an advanced level. Michigan State University offers an attractive benefits package, including health and retirement coverage. This is not a tenure track position, but is within the continuing appointment academic specialist system. If the candidate is reappointed after two 3 year probationary periods, they receive continuing appointment status (job security) as a Teaching Specialist within the Department. To apply, please arrange for all of the following to be submitted: (1) a curriculum vitae, (2) a statement of teaching philosophy, and (3) three letters of recommendation. Additional materials, such as copies of publications or a teaching portfolio, may also be submitted as a part of the application. All application materials should be sent to: Teaching Specialist Search Committee, Department of Statistics and Probability, A413 Wells Hall, Michigan State University, East Lansing, MI 48824-1027. Completed applications received by **April 15, 2007** will be assured full consideration. Electronic applications may be sent via e-mail to (sparks@stt.msu.edu). The search will continue until the position is filled. Michigan State University is an Affirmative Action/Equal Opportunity Employer.

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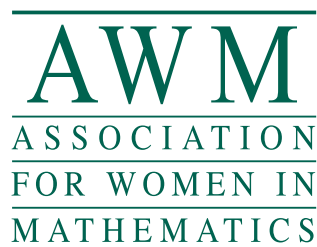
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