

ASSOCIATION FOR
WOMEN IN MATHEMATICS

Newsletter

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The purpose of the Association for Women in Mathematics is

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

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PRESIDENT'S REPORT

Whether you accept Winston Churchill's view that "there is nothing wrong with change, if it is in the right direction" or are more inclined to side with Robert Gallagher's cynical remark, "Change is inevitable—except from a vending machine," expect change from AWM in the coming months.

The new AWM website will debut this summer. Volunteers from Google have generously donated countless hours of effort to this project, which has been underway for well over a year now. Holly Gaff, AWM Web Editor, is spearheading the "porting" of the pages over to the new Google structure, while AWM Executive Director Maeve McCarthy is leading the editorial content transfer work. They are assisted in this monster effort by Gerhard Hartl, a systems support analyst, and by Glenna Buford, a mathematics major at Murray State University who is headed to graduate school at Vanderbilt University in the fall.

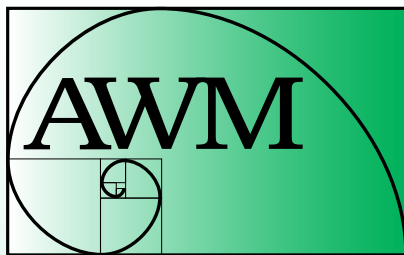
The renovated website will offer important new features. Google E-Commerce will facilitate renewal of dues online for those who opt to use that route when the new AWM membership year rolls around in September. In addition, the newsletter eventually will be accessible to AWM members online (as well as in hard copy for any eligible member who elects to continue to receive it that way).

AWM's project to digitize its past newsletters is in full swing, thanks to a substantial donation from former AWM President Jean Taylor, to the AWM Digitizing Task Force headed by Alison Marr, and to Michael Doob, who gave us expert advice on the scanning process. The hope is that the back issues (pre-pdf and printed in various and sundry formats, but nonetheless valuable records of AWM's history) will eventually be searchable on the AWM website in the not-so-distant future.

As many of you are aware from the listserv announcement that was sent to AWM members in May, AWM has begun a reciprocal membership agreement with the Society for Industrial and Applied Mathematics (SIAM). This agreement was suggested by SIAM President Douglas Arnold and has been in the works for almost a year. It offers the potential to attract new members to both organizations. SIAM's current membership is only about 10–15% women, while the number of AWM members working in industry and in governmental labs and offices is quite small. Both societies would like this to change. In the words of Sue Minkoff, Chair of the SIAM Membership Committee, "SIAM is committed to reaching out to a variety of different groups and especially to increasing the number of women members."

What's this agreement all about? you might ask. Change. And more of it stays in your purse if you become a reciprocal member. Individuals who belong to AWM receive a 20% discount off the SIAM regular member dues rate and all the

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ASSOCIATION FOR WOMEN IN MATHEMATICS

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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President's Report *continued from page 1*

benefits of SIAM regular membership. SIAM regular members joining AWM for the first time will receive a discounted rate of \$30 for each of their first two years of AWM membership. The reciprocal membership is open to women and men who would like to belong to both societies. Further details can be found at the website <http://www.siam.org/membership/individual/reciprocal.php> and will appear on our new and vastly improved website soon.

In 2008, SIAM members approved the SIAM Fellows Program to honor certain of its members who have made outstanding contributions to fields served by SIAM. The second class of Fellows was announced in March, and among the 34 named for 2010 are 3 women—all of them AWM members. Andrea Bertozzi of UCLA was cited for her contributions to the application of mathematics in incompressible flow, thin films, image processing, and swarming. She was the AWM-SIAM Sonia Kovalevsky Lecturer in 2009. Susanne Brenner of Louisiana State University was recognized for advances in finite element and multigrid methods for the numerical solution of partial differential equations, and Barbara Lee Keyfitz of The Ohio State University for advances in hyperbolic conservation laws and the study of shock waves. Susanne, who has served on the editorial board of the *Notices of the American Mathematical Society* (AMS) since 2001, received an Alexander von Humboldt Foundation research award in 2005. Barbara, a past president of AWM and now the president-elect of the International Council of Industrial and Applied Mathematics (ICIAM), was recently awarded an honorary degree from the University of Waterloo in Canada. We are proud of the accomplishments of these AWM members—congratulations from us all!

In other award news, Andrea Bertozzi and Mary Wheeler were recently elected to the American Academy of Arts and Sciences. In 2009, Dr. Wheeler was honored with SIAM's prestigious Theodore von Kármán Prize, which has been awarded every five years for a notable application of mathematics to mechanics and/or the engineering sciences.

AWM Executive Committee member Trachette Jackson of the University of Michigan is the 2010 winner of the Blackwell-Tapia Prize. The Mathematical Sciences Research Institute (MSRI) in Berkeley and Cornell University established the prize in honor of David Blackwell and Richard A. Tapia, distinguished mathematical scientists who have been inspirations to more than a generation of African American and Hispanic American students and professionals in the mathematical sciences. It will be presented at the Sixth Blackwell-Tapia Conference, to be held November 5–6, 2010 at the Mathematical Biosciences Institute at Ohio State. Dr. Jackson, who is the first woman to receive the Blackwell-Tapia Prize, co-directs the Mathematical Biology Research Group at Michigan. Her research team combines continuous and discrete approaches to derive, analyze, and validate novel mathematical models of tumorigenesis and disease progression and develops quantitative approaches to cancer research.

Since 1925, Guggenheim Fellowships have been presented annually by the John Simon Guggenheim Foundation to individuals “who have demonstrated exceptional capacity for productive scholarship or exceptional creative ability in the arts.” Among the 180 artists, scientists, and scholars selected from this year's 3,000 applicants are Princeton University Applied Mathematics Professor Ingrid Daubechies and Computer Science Professors Dawn Song of the University of California Berkeley and Tandy Warnow of the University of Texas at Austin.

Change—from one Cambridge to another—and no doubt one that Sir Winston would agree is in the right direction) is in store for Maria Monks, a recent MIT graduate, who will be heading off to Churchill College at Cambridge University in England on a Churchill Scholarship to pursue a one-year master's degree in mathematics. Among the most competitive scholarships in the United States, the Churchill Scholarship recognizes extraordinary accomplishment and promise. Maria, winner of the 2009 Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman and the 2010 runner-up for the Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student, already has six mathematics publications and also has earned All-American honors as one of the country's premier cross-country runners.

Congratulations to all these winners on their amazing achievements!

At the end of April, AMS Executive Director Donald McClure reported to the AMS Council on the current job market. A recent AMS survey showed that the number of full-time positions requiring a doctorate that mathematics departments tried to fill in 2009–10 was down 58.3% from 2007–08. By contrast, in 2008–09 the number was down 47.3% from 2007–08, in a job market that had been described previously as “catastrophic.” Almost a decade ago, the Committee on the Profession of the Mathematical Association of America (MAA) proposed a resolution that was passed by the MAA Board of Governors in August 2002 and said, in part,

while nonpermanent faculty often make valuable contributions to undergraduate education, over-reliance on temporary faculty (whether part-time or full-time) can decrease stable and continuous faculty involvement in course and curriculum development, peer teaching review, student advising, and departmental governance, and simultaneously lead to a shift of responsibility for out-of-class departmental duties into the hands of fewer permanent faculty members.... The decline in the number of permanent faculty positions can disrupt the professional development of new Ph.D. recipients who are forced to be in job-search mode year after year, as they move from one temporary position to another.

The percentage of mathematics sections taught by part-time faculty over all types of mathematics departments stood at 20% in 2005, according to the 2005 Conference Board of the Mathematical Sciences (CBMS) Survey (see [1] and also [2]). Now more than ever, when colleges and universities are struggling with shrinking budgets, the temptation to hire adjuncts to teach courses at \$4000 per course is even greater than it was in 2005. As more graduating doctoral students face the reality that the academic jobs they hoped for are currently unavailable, AWM and the other societies in the mathematical sciences grapple with the question of what can be done to alleviate the critical job situation and give support to these early career mathematicians. Urging departments and university administrations to push for the creation of postdoctoral positions, perhaps supplemented with money from combining individual grants, might help in some small way. Creative suggestions and actions by our members would be especially welcome.

The AWM Workshops for Graduate Students and Recent Ph.D.'s have been an integral part of the organization's effort to mentor early career mathematicians. Held in conjunction with the Joint Mathematics Meetings each January and the

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Membership Dues

Membership runs from Oct. 1 to Sept. 30

Individual: \$55 **Family (no newsletter):** \$30

Contributing: \$125

New member, retired, part-time: \$30

Student, unemployed, developing nations: \$20

Foreign memberships: \$10 add'l. for postage

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

Institutional Membership Levels

Category 1: \$300

Category 2: \$300

Category 3: \$175

Category 4: \$150

See www.awm-math.org for details on free ads, free student memberships, and ad discounts.

Sponsorship Levels

Friend: \$1000+

Patron: \$2500+

Benefactor: \$5000+

Program Sponsor: \$10,000+

See the AWM website for details.

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

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

Newsletter Ads—AWM will accept ads for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Managing Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the Newsletter must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is \$110 for a basic four-line ad. Additional lines are \$13 each. See the AWM website for *Newsletter* display ad rates.

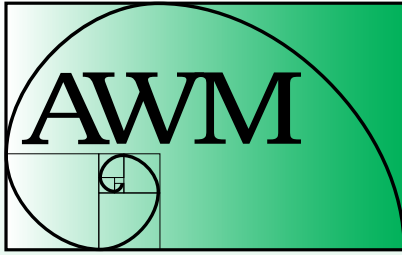
Newsletter Deadlines

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

Ads: Feb. 1 for March–April, April 1 for May–June, June 1 for July–Aug., Aug. 1 for Sept.–Oct., Oct. 1 for Nov.–Dec., Dec. 1 for Jan.–Feb.

Addresses

Send all **Newsletter** material **except ads and material for columns** to Anne Leggett, e-mail: leggett@member.ams.org; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Bayer, e-mail: bayer@math.ku.edu; fax: 785-864-5255. Send all **media column** material to Sarah Greenwald, e-mail: greenwaldsj@appstate.edu; and Alice Silverberg, e-mail asilverb@math.uci.edu. Send everything else, **including ads and address changes**, to AWM, fax: 703-359-7562; e-mail awm@awm-math.org. Visit www.awm-math.org for snail mail addresses.



ASSOCIATION FOR
WOMEN IN MATHEMATICS

AWM ONLINE

AWM Web Editor

Holly Gaff
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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

SKHS/SKMS Mathematics Days:
August 4, 2010

AWM Workshop at JMM: August 15, 2010

NSF-AWM Travel Grants:
October 1, 2010 and February 1, 2011

Alice T. Schafer Prize: October 1, 2010

AWM Noether Lecturer: October 15, 2010

AWM Workshop at ICIAM: October 31, 2010

Ruth I. Micheler Memorial Prize:
November 1, 2010

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President's Report *continued from page 3*

SIAM Annual Meeting each July, these workshops include research presentations, panels and symposia focused on career development, and mentoring by more experienced mathematicians. Participants are selected on a competitive basis with research excellence as the main criterion. AWM is pleased to announce that Cammey Cole Manning of Meredith College will assume the newly created position of Workshop Director. In this capacity, she will oversee and supervise AWM's workshop efforts, which involve a number of volunteer committees to choose participants, run the workshops, participate in panel discussions, and mentor participants. Cammey is thoroughly versed in the ins and outs of such workshops, having participated in the AWM workshop at the SIAM annual meeting as a graduate student, as a Ph.D. recipient, and most recently, as chair of the workshop committee. [See also p. 7.]

The 2007 report of the AMS Task Force on Employment Prospects urges schools to "make students aware of job market realities and prepare them for a broad range of careers." Steve Lohr's column, "For Today's Graduate, Just One Word: **Statistics**," in the *New York Times* last August offers more pointed advice to students. According to Lohr, there are exciting roles mathematicians can play in the world of data analysis:

At Harvard, Carrie Grimes majored in anthropology and archaeology and ventured to places like Honduras, where she studied Mayan settlement patterns by mapping where artifacts were found.... Now Ms. Grimes does a different kind of digging. She works at Google, where she uses statistical analysis of mounds of data to come up with ways to improve its search engine.... Ms. Grimes, 32, got her doctorate in statistics from Stanford in 2003 and joined Google later that year. She is now one of many statisticians in a group of 250 data analysts. She uses statistical modeling to help improve the company's search technology. The new breed of statisticians tackles that problem. They use powerful computers and sophisticated mathematical models to hunt for meaningful patterns and insights in vast troves of data.... Statisticians are only a small part of an army of experts using modern statistical techniques for data analysis. Computing and numerical skills, experts say, matter far more than degrees. So the new data sleuths come from backgrounds like economics, computer science and mathematics.

Catherine O'Neil, 1993 Schafer prize co-winner, might offer a different word of advice to graduates: **finance**. In an interview that appeared in the *Notices of the AMS* in 2008, O'Neil discusses her life as a "quant" (quantitative analyst). She remarks that quants typically come from mathematics, physics, or computer science backgrounds and often have Ph.D.'s. Although a Ph.D. is not necessarily a requirement, being a creative, careful thinker is. Catherine herself earned an undergraduate degree in mathematics at Berkeley and a Ph.D. in number theory from Harvard in 1999. Following a Moore Instructorship at MIT and a second postdoctoral appointment, she settled into a tenure-track job in 2005 but left that two years later to enter the world of finance. At the time of the *Notices* interview she worked for D.E. Shaw, a financial group, but now she is employed at Riskmetrics. In answer to the question, "Is finance a good place for women?" Catherine replied,

Even though women are extremely underrepresented in finance, and especially as quants, I would maintain that finance is probably a better place

for mathematical women than academics. The overall quantitative structure of finance means that your work is constantly being evaluated and that you are constantly receiving feedback. From my experience, this is far from being true in the sphere of academics, which is much more reputation-based and vague, and where often people who have never read your papers are put in the position of evaluating you. I think women are particularly hurt by such a system, because in my estimation women are more likely to flourish with feedback and documentation of quantifiable success. I encourage women, and for that matter men, to consider these issues when they decide what kind of careers to pursue.

North Carolina State University's efforts to involve students in successful research experiences and to offer extensive career development have earned it the designation as the recipient of the 2010 AMS Award for an Exemplary Program or Achievement in a Mathematics Department. The NC State department has two undergraduate programs: Research Experiences for Undergraduates (REU), which is one of the largest REUs in the nation, and REU+, aimed at students traditionally underrepresented in the mathematical sciences. A graduate level counterpart program aims to involve Ph.D. students in research early in their studies. As a result, graduate students in the department are having an easier time finding advisors and are completing their degrees more quickly. They also have opportunities to participate in off-campus internships at such institutions as the Aerospace Corporation, the Boeing Company, the Hammer Institute, Harvard Medical School, Lawrence Livermore National Laboratory, Merck Pharmaceutical Company, MIT Lincoln Laboratory, and the National Institute of Environmental Health Sciences. The department has had notable success in mentoring students traditionally underrepresented in mathematics. The percentage of female graduate students has increased steadily from its historic average of around 33% to its current level of 49%. In the last decade, at least ten African-American students earned Ph.D. degrees from the NC State Mathematics Department.

This summer, NC State will host the EDGE (Enhancing Diversity in Graduate Education) Summer Program. Started in 1998 at Spelman and Bryn Mawr Colleges by AWM Executive Committee Member Sylvia Bozeman and AWM past-president Rhonda Hughes, the program has achieved its goal of strengthening the ability of women students to successfully complete graduate programs in the mathematical sciences by providing them a supportive and positive learn-

ing environment the summer prior to graduate school. Ruth Haas of Smith College (also one of our Executive Committee members) will be on the faculty of this summer's program.

In April I visited NC State and in one jam-packed day had the opportunity to talk with administrators and department members (some even about research), to give a colloquium, and to meet with graduate students over lunch and in an informal discussion about AWM. Since then, I have been corresponding with graduate students and faculty members there about starting an AWM student chapter. They're very interested—and are even contemplating hosting a Sonia Kovalevsky Day as one of the chapter's first activities. Way to go, NC State, for all your exemplary efforts!

AWM currently has 27 student chapters at schools that run the gamut from small liberal arts colleges to large research universities. Chapters engage in a variety of activities: mentoring high school and undergraduate students, hosting invited speakers, running Sonia Kovalevsky Days, proposing problems (and posting their solutions), having discussion panels, and tutoring. Chapters are open to men as well as women, to undergraduates as well as graduate students. Schools interested in forming a student chapter of AWM should consult the AWM web page <http://www.awm-math.org/studentchapter.html>. [See pp. 11–13 for reports from three chapters.]

AWM has never had funding for its student chapter program, but we are actively seeking support, so that our chapters can apply for funds to sponsor an activity. Spare change, anyone?

- [1] David J. Lutzer, Stephen B. Rodi, Ellen E. Kirkman, and James W. Maxwell. *Statistical Abstract of Undergraduate Programs in the Mathematical Sciences in the United States, CBMS 2005 Survey*, Amer. Math. Soc., Providence, RI, 2007.
- [2] David J. Lutzer and James W. Maxwell. Staffing shifts in mathematical sciences departments, 1995–2000, *Notices Amer. Math. Soc.* 50 (2003), 683–686.

Georgia Benkart

Georgia Benkart
Madison, WI
May 20, 2010



Georgia Benkart

Suzanne Lenhart to be AWM-SIAM Sonia Kovalevsky Lecturer



Suzanne Lenhart

AWM and SIAM have selected Suzanne Lenhart of the University of Tennessee to deliver the prestigious Sonia Kovalevsky Lecture at the 2010 SIAM Annual Meeting. She was selected as the Kovalevsky Lecturer in recognition of her significant research in partial differential equations, ordinary differential equations and optimal control. She works on a variety of applications, including population models, disease models, and resource management. She has over 100 research journal publications and a book, *Optimal Control Applied to Biological Models*.

Lenhart received her B.A. in Mathematics from Bellarmine College and her M.A. and Ph.D. in Mathematics from the University of Kentucky. She began her academic career in the Mathematics Department at the University of Tennessee at Knoxville and is now a full professor there. She has held many visiting professorships around the world throughout her career. She was a part-time researcher at Oak Ridge National Laboratory from 1987–2009.

She was the President of the Association for Women in Mathematics in 2001–2002. She is one of the co-organizers of the AWM Teacher Partnership program, which pairs teachers with mathematicians from colleges, industry and government. She works weekly with the Bearden High School math club and is active in Mu Alpha Theta activities (national high school math honors society). She is a member of the Scientific Advisory Committee of the Mathematical Biosciences Institute. Lenhart was the director of the Research Experiences for Undergraduates summer program at UT from 1990–2005 and was chair of the MAA CUPM Committee on Research by Undergraduates for five years. She served two terms on the Board of Trustees of the Society for Industrial and Applied Mathematics from 2004–2009.

She is the Associate Director for Education, Outreach and Diversity for the National Institute for Mathematical and Biological Synthesis and directs the REU summer program for this institute. She was recently elected as a Fellow of AAAS.

The 2010 SIAM Annual Meeting will be held July 12–16 in Pittsburgh, PA. The Kovalevsky Lecture honors Sonia Kovalevsky (1850–1891), the most widely known Russian mathematician of the late 19th century. In 1874, Kovalevsky received her Doctor of Philosophy degree from the University of Göttingen and was appointed lecturer at the University of Stockholm in 1883. She did her most important work in the theory of differential equations. Past Kovalevsky lecturers are Andrea Bertozzi, Dianne O’Leary, Lai-Sang Young, Irene Fonseca, Ingrid Daubechies, Joyce McLaughlin and Linda Petzold.

CALL FOR NOMINATIONS:

The 2012 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, Olga 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, Audrey Terras, Fan Chung Graham and Carolyn Gordon.

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. Nominations should be sent by **October 15, 2010** to awm@awm-math.org. If you have questions, phone 703-934-0163 or email awm@awm-math.org.

Cammeey Manning Named AWM Workshop Director

AWM has named Cammeey Cole Manning as its workshop director. In her new position, Manning will oversee AWM's successful workshop programs by coordinating with the workshop committees and the AWM Executive Committee.

As a member of all of the workshop committees, Dr. Manning will provide continuity for the workshop program. She will work with the executive director, Maeve McCarthy, and the managing director, Jennifer Lewis, to seek funding for the workshop program. Other duties will include grant reporting and facilitating volunteer efforts for AWM's workshop programs.



Cammeey Manning

Manning received her B.S. in Mathematics and Computer Science from Duke University and her M.S and Ph.D. in Applied Mathematics from North Carolina State University under the direction of Hien T. Tran. Manning accepted a faculty position at Meredith College after receiving her Ph.D. and is now an associate professor.

Manning was a 2001 Project NExT fellow. She began her involvement with AWM in 2000 as a graduate student when she participated in an AWM workshop at the SIAM Annual Meeting and in 2002 when she participated in an AWM workshop as a postdoc at the SIAM Annual Meeting. She has served as a mentor for the AWM workshop at the SIAM Annual Meeting since July 2003. She has helped organize many programs at conferences, including AWM workshops and research minisymposia at SIAM meetings, as well as SAMSI/CRSC undergraduate workshops.

Her research interests include developing and implementing technical concepts from linear and nonlinear dynamics and numerical analysis to study and improve the modeling of physiological and biological systems. In 2005, she received the Pauline Davis Perry Award for Excellence in Research and Publication from Meredith College.

NSF-AWM Travel Grants for Women

Mathematics Travel Grants. Enabling women mathematicians to attend conferences in their fields provides them a valuable opportunity to advance their research activities and their visibility in the research community. Having more women attend such meetings also increases the size of the pool from which speakers at subsequent meetings may be drawn and thus addresses the persistent problem of the absence of women speakers at some research conferences. 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.

Mathematics Education Travel Grants. There are a variety of reasons to encourage interaction between mathematicians and educational researchers. National reports recommend encouraging collaboration between mathematicians and researchers in education and related fields in order to improve the education of teachers and students. Communication between mathematicians and educational researchers is often poor, and second-hand accounts of research in education can be misleading. Particularly relevant to the AWM is the fact that high-profile panels of mathematicians and educational researchers rarely include women mathematicians. The Mathematics Education Research Travel Grants provide full or partial support for travel and subsistence for

- mathematicians attending a research conference in mathematics education or related field, or
- researchers in mathematics education or related field attending a mathematics conference.

Selection Procedure. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians and mathematics education researchers appointed by the AWM. A maximum of \$1500 for domestic travel and of \$2000 for foreign travel will be funded. For foreign travel, US air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

Eligibility and Applications. These travel funds are provided by the Division of Mathematical Sciences (DMS) of the National Science Foundation. The conference or the applicant's research must be in an area supported by DMS. Applicants must be women holding a doctorate (or equivalent) and with a work address in the USA (or home address, in the case of unemployed applicants). Please see the website (<http://www.awm-math.org/travelgrants.html>) for further details and do not hesitate to contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance.

Deadlines. There are three award periods per year. Applications are due **February 1, May 1, and October 1.**

The Rising Cost of College Textbooks

Mary Morley, Ocean County College

The high cost of college textbooks has become an important topic at the college where I teach and at other colleges throughout the country. Students, parents, and administrators are all concerned. The issue has given rise to a Government Accounting Office report¹ and legislation at both the national and state levels. This column is too short to do complete justice to the issue. The intent here is just to inform the mathematics community and to discuss possible ways to make textbooks more affordable. I am also interested about hearing from anyone with experience using nontraditional textbooks.

There is no doubt about the increase in the cost of textbooks over the long term, although they have increased at a slightly lower rate than tuition. According to the Government Accounting Office (GAO),² “textbook prices nearly tripled from December 1986 to December 2004, while tuition and fees increased by 240 percent and overall inflation was 72 percent.” Last year, at the community college where I teach, several of the textbooks used for service courses had increases of \$50 per book. The cost of textbooks may be more of an issue at community colleges, since tuition costs are lower. The same GAO report cited above states that in 2004, the cost of textbooks and other supplies at community colleges averaged 72% of the tuition costs. There is some disagreement, however, on just how much students are spending.

How much do textbooks and supplies actually cost? The cost of books and other supplies varies from subject to subject. A report from 2008 gives median costs per course and lists Life Sciences as having the highest cost per course (\$188.18 at Universities), followed by Physical Sciences, Business, and Mathematics (\$130.78). The lowest cost reported was for education at \$96.22 per course.³ This same report

states that costs tend to be cheaper at off-campus stores.⁴ I was unable to find hard data on costs per course after 2008, but the list prices of the two most popular calculus texts on Amazon.com are both over \$200, and even at a discount, they are selling for over \$150.⁵ There is conflicting data on total costs for students. The College Board website says that the average cost for books and supplies in 2009–2010 at four-year colleges was \$1122.⁶ The National Association of College Stores (NACS) website, on the other hand, claims that full-time students spent on average \$693 in the past year.⁷ Perhaps these figures are both correct. Maybe students are spending \$693 when they should be spending \$1122.⁶ Jennifer Libertowski of NACS was quoted in the *Washington Post* as saying that nearly 60 percent of students nationwide choose not to buy all of the course materials.⁸ This situation is bad for everyone. Students who do not buy math books are probably not reading the book or doing any homework. They may think they are saving money, but they could end up repeating the course, which will cost them in tuition and time. This also creates problems for the publishers. They make their money on the sale of new books. Most of the cost of the book is in creating and marketing the book. The marginal costs of printing and delivering one book are a small part of the cost. The publisher’s costs do not decrease significantly if students do not buy the book, but their income does decrease. The rising number of students who do not buy the book could be a contributing factor to the rise in textbook costs.

There is disagreement over the reasons for the high cost of textbooks. The title of the GAO report states their position: “College Textbooks: Enhanced Offerings Appear to Drive Recent Price Increases.” College textbooks frequently come with enhanced offerings such as CDs, DVDs, or access to on-line homework systems or other instructional materials. Developing these materials does cost money, and this cost is passed on to the purchaser. The publishers’ position seems to be that these materials are needed and were developed in response to demand from professors and colleges. It is not clear if the enhanced offerings came from pull by professors or push from the publishers. Another factor increasing the cost

¹ U.S. Government Accountability Office. (2005, July). “College Textbooks: Enhanced Offerings Appear to Drive Recent Price Increases.” (Publication Number GAO-05-806) <http://www.gao.gov/products/GAO-05-806> (accessed May 28, 2010)

² *Ibid.*, p 2.

³ OPPAGA: Office of Program Policy Analysis and Government Accountability (April 2008). “Options Exist to Address the Rising Costs of Textbooks for Florida’s College Students.” (Report 08-29), p 3. <https://www.wvhepc.org/commission/Textbooks%20Study/Office%20of%20Program%20Policy%20AnalysisandGovernment%20Accountability%20Report.pdf> (accessed May 28, 2010)

⁴ *Ibid.*, p 4.

⁵ <http://www.amazon.com/gp/bestsellers/books/13905> (accessed May 28, 2010)

⁶ <http://www.collegeboard.com/student/pay/add-it-up/482.html> (accessed May 28, 2010)

⁷ <http://www.nacs.org/research.aspx> (accessed May 28, 2010)

⁸ Kinzie, Susan Swelling “Textbook Costs have College Students Saying ‘Pass’ ” *The Washington Post*, Monday, January 23, 2006. <http://www.washingtonpost.com/wp-dyn/content/article/2006/01/22/AR2006012201290.html> (accessed May 28, 2010)

to the student is frequent revisions to textbooks. When I was in college a new edition of a textbook might come out every five years. Currently the average time between book editions seems to be about three years. Frequent changes in editions limit the ability of students to buy used copies of the book. Publishers may argue that frequent editions are necessary to keep up with advances in the field. However, this is not always the case. In Computer Science or Biology advances in the subject may require frequent updates, but in undergraduate mathematics most of the edition changes I have seen have been cosmetic. However, a change in editions does seem to require changes in homework exercises, thus making it difficult to assign consistent homework when students have different versions of the book.

There are a number of methods that could be used to lower the cost of textbooks, or at least slow the increase: legislative solutions, digital textbooks, older texts, and free resources. All of them can help, but none of them is a complete solution. First let us consider legislative solutions. The 2008 Higher Education Opportunity Act⁹ includes several requirements aimed at decreasing the costs of college textbooks. This act requires colleges to give students information on the ISBN numbers of textbooks and what they will cost

⁹Public Law 110-315—AUG. 14, 2008 Higher Education Opportunity Act. <http://ed.gov/policy/highered/leg/hea08/index.html> (accessed May 28, 2010)

before they register for classes. This allows students to make informed decisions and to buy the textbook wherever they can find it at the lowest price. Another requirement of the act is that bundled materials must also be sold and priced separately. Perhaps a student can find parts of the bundle more cheaply elsewhere if they can be purchased separately. There is another recent change in the law that does nothing to bring down inflation on textbooks, but does offer students and parents some relief. The American Opportunity Tax credit is a \$2,500 credit for “qualified tuition and related expenses.” Required textbooks now qualify as related expenses, at least for 2009 and 2010.¹⁰ A second way to lower textbook costs is through the use of digital or e-books. These are cheaper, typically running 50% to 70% of the price of regular textbooks. Currently, digital textbooks have only 0.5% of the market, although it has been projected that they will reach 18% of the market within 5 years.¹¹ A third way to lower cost that has been suggested is to use older textbooks. These books, particularly if they are out of copyright, can often be

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¹⁰<http://www.irs.gov/newsroom/article/0,,id=211309,00.html> (accessed on May 28, 2010)

¹¹ Reynolds, Bob and Ioffe Yevgeny “Digital Textbook Sales in Higher Education: A five Year Projection.” Xplana. April 2010, p2. <http://blog.xplana.com/reports/digital-textbook-sales-in-u-s-higher-education-%E2%80%93-a-five-year-projection/> (accessed on May 28, 2010)

CALL FOR NOMINATIONS

The 2011 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. However, the 2011 lecture will be given at ICIAM in Vancouver. 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, Lai-Sang Young, Dianne P. O’Leary, Andrea Bertozzi, and Suzanne Lenhart.

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 awm@awm-math.org. Nominations must be received by **November 1, 2010** and will be kept active for two years.

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.

had fairly cheaply, since the price of the book just has to cover printing and distribution. My eldest son went to St. John's College in Annapolis, Maryland, which has a Great Books Program. He had to purchase a large number of books, but the total cost per semester was less than the cost of some calculus texts. All of these methods can help with the cost of textbooks, but I do not think in the long run they are a complete solution. Allowing students to buy textbooks elsewhere can save money, but perhaps not a large amount. The OPPAGA (The Florida State Legislature's Office of Program

Policy Analysis and Government accountability) report cited earlier found an average savings of \$2.15 from purchasing items online.¹² Digital textbooks can reduce printing and distribution costs, but they do not address the cost of developing and marketing the material. In addition, buying a digital textbook is often just renting it. The student cannot sell it back at the end of the semester and may not even be able to keep it as a reference for future courses. On the other hand, if digital textbooks come with homework and/or

¹² OPPAGA, p 3.

AWM Workshop for Women Graduate Students and Recent Ph.D.'s at ICIAM 2011

Application deadline: **October 31, 2010**

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: Pending additional support, an AWM Workshop is scheduled to be held as part of an embedded meeting of AWM that will be held during the International Congress on Industrial and Applied Mathematics (ICIAM), Vancouver, British Columbia, Canada, July 18–22, 2011.

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 expenses for between fifteen and 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.

MENTORS: We also seek volunteers to act as mentors for workshop participants. If you are interested in volunteering, please contact the AWM Workshop Director, Cammey Manning, at manningc@meredith.edu.

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. 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 and a brief abstract (75 words or less) of the proposed poster or talk
- a concise description of research (one-two pages)
- a curriculum vitae
- at least one letter of recommendation from a faculty member or research mathematician who knows the applicant's work is required for graduate students and recommended but not required for recent Ph.D.'s. In particular, a graduate student should include a letter of recommendation from her thesis advisor.

Applications must be completed electronically by **October 31, 2010**.

See <http://www.awm-math.org/workshops.html>.

assessment systems, then every student will have to buy them. Then all students will be supporting the publishing companies, not just those buying new copies. This would at least create a stable situation, but in the long run I do not think it will get us back to the days of relatively affordable textbooks. But perhaps students (or at least the professor who has less grading to do) might be getting more value. Using older books might work for some classes, but certainly not for all. And rather than go for cheap, why not go for free? Perhaps the most interesting possibility is simply to use free resources.

There are a surprising number of very good free resources online. One of the best places to look is the MIT open course site.¹³ There are some wonderful videos of lectures available for free on the site, as well as other course materials. One of the supplemental materials available free is the complete text of Gilbert Strang's calculus book, available as a pdf.¹⁴ The same site has an instructor's manual, a student guide, and answers to the odd number problems. The Worldwide Center of Mathematics also has free resources on their website,¹⁵ including calculus books as pdfs. These include pop-up margin comments and embedded videos. There are other sites that are useful as well. George Cain of Georgia Institute of Technology has a list of sites offering free mathematics textbooks on his website.¹⁶ The American Mathematical Society also has a site listing websites that have online books.¹⁷ The Mathematics and Multimedia blog also has a list of free books,¹⁸ and it is a good site to visit to look for more elementary mathematics texts and free mathematics software. A more general site with free e-books in a variety of technical fields is [freebookcentre.net](http://www.freebookcentre.net).¹⁹ There are probably many others as well, but these are the ones I was able to find.

I would be very interested in hearing from anyone about their experience using free e-books or other non-standard textbooks in their classes. My email address is mmorley@ocean.edu.

¹³<http://ocw.mit.edu/OcwWeb/webhome/home/index.htm> (accessed on May 28, 2010)

¹⁴<http://ocw.mit.edu/OcwWeb/resources/RES-18-001Spring-2005/Textbook/index.htm> (accessed on May 28, 2010)

¹⁵ <http://www.centerofmath.org/> (accessed on May 28, 2010) website.

¹⁶ <http://people.math.gatech.edu/~cain/textbooks/onlinebooks.html> (accessed on May 28, 2010)

¹⁷ <http://www.ams.org/delete/online-books-web.html> (accessed on May 28, 2010)

¹⁸ <http://math4allages.wordpress.com/math-and-multimedia-in-facebook/> (accessed on May 28, 2010)

¹⁹ <http://www.freebookcentre.net/> (accessed on May 28, 2010)

AWM Student Chapter Annual Reports

University of Kansas

We encourage undergraduate students to join us, especially students who are interested in Science, Technology, Engineering and Mathematics (STEM). The KU chapter invites women who are leaders in their professions to be guest speakers. Our first speaker this academic year was Professor Alice Bean from the Department of Physics and Astronomy at KU. She shared her research on experimental particle physics and info on the Large Hadron Collider in Switzerland, which is one of the largest scientific projects ever undertaken. She leads a Program in International Research and Education project which brings undergraduate and graduate students to Switzerland for study as well as research.

The AWM student chapter is devoted to helping the Math Department do a better job with recruitment and retention of women. In order to help undergraduate students with their concerns, we invited Professor Jeffrey Humpherys from Brigham Young University. He discussed a new model for research and education, IMPACT, Interdisciplinary Mentoring Program in Analysis, Computation and Theory. He talked about the intellectual core, program vision, interdisciplinary research, modernized curriculum, industrial cooperation, socialization and team building. In order to help graduate students with their concerns, we invited Professor Sara Thomas, Associate Vice Provost for Research and Graduate Studies. She has primary responsibility for the administration of graduate education at KU, university-wide graduate policies and processes, including GTA and GRA contracts, the graduate student application process, data gathering and reporting, and new graduate program approval. In her talk, she focused on graduate training models as well as the importance of having a good mentoring system.

It has been observed that graduate academic life becomes more difficult for graduate students after they get married, even more so when they become mothers. To address these issues, we invited our fourth speaker, Professor Donna Ginther, from Economics and the Director of the Center for Economic and Business Analysis at the Institute for Policy & Social Research at KU. She discussed scientific labor markets, gender differences in employment outcomes, wage inequality, scientific entrepreneurship, and children's educational attainments. Most of the participants were graduate students and faculty members.

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Student Chapters *continued from page 11*

In order to welcome our new chancellor, Bernadette Gray-Little, we invited her to speak. She is the first woman and the first African-American to serve as chancellor of KU. She led a discussion on how to help undergraduate students having difficulties in math classes. Faculty members gave their suggestions, and Gray-Little listened to everyone and then shared her observations and suggestions.

AWM's KU Chapter also nominates and endorses female undergraduate students for participation in conferences. Yue Chu, an Honors Program student and a Dean's Scholar, has taken five graduate courses while only a junior. She was fully supported by the math department to attend the University of Nebraska conference for female undergraduates who have been involved in research. She shared her experience at the conference with the chapter.

Our AWM chapter has several activities remaining in the academic year. The chapter plays an important role in helping the Math Department organize the Mathematics Awareness Month(MAM)/Outreach Program activities, including workshops for 6th graders and the MAM competition for 4th–12th graders. Katarzyna Piaskowska, a Ph.D. student from Poland, will give a technical talk and a workshop on how to design and run an international meeting. She is a co-organizer of a very successful annual conference for Ph.D. students and young scientists in Poland, “Young scientists towards the challenges of modern technology.” We will finish the year with a reception open to all faculty and students.

Emory University

The Emory student chapter of AWM has had an active first four years. Emory AWM members are involved in departmental programs and community events. In 2009 they hosted Emory's “Excursion in Math for Undergrads” for the first time and continued promoting a mentoring program for first year graduate students.

The chapter is committed to mentoring younger students as well. An event for undergraduate students held in November 2009 was a great success, according to the positive survey responses of participants and favorable feedback from the Dean at Emory as well as faculty from Emory and other local universities and colleges. As at an academic conference, students had the opportunity to listen to three interactive talks on card tricks, martial arts, and mathematics applied to medicine given by Dr. Colm Mulcahy, Catherine Crompton, and Dr. Alessandro Veneziani, respectively. In addition, undergraduate students greatly enjoyed math games during the lunch break, and they participated in a panel where Emory professors and graduate students answered their questions about possible career paths in mathematics and graduate school.

Helping current graduate students is also one of the chapter's goals. In October 2009, the new mentor/mentee pairs in the mentoring program explored the Carlos Museum (on campus). They then enjoyed an informal, friendly, and informative discussion in the atrium of the department. This was

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, 2010. 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 New Orleans, LA, January 2011.

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, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. Nomination materials for this award, with the exception of transcripts, should be sent to awm@awm-math.org. Transcripts should be mailed 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, 2010**. If you have questions, phone 703-934-0163, email awm@awm-math.org, or visit www.awm-math.org.

a great chance for them to get together, meet senior graduate students in the department, and ask practical questions about graduate student life.

The chapter is planning to host several events during the spring semester. To help prepare graduate students for the job search process, the chapter will sponsor a talk on how to manage a professional web page, with technical details supplied by a member of the technical staff in the math department. Finally, at the end of the year, mentors and mentees will get together for a lunch party where they will discuss their impressions of the past year.

More info about chapter activities can be found at www.mathcs.emory.edu/awm.

Clarkson University

The Clarkson Student Chapter of the Association for Women in Mathematics was formed in 2004 and has served as “math club” ever since. Meetings are open to all students regardless of gender (most of our members are male!). These meetings and activities expose students to the world of professional mathematics, help students obtain information about graduate school and careers, and develop leadership

skills through service to the University and local community.

Yearly events include peer tutoring for the freshmen Calculus Gateway Exams, creating a pi-day celebration for roughly 180 local middle and high school students, sponsoring an essay contest for local middle school students to celebrate Math Awareness Month, various panel discussions about graduate school and research, bowling nights, casino nights, as well as joint movie nights with the SIAM student chapter. The highlight event of the year is the Undergraduate Research Symposium in Mathematics Dessert Reception. The purpose of this event is to showcase our undergraduate majors who participated in summer research projects and to inform incoming majors about the possibilities of various REU programs. Student speakers give 10-minute presentations or present a poster, and AWM members provide sweets treats for the audience.

This past year we also won the campus-wide door decorating contest with our interpretation of the 12 Days of Calculus (which took up 12 doors in our department): 12 regions revolving, 11 sequences converging, 10 rates relating, 9 curves increasing, 8 exponentials decaying, 7 teachers teaching, 6 students crying, 5 integrals, 4 tangent lines, 3 limits, 2 derivatives, and a local max at the origin!

BOOK REVIEW

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

Equal Rites, Unequal Outcomes: Women in American Research Universities, Lilli S. Hornig, Kluwer Academic/Plenum Publishers, 2003, ISBN 0-306-47351-8.

Reviewer: Gwen Spencer, Cornell University Operations Research

This book is a collection of updated papers first presented at a 1998 conference at Harvard on Women in Research Universities. It provides an interesting mix of surveys on the state of employment for women in research universities in the US (particularly in science and engineering) and papers that describe the necessity of women’s perspectives and feminist/womanist values in research and in research universities of the future. While a few articles include a longer picture of the history of women in the academy, the main focus is on progress since the early ’70s.

Most of these articles are strongly data driven. Many of the statistics in this book describe phenomena I had heard hinted at, whispered about, etc., but which I had never realized were

documented. In fact, here they are. Here is documentation of a major salary gap (7–10%) which remains after removing many of the most obvious confounding variables: differences in average academic age, experience, etc. Here is concrete data on the percentage of women faculty who feel isolated in their departments, and for whom “subtle discrimination” is a source of major stress (44.1% in Research Universities). Also covered are the slower promotion of equally qualified women and the differential in acceptance rate of papers when it is known that the author is a woman (complete with useful references). I am stacking negatives here, but actually, there are many findings in these studies to feel optimistic about. For example, in all fields covered, the number of women in academic positions at least tripled between 1973 and 1995, and the percentage of women assistant professors in Math and Engineering at Research I schools is substantially higher than the percentage of women Ph.D.’s in those subjects over the last seven years (though, of course, many female assistant professors may be more than seven years past the Ph.D.).

Some of the statistical differences between women and men in the academy can be explained by environmental factors beyond gender bias. For example, progress towards representation of women in the higher ranks is slow partially because hiring at these upper levels has slowed dramatically in

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recent years; the percentage of women faculty in temporary or non-tenure track positions is more than twice the percentage of men faculty in positions of this type partially because the availability of a large pool of women has coincided with the slowing of the academic job market. Initially, it may feel comforting that some of the underrepresentation of women is due to logistical factors (not simply to direct bias), but Hornig points out that the effective result is that the make-up of research university faculties “far from breaking down outmoded stereotypes ... support(s) the increasingly false perception that women aren’t scientists,” even as the pool of women Ph.D.’s in science subjects continues to swell. Also, even after extensive controls, for “gender differences in career age, field of employment, and type of institution, men continue to have an almost 10 percentage point advantage in being full professors.” (Chapter 6, Long)

A female Ph.D. student who is considering leaving grad school for a job in industry recently complained to me that in the seven years of her technical education she had never had a female professor; one of the most revelatory things in reading this book is the hard statistical evidence supporting anecdotes many women in academics have probably observed personally: “In 1995, a woman undergraduate or graduate student in a research university had slightly over one chance in ten of encountering a tenure track woman if she was in the physical sciences, math or engineering.” (Chapter 6, Long) The interesting double cost of this shortage is also discussed: young female faculty who are preparing for tenure reviews are swamped by requests and interest from female students who are looking for guidance and perspective. Mix in the following startling fact, and the complexity and cruelty of this role-model issue comes into sharp relief: when “women trainees see what women faculty are experiencing ... they elect other career directions on that basis if they see their role models as having low likelihood of career success or satisfaction.” (Chapter 9, Fried et al.) In other words, junior women in scientific fields are frustrated when they can’t find female role models or mentors, and the situation doesn’t necessarily improve when they find female role models or mentors.

The authors of these articles make a careful and thorough attempt to remove correlated explanatory variables and to acknowledge critically when they have not been able to do so. The result is that the conclusions drawn about remaining differences in the data seem solid and well-reasoned. My statistician goggles, which often leave me frustrated with analysis of this kind of data, remained mostly clear throughout.

The notable exception was in a chapter that attempted to quantify some differences in the ideology/orientation of male and female faculty. The data set under consideration was a huge survey of some 110,000 academics. Faculty were asked the relative importance of certain factors in their careers. The descriptive data on their responses were often very interesting. (For example, in the “Sources of Stress” section, 29.5% of women report that the care of an elderly parent is either “somewhat” or “extensively” stressful, versus 24.1% of men). Then Astin and Cress create some composite variables with rather loaded names like “use of student-centered pedagogy” and “personal commitment to service,” and use them to draw the conclusion that women are more “student-centered” and “interested in activism and service” while men have “greater interest in prestige and status, and value intellectual freedom to a greater extent.” While the differences in these indicators are statistically significant, the magnitude of the differences is often very small (the mean of the distribution for women’s “personal commitment to service” is less than a third of a standard deviation above the mean of that distribution for men, the mean of men’s interest in “occupational prestige/status” is less than one thirteenth of a standard deviation above the mean of that distribution for women). Once the rather meek numbers are removed, it seems that these conclusions are tailor-made to support the case that women faculty are better citizens of the research university than men faculty precisely because women and men conform to the long-standing stereotypes about their genders: women are altruistic nurturers, men are egotistical, wealth-oriented and independent. These conclusions are referenced several additional times in the book (now free of numbers); it seems dangerous to stake the argument for women’s inclusion on what up-close look suspiciously like projections of outmoded stereotypes onto the data. In making the case that diversity is an important asset to the research university of the future, it is critical to avoid relying on cultural ideas of “how women are” and “how men are” even in the occasional cases when those comparisons are favorable to women.

One of the most interesting features of the book is two illuminating case studies at University of Michigan and the medical school at Johns Hopkins where targeted programs at improving conditions for female faculty were undertaken. These case studies address both the efficacy of certain policies and the organizational and administrative stars which must come into alignment to facilitate major institutional change. In particular, the role of a prominent and committed ally/leader in the administration seems essential: such authority legitimizes the project of change among both female and male faculty, and there is a resulting decrease in perceived personal

career risk female faculty feel in becoming involved in these advocacy projects. At Johns Hopkins, the high turnover of female faculty was recognized as an obstacle to institutional excellence, both in terms of attracting and retaining the best qualified faculty, and in terms of losing investments made in women faculty who later chose to leave. The long term efforts begun as a result seem to have made a major difference almost instantaneously: while in “1990, 81% of women assistant professors were seriously considering leaving academic medicine ... in 1993, only 40% reported these plans.”

These case studies provide valuable focus on the practical details of accommodation, and they strongly support the consensus which seems to emerge as a whole from the collection of articles: much progress has been made, but it is now essential to go beyond seeking equal treatment under the current system. Simply, it is time to look at reshaping a system that was formulated on the assumption that a faculty member is a man with a stay-at-home spouse (or is single) in favor of a system that allows space for individuals of a wide range of backgrounds and lifestyles to prosper. As policies related to delaying the tenure clock for new parents become more widespread nationally, hopefully the nagging perception that a career disadvantage results from using these policies will dissipate. When the reality is that “90% of the spouses/partners of female faculty work full time” while only 37% of the spouses/partners of male faculty do (Chapter 8, Hollenshead),

simple measures like introducing childcare on campus, providing assistance with eldercare, and increasing efforts to accommodate academic couples have improved conditions for both genders while allowing women to thrive at institutions which have been forward-thinking enough to implement them already.

Is She or Isn't She?

The book *Emmy Noether, Mother of Modern Algebra* by M.B.W. Tent, published by A.K. Peters, was reviewed by Karen Hunger Parshall in the November–December issue of this newsletter. Bhama Srinivasan, former AWM president, was asked to review the book for the MAA publication *College Mathematics Journal*. As did Parshall, she reviewed the book positively (see page 72 of the January 2010 issue of *CMJ*). However, she thought the cover picture was not a good one, and furthermore felt that the picture from the Oberwolfach archive didn't look like Noether. On page 27 of the same issue of *CMJ* there is a boxed paragraph titled “Emmy Noether?” showing both a photo known to be Noether and a picture of the book cover, drawing the readers' attention to the controversy surrounding the picture (it has now been withdrawn from the photo archive appearing on the Oberwolfach website). Your newsletter editor agrees with Bhama that the photo on the cover doesn't look much like Emmy.

MEDIA COLUMN

In addition to longer reviews for the media column, we invite you to watch for and submit short snippets of instances of women in mathematics in the media (WIMM Watch). Please submit to the Media Column Editors: Sarah Greenwald, Appalachian State University, greenwaldsj@appstate.edu and Alice Silverberg, University of California, Irvine, asilverb@math.uci.edu.

WIMM Watch: Math Clubs

Sarah J. Greenwald

Two detective series on television recently broached the subject of high school math clubs.

Castle [ABC Television Series]

In the episode “The Mistress Always Spanks Twice” (Season 2, Episode 16, Original Airdate March 8, 2010), Richard

Castle's daughter Alexis considers joining the cheerleading team. Castle's response is less than enthusiastic: “Who are you and what have you done with my daughter?” Later on, Castle discusses his hesitation with his colleague Kate Beckett:

Castle: She wants to join a team, why not join Mathletes?

Beckett: Why can't she do both?

Bones [Fox Television Series]

In the episode “The Death of the Queen Bee” (Season 5, Episode 17, Original Airdate April 15, 2010), the yearbook photo of main character Temperance Brennan, a forensic anthropologist, lists her as belonging to the “Chemistry Club” and the “Math Club” and lists her interests as “Chemistry and Math.”

Legal Notice and Disclaimer: Each of the movies or shows is trademarked and copyrighted by their respective companies as listed above. DVD releases can be found for these titles at official company sites. This review is for educational use only and the content listed here is not specifically authorized.

Common Core State Standards

National Governors Association and State Education Chiefs Launch Common State Academic Standards

NGA and CCSSO, June 2010

On June 2, 2010, the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO) released a set of state-led education standards, the Common Core State Standards, at Peachtree Ridge High School in Suwanee, GA. The English-language arts and mathematics standards for grades K–12 were developed in collaboration with a variety of stakeholders including content experts, states, teachers, school administrators and parents. The standards establish clear and consistent goals for learning that will prepare America's children for success in college and work.

The release of the standards marks the conclusion of the development of the Common Core State Standards and signals the start of the adoption and implementation process by the states. The year-long process was led by governors and chief state school officers in 48 states, 2 territories and the District of Columbia. The final standards were informed by nearly 10,000 public comments and by standards in other top performing countries so that all students are prepared to succeed in our global economy.

“American competitiveness relies on an education system that can adequately prepare our youth for college and the workforce,” commented Georgia Governor Sonny Perdue. “When American students have the skills and knowledge needed in today's jobs, our communities will be positioned to compete successfully in the global economy.”

“Strong schools are the surest path to our nation's long-term economic success. America's students are now competing with children around the globe for jobs and opportunities after graduation. We need to maintain a national focus to ensure our kids are ready to compete and ready to win. That's why our nation's governors committed to this effort to create a common set of high expectations for students across the country. The Common Core State Standards reflect what can come from cooperation to improve student achievement,” said Delaware Governor Jack Markell.

“The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn,

so teachers and parents have a roadmap for what they need to do to help them. Further, these standards provide appropriate benchmarks for all students, regardless of where they live, and allow states to more effectively help all students to succeed,” commented Steve Paine, West Virginia State Superintendent of Schools. “I am excited to have a common framework from which to share best practices with fellow superintendents across the nation. With students, parents, and teachers all on the same page and working together for shared goals, we can ensure that students make progress each year and graduate from school prepared to succeed and build a strong future for themselves and the country.”

“Our best understanding of what works in our schools comes from the teachers who teach in our classrooms every day. That is why these standards establish what students need to learn, but do not dictate how teachers should teach. Instead, the standards enable schools and teachers to decide how best to help students reach the standards,” said Florida Commissioner of Education Dr. Eric J. Smith. “We are entering the most critical phase of the movement for Common Core State Standards. It is now up to states to adopt the standards and carry on the hard work of the educators and community leaders that worked to develop them.”

These standards define the knowledge and skills students should have within their K–12 education careers so that they will graduate from high school fully prepared for college and careers. The standards are:

- Aligned with college and work expectations;
- Clear, understandable and consistent;
- Inclusive of rigorous content and application of knowledge through high-order skills;
- Built upon strengths and lessons of current state standards;
- Informed by other top performing countries, so that all students are prepared to succeed in our global economy and society; and
- Evidence- and research-based.

In the coming months, each state will follow its own procedures and processes for adoption of the Common Core State Standards. The NGA Center and CCSSO recognize that meaningful and effective implementation of the Common Core State Standards is critical to achieving these goals. To that end, the two organizations are continuing to work closely with a range of partners on how to best support states and districts as they move from adoption to implementation.

To learn more about the Common Core State Standards, please visit www.corestandards.org.

Mathematics Education Organizations Unite to Support Implementation of Common Core State Standards

A joint public statement of the National Council of Teachers of Mathematics (NCTM), the National Council of Supervisors of Mathematics (NCSM), the Association of State Supervisors of Mathematics (ASSM), and the Association of Mathematics Teacher Educators (AMTE), June 2, 2010

The release of the Common Core State Standards (CCSS) is a welcome milestone in the standards movement that began more than 20 years ago when the National Council of Teachers of Mathematics published *Curriculum and Evaluation Standards for School Mathematics*. By initiating the development of the CCSS, state leaders acknowledged that common K–grade 8 and high school standards culminating in college and career readiness would offer better support for national improvement in mathematics achievement than our current system of individual state standards. The CCSS provides the foundation for the development of more focused and coherent instructional materials and assessments that measure students' understanding of mathematical concepts and acquisition of fundamental reasoning habits, in addition to their fluency with skills. Most important, the CCSS will enable teachers and education leaders to focus on improving teaching and learning, which is critical to ensuring that all students have access to a high-quality mathematics program and the support that they need to be successful.

Greater Coherence Built on a Strong Foundation

The National Council of Teachers of Mathematics (NCTM), the National Council of Supervisors of Mathematics (NCSM), the Association of State Supervisors of Mathematics (ASSM), and the Association of Mathematics Teacher Educators (AMTE) support the goal of the CCSS to describe a coherent, focused curriculum that has realistically high expectations and supports an equitable mathematics education for all students. Many aspects of the central elements of the CCSS echo the longstanding positions and principles of our organizations:¹

- All students need to develop mathematical practices such as solving problems, making connections, understanding multiple representations of mathematical ideas, communicating their thought processes, and justifying their reasoning.
- All students need both conceptual and procedural knowl-

edge related to a mathematical topic, and they need to understand how the two types of knowledge are connected.

- Curriculum documents should organize learning expectations in ways that reflect research on how children learn mathematics.
- All students need opportunities for reasoning and sense making across the mathematics curriculum—and they need to believe that mathematics is sensible, worthwhile, and doable.

Supporting and Facilitating Implementation

The collective strengths of our organizations give us the potential to generate the momentum necessary to implement the CCSS effectively. Together, our organizations represent mathematics teachers, mathematics education leaders at the school, district, state, and national levels, researchers, and mathematics teacher educators in schools and colleges of education and departments of mathematics, who collectively have the expertise to lead implementation efforts.

The critical first steps will be to help educators interpret and understand the CCSS and to support the development and implementation of comprehensive, coherent instruction and assessment systems. To this end, we intend to do the following:

- Work with our local, state, and national affiliates to feature the CCSS in our professional development opportunities, including annual and regional conferences, academies, and seminars, and infuse them into our teacher education classes.
- Support the development and implementation of the corresponding assessment system, particularly with respect to preparing teachers, leaders, and teacher educators to use assessment results effectively to inform instruction and to incorporate formative assessment practices in the classroom.

Finally, we strongly encourage and support both research about the standards themselves (e.g., research on specific learning trajectories and grade placement of specific content) and their implementation, as well as periodic review and revision based on such research.

¹As articulated in NCTM's Standards publications (1989, 1991, 1995, 2000), NCTM's *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics: A Quest for Coherence* (2006), NCSM's *Principles and Indicators for Mathematics Educators (PRIME) Leadership Framework* (2008), NCTM's *Focus in High School Mathematics: Reasoning and Sense Making* (2009), and AMTE's *Standards for Elementary Mathematics Specialists State Certification* (2010).

Mary Powderly Tong

Dr. Mary Powderly Tong passed away on Sunday, May 23, 2010, one day before her 86th birthday. A member of AWM since the 1970s, she resided in Oradell, NJ. She received her Ph.D. from Columbia University in 1961. She retired from William Paterson University, having taught earlier at Columbia, the University of Connecticut, and Fairfield University. Her articles on topology and the foundations of set theory appeared in such publications as the *Duke Mathematics Journal* and the *Journal für die reine und angewandte Mathematik*. In her retirement, she worked tirelessly in the field of mental health.

Powderly Tong was the wife of the late Dr. Hing Tong (also a mathematician) and is survived by five children, two grandchildren, a brother, and two nieces. She will be greatly missed by all.

Millie Niss

Millie Niss's obituary in the *Buffalo News* (see <http://www.buffalonews.com/2009/12/02/879953/millie-niss-writer-poet-web-installation.html>) refers to her as "writer, poet, Web installation creator," but AWM knew her for receiving "special recognition" in the 1991 Alice T. Schafer Prize competition as a freshman at Columbia University. A faculty member described her as the "strongest undergraduate student I have ever worked with, irrespective of year, sex, or any other arbitrary category." A rare immunological illness, Behcet's disease, cut short her mathematical career. She died in November 2009 at the age of 36.

After leaving graduate school, she became involved in a myriad of creative activities. From the obituary cited above, we learn that "in partnership with her mother, Dr. Martha Deed, she developed text, videos, multimedia installations and ultimately a microblog that received mention in an electronic literature collection, an Internet art site and scholarly papers on the history and creation of digital art." [See www.sporkworld.org.]

Niss is survived by her mother, her father, her stepfather, three stepbrothers, and two stepsisters.

**Join AWM online at
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Workshop on Mathematical Modeling

The goals of the NSF Workshop on Mathematical Modeling and Computer Simulations for Soft Materials to be held at Colorado State University, September 13–17, 2010 are to identify new challenges and opportunities for the theory, modeling and simulation of soft materials and to investigate the growing role of applied and computational mathematics in meeting those challenges. Topics include adaptive and robust numerical methods, multiscale modeling and simulation, phase field models, and their application in the understanding of polymers, liquid crystals, bio-materials, phase transformations and microstructure evolution, as well as morphology, pattern formation, and self-assembly in materials.

Contributed presentations in either a short lecture or poster format are invited in all areas consistent with the conference themes. Young researchers, women and minorities are encouraged to apply. The deadline to apply for financial support for graduate students and young researchers is **July 16, 2010**; later applications will be considered if funds remain uncommitted. See <http://www.math.colostate.edu/SoftMatter2010>.

Fields Research Immersion Fellowship

This program supports individuals with high potential to re-enter an active research career after an interruption for family responsibilities. The RIF is expected to participate fully in one or more thematic programs at the Fields Institute, in the expectation that this will allow her or him to enhance her or his research capabilities and to establish or re-establish a career as a productive, competitive researcher.

To qualify, candidates must have been in a postdoctoral or faculty position at the time their active research career was interrupted, for a period of at least one year and no more than eight years. Examples of qualifying interruptions include a complete or partial hiatus from research activities for child rearing; an incapacitating illness or injury of the candidate, spouse, partner, or a member of the immediate family; or relocation to accommodate a spouse, partner, or other close family member.

The program is intended neither to support additional graduate training nor to support career changes from non-research to research careers for individuals without prior research training. The candidate may be in complete or partial hiatus from research activities at the time of application and should not be engaged in full-time paid research activities. The candidate need not occupy a tenured or tenure-track

position, but the most compelling applications will present a plan to continue with research activities beyond the period of the fellowship.

The award is to be held at the Fields Institute, but there are no restrictions on the nationality or country of employment of the re-entry candidate. The program has the dual goals of increasing women's participation in mathematical research world-wide and of boosting thematic programs at Fields by the inclusion of additional long-term participants.

Please submit a cover sheet indicating your interests, a CV, a brief description of the circumstances altering your research activity, and a proposal describing the impact you expect a semester at Fields to have on your research career. Include the names of faculty who will be participating in the Thematic Program who may be appropriate as supervisors or research

advisors. Application should be sent by email to director@fields.utoronto.ca. For programs in a given program year (which runs July to June) the closing date will be August 31 of the year before but applications will be accepted until the fellowship position is filled.

Geometric Threads

This summer, on most Saturdays in July and August, experience the breadth and beauty of geometry found in traditional and contemporary crafts in "Geometric Threads: Artisanal Takes on Pattern, Dimension, and Topology" at the Exploratorium in San Francisco, CA. Explore tessella-

continued on page 20

AWM Workshop for Women Graduate Students and Recent Ph.D.'s at the 2011 Joint Mathematics Meetings

Application deadline: **August 15, 2010**

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. We have received support from the National Security Agency for the AWM Workshop to be held in conjunction with the Joint Mathematics Meetings in New Orleans, LA in January 2011.

FORMAT: Up to twenty women will be selected in advance of the workshop to present their work; the graduate students will present posters and the recent Ph.D.'s will give 20-minute talks. AWM will offer funding for travel and two days subsistence for the selected participants. The workshop will also include a dinner with a discussion period, a luncheon, and a panel discussion on areas of career development. Workshop participants will have the opportunity to meet with other women mathematicians at all stages of their careers.

All mathematicians (female and male) are invited to attend the talks, posters, and panel. Departments are urged to help graduate students and recent Ph.D.'s who are not selected for the workshop to obtain institutional support to attend the presentations and panel.

ELIGIBILITY: Applications are welcome from graduate students who have made substantial progress towards their theses and from women who have received their Ph.D.'s within approximately the last five years, whether or not they currently hold a postdoctoral or other academic position. Women with grants or other sources of support are welcome to apply. All non-US citizens must have a current US address.

All applications should include:

- a cover letter
 - a title of the proposed poster or talk
 - an abstract in the form required for AMS Special Session submissions for the Joint Mathematics Meetings
 - a concise description of research
 - a curriculum 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 recommendation from her thesis advisor.

Applications (including abstract submission via the Joint Mathematics Meetings website) must be completed electronically by **August 15, 2010**.

See <http://www.awm-math.org/workshops.html>.

tion through patterns found in quilts, Hawai'ian kapa cloth design, and Moroccan mosaic tiles. Untangle the intricacies of topology looped inside maritime knots and Korean maedeup. Move between dimensions with basket weavers, clothing designers, and upholsterers, and learn how origami artists transform flat shapes into fully realized 3D forms. Discover how similar shapes can give rise to a diversity of artistic expression, from Japanese temari to European lace and crochet. Through master presentations, skilled artisans illuminate the mathematics inherent in mosaics, origami, and textile arts practiced across the globe. See <http://press.exploratorium.edu/geometric-threads-june-2010/> for further information.

Update

Mary Flahive, Oregon State, and Marie Vitulli, University of Oregon, have written an extensive analysis of gender differences in first jobs for new Ph.D.s in mathematics, based on data from 1996–2008. Their article “Update to Are Women Getting All the Jobs?” will appear in the September *Notices of the AMS*; the original article appeared there in 1997. A preprint is available at <http://www.uoregon.edu/~wmmath/Statistics/index.html>.

Sonia Kovalevsky High School and Middle School Mathematics Days

Through a grant from the National Science Foundation (NSF), the Association for Women in Mathematics expects to support Sonia Kovalevsky High School and Middle 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 female high school or middle school 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 transitions between middle school and high school mathematics and 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 middle schools and high schools in their area.

AWM awards grants ranging on average from \$1500 to \$2200 each (\$3000 maximum) to universities and colleges. Historically Black Colleges and Universities are particularly encouraged to apply. Programs targeted toward inner city or rural schools are especially welcome.

Applications, not to exceed six pages, should include:

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

Organizers should send announcements including date and location of their SK Days to the AWM web editor for inclusion on the AWM website. If funded, 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, whichever comes first. Reimbursements will be made in one disbursement; no funds may be disbursed prior to the event date. The annual fall deadline is August 4, with a potential additional selection cycle with a deadline of February 4.

AWM anticipates awarding 12 to 20 grants for Fall 2010 and Spring 2011. Applications must be received by **August 4, 2010**. Decisions on funding will be made in late August. Applications should be sent to awm@awm-math.org. If you have questions, phone 703-934-0163 or email awm@awm-math.org.

Discounted SIAM Dues for AWM Members

AWM and SIAM have a new reciprocity agreement that allows regular AWM members to receive a 20% discount on SIAM dues—\$104 instead of \$130!

SIAM members who join AWM as a new member will be eligible for the AWM new member rate (\$30) for a total of two years. Please encourage our SIAM friends to join AWM.

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MEMORIAL UNIVERSITY OF NEWFOUNDLAND DEPARTMENT OF MATHEMATICS AND STATISTICS — Tenure-Track Position in Algebra — The Department of Mathematics and Statistics at Memorial University of Newfoundland is undergoing a process of faculty renewal and is making a number of tenure-track appointments, subject to budgetary approval. The Department invites applications for a tenure-track Assistant Professor position in Algebra. While outstanding applications from all areas of algebra are welcome, preference may be given to applicants with publications in the area of algebra compatible with departmental research. Applicants must have an earned doctorate and an excellent publication record in Algebra. Candidates should have some teaching experience and the skills required to become an excellent teacher. Duties for the position include graduate teaching and supervision; undergraduate teaching and the development of a vigorous research program. The closing date for applications will be **September 17, 2010**. Candidates should submit a Curriculum Vitae, a description of research and teaching interests; and the names and addresses (include e-mail) of at least three referees. Applications should be sent to: Head of Department, VPA-MAST-2010-001, Department of Mathematics & Statistics, Memorial University of Newfoundland, St. John's, NL, A1C 5S7 Canada. E-mail: mathstat@mun.ca. Internet: www.mun.ca/math. You MUST use the code VPA-MAST- 2010-001 on all correspondence.

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MEMORIAL UNIVERSITY OF NEWFOUNDLAND DEPARTMENT OF MATHEMATICS AND STATISTICS — Tenure-Track Position in Topology — The Department of Mathematics and Statistics at Memorial University of Newfoundland is undergoing a process of faculty renewal and will be making a number of tenure-track appointments, subject to budgetary approval. The Department invites applications for a tenure-track Assistant Professor position in Topology. Research in an area compatible with existing departmental research in Topology would be an advantage. Applicants must have an earned doctorate and an excellent publication record in Topology. Candidates should have some teaching experience and the skills required to become an excellent teacher. Duties for the position include graduate teaching and supervision; undergraduate teaching and the development of a vigorous research program. Graduate courses in Point Set Topology, Homology and Homotopy Theory are regularly offered by the Department. The closing date for applications will be **September 17, 2010**. Candidates should submit a Curriculum Vitae, a description of research and teaching interests; and the names and addresses (include e-mail) of at least three referees. Applications should be sent to: Head of Department, VPA-MAST- 2010-003, Department of Mathematics & Statistics, Memorial University of Newfoundland, St. John's, NL, A1C 5S7 Canada. E-mail: mathstat@mun.ca. Internet: www.mun.ca/math. You MUST use the code VPA-MAST- 2010-003 on all correspondence.

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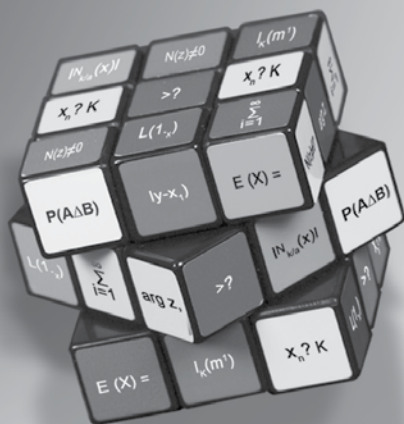
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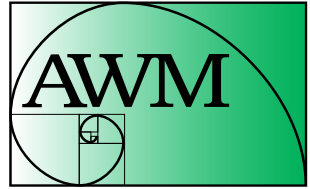


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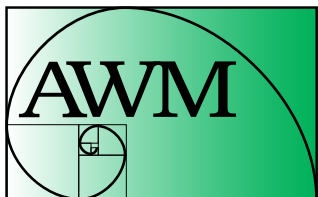
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Volume 40, Number 4, July–August 2010

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