AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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President's Report

Dear Colleagues:

If you have exchanged e-mail recently with our managing director Jennifer Lewis you may have noticed the CAE in her signature. This stands for "Certified Association Executive," which is the highest professional credential awarded by the association industry—and not easy to earn. Congratulations, Jennifer!

I am writing after the Society for Industrial and Applied Mathematics Conference in San Diego. This conference was new to me (my background is far from applied) and I was happy to have the opportunity to meet people whose names I have known for years through AWM. One of these was Jill Mesirov (past president of AWM) who gave an inspiring after-dinner talk for the AWM workshop. Another was Tamara Kolda, who, with Lenore Cowen, chaired the conference organizing committee.

Many thanks to the workshop mentors for so generously giving their time and energy to the graduate students and post-docs at the workshop. Andrea Bertozzi, Maeve McCarthy, and Linda Petzold gave informative—and amusing—talks for the career panel. Thanks also to the AWM workshop organizers: Renee Fister, Kristin Lauter, and Maeve McCarthy. (Maeve volunteered as a workshop organizer before she thought of becoming the AWM Executive Director. She gracefully managed these two roles—and filled in for a missing workshop panelist at the last minute.) Although she was not an official workshop organizer, Suzanne Lenhart deserves special thanks for her help and advice.

Thanks also to the speakers in the session on "Gender Equity: Recommendations and Programs." Barbara Keyfitz gave an illuminating discussion of the BIRS report, *Women Mathematicians in the Academic Ranks: A Call to Action. Report of the BIRS Workshop on Women in Mathematics.* (If you haven't read it, I encourage you to download it from the BIRS website at http://www.birs.ca/workshops/2006/06w5504/report06w5504.pdf and do so. It's eighteen pages

IN THIS ISSUE

AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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.

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long, and, in my biased opinion—as one of its many authors—easy to read.) Geri Richmond described outcomes of three workshops on gender bias for chairs of the "top 50" U.S. departments in chemistry, physics, and materials science. The final speaker was John Meakin, who is the chair of the mathematics department at the University of Nebraska–Lincoln. This department is well known as a productive environment for women and John described some of the practices that help to make it that way.

Dianne O'Leary gave a wonderful Sonia Kovalevsky Lecture that explained its title "A Noisy Adiabatic Theorem: Wilkinson Meets Schrödinger's Cat." Days afterward, I kept thinking about both the ideas in the talk and about the kind of skill that it takes to create such a talk for a general mathematical audience.

How to give a talk for a general audience is one of many things not often taught in graduate school, but might be learned or, at least, inspired, by observation. Other, less difficult, kinds of knowledge—what to put on a curriculum vitae (c.v.) or what not to put on one's Web site—are also not always explicitly taught in graduate school. These were among the topics discussed by the AWM workshop panel and by the professional development panel later in the week.

Knowing how to give a talk and write an article, present a poster, and knowing what to include (or omit) on a c.v. or home page are all examples of what the BIRS report calls "knowledge of the craft." Each of these has variations that depend on audience and there is now much advice about them available on and off the Web. See, for example, the AMS page on the profession, SIAM's careers and jobs page, and Nicholas Higham's *Handbook of Writing for the Mathematical Sciences.*

Finding this advice is not difficult. But, knowing what kind of advice to look for can be hard. That's where a mentor, peer, or "critical friend" who listens to your talk or reads your article can be extremely helpful.

Nurturing ability may be important too. I was struck by the advice given by the SIAM panelists about monitoring one's reactions to a work situation. "Have fun." "Keep track of your 'professional temperature.'" This is interesting advice. My guess is that some of us may get used to a certain level of discomfort during graduate school and may come to expect it (and ignore it) at work. When I heard comments about having fun and not being unhappy on average, I started to wonder if an important aspect of career success is the ability to leave or modify a job that is a bad fit.

In either case, a network of friends and colleagues may be very, very useful. This was illustrated in a panel on "Work and Family: Achieving a Balance" at my local Association for Women in Science (AWIS) chapter. Two of the three speakers were scientist-mothers who had taken time off from work due to children. Both credited their networks, established before

their pregnancies and maintained while they were away from work, with helping them to find work and research opportunities. (One of the speakers, Pia Abola, wrote about her experiences in *Motherhood, The Elephant in the Laboratory,* part of which is available online.)

These experiences occurred in the sciences, not mathematics, and in the San Francisco Bay Area, where biomedical and biotech companies abound. A mathematician may think, "What about academe?" Mary Ann Mason, the third speaker at the AWIS meeting, described current efforts to make academe, in particular the University of California, more family friendly. You may have heard of her in connection with the "Do Babies Matter?" study. Its findings underlie *Mothers on the Fast Track: How a New Generation Can Balance Family and Careers,* which Mason wrote with her daughter Eve Mason Ekman. (The first chapter of this book and reports from Do Babies Matter? are posted at Mason's Web site.)

Mason is also a principal investigator for the Family Friendly Edge project at the University of California. Part of this project involves programs and policies such as tenure-clock stoppage and "active service-modified duties" (a part-time tenure-track option). However, there is more to the Family Friendly Edge than programs like these.

As a 2004 *Chronicle of Higher Education* article points out, "Part-time, tenure-track arrangements have been on the books at a substantial number of institutions for years." Most were unusable, due to a culture of long work hours, a focus on speed to tenure, and sometimes no guarantee of the right to return to full-time work. Part-time options were derisively dubbed the "mommy track" and part-timers often became a part of the marginalized "second tier"—rather than the more prestigious "first tier" or fast track.

"New options by themselves do not transform a culture," say Mason and Ekman. An innovative aspect of the Family Friendly Edge is a "School for Chairs" which educates department chairs about the use of part-time options and other strategies for retaining new parents. Several of these strategies echo recommendations of the BIRS report, for example, discounting résumé gaps due to parenthood and ending faculty meetings at 5:00 p.m. BIRS report recommendations are also echoed in *Designing and Implementing Family Friendly Policies in Academe,* a new report from the University of Michigan.

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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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See www.awm-math.org for details on free ads, free student memberships, and ad discounts.
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Benefactor: $5000+ — Program Sponsor: $10,000+
See the AWM website for details.

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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).

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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.

AWM
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Online Ads Info
Classified and job link ads may be placed at the AWM website.

Website
http://www.awm-math.org

AWM DEADLINES

Alice T. Schafer Prize: October 1, 2008

NSF-AWM Travel Grants: October 1, 2008 and February 2, 2009

AWM Noether Lecture: October 15, 2008

AWM-SIAM Kovalevsky Prize Lecture: November 1, 2008

Ruth I. Michler Prize: November 1, 2008

AWM Workshop at SIAM: January 26, 2008

NSF-AWM Mentoring Travel Grants: February 1, 2009

Sonia Kovalevsky High School Mathematics Days: February 4, 2009

AWM Essay Contest: February 27, 2009

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Discounting résumé gaps, ending faculty meetings at 5:00, and part-time tenure-track positions have an obvious connection with the concerns of new parents. But lately, I have started to wonder if the fast track in academe is a productive environment for everyone else. I am not the first to note that new mothers in "fast-track" positions—inside and outside of academe—may be the proverbial canaries in the coal mine. Many of these mothers feel the opposing forces of what Mason and Ekman call "the new momism"—societal pressure for mothers to constantly supervise children—and the ever-greedier workplace, in which "full-time" really means much more than forty hours per week.

At the University of California, faculty women with children reported an average of ninety-four hours per week spent on professional work, housework, and caregiving. Fifty-three of those hours went to professional work. The corresponding numbers for women without children were eighty and fifty-nine. The averages for men without children were smaller (seventy-seven and fifty-eight). Men with children spent more time on caregiving and less time on professional work.

In academe, this greedy workplace often seems to play out as pressure to produce more and faster—more talks, more articles (with many citations, in "high-impact" journals), more grant proposals (and more grants). At some universities, faculty productivity is measured by "simple and objective" methods that rely heavily on statistics derived from citation data. Some pitfalls of these methods are discussed in *Citation Statistics,* a report produced by the International Mathematics Union in cooperation with ICIAM and SIAM.

The charge to the *Citation Statistics* committee attributes the use of algorithmic methods in evaluating faculty publications to a drive for more accountability and transparency. That may well be the case. But, I notice that, along with being "simple and objective," such methods may seem to reduce the need for time and thought in evaluating faculty members. Care in evaluating faculty, refereeing, editing journals, mentoring students, committee service, and other "invisible work" in academic life is harder to quantify. Documenting for outsiders the necessity of such work is often hard, sometimes impossible—and requires yet more time.

Worries like these have existed in academe for several decades, at least. However, *Citation Statistics* and reports of serious slips made by referees suggest that the demands for visible and quantifiable work have increased at the expense of less visible work.

Such demands are a sharp contrast to the tenets of the Slow Food movement, which advocates taking more care in preparing and enjoying food—building a food system that is "sustainable, just, and delicious." This movement has taken root where I live, and at the end of August we will celebrate food at Slow Food Nation in San Francisco.

After reading about the fast track, misuse of citation statistics, and other pressures of academe, it's hard not to ask: Is it time for a Slow Academe movement?

Cathy Kessel
Berkeley, CA
August 3, 2008

Workshop Mentors Needed

Are you looking for an opportunity to be more active in AWM? Have you considered being a mentor at one of our workshops?

We're looking for volunteers to serve as mentors at the January AWM workshop, to be held January 7–8, 2009, in conjunction with the annual Joint Mathematics Meetings in Washington, DC. Being a mentor for a graduate student or recent Ph.D. is incredibly rewarding.

If you'd like to help, contact our Executive Director, Maeve McCarthy at mlmccarthy@awm-math.org.

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. Two types of grants are available. The Mathematics Travel Grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization. The Mathematics Education Research Travel Grants provide full or partial support for travel and subsistence in math/math education research, for mathematicians attending a math education research conference or math education researchers attending a math conference. In either case, a maximum of $1500 for domestic travel and of $2000 for foreign travel will be applied. For foreign travel, US 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 the case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years is ineligible. Anyone receiving more than $2000 yearly in external governmental funding 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. All applications must be submitted online via the web-based system which is available through a hotlink at http://www.awm-math.org/travelgrants.html. The application requirements and a complete step-by-step process are available at the online site. If you have not already done so you must first create a user account—this will be the first screen when you access the site. During the application process you will be asked to attach one .pdf file that includes your proposal, CV and current and pending funding information, as applicable. If you have a speaker confirmation letter or e-mail notification, scan the document as an electronic file and attach it as a .pdf. In addition, please complete the application pre-survey administered by an independent evaluator. You may contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance. There are three award periods per year. The next two deadlines for receipt of applications are **October 1, 2008** and **February 1, 2009**.

AWM at the 2008 SIAM Annual Meeting

Maeve Lewis McCarthy, AWM Executive Director

This year, the SIAM Annual Meeting was held in San Diego, CA July 11–15, 2008 in conjunction with the SIAM Conference on Imaging Science. Almost 1200 people attended the meetings which took place at the Town and Country Resort in San Diego.

Lenore Cowen, Tufts University, and **Tamara G. Kolda**, Sandia National Laboratories, co-chaired the Organizing Committee for the SIAM Annual Meeting, while **Margaret Cheney**, Rensselaer Polytechnic Institute, co-chaired the Organizing Committee for the SIAM Conference on Imaging Science.

Twenty percent of the invited lecturers were women—a five percent drop from the last SIAM Annual Meeting (Boston, 2006). **Karen Devine**, Sandia National Laboratories, spoke on "Software Design for Scientific Applications." **Lise Getoor**, University of Maryland, College Park, presented a lecture entitled "Graph Identification." **Jill P. Mesirov**, Broad Institute of MIT and Harvard University, spoke on "Beyond the Human Genome Project: Challenges and Opportunities in Genomic Medicine." **Cécile Penland**, National Oceanic and Atmospheric Administration, discussed "A Stochastic Model of El Nino." **Mila Nikolova**, ENS Cachan, France spoke on "Qualitative Features of the Minimizers of Energies and Implications on Modelling."

Cathy Kessel and Diane O'Leary

Jill Mesirov

Dianne P. O'Leary, University of Maryland at College Park, delivered the AWM-SIAM Sonia Kovalevsky Lecture: "A Noisy Adiabatic Theorem: Wilkinson Meets Schrödinger's Cat." O'Leary began by providing a brief history of Sonia Kovalevsky's mathematical career and her contributions to multiple fields of mathematics. O'Leary expertly introduced the concept of perturbations in a system defined by Schrödinger's equation. She used Wilkinson style perturbation analysis to effectively produce bounds on the effects of these perturbations.

The AWM Workshop for Women Graduate Students and Recent Ph.D.'s was organized by **Renee Fister**, Murray State University, **Kristen Lauter**, Microsoft Research, and **Maeve McCarthy**, Murray State University.

The workshop dinner was held on Sunday night. This was the first opportunity for graduate and post-doctoral participants to meet with their mentors. The evening began with opening remarks by **Doug Arnold**, University of Minnesota and President-Elect of SIAM. Dinner and

informal discussion between mentees and their mentors was followed by candid remarks by AWM Past-President **Jill Mesirov** of the Broad Institute of MIT and Harvard University. Mesirov discussed the opportunities that she has chosen to take in a career that has involved both industry and academia.

The workshop continued on Monday with the mini-symposium "Learning from Our Experiences." With standing room only, the speakers shared what they had learned from their careers on how to be succeed in applied mathematics. In her talk "No!!!!!" **Linda Petzold**, University of California, Santa Barbara, discussed the appropriate times to say yes or no to opportunities ranging from talks and refereeing to committee work. **Maeve L. McCarthy**, Murray State University, shared her personal view of success and its impact on her career in "Beyond Perception: Defining Your Own Success." **Andrea L. Bertozzi**, University of California, Los Angeles, spoke on "Advice for Ph.D. Students and Postdocs Looking for Jobs" where she warned of the big mistakes job seekers make—everything from poor choices on their Facebook pages to forgetting to say thank you.

The workshop continued on Tuesday with presentations by postdoctoral participants in one of two minisymposia.

Dynamics of Oscillations and Effects of Noisy Data

Saziye Bayram, State University of New York at Buffalo
"Dynamics of Closely Coupled Nephrons"

Vrushali Bokil, Oregon State University
"Analysis of Stability and Dispersion in a Finite Element Method for Debye and Lorentz Dispersive Media"

Anna Ghazaryan, North Carolina State University
"On the Stability Analysis of Wavefronts in Marginal Cases"

Call for Nominations: The 2009 Kovalevsky Prize Lecture

AWM and SIAM established the annual Sonia Kovalevsky Prize Lecture to highlight significant contributions of women to applied or computational mathematics. This lecture is given annually at the SIAM Annual Meeting. Sonia Kovalevsky, whose too-brief life spanned the second half of the nineteenth century, did path-breaking work in the then-emerging field of partial differential equations. She struggled against barriers to higher education for women, both in Russia and in Western Europe. In her lifetime, she won the Prix Bordin for her solution of a problem in mechanics, and her name is memorialized in the Cauchy-Kovalevsky theorem, which establishes existence in the analytic category for general nonlinear partial differential equations and develops the fundamental concept of characteristic surfaces.

The mathematicians who have given the prize lecture in the past are: Linda R. Petzold, Joyce R. McLaughlin, Ingrid Daubechies, Irene Fonseca, and Lai-Sang Young. This year's lecture will be delivered by Dianne P. O'Leary.

The lectureship may be awarded to anyone in the scientific or engineering community whose work highlights the achievements of women in applied or computational mathematics. The nomination must be accompanied by a written justification and a citation of about 100 words that may be read when introducing the speaker. Nominations should be sent to the AWM office (*five* copies to: Kovalevsky Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030; phone: 301-405-7892) or electronically to awm@awm-math.org, to arrive by **November 1, 2008**.

The awardee will be chosen by a selection committee consisting of two members of AWM and two members of SIAM. Please consult the award web pages www.siam.org/prizes/sponsored/kovalevsky.php and www.awm-math.org/kovalevskylectures.html for more details.

Fatma Kazanci, Emory University
"Effects of Local Coupling on Asynchronous Solution of the Kuramoto Model"

Algorithms and Optimization

Elena Constantin, University of Pittsburgh, Johnstown
"Second Order Necessary Conditions in Nonsmooth Optimization"

Linh Thi Hong Nguyen, Princeton University
"An Extended Cutting Plane Method for a Class of Nonconvex Problems"

Hong-Kun Zhang, Northwestern University
"Slow Decay of Correlations of Chaotic Billiards"

Julia Zuev, University of Colorado at Boulder
"Fast 2–D Spline Interpolation Algorithm"

On Tuesday evening, twelve graduate students presented AWM posters during the SIAM poster session and dessert reception. This concluded another successful AWM-SIAM workshop.

Genevieve Brown, Evelyn Sander, Hong-Kun Zhang, Barbara Keyfitz

Gouhua Zhou

Poster Session

Genevieve Brown, Northwestern University
"Time-delayed Feedback Control and the Stabilization of Periodic Orbits"

Sunyoung Bu, University of North Carolina at Chapel Hill
"Semi-implicit Preconditioning Techniques for Krylov Deferred"

Jennifer Burke, University of California, Riverside
"Gaussian Bounds as they Relate to the 3-D Axisymmetric Navier-Stokes Equations"

Carrie Manore Donkor, Oregon State University
"Mathematical Modeling of Disease and Competition Dynamics in Metapopulations with Applications to Barley Yellow Dwarf Virus"

Malena I. Espanol, Tufts University
"Multilevel Approach for Signal Restoration Problems with Structured Matrices"

Jessica Libertini, Brown University
"Measuring Tumor Blood Flow Parameters Using Contrast-Enhanced Dynamic Image Techniques"

Kara L. Maki, University of Delaware
"An Overset Grid Method for the Study of Human Tear Film"

Rachael L. Miller, University of Tennessee
"Optimal Control Applied to Native-Invasive Population Dynamics"

Tiffany Psemeneki, Northwestern University
"Optimal Movement in the Prey Capture Behavior of Weakly Electric Fish"

Teresa Selee, North Carolina State University
"Using IMSCAND to Extract Clusters from Data with Multiple Similarity Measures"

Deborah A. Smith, Florida State University
"Characterizing the Cortical Folding Pattern Across Species Using Prolate Spheroidal Harmonics"

Guohua Zhou, Clarkson University
"Compact Conservative Jacobians on Rectangular and Hexagonal Grid"

This workshop was made possible by funding from the Office of Naval Research and the Department of Energy. A special thanks to the volunteers who organized, spoke and mentored: Renee Fister, Kristin Lauter, Maeve McCarthy, Andrea Bertozzi, Linda Petzold, Janet Best, Margaret Cheney, Nina Fefferman, Misha Kilmer, Tamara Kolda, Suzanne Lenhart, Cammey Cole Manning, Dianne O'Leary, Malgo Peszynska, Susan Minkoff, Evelyn Sander and Katherine Socha.

Hong-Kun Zhang (Northwestern University), Julia Zuev (Eckerd College), Linh Thi Hong Nguyen (Princeton University), Elena Constantin (University of Pittsburgh, Johnstown)

Vrushali Bokil (Oregon State University), Ffatma Kazanci (Emory University), Saziye Bayram (SUNY-Buffalo State College), Anna Ghazaryan (University of North Carolina)

AWM at the 2008 SIAM Annual Meeting

Carrie Monkor

Saziye Bayram, Renee Fister, Jennifer Burke, Katherine Socha

Jessica Libertini

Jennifer Burke

Jill Mesirov, Vrushali Bokil, Saziye Bayram

Examples of Groups 2008

Brie Feingold, University of California, Santa Barbara

A warm rain greeted the twenty-seven graduate students and ten speakers who ventured to Ohio State University for the first Examples of Groups Summer School. The organizer, Indira Chatterji, provided an opportunity for participants from the U.S., Canada, and even Switzerland to build on their knowledge of geometric group theory topics. In contrast with most mathematical gatherings, over sixty percent of the mathematicians attending and giving talks were women. One participant wrote: "I liked the choice of speakers and topics and most of all the diversity of graduate students who showed up."

Ruth Charney's talk on braid groups kicked off the workshop and was followed by a problem session. Although it had not been announced ahead of time, the session was a great icebreaker, gently pushing participants to work together and interact with the speaker. Talks on Coxeter groups, relatively hyperbolic groups, mapping class groups, Basse-Serre theory, buildings, and more were peppered throughout the week, and a mini-course on SL(n,Z) and lattices ran continuously. One survey from the workshop reads:

Working hard at a problem session

In the classroom

"I sincerely think this conference rocked! I feel I actually learned something from each lecture."

The problem sessions cemented key ideas and resolved many questions immediately after the lectures. Pages of questions easily kept participants busy and sometimes included open problems or a series of exercises leading to an interesting theorem or example. Switching groups from time to time gave everyone a chance to work with one another. The problems were approachable but challenging, and informal pizza dinners provided a venue where post docs, graduate students, and professors could discuss specific questions or just chat. The variety of topics also helped participants identify each other's area(s) of expertise and common mathematical interests.

During long lunches and in the evenings we had time to explore the OSU campus, buy umbrellas, and talk about our own research interests with one another. Hot topics were not limited to research but extended to other experiences like becoming a parent, applying for post-docs, teaching, writing papers, or fitting in time for our non-academic interests. However, due to the presenters' enthusiasm and the nagging awareness of yet unfinished problem sets, math often leapt to the front of our minds as we walked along High Street or chatted at the Thirsty Scholar over beers.

Although the question "What's your favorite group?" might not usually elicit a mathematical response, that was exactly the question that Indira asked us all in order to wrap

things up. We spent the last half hour of the conference hearing a few words about some of the groups which had not been discussed already, and at Indira's prompting, naming a few of our favorite groups. A Facebook group, one of the social kind, was created, and ideas for next year's Summer School are floating around already, so stay tuned. For a full list of the lecturers, participants, and the program of the conference see http://www.math.ohio-state.edu/~indira/SS2008.html.

Book Review

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

The Science Education of American Girls. A Historical Perspective. Kim Tolley. RoutledgeFalmer, New York, 2003. ISBN 0-415-93472-9

Reviewer: Margaret Bayer

Review, Part I

Margaret Rossiter in *Women Scientists in America: Struggles and Strategies to 1940* made us aware of the non-monotonic progression of women's participation as professional scientists. Understanding that progression requires studying the shifting landscape of girls' precollege math and science education. In this book, Tolley gives us a well-researched, well-documented, well-organized and well-written history of *The Science Education of American Girls*. I found the book fascinating. In this issue I will discuss the history before 1900; in the next issue will be Part II, mostly on the twentieth century.

In the post-revolutionary United States the need to build up and expand the country led to an emphasis in the schools on science and, specifically, geography. Besides support for surveys and scientific expeditions, the study of geography (which often included astronomy, botany and geology) was thought to develop good citizenship and national pride and to honor God through appreciation of nature. The study of science would make middle- and upper-class white women better conversationalists and better teachers of their young children. Some people valued science education because they thought that mental gains acquired through education could be inherited.

Science also enjoyed a cultural or recreational appeal. Magazines addressed to families and children published popular science articles. Scientists went on tours, giving lectures to general audiences. Amateur science societies were found in various communities.

In the early 19th century schools moved beyond the general geography texts, with new separate textbooks for the study of chemistry, astronomy, "natural philosophy' (including physics and physiology), and "natural history" (including biology and geology). Some of these textbooks were differentiated by gender. Girls' books were often written in a conversational style and included pictures of girls conducting experiments.

The science curriculum was embedded in two very different curricula for girls and boys. The education of upper class boys focused on the Classics; the study of Latin and Greek was required for admission to university. The Classics were considered too difficult and irrelevant for girls, however; their curriculum included reading, writing, arithmetic, science, and some "ornamental subjects," such as drawing, painting, needlework and music. Tolley reports that in the period 1800 to 1840 a higher percentage of girls' schools than boys' schools (in both the North and the South) advertised science classes in their curricula [pp. 43–44]. Indeed,

> From the close of the eighteenth century until just after the Civil War, natural philosophy, astronomy, chemistry, and botany were among the ten subjects most frequently listed in the published courses of study of female academies and seminaries. [p. 35]

European visitors expressed surprise at the emphasis on science and the general rigor of girls' schools in America. Science did not yet enjoy academic prestige, nor was it considered economically useful (for the upper classes, that is; evening schools for the working and merchant class

offered geography, trigonometry, geometry, surveying and navigation).

"Higher mathematics" (beyond arithmetic) was not regarded as valuable for women in their roles as companions for their husbands and teachers of their children. Furthermore, it was most often considered a tool for navigation and surveying, which women were certainly not expected to learn. Mathematics did not enjoy the cultural appeal of science. Thus mathematics was not taught in girls' schools through the early 1800s, and, as a consequence, early 19th century girls' science textbooks were less advanced mathematically than boys'. Emma Willard is credited with starting the movement to teach mathematics to girls. (She taught herself most of the geometry and algebra she knew.) In the 19th century students at many schools had public oral examinations. The community in Waterford, New York, was shocked in 1818 when Willard's first female geometry student passed the public examination [p. 80]. Willard went on to found the Troy Female Seminary, where she trained many young women to go teach mathematics in girls' schools around the country.

After 1830 algebra, geometry and trigonometry became more common in girls' schools. The push to teach girls higher mathematics apparently stemmed from a desire to improve the status of the schools. Higher mathematics was not at the time required for admission to university, but it was in the college curriculum. Inclusion of mathematics in a school's curriculum conveyed an aura of higher education. Unlike in science, there were never textbooks or modes of instruction in mathematics aimed specifically at girls. However, this did not mean that everyone accepted mathematics as appropriate for girls. At Willard's student's public examination, one observer claimed that "no woman ever did, or could, understand geometry" [p. 80]. In the 1850s the school committee of Groveland, Massachusetts, expressed concern at the greater participation of girls in the town's schools and their higher marks in mathematics:

> Our best mathematicians are not those who, if the present order of the world continues, will have occasion to use such knowledge. The fact should awaken serious inquiry.

Call for Nominations: Alice T. Schafer Mathematics Prize

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominee may be at any level in her undergraduate career, but must be an undergraduate as of October 1, 2008. She must either be a US citizen or have a school address in the US. The Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in Washington, D.C., January 2009.

The letter of nomination should include, but is not limited to, an evaluation of the nominee on the following criteria: quality of performance in advanced mathematics courses and special programs, demonstration of real interest in mathematics, ability for independent work in mathematics, and performance in mathematical competitions at the local or national level, if any.

With letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks given by members of student chapters, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. Send five complete copies of nominations for this award to: The Alice T. Schafer Award Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. Nominations must be received by **October 1, 2008**. If you have questions, 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.

(We can be happy that the "present order of the world" did not continue.)

Of course, this was an era before universal education. The high schools either operated entirely on tuition or were partially supported by churches, philanthropic organizations, or towns. At the time, there were few day schools for free Blacks, for native Americans, or for children of working class and farming families, but Tolley does include a little information on specific schools for these populations [pp. 42–44]. In 1821 Boston opened a high school for boys. Most of the students left to go to apprenticeships without completing the whole course. In 1826 the city opened a high school for girls. Unable or unwilling to handle the large number of girls who enrolled (and who were likely to stay for the complete course), Boston closed the school within two years. Instead they extended the city grammar schools for girls (but not those for boys) by two grades [pp. 85–86].

Natural history, particularly botany, occupied a major place in 19th century education, particularly for girls. These subjects were the focus of much of the popular science literature and public lectures. They also provided an opportunity for active involvement: as individuals and in clubs, amateurs engaged in collecting and cataloguing specimens. Amateurs, often women, sometimes developed working relationships with professional scientists; in a few cases naturalists relied on amateur collaborators, and amateurs were credited with discovering new species. Some of the naturalists were highly visible supporters of women, contributing to the society's acceptance of natural history, at least, as being in "women's sphere." In 1873 Harvard zoology professor Louis Agassiz opened the Anderson School of Natural History. In the first summer school, Agassiz selected 18 women students out of a total of 50, much to the consternation of some of his colleagues and students [pp. 113–114].

After the Civil War, more colleges and universities began to admit women. About 20% of the institutions offered a choice between a "collegiate department" and a "scientific department." In those institutions with a choice, 59% of the female students (878 out of 1477) in 1872 chose the scientific department [p. 154]. The reasons for the preference for science may have been largely practical. Admission to collegiate departments often required knowledge of Latin or Greek. The typical girls' high school better prepared its students for the scientific departments. The scientific depart-

Call for Nominations: The 2010 Noether Lecture

AWM established the Emmy Noether Lectures to honor women who have made fundamental and sustained contributions to the mathematical sciences. This one-hour expository lecture is presented at the Joint Mathematics Meetings each January. Emmy Noether was one of the great mathematicians of her time, someone who worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration.

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Kopell, Linda Keen, Lesley Sibner, Ol'ga Ladyzhenskaya, Judith Sally, Olga Oleinik, Linda Rothschild, Dusa McDuff, Krystyna Kuperberg, Margaret Wright, Sun-Yung Alice Chang, Lenore Blum, Jean Taylor, Svetlana Katok, Lai-Sang Young, Ingrid Daubechies, Karen Vogtmann and Audrey Terras.

The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. *Five* copies of nominations should be sent by **October 15, 2008** to: The Noether Lecture Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. If you have questions, phone 703-934-0163 or e-mail awm@awm-math.org. Nominations via e-mail or fax will not be accepted.

ments could prepare women to teach in secondary schools. The degree program in such departments was often shorter than that of the collegiate departments, and it carried less prestige. Some girls' schools shifted their curriculum to emphasize Latin over science, as they perceived this would bring them more status. As it turned out this was a poor strategy, and boys were moving away from the Classics. In coed schools, teachers were happy to welcome girls to the Classics classes, as boys' enrollment was decreasing.

I was not familiar with the story Tolley tells about Stanford University in its early years. Stanford was established by Leland and Jane Stanford, opening its doors in 1891. Leland Stanford died two years later. His widow continued to be a major force at the university, particularly in financial and capital matters. From the beginning, women were admitted as students at Stanford, and in 1899 they made up 40% of the student body. In that year, Mrs. Leland Stanford established an upper bound on the number of female students, because she feared that men would be discouraged from enrolling by the large number of females. Of special interest is Tolley's table showing the Bachelor of Arts degrees in mathematics every fifth year from 1892 to 1932 [p. 91]. The total number of math degrees for the nine years sampled was 53; 30 of these went to women. On average for those nine years, women made up 24% of the Stanford student body. Berkeley and Wisconsin also awarded more math degrees to women than to men in the early 1900s.

Next time I will report on how the expanded opportunities for women as teachers was related to girls' study of science; the nature-study movement; the rise of vocational education, including home economics; and the effect of the World Wars and Sputnik on science education for girls.

Awards and Honors

2008 Oersted Medal

American Association of Physics Teachers, November 2007

The American Association of Physics Teachers (AAPT) has announced that the 2008 Oersted Medal has been awarded to **Mildred S. Dresselhaus**, Ph.D., MIT Institute Professor of Physics and Electrical Engineering, in recognition of her outstanding, widespread, and lasting impact on the teaching of physics.

The Oersted Medal was presented to Dr. Dresselhaus at a Ceremonial Session of the AAPT Winter Meeting in January 2008. Following the presentation, Dr. Dresselhaus delivered her keynote address titled "Expanding the Audience for Physics Education."

Ken Heller, Chairman, AAPT Awards Committee, said, "Dr. Dresselhaus is a dynamo in her support of physics in all of its aspects. Her research is on the cutting edge of materials physics and currently focuses on nanoscience. She has led some of the largest and most important scientific organizations in the United States. Most importantly, she was an early leader in pointing out the necessity for expanding opportunities in science and engineering to women and other underrepresented populations. Her leadership by words and deeds has had a profound influence on advancing this important issue."

"It is difficult to believe how Millie can fit all her activities in one lifetime! In addition to her research and public service, she has maintained a great sensitivity and commitment to her teaching and physics education. She continues to be an encouraging influence on aspiring scientists and engineers. That aspect of her life alone is worthy of our high respect and admiration," stated Toufic Hakim, AAPT's Executive Officer.

Professor Dresselhaus is a native of New York City, where she attended public schools, completing her high school education at Hunter College High School. She began her higher education at Hunter College in New York City and received a Fulbright Fellowship to attend the Cavendish Laboratory, Cambridge University (1951–52). Dresselhaus received her master's degree at Radcliffe College (1953) and her Ph.D. at the University of Chicago (1958). She began her MIT career at the Lincoln Laboratory.

A leader in promoting opportunities for women in science and engineering, Dresselhaus received a Carnegie Foundation grant in 1973 to encourage women's study of traditionally male dominated fields, such as physics. In 1973,

she was appointed to The Abby Rockefeller Mauze chair, an Institute-wide chair, endowed in support of the scholarship of women in science and engineering.

Dresselhaus, who chaired numerous national studies and directed the Science Office of the U.S. Department of Energy, is currently the Chair of the Governing Board of the American Institute of Physics. She has received many prestigious awards, including the National Medal of Science, the Buckley Condensed Matter Prize (2008) from the American Physical Society, the Compton Medal from the American Institute of Physics, and a 2007 L'Oréal-UNESCO Award for Women in Sciences. She has 24 honorary doctorates, is a member of the National Academy of Sciences and the National Academy of Engineering, and is a Foreign Fellow of the National Academy of Sciences in India and also Brazil.

Regarding the award, Dresselhaus stated, "I was truly surprised to be chosen for the Oersted Medal in view of the list of stellar past recipients. Now that I have been selected as the 2008 recipient of this award, I am further inspired to bring the love and appreciation of physics to new audiences."

About the Award: The Oersted Medal is named for Hans Christian Oersted (1777–1851), a Danish physicist who, in the course of creating a demonstration for teaching his class, discovered that electric currents caused a magnetic field. This was a crucial step in establishing the theory of electromagnetism so important in building modern technology and modern physics. The award was established by AAPT in 1936 and is given annually to a person who has had outstanding, widespread, and lasting impact on the teaching of physics.

Sonia Kovalevsky High School Mathematics Days

Through grants from Elizabeth City State University 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.

An additional selection cycle will be held in February 2009 for Spring 2009 using funds remaining after the August 2008 selection cycle. AWM anticipates awarding up to six additional grants ranging on average from $1500 to $2200 each ($3000 maximum per school) to universities and colleges. Historically Black colleges and universities are 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 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 itemized 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. This 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 February for high school days to be held in Spring 2009. If selected, a report of the event along with receipts (originals or copies) for reimbursement must be submitted to AWM within 30 days of the event date or by June 1, 2009, whichever comes first. Reimbursements will be made in one disbursement; no funds will be disbursed prior to the event date.

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 **February 4, 2009**; applications via e-mail or fax will not be accepted.

L'Oréal-UNESCO Award

MIT, February 2007

MIT Institute Professor **Mildred Dresselhaus** is the North American winner of a 2007 L'Oréal-UNESCO Award for Women in Science.

She and four other recipients, each representing a different continent, were named at a ceremony held at UNESCO House in Paris where Sir Lindsay Owen-Jones, chairman of L'Oréal, and Koïchiro Matsuura, director-general of UNESCO, presented each laureate with her $100,000 award.

Dresselhaus was selected for "conceptualizing the creation of carbon nanotubes," according to L'Oréal and UNESCO (United Nations Educational, Scientific and Cultural Organization). Due to their small size, high strength and electrical conductivity, carbon nanotubes are ideal for new materials used in objects such as lightweight bicycles and flat-panel screens.

Now in its ninth year, the L'Oréal-UNESCO Award for Women in Science is the only one of its kind to honor eminent women scientists at the international level. The five laureates are nominated by respected scientists from around the world, and a jury of 14 distinguished international scientists selects the final recipients.

The Women in Science award is designed to recognize, reward and advance the role of women in scientific research as well as provide the next generation of women scientists with inspirational role models.

The Women in Science program also offers an online community, Agora, for scientists to discuss issues and commonalities and to debate the challenges women must overcome to gain recognition in their fields. Agora not only connects researchers from around the world, but it also provides opportunities to communicate with some of the top scientists in the world, including Nobel laureates.

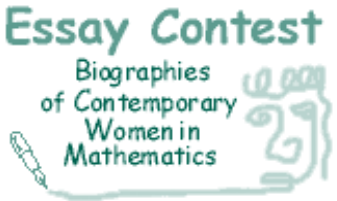
PIMS 2008 Education Prize The Research Design

PIMS, April 2008

The Pacific Institute for the Mathematical Sciences (PIMS) is pleased to announce that one of the two winners of the 2008 PIMS Education Prize is **Virginia Warfield** (University of Washington).

Warfield has made significant contributions to education in the Pacific Northwest through teaching, graduate student training and mentoring, outreach and collaborations with K–16 communities. She 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." In 2007 Warfield received the Louise Hay Award from the Association for Women in Mathematics.

The 2008 PIMS Education Prizes were given out



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 victoria.howle@ttu.edu or see the contest Web page: www.awm-math.org/biographies/contest.html. The deadline for receipt of entries is **February 27, 2009**. *(To volunteer as an interview subject, contact Howle at the e-mail address given.)*

at a special ceremony during the PIMS "Changing the Culture" conference in Vancouver in April 2008. PIMS is very grateful to Boeing for its sponsorship of this prize.

2007 Hans Freudenthal Medal

The Hans Freudenthal Medal for 2007 goes to **Anna Sfard**, University of Haifa, Israel, and the Institute of Education, University of London, UK, also affiliated with Michigan State University.

It is with great pleasure that the ICMI Awards Committee announces that the Hans Freudenthal Medal for 2007 is given to Professor Anna Sfard, University of Haifa and the University of London in recognition of her highly significant and scientifically deep accomplishments within a consistent, long-term research program focused on objectification and discourse in mathematics education, which has had a major impact on many strands of research in mathematics education and on numerous young researchers.

In addition to publications related to the above-mentioned research program, Sfard has published numerous other papers and book chapters within a broad range of topics. It is a characteristic feature of her scientific achievements that they are always very thorough, original and intellectually sharp. She often uncovers the tacit if not hidden assumptions behind notions, approaches, and conventional wisdom, and by turning things upside-down she usually succeeds in generating new fundamental and striking insights into complex issues and problématiques.

Influenced greatly by her interest in communicational philosophy and psychology (e.g. Wittgenstein, Piaget

NSF-AWM Mentoring Travel Grants for Women

The objective of the NSF-AWM Mentoring Travel Grants is to help junior women to develop a long-term working and mentoring relationship with a senior mathematician. This relationship should help the junior mathematician to establish her research program and eventually receive tenure. AWM expects to award up to seven grants, in amounts up to $5000 each. Each grant will fund travel, accommodations, and other required expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. Awardees may request to use any unexpended funds for further travel to work with the same individual during the following year. In such cases, a formal request must be submitted by the following February 1st to the selection committee, or the funds will be released for reallocation. (Applicants for mentoring travel grants may in exceptional cases receive two such grants throughout their careers, possibly in successive years; the second such grant would require a new proposal and would go through the usual competition.) For foreign travel, US air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

Eligibility. Applicants must be women holding a doctorate or equivalent experience and with a work address in the US (or home address if unemployed). The applicant's research may be in any field that is supported by the Division of Mathematical Sciences of the National Science Foundation. (See http://www.nsf.gov/od/lpa/news/publicat/nsf03009/mps/dms.htm#1 for the list of supported areas.)

Applications. All applications must be submitted online via the web-based system which is available through a hotlink at http://www.awm-math.org/travelgrants.html. The application requirements and a complete step-by-step process are available at the online site. If you have not already done so you must first create a user account—this will be the first screen when you access the site. During the application process you will be asked to attach one .pdf file that includes your research proposal (approximately five pages in length, specifying why the proposed travel would be particularly beneficial), CV, proposed budget and information on current and pending funding, if applicable. In a second step you will be asked to attach one PDF file that includes the proposed mentor's letter of support (indicating his/her availability at the proposed travel time) and CV. You may contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance. A final report will be required from each awardee. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. The deadline for receipt of applications is **February 1, 2009**.

and Vygotsky) as well as in history and languages, Sfard's research program took off in a series of papers published in the early 1990s that studied process-object duality and reification in mathematics—in particular in algebra—from both theoretical and empirical perspectives. These papers include "On the dual nature of mathematical conceptions: reflections on processes and objects as different sides of the same coin" (*ESM,* 22, 1991, 1–36), "The gains and pitfalls of reifications: The case of algebra" (with Liora Linchevski) (*ESM,* 1994, 26, 191–228), "Reification as a birth of a metaphor" (*FLM,* 1994, 14 (1), 44–55), and "The development of algebra: Confronting historical and psychological perspectives" (*JMB,* 1995, 14, 15–39) which have already become classics within their domain.

Gradually, Sfard's research program developed into a somewhat broader one dealing with aspects of communication and discourse. First, she went on to study the nature and roles of metaphors in mathematics education, for instance in "On two metaphors for learning and the dangers of choosing just one" (*ER,* 1998, 27(2), 4-13), and in "Steering (dis) course between metaphor and rigor. Using focal analysis to investigate the emergence of mathematical objects" *(JRME,* 2000, 31 (3), 296–327).

From the early years of this century, she paid increasing attention to the relationship between mathematical learning (cognition) and discourse. This is reflected in a series of impressive high quality publications, among others "There is More to Discourse than Meets the Ears: Learning from mathematical communication things that we have not known before" (*ESM,* 2001, 46 (1/3), 13–57), "Learning discourse: Socio-cultural approaches to research in mathematics education" (with Ellice Forman and Carolyn Kieran) (*ESM* 46(1/3), 1–12), "Why cannot children see as the same what grownups cannot see as different?—early numerical thinking revisited" (*CI,* 2005, 23(2), 237–309), and "What changes when learning goes to school: The communicational version, the case of mathematics" (*EJSP,* 2005, 3(1), 301-326).

Today, Sfard's research program might be condensed by making use of the term she has coined to dissolve the classical dichotomy between communication and cognition, commognition. In 2008 Cambridge University Press published her monograph *Thinking as communicating: Human development, the growth of discourses, and mathematizing,* which provides an organized and systematic account of her research program and its results.

Sfard began her studies in physics at the University of Warsaw, Poland, in 1967, and obtained a B.Sc. in Mathematics and Physics (1972) and a M.Sc. in mathematics (1977), both at the Hebrew University, Jerusalem, Israel, where she also got her Ph.D. in mathematics education in 1989 (with a dissertation on the teaching of algorithms in high school), while having held various positions at her university since 1972. After having had post-doctoral positions and visiting scholar positions in the USA, UK, and Canada, she was appointed assistant professor (1995) at the University of Haifa, Israel, where she has been professor in the Faculty of Education since 2001. From 2003 to 2007 Sfard also held a chair (as the Lappan-Phillips-Fitzgerald Professor) at the Division of Science and Mathematics Education, Michigan State University, with which she is still affiliated. In 2007 she was appointed to a chair of mathematics education at the Institute of Education, University of London, UK, jointly with her position in Haifa.

She has been invited to give key-note addresses and plenary presentations in an impressive number of international conferences, including the ICMEs, in addition to having served as a member of several scientific committees, editorial boards, Ph.D. committees, etc. on several continents. Sfard has also supervised numerous master's and PhD students in Israel and abroad.

3M National Teaching Fellowship

Stuart Colcleugh, Simon Fraser University, February 2008

It will come as no surprise to her SFU colleagues and thousands of former students that **Malgorzata Dubiel** was named to the 3M National Teaching Fellowship, a select group of 228 of Canada's finest university teachers.

"I'm overwhelmed," says Dubiel, a senior mathematics lecturer, who was introduced to Canadians along with this year's other nine recipients in a special undergraduate issue of *Maclean's* magazine. "It's such a prestigious award I really didn't believe I would get it."

The annual award, now in its 23rd year, is sponsored by the Society for Teaching and Learning in Higher Education and 3M Canada to celebrate individuals who demonstrate exceptional leadership and commitment to improving university teaching. The 2008 winners were selected from 52 closely vetted nominations to join the fellowship, which represents a diverse range of academic disciplines from 43 Canadian universities.

Dubiel received a Ph.D. in mathematical logic in her native Poland before joining SFU as a lab instructor in 1985. She was instrumental in designing SFU's FanX99 course for first-year students who bombed at high school math. The course aims to develop their math study skills, instill confidence in their quantitative abilities and teach them how mathematics is both a key to mastering other disciplines and useful in everyday situations.

"Many colleges teach remedial courses that basically repeat high school courses, but our approach is different," she says. "We focus on teaching people to think, to problem-solve and generally understand mathematics.

"So, I hope this award will contribute to focusing on the positive side of math and also on what SFU in particular can offer to students."

Dubiel employs humor and an array of models, props and other devices to make learning math fun. And while math-phobic freshmen are her main concern, she is also bent on demystifying the subject in SFU's Math 190 course for future elementary school teachers, because she says that's where math anxiety often starts.

"An elementary teacher who doesn't know math well or doesn't particularly like the subject isn't going to communicate it well, and that turns children off math right from the start."

Dubiel also won the 2002 SFU Excellence in Teaching Award and the 1998 C.D. Nelson memorial award.

Fulfilling the Potential of Women in Academic Science and Engineering Act of 2008

Committee on Science and Technology, U.S. House of Representatives, May 2008

In May the House Science and Technology's Subcommittee on Research and Science Education held a hearing to discuss ways to remove barriers for women in academic science and engineering fields. There the Subcommittee received comments on draft legislation that incorporates recommendations from the National Academies panel that were presented at a hearing in October of 2007.

"The United States cannot afford to continue losing our best and brightest women from academic science and engineering careers," said Subcommittee Chairman Brian Baird (D-WA). "The programs in this bill are just a small part of what is needed to tackle the barriers to women in science and engineering. In fact, there is only so much Congress can do to compel what is ultimately a change to an academic culture with a long and proud history. I want to thank Congresswoman Johnson for bringing this important legislative proposal before the subcommittee."

The legislation, titled *Fulfilling the Potential of Women in Academic Science and Engineering Act of 2008* and sponsored by Rep. Eddie Bernice Johnson (D-TX), includes workshops to increase awareness of implicit gender bias in grant review, hiring, tenure, promotion, and selection for other honors based on merit; extended grant support for caregivers; and improved demographic data collection on federal grant-making.

"While I do not intend to be heavy-handed toward our universities, I do feel that not nearly enough is being done to educate persons of influence on the subtle gender bias that exists and is holding women back from achieving at the same level as men," said Johnson.

Women are consistently underrepresented in tenured faculty positions as research universities, despite earning more than half of all science and engineering bachelor's degrees in 2005. According to data compiled by NSF, in

2006 women held 30 percent of all full-time science and engineering faculty positions at U.S. colleges and universities. Specifically, they constituted 19 percent of full professors, 34 percent of associate professors and 42 percent of junior professors, a category that includes both instructors at 2-year colleges and assistant professors at 4-year institutions.

The 2007 panel found that most of the barriers to women in academia are not created with intent. Even policies that seem gender-neutral in theory might not be so in practice. The panel recommended that Federal science agencies sponsor workshops on gender bias in order to raise awareness of and provide strategies to overcome the collective effect of many small and subtle incidents of subconscious bias and barriers that are often built into academic culture. The draft bill under consideration creates a program of such workshops, and the Subcommittee solicited input on the details of that program and on metrics for evaluation.

The National Academies panel also highlighted the need for better data collection, to understand the extent of gender inequity and to have a basis for evaluating policies to address the gap. The draft bill therefore requires Federal science agencies to collect demographic data on the grant making process and encourages universities to collect better data for the purposes of evaluating the gender bias workshops.

The following witnesses testified before the Subcommittee: Dr. Lynda T. Carlson, Director of the Division of Science Resource Statistics, Directorate for Social, Behavioral and Economic Sciences, National Science Foundation; Dr. Linda G. Blevins, Senior Technical Advisor in the Office of the Deputy Director for Science Programs, Office of Science, Department of Energy; and Dr. Donna K. Ginther, Associate Professor of Economics and Director of the Center for Economic and Business Analysis, Institute for Policy Research, University of Kansas.

For more information on this hearing or to access witness testimony, visit the Committee's website http://science.house.gov.

Paycheck Fairness Act

AAUW, July 2008

AAUW applauds the House of Representatives for passing (247-178) the Paycheck Fairness Act (H.R. 1338). If signed into law, the measure would strengthen and update the Equal Pay Act—passed 45 years ago—and would provide critical tools in the fight to close the sizable wage gap between men and women.

Nearly a century after AAUW called for a repeal of salary restrictions in the Women's Bureau, women working full time earn, on average, about 77 cents for every dollar their male counterparts earn.[1] Women of color face an even larger wage gap. AAUW's 2007 *Behind the Pay Gap* report found that the pay gap between college-educated men and women appears the first year after college—even when women are working full time in the same fields as men—and continues to widen over time.[2]

"AAUW has long supported a fair playing field and a fair paying field—the Paycheck Fairness Act represents both," said AAUW Executive Director Linda D. Hallman, CAE. "AAUW continues to be on the frontline of the pay equity fight. Our members have worked tirelessly to pass this bill."

Championed by Rep. Rosa DeLauro (D-Conn.), the Paycheck Fairness Act would deter wage discrimination by strengthening penalties for equal pay violations and by prohibiting retaliation against workers who inquire about employers' wage practices or disclose their own wages. Under the bill, employers would have to show that wage gaps truly are the result of factors other than sex discrimination. It would also require the U.S. Department of Labor to reinstate activities that promote equal pay, including collecting wage-related data. The bill had 231 co-sponsors when it passed.

[1] U.S. Census Bureau and the Bureau of Labor Statistics. (August 2007). Annual Demographic Survey.

[2] AAUW Educational Foundation. (2007). *Behind the Pay Gap,* by Catherine Hill and Judy Goldberg Dey. Washington, DC.

"This vote was a fair measure of representatives' stance on pay equity issues," said Lisa M. Maatz, AAUW director of public policy and government relations. "AAUW will include the vote in our Congressional Voting Record for the 110th Congress, and we'll make sure our members have the information they need to hold their elected officials accountable."

Among their top issues, younger women especially identified equal pay for equal work as a main concern.[3]

"Concerns over pay equity will be one of the key issues that drives women to the polls," Maatz said. "In this economy and this election year, AAUW believes now is the time to address these issues."

[3] Greenberg Quinlan Rosner Research. "Unmarried Women and Pay Inequity." May 29, 2007. Retrieved July 16, 2008 from http://www.wvwv.org/assets/2007/10/22/payequity6.1.pdf. In a January 2007 Women's Voices, Women Vote survey of 1000 unmarried women, pay equity ranked at the top of vote-driving issues.

SACNAS and MentorNet Partnership

SACNAS and MentorNet, June 2008

New mentoring opportunities will be available to encourage and support more of this year's graduates going on to college or graduate study in engineering and related sciences through a new partnership between two non-profit organizations dedicated to developing the next generations of scientists and engineers.

Though about half of those entering college already interested in science and engineering leave those fields before graduating, effective mentoring increases the likelihood that they will complete degrees in engineering and science and move successfully into professional work in the fields.

The Society for Advancement of Chicanos and Native Americans in Science (SACNAS) is already well-known for mentoring which occurs between its student and professional members, especially through its annual conference. MentorNet, focusing on women and others underrepresented in engineering and science, provides an infrastructure to support one-on-one mentoring relationships at a distance and has matched more than 22,000 one-on-one pairs since its program first launched ten years ago. The two are joining efforts and today announced a partnership to extend SACNAS mentoring activities through MentorNet.

"SACNAS has consistently experienced a tremendous amount of success with mentoring at our annual national conference," says Judit Camacho, Executive Director of SACNAS. "This new, highly interactive member benefit will encourage SACNAS members to create new mentoring relationships beyond what the national conference can provide."

"Though effective mentoring makes a difference for many students, many programs fail to be sustained because of the high human resource costs involved. In partnership with many institutions of higher education, corporations, government labs, and professional societies, MentorNet's research-based program and technology infrastructure enables one-on-one mentoring for students and early career faculty on a very large scale," says Carol B. Muller, Founder and CEO of MentorNet. "We are really pleased to have SACNAS join with us to extend mentoring opportunities even more broadly across the population of today's science and engineering students."

The e-mentoring infrastructure offered through MentorNet features an in-depth profile matching process between protege and mentor. Once a pair is matched, the program provides a coaching curriculum that the two participants follow via email. Training through online guides for mentoring and tutorials, and evaluation at the end of the mentoring experience are among the program features.

"As a recently-matched MentorNet mentor, I am excited to be in a position to share my personal experiences with a junior colleague, to provide a supportive role as she negotiates her path to a Ph.D. degree, and to offer guidance through her development and growth as a scien-

tist and a leader in her community," says SACNAS Board Member Dr. Healani Chang, who is also an associate research professor at the Pacific Biosciences Research Center at the University of Hawaii at Manoa in Honolulu, Hawaii. "MentorNet's useful e-mentoring tips and suggests topics of discussion are helpful in ensuring the e-mentoring relationship progresses smoothly for both mentor and protégé. The case studies provided in interactive training tutorials also provided me with insights about how I would like to begin my e-mentoring relationship with my protege, and work together toward reasonable expectations and outcomes."

Grant for Mentoring Latinas in Computing

Sun Microsystems, July 2008

Of nearly 2 million employed computer and information scientists in the U.S. in 2003, Hispanic women represented just 18,000, or less than 1%, and Hispanic men outnumber Hispanic women in this field by more than three to one. Since mentoring has been identified as a critical strategy in the retention of students, particularly those underrepresented in these fields, a grassroots group, Latinas in Computing, is working with MentorNet, The E-Mentoring Network for Diversity in Engineering and Science, to build more mentoring relationships between students and professionals in the fields of computing.

A recent grant from Sun Microsystems will help support a web portal for Latinas in Computing developed earlier this year. Sun joins MentorNet, Latinas in Computing, Texas Instruments, and the Association for Women in Science in helping to sponsor this project. The portal provides direct access for Latinas studying or employed in computing sciences and engineering to participate in mentoring and networking, including opportunities for undergraduate and graduate students, postdoctoral scholars, and early career faculty to engage in one-on-one mentoring relationships with professionals in their fields.

Gilda Garreton, Senior Staff Engineer for the VLSI Research Group at Sun Microsystems Laboratories, has been instrumental in building the partnership between Latinas in Computing and MentorNet. "The MentorNet Latinas in Computing web portal is one more way we can reach and encourage diverse new talent, and we are really pleased to have Sun Microsystems' support in the effort," she says. "Sun is proud of its efforts to foster an inclusive global workforce, while also engaging employees in programs which meet our social responsibility goals and commitments. We know that mentoring works and that a diverse workforce provides a competitive advantage."

"As Hispanic populations grow in the U.S., the Latinas in Computing web portal is one more way we can ensure we have the talent for tomorrow," says Carol B. Muller, Founder and CEO of MentorNet. "We really appreciate Sun's support in sustaining this new gateway for Latinas in Computing, as part of our focus on mentoring for diverse populations of engineers and scientists, and in providing a way for industry leaders to connect with future employees. MentorNet has a long track record of work toward retaining women and others underrepresented in engineering, science and related fields through e-mentoring programs and related best practices."

The portal is available on the web at: www.MentorNet.net/LiC/.

PREMA: Reflecting and Acting on the Math Gender Gap

PREMA, July 2008

Girls have equal abilities to boys, they often even get better grades. True as this may be, gender differences in the ambit of mathematics education still exist. PREMA (Promoting Equality in Math Achievements) aims at understanding the sociocultural and pedagogic factors responsible for this gap which in turn affects women's participation in professions that rely on math.

Some examples of concrete teaching guidelines that emerged from the work undertaken of PREMA in several national contexts follow. (For the full list, see http://prema.iacm.forth.gr/deliverables.php.)

In the Austrian context they include:

- As basic requirement: Make sure that your explanations are clear and that you have good subject knowledge.
- Give equal attention to girls and boys—ask boys and girls questions which are equally demanding.
- Avoid "teaching" stereotypes by working with stereotyped images in textbooks and teaching materials, and eliminate sexism in your use of language.

In the Greek context:

- Girls learn mathematics in a different way than boys. Girls study more but learn "what they have to learn," question less and need their teacher's attention more.
- When girls do not understand something in math they give up more easily than boys, they are more hesitant and try to resolve the problem among themselves rather than by asking the teacher.
- Different motivation is required on the teacher's part for the two genders—s/he has to try to convince girls that they can do better, praise their efforts, explain that if they study more they will succeed, s/he has to enhance girls' self-esteem. In most cases, girls are shyer than boys.

In the UK context they include:

- Stimulate interest in STEM: the critical issue to be addressed in the UK is the general lack of engagement with Science, Technology, Engineering, and Mathematics, not gender issues per se. Too few pupils engage with STEM.
- Reform the curriculum to make mathematics more interesting, more relevant, and more pervasive: pupils' choices concerning post-compulsory education are strongly influenced by their interest and enjoyment.
- Include more interesting contexts in mathematics. Pointers to appropriate contexts can be gleaned by looking at those subjects whose popularity is rising dramatically, such as psychology.

The scope of the first phase of the project, PREMA1, was the identification of discrepancies between "needs and provisions" in mathematics education and teaching. PREMA2 is about initiating an intervention to alleviate the gender gap in math education. This is to be achieved by the articulation of a teacher training curriculum framework on gender and mathematics that will include a set of reflective tools to assist teachers to be aware, ask questions and reflect on gender issues.

We invite you to join the PREMA2 Network. Through virtual meetings, brainstorming and discussions forums, a preliminary version of the tools kit developed by PREMA will be presented for analysis, criticism and discussion in the PREMA2 Network. To join, see http://prema2.iacm.forth.gr.

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

Supported by the Department of Energy, the Office of Naval Research, and the Association for Women in Mathematics

For many 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: An AWM Workshop is scheduled to be held in conjunction with the SIAM Annual Meeting, Denver, CO, July 6–10, 2009.

FORMAT: The workshop will consist of a poster session by graduate students and two or three minisymposia featuring selected recent Ph.D.'s, plus an informational minisymposium directed at starting a career. The graduate student poster sessions will include all areas of research, but each research minisymposium will have a definite focus selected from the areas of Mathematical Biology, Modeling, Control, Optimization, Scientific Computing, and PDEs and Applications. AWM will offer funding for travel and two days subsistence for as many as twenty participants. Departments are urged to help graduate students and recent Ph.D.'s obtain supplementary institutional support to attend the workshop presentations and the associated meetings. All mathematicians (female and male) are invited to attend the program.

DISCUSSION GROUP LEADERS: 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: To be eligible for selection and funding, a graduate student must have begun work on her thesis problem, and a recent Ph.D. must have received her degree within approximately the last five years, whether or not she currently holds a postdoctoral or other academic or non-academic position. All non-US citizens must have a current US address. All selected and funded participants are invited and strongly encouraged to attend the full AWM two-day program. Those individuals selected will be notified by the AWM Office and will need to submit a final title and abstract with name, affiliation, address, etc. by mid-February to SIAM for the meeting program; AWM will provide instructions with the notification. For some advice on the application process from some of the conference organizers see the AWM website.

All applications should include:

- a cover letter
- a title of the proposed poster or talk
- a concise description of research
- a curricultum vitae
- 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 recommendaiton from her thesis advisor.

Applications will open on **November 1, 2008** and must be completed electronically by **January 2, 2009.**

See http://www.awm-math.org/workshop_application/application.html.

AWM Membership: Renewals and Thank-yous

By now you should have received your renewal notices for the 2008–2009 membership year. We hope you will renew promptly if you have not already done so. Please consider contributing at a higher level, and encourage your institution and colleagues to join.

We appreciate the support from all of you. We also extend here our annual special thank-yous to contributing members, donors, sponsors, and institutional members by listing them here. We also thank those who prefer to remain anonymous.

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BOSTON COLLEGE — Tenure-Track Positions in Number Theory and in Geometry/Topology — The Department of Mathematics at Boston College invites applications for two tenure-track positions at the level of Assistant Professor beginning in September 2009, one in Number Theory and the second in Geometry/Topology. In exceptional cases, a higher level appointment may be considered. The teaching load for each position is three semester courses per year. Requirements include a Ph.D. or equivalent in Mathematics awarded in 2007 or earlier, a record of strong research combined with outstanding research potential, and demonstrated excellence in teaching mathematics. A completed application should contain a cover letter, a description of research plans, a statement of teaching philosophy, curriculum vitae, and at least four letters of recommendation. One or more of the letters of recommendation should directly comment on the candidate's teaching credentials. Applications completed no later than **December 1, 2008** will be assured our fullest consideration. Please submit all application materials through MathJobs.org. If necessary, printed materials may otherwise be sent to: Chair, Search Committee in Number Theory (resp. in Geometry/Topology) Department of Mathematics Boston College Chestnut Hill, MA 02467-3806 Applicants may learn more about the Department, its Faculty and its programs at www.bc.edu/math. Electronic inquiries concerning these positions may be directed to math-search-nt@bc.edu or math-search-gt@bc.edu. Boston College is an Affirmative Action/Equal Opportunity Employer. Applications from women, minorities and individuals with disabilities are encouraged.

BOSTON UNIVERSITY — Postdoctoral and Predoctoral positions are available for "BioDynamics at Boston University," a Research and Training Grant funded by the NSF. The RTG group is associated with the Center for BioDynamics (CBD). The senior faculty members of this group are from Mathematics (U. Eden, E. Kolaczyk, N. Kopell (PI), T. Kaper, C. E. Wayne) and Biomedical Engineering (J. Collins, D. Segre, K. Sen). Research themes of the RTG focus on analysis of systems with multiple time-scales, applications of dynamical systems to neuroscience, and applications of dynamical systems to genetic regulatory networks. For information about collaborative activities of this group, please see cbd.bu.edu. Postdoctoral applications should be sent to: Joan Butler, Center for BioDynamics, 111 Cummington Street, Boston University, Boston MA 02215. Please include a CV and a cover letter stating the reasons you are appropriate for this group. Also have 3 letters of recommendation sent to the CBD. Applications will be reviewed starting from **Dec. 1, 2008**. Interested Ph.D candidates should apply to one of the associated departments and mention interest in the CBD and this RTG grant. Information about applications to the Math Dept. can be found at http://www.bu.edu/grs/academics/admissions/index.html. For the BME Dept. see http://www.bu.edu/eng/grad/apply. Applicants must be US citizens or resident aliens. Successful Postdoctoral candidates will teach one course per semester, including opportunities to design and/or teach new interdisciplinary curricula. For further possible positions associated with the CBD, please see http:/www.cbd.bu.edu.

CORNELL UNIVERSITY — H.C. Wang Assistant Professors — The Department of Mathematics at Cornell University invites applications for possible H.C. Wang Assistant Professors, non-renewable, 3-year term beginning July 1, 2009. Successful candidates are expected to pursue independent research at Cornell and teach three courses per year. A PhD in mathematics is required. The Department actively encourages applications from women and minority candidates. Applicants are strongly encouraged to apply electronically at http://www.mathjobs.org. For information about our positions and application instructions, see: http://www.math.cornell.edu/Positions/facpositions.html. Applicants will be automatically considered for all eligible positions. Deadline **December 1, 2008**. Early applications will be regarded favorably. Cornell University is an Affirmative Action/Equal Opportunity Employer and Educator.

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CORNELL UNIVERSITY — Half-Time Visiting Positions — The Department of Mathematics at Cornell University invites applications for two or more half-time visiting positions (rank based on experience) for mathematics professors on sabbatical/other leaves from colleges, universities, and engineering schools for our Teaching Program Visiting Faculty Positions beginning August 16, 2009. Candidates with substantial experience teaching undergraduate mathematics, and with teaching and research interests compatible with current faculty, are sought. Successful candidates are expected to pursue a program of study and/or research at Cornell. The normal duties are to teach two identical courses each semester. A PhD in mathematics or a related field is required. The Department actively encourages applications from women and minority candidates. Applicants are strongly encouraged to apply electronically at http://www.mathjobs.org. For information about these positions and application instructions, see: http://www.math.cornell.edu/Positions/facpositions.html. Deadline **December 1, 2008**. Cornell University is an Affirmative Action/Equal Opportunity Employer and Educator.

CORNELL UNIVERSITY — Visiting Positions — The Department of Mathematics at Cornell University invites applications for possible visiting positions, academic year or one semester teaching positions (rank based on experience) beginning August 16, 2009. We are seeking candidates who have excellent teaching skills. Teaching load varies from 1-4 courses per year, depending on the individual and the availability of courses. Candidates with teaching and research interests compatible with current faculty are sought. A PhD in mathematics or a related field is required. The Department actively encourages applications from women and minority candidates. Applicants are strongly encouraged to apply electronically at http://www.mathjobs.org. For information about our positions and application instructions, see: http://www.math.cornell.edu/Positions/facpositions.html. Applicants will be automatically considered for all eligible positions. Deadline **December 1, 2008**. Early applications will be regarded favorably. Cornell University is an Affirmative Action/Equal Opportunity Employer and Educator.

DARTMOUTH COLLEGE — John Wesley Young Research Instructorship – 2-3 years, new or recent Ph.D. graduates whose research overlaps a department member's. Teach 4 ten-week courses spread over 3 terms. Appointment for 26 months, with possible 12 month renewal; monthly salary of $4,833, including two-month research stipend for Instructors in residence during 2 of 3 summer months; if not in residence, salary adjusted accordingly. To initiate an application go to http://www.mathjobs.org – — Position ID: 237-JWY. You can also access the application through a link at http://www.math.dartmouth.edu/recruiting/. General inquiries can be directed to Annette Luce, Department of Mathematics, Dartmouth College, 6188 Kemeny Hall, Hanover, New Hampshire 03755-3551. Files complete by **January 5, 2009** considered first. Dartmouth College is committed to diversity and strongly encourages applications from women and minorities.

DREXEL UNIVERSITY — The Department of Mathematics at Drexel University invites applications for at least two tenure-track/tenure positions, effective September 2009. We are especially interested in candidates in Probability, Combinatorics, Dynamical Systems, Mathematical Biology, Partial Differential Equations, and Computational Mathematics, though exceptional candidates in other areas will be considered as well. Applicants must possess a doctoral degree in mathematics, statistics, or equivalent and show a strong record and commitment to research and teaching. Applicants for senior positions should demonstrate an outstanding record of achievement commensurate with the level of appointment, including a track record of external support and research group leadership. Drexel University is a private, urban university, with over 10,000 full-time undergraduates and is well-known for its co-operative education program. The Mathematics Department offers undergraduate, masters and PhD degrees. To apply for this position please visit https://www.mathjobs.org/jobs/157/1280 and follow instructions to submit all relevant materials online. These include: AMS cover sheet, letter of application, vita, statement of research program and evidence of teaching effectiveness and at least three letters of reference. Review of applications will begin **December 1, 2008** and continue until the positions are filled. Drexel University is an Equal Opportunity/Affirmative Action Employer.

INSTITUTE FOR ADVANCED STUDY — The School of Mathematics has a limited number of memberships, some with financial support for research in mathematics and computer science at the Institute during the 2009 -2010 academic year. Candidates must have given evidence of ability in research comparable at least with that expected for the Ph.D. degree. During the academic year of 2009-2010, Enrico Bombieri of the School and Peter Sarnak of Princeton University/Institute for Advanced Study will lead a program on analytic number theory. The program will have an emphasis on analytic aspects, and particular topics that will be covered include the distribution of prime numbers, sieves, L functions, special sequences as well as additive and combinatorial methods, exponential sums, spectral analysis and modular forms. Minicourses explaining some of the basic methods and tools connected with these topics will be held towards the beginning of each term, and a weekly seminar will take place on Tuesday afternoons. A week-long workshop highlighting recent developments connected with the program will be held in the spring. Recently the School has established the von Neumann Early Career Fellowships. Six of these fellowships will be available for the 2009-2010 academic year. To be eligible for the von Neumann Fellowships, applicants should be at least 5 years following the receipt of their Ph.D. but not yet eligible to receive their first paid sabbatical. The Veblen Research Instructorship is a three-year position which the School of Mathematics and the Department of Mathematics at Princeton University established in 1998. Three-year instructorships will be offered each year to candidates in pure and applied mathematics who have received their Ph.D. within the last three years. The first and third year of the instructorship will be spent at Princeton University and will carry regular teaching responsibilities. The second year will be spent at the Institute and dedicated to independent research of the instructor's choice. Application materials may be requested from Applications, School of Mathematics, Institute for Advanced Study, Einstein Drive, Princeton, NJ 08540; email: applications@math.ias.edu. Application forms may be downloaded via a Web connection to http://www.math.ias.edu. Application deadline is **December 1, 2008**. The Institute for Advanced Study is committed to diversity and strongly encourages applications from women and minorities.

INSTITUTE FOR PURE AND APPLIED MATHEMATICS, UCLA — The Institute for Pure and Applied Mathematics (IPAM) at UCLA is seeking a second Associate Director (AD), to begin a two-year appointment on July 1, 2009. The AD is expected to be an active and established research mathematician or scientist in a related field, with experience in conference organization. The primary responsibility of the AD will be running programs in coordination with the organizing committees. For a detailed job description and application instructions, go to www.ipam.ucla.edu/jobopenings/assocdirector.aspx. Applications will receive fullest consideration if received by **February 1, 2009**. UCLA is an equal opportunity/affirmative action employer.

JOHNS HOPKINS UNIVERSITY — Associate Professor or Full Professor positions — The Department of Mathematics invites applications for one or more positions at the Associate Professor or Full Professor level in general areas of analysis, algebra, topology, number theory, and mathematical physics beginning Fall 2009 or later. To submit your applications go to www.mathjobs.org/jobs/jhu. Applicants are strongly advised to submit their other materials electronically at this site. If you do not have computer access, you may mail your application to: Appointments Committee, Department of Mathematics, Johns Hopkins University, 404 Krieger Hall, Baltimore, MD 21218. Application should include a vita, at least four letters of recommendation of which one specifically comments on teaching, and a description of current and planned research. Write to cpoole@jhu.edu for questions concerning these positions. Applications received by **November 17, 2008** will be given priority. The Johns Hopkins University is an Affirmative Action/Equal Opportunity Employer. Minorities and women candidates are encouraged to apply.

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JOHNS HOPKINS UNIVERSITY — Non-Tenure-Track J.J. Sylvester Assistant Professor — Subject to availability of resources and administrative approval, the Department of Mathematics solicits applications for non-tenure-track Assistant Professor positions beginning Fall 2009. The J.J. Sylvester Assistant Professorship is a three-year position offered to recent Ph.D.'s with outstanding research potential. Candidates in all areas of pure mathematics, including analysis, mathematical physics, geometric analysis, complex and algebraic geometry, number theory, and topology are encouraged to apply. The teaching load is three courses per academic year. To submit your applications go to www.mathjobs.org/jobs/jhu. Applicants are strongly advised to submit their other materials electronically at this site. If you do not have compute access, you may mail your application to: Appointments Committee, Department of Mathematics, Johns Hopkins University, 404 Krieger Hall, Baltimore, MD 21218. Application should include a vita, at least four letters of recommendation of which one specifically comments on teaching, and a description of current and planned research. Write to cpoole@jhu.edu for questions concerning these positions. Applications received by **November 17, 2008** will be given priority. The Johns Hopkins University is an Affirmative Action/Equal Opportunity Employer. Minorities and women candidates are encouraged to apply.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Assistant Professor or higher positions — The Mathematics Department at MIT is seeking to fill positions at the level of Assistant Professor or higher for September 2009. Appointments are based on exceptional research contributions in pure mathematics. Appointees will be expected to fulfill teaching duties and pursue their own research program. PhD required by employment start-date. We request that applications and other materials, including (a) curriculum vitae, (b) research description, and (c) three letters of recommendation be submitted online at www.mathjobs.org. Applications should be complete by **December 1, 2008** to receive full consideration. We request that your reference letters be submitted by reviewers online via mathjobs. We will also accept recommendations sent as PDF attachments to pure@math.mit.edu, or in hardcopy mailed to: Pure Mathematics Committee, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — C.L.E. Moore Instructorships in Mathematics — These positions for September 2009 are open to mathematicians who show definite promise in research. Applicants with PhD's after June 2008 are strongly preferred. Appointees will be expected to fulfill teaching duties and pursue their own research program. We request that applications and other materials, including (a) curriculum vitae, (b) research description, and (c) three letters of recommendation, be submitted online at www.mathjobs.org. Applications should be complete by December 1, 2008 to receive full consideration. We request that your letters of reference be submitted by the reviewers online via mathjobs. We will also accept recommendations either as PDF attachments sent to pure@math.mit.edu, or as paper copies mailed to: Pure Mathematics Committee, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Applied Mathematics positions — The applied mathematics group at MIT is seeking to fill combined teaching and research positions at the level of Instructor, Assistant Professor or higher, beginning September 2009. PhD required by employment start-date. Appointments are mainly based on exceptional research qualifications. Candidates in all areas of applied mathematics, including physical applied mathematics, computational molecular biology, numerical analysis, scientific computation, and theoretical computer science will be considered. Current activities of the group include: combinatorics, operations research, theory of algorithms, numerical analysis, astrophysics, condensed matter physics, computational physics, fluid dynamics, geophysics, nonlinear waves, theoretical and computational molecular biology, material sciences, quantum computing and quantum field theory, but new hiring may involve other areas as well. We request that applications and other materials, including (a) curriculum vitae, (b) research description, and (c) three letters of recommendation be submitted online at www.mathjobs.org, preferably well in advance of our deadline of **January 1, 2009** since we will begin our deliberations in December. We request that your reference letters be submitted by reviewers online via mathjobs. We will also accept recommendations sent as PDF attachments to applied@math.mit.edu, or in hardcopy mailed to: Applied Mathematics Committee, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Statistics and Applied Probability positions — The Department of Mathematics at MIT is seeking to fill combined teaching and research positions at the level of Instructor, Assistant Professor or higher in STATISTICS or APPLIED PROBABILITY beginning September 2009. Appointments are mainly based on exceptional research qualifications. PhD required by employment start-date. We request that applications and other materials, including (a) curriculum vitae, (b) research description, and (c) three letters of recommendation be submitted online at www.mathjobs.org. Applications should be complete by **January 1, 2009** to receive full consideration. We request that your reference letters be submitted by reviewers online via mathjobs. We will also accept recommendations sent as PDF attachments to statistics@math.mit.edu, or in hardcopy mailed to: Committee on Statistics, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

NORTH CAROLINA STATE UNIVERSITY — Tenure-track, rank-open, position — The Mathematics Department at North Carolina State University invites applications for a tenure-track, rank-open, position beginning Fall 2009. We seek individuals whose research focuses on modeling in Bio-Medical Mathematics and will play an active role in the Center for Quantitative Sciences in Biomedicine (CQSB), the Center for Research in Scientific Computing (CRSC) and the Bio-Math Program. The successful candidate will be expected to quickly provide scientific vision and leadership for the new CQSB. Preference will be given to applicants that have established a successful record of grant support and advising of Ph.D. students. Candidates must have a Ph.D. in the mathematical sciences, a record of successful postdoctoral experience or equivalent, experience in interdisciplinary research, and a commitment to effective teaching at the undergraduate and graduate levels. The Department of Mathematics has strong research programs in both applied and pure mathematics and provides/shares leadership for CQSB, CRSC and Bio-Math. More information about the department, CQSB and CRSC can be found at http://www.math.ncsu.edu. To submit your application materials, go to www.mathjobs.org/jobs/ncsu. Include a vita, at least three letters of recommendation, and a description of current and planned research. You will then be given instructions to go to http://jobs.ncsu.edu/applicants/Central?quickFind=81074 and complete a Faculty Profile for the position. Write to math-jobs@math.ncsu.edu for questions concerning this position. NC State University is an Equal Opportunity and Affirmative Action Employer. In addition, NC State welcomes all persons without regard to sexual orientation. The College of Physical and Mathematical Sciences welcomes the opportunity to work with candidates to identify suitable employment opportunities for spouses or partners. Review of applications will begin on **December 1, 2008**.

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NORTH CAROLINA STATE UNIVERSITY — Tenure-track, rank-open, positions — The Mathematics Department at North Carolina State University invites applications for up to three tenure-track, rank-open, positions beginning Fall 2009. We seek individuals whose research focuses on interdisciplinary mathematics. Two focus areas are applications to energy and the environment. Candidates must have a Ph.D. in the mathematical sciences, a record of successful postdoctoral experience, experience in interdisciplinary research, and a commitment to effective teaching at the undergraduate and graduate levels. Senior-level applicants must demonstrate a strong record of grant support and advising of Ph.D. students. The Department of Mathematics has strong research programs in both applied and pure mathematics. Many members of the department lead interdisciplinary research programs at both the local and national levels. More information about the department can be found at http://www.math.ncsu.edu. To submit your application materials, go to www.mathjobs.org/jobs/ncsu. Include a vita, at least three letters of recommendation, and a description of current and planned research. You will then be given instructions to go to http://jobs.ncsu.edu/applicants/Central?quickFind=81073 and complete a Faculty Profile for the position. Write to math-jobs@math.ncsu.edu for questions concerning this position. NC State University is an Equal Opportunity and Affirmative Action Employer. In addition, NC State welcomes all persons without regard to sexual orientation. The College of Physical and Mathematical Sciences welcomes the opportunity to work with candidates to identify suitable employment opportunities for spouses or partners. Review of applications will begin on **December 1, 2008**.

SEATTLE UNIVERSITY — Tenure-track positions in the mathematical sciences — Seattle University invites applications for several tenure-track positions in the mathematical sciences beginning September 2009. For at least one of the positions, the preference is for a mathematician in an area of algebra. The positions will be filled at the rank of assistant professor or, possibly, at the rank of associate professor for an exceptional applicant with teaching experience and qualifications appropriate to the associate professor level. Seattle University is the largest independent university in the Pacific Northwest, and is continuing to grow. The Mathematics Department is a vital component of the College of Science and Engineering, providing teaching support for all areas of the University as well as for our 50 mathematics majors. Department faculty engage in research in a variety of mathematical areas, and many also supervise students as part of a flourishing undergraduate research program. Seattle University, founded in 1891, continues a four hundred and fifty year tradition of Jesuit higher education. The University's Jesuit Catholic ideals underscore its commitment to the centrality of teaching, learning and scholarship, of values-based education grounded in the Jesuit and Catholic traditions, of service and social justice, of lifelong learning, and of educating the whole person. Located in the heart of dynamic Seattle, the University enrolls approximately 7200 undergraduate and graduate students in eight colleges and schools. Students enjoy a university ethos characterized by small classes, individualized faculty attention, a strong sense of community, a commitment to diversity, and an outstanding faculty. Requirements for the positions include: a Ph.D. in mathematics, applied mathematics, or statistics; demonstrated excellence in teaching undergraduates; strong teaching recommendations; a commitment to continued scholarly growth, to undergraduate research, to the use of technology in teaching, and to contributing to the mission of Seattle University. A complete application must include an AMS Standard Cover Sheet, curriculum vitae, unofficial graduate transcripts, statements of your teaching philosophy and research plans, and three confidential letters of reference including phone numbers. Your application must also include a cover letter that addresses how you could contribute to the mission of Seattle University. Please send to: Mathematics Search Committee, Mathematics Department, Seattle University, 901 12th Avenue, P.O. Box 222000, Seattle, WA 98122-1090. Closing date: Friday, November 28th, 2008. Seattle University is an equal opportunity employer. For more information about the Mathematics Department at Seattle University as well as this position, visit our website at http://www.seattleu.edu/scieng/math.

TEXAS A&M UNIVERSITY — Openings for tenured, tenure-eligible, and visiting faculty positions — The Department of Mathematics anticipates several openings for tenured, tenure-eligible, and visiting faculty positions beginning fall 2009. The field is open, but we particularly seek applications from individuals whose mathematical interests would augment and build upon existing strengths both within the Mathematics Department as well as other departments in the University. Salary, teaching loads and start-up funds are competitive. For a Tenured Position the applicant should have an outstanding research reputation and would be expected to fill a leadership role in the department. An established research program, including success in attracting external funding and supervision of graduate students, and a demonstrated ability and interest in teaching are required. Informal inquiries are welcome. For an Assistant Professorship, we seek strong research potential and evidence of excellence in teaching. Research productivity beyond the doctoral dissertation will normally be expected. We also have several visiting positions available. Our Visiting Assistant Professor positions are three-year appointments and carry a three course per year teaching load. They are intended for those who have recently received their Ph.D. and preference will be given to mathematicians whose research interests are close to those of our regular faculty members. Senior Visiting Positions may be for a semester or one year period. A complete dossier should be received by **December 15, 2008**. Early applications are encouraged since the department will start the review process in October, 2008. Applicants should send the completed "AMS Application Cover Sheet," a vita, a summary statement of research and teaching experience, and arrange to have letters of recommendation sent to: Faculty Hiring, Department of Mathematics, Texas A&M University, College Station, Texas 77843-3368. Further information can be obtained from: http://www.math.tamu.edu/hiring. Texas A&M University is an equal opportunity employer. The University is dedicated to the goal of building a culturally diverse and pluralistic faculty and staff committed to teaching and working in a multicultural environment and strongly encourages applications from women, minorities, individuals with disabilities, and veterans. The University is responsive to the needs of dual career couples.

TEXAS A&M UNIVERSITY — IAMCS-KAUST Postdoctoral Fellowships — The Institute for Applied Mathematics and Computational Science (IAMCS) at Texas A&M University is pleased to invite applications for its IAMCS-KAUST Postdoctoral Fellowships. IAMCS is an interdisciplinary research institute at Texas A&M University recently named as one of the four inaugural King Abdullah University of Science and Technology (KAUST) Global Research Partner Centers. Its core members number more than two dozen faculty from the fields of Mathematics, Statistics, Computer Science and Engineering. Fostering collaboration and interdisciplinary research anchored in the mathematical sciences are at the heart of IAMCS's mission. To that end, IAMCS emphasizes among its activities annual research themes. Its first two annual themes are Computational Earth Science and Computational Material Science and Engineering. IAMCS Postdoctoral candidates should have demonstrated interest and involvement in interdisciplinary research, and successful candidates will be encouraged to participate in the annual theme activities and to establish research collaborations exploring theme year topics. Moreover, each fellow will be invited to establish collaborations with KAUST faculty, postdocs and students as well as all of the KAUST Global Research Partner institutions and individual investigators. This offers an unprecedented opportunity for postdoctoral fellows to join a remarkable network of leading research institutions and eminent scholars assembled through the KAUST GRP program. KAUST is a new graduate research university being rapidly developed by the Kingdom of Saudi Arabia at a site along the Red Sea a short distance north of Jeddah. When it opens in September 2009, it will offer world class, state-of-the-art research and instructional facilities supporting its core research and graduate programs in earth sciences, materials science and engineering, biosciences, and applied mathematics and computational science. A key element in KAUST's development as a premier graduate research university is its Global Research Partnership (GRP) program. The GRP consists of its Academic Excellence Alliance Partners, Research Center Partners and Individual Research Scholar Partners. The IAMCS-KAUST Postdoctoral Fellowships at Texas A&M University are two year appointments with the possibility of extension to a third year. The fellowship stipend is $50K over 12 months plus fringe benefits. Interested individuals should submit their application materials (CV, research statement and three letters of recommendation) to the email address KAUST@tamu.edu by **15 December 2008**. IAMCS intends to select up to four IAMCS-KAUST Fellows. Texas A&M University is an equal opportunity employer. The University is dedicated to the goal of building a culturally diverse pluralistic faculty and staff committed to teaching and working in a multicultural environment and strongly encourages applications from women, minorities and individuals with disabilities.

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UNIVERSITY OF MICHIGAN — Lecturer III in Mathematics — Pending authorization, the Department invites applications for a Lecturer III in Mathematics to begin September 2009. This is not a tenure track position but may be renewed, annually for up to the first four years, and thereafter for intervals of three to five years. Criteria for renewal are excellence in classroom teaching and participation in administration of the Department's Introductory Program and instructor development. Interest and activity in pedagogical research is encouraged but not essential for reappointment. The successful candidate is likely to have both a doctorate and substantial experience in teaching mathematics. Please submit a curriculum vitae, a statement of teaching philosophy and experience, evidence of teaching excellence, and the names of at least three references. Application materials should preferably be submitted electronically through the AMS website MathJobs.Org. Alternatively, applications may be sent to: Personnel Committee, University of Michigan, Department of Mathematics, 2074 East Hall, 530 Church Street, Ann Arbor MI 48109-1043. Applications are considered on a continuing basis but candidates are urged to apply by **November 1, 2008**. Inquiries may be made by e-mail to math-fac-search@umich.edu. More detailed information regarding the Department may be found on our website: www.math.lsa.umich.edu. Women and minority candidates are encouraged to apply. The University of Michigan is an equal opportunity /affirmative action employer.

UNIVERSITY OF MICHIGAN — Tenure-track or tenured level positions — Pending authorization, the Department of Mathematics anticipates having one or more openings at the tenure-track or tenured level. Candidates should hold a PhD in mathematics or a related field and should show outstanding promise and/or accomplishments in both research and teaching. Applications are encouraged from any area of pure, applied, computational, or interdisciplinary mathematics. Salaries are competitive and are based on credentials. Junior candidates should furnish a placement dossier consisting of a letter of application, curriculum vitae and three letters of recommendation; senior candidates should send a letter of application, curriculum vitae, and names of three suggested references. In all cases please provide a statement of teaching philosophy and experience, evidence of teaching excellence, and a statement of current and future research plans. Application materials should preferably be submitted electronically through the AMS website MathJobs.Org. Alternatively, applications may be sent to: Personnel Committee, University of Michigan, Department of Mathematics, 2074 East Hall, 530 Church Street, Ann Arbor MI 48109-1043. Applications are considered on a continuing basis but candidates are urged to apply by **November 1, 2008**. Inquiries may be made by e-mail to math-fac-search@umich.edu. More detailed information regarding the Department may be found on our website: www.math.lsa.umich.edu. Women and minority candidates are encouraged to apply. The University of Michigan is supportive of the needs of dual career couples and is an equal opportunity /affirmative action employer.

UNIVERSITY OF NOTRE DAME — Instructorship in Mathematics — The Department of Mathematics of the University of Notre Dame invites applications from recent doctorates for the position of Notre Dame Instructor in Mathematics. Candidates in any specialty compatible with the research interests of the department will be considered. The teaching load and salary will be competitive with those of distinguished instructorships at other AMS Group I universities. This position is for a term of three years beginning August 22, 2009; it is not renewable and is not tenure track. Applications, including a curriculum vitae and a completed AMS standard cover sheet, should be filed through MathJobs (www.MathJobs.org). Applicants should also arrange for at least three letters of recommendation to be submitted through the MathJobs system. These letters should address the applicant's research accomplishments and supply evidence that the applicant has the ability to communicate articulately and teach effectively. Notre Dame is an equal opportunity employer, and we particularly welcome applications from women and minority candidates. The evaluation of candidates will begin **December 1, 2008**. Information about the department is available at http://math.nd.edu

WILLIAMS COLLEGE — Tenure track position in mathematics — The Williams College Department of Mathematics and Statistics invites applications for one tenure track position in mathematics, beginning fall 2009, at the rank of assistant professor (in an exceptional case, a more advanced appointment may be considered). We are seeking a highly qualified candidate who has demonstrated excellence in teaching and research, and who will have a Ph.D. by the time of appointment. Williams College is a private, coeducational, residential, highly selective liberal arts college with an undergraduate enrollment of approximately 2,000 students. The teaching load is two courses per 12-week semester and a winter term course every other January. In addition to excellence in teaching, an active and successful research program is expected. Applicants are asked to supply a vita and have three letters of recommendation on teaching and research sent. Teaching and research statements are also welcome. Applications may be made on-line (http://www.mathjobs.org/jobs). Alternately, application materials and letters of recommendations may be sent to Olga R. Beaver, Chair of the Hiring Committee, Department of Mathematics and Statistics, Williams College, Williamstown, MA 01267. Evaluation of applications will begin on or after **November 15** and will continue until the position is filled. For more information on the Department of Mathematics and Statistics, please visit http://www.williams.edu/Mathematics. Williams College is committed to building and supporting a diverse population of faculty, staff and students, to fostering a varied and inclusive curriculum, and to providing a welcoming intellectual environment for all. As an EEO/AA employer, Williams encourages applications from all backgrounds. To learn more about Williams College, please visit http://www.williams.edu.

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