AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 35, Number 2 NEWSLETTER March–April 2005

PRESIDENT'S REPORT

The pressure of newsletter deadlines means that I am writing this message a week before actually becoming President of AWM. This lends to my report a mood of unreality. On the one hand, I strongly feel the honor of being selected to help to carry out the mission of AWM for the next two years; on the other, I must echo the sentiment Ingrid Daubechies expressed at the beginning of her splendid Gibbs Lecture: "Maybe this will be the time they discover that I'm a fraud."

There are some protections. AWM is fortunate to have a large support system of hard-working volunteers: Executive Committee, former presidents and friends—including the many staff members of the mathematical sciences societies who are AWM members themselves and who have been unstinting in their time and support. By the time you read this, we expect that AWM will have a new headquarters staff in place, which you will read about in a future issue.

AWM was very much in evidence at the Joint Mathematics Meetings in Atlanta, where the AWM-NAM panel discussions were lively and well-attended, the party a brilliant success, the workshop sessions and dinner exciting, the Schaefer honorees and Hay awardee wonderful—and Noether lecturer Lai-Sang Young gave "the best talk I've heard in years," in the words of one listener. See pages 7–14 for further information Women were also honored by other organizations, receiving Haimo teaching awards, the Satter Prize, and MAA Section awards. In addition to Daubechies and Young, three other women gave great invited talks: Georgia Benkart, "Square ice is very nice, but can you put a match to it?"; Andrea Bertozzi, "Processing images with nonlinear PDEs"; and Eleny Ionel, "Embedded curves and Gromov-Witten invariants.".

We thank all who made these events possible: the AMS and the MAA for their efforts on behalf of all the AWM activities; Bettye Anne Case and Dawn Wheeler for coordinating the AWM activities at the Meetings; Suzanne M. Lenhart and Sylvia T. Bozeman for organizing the panels;

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AWM
ASSOCIATION
FOR WOMEN IN
MATHEMATICS

The purpose of the Association for Women in Mathematics is

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

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

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

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Helen Moore for leading a stimulating focus group on AWM's future; Dawn A. Lott, Claudia Polini, and Judy L. Walker for organizing the workshop; and especially the AMS Meetings Staff for their continued and loyal assistance.

Members have already begun asking me questions, for example about our web page. It is under the direction of AWM Web Editor Holly Gaff, with technical assistance from Aileen Gormley. AWM would like to make the website an even better resource for members. Your suggestions for postings are welcome and should be sent to Holly (hgaff@epi.umaryland.edu) in any format; suitable contributions will be posted at www.awm-math.org. We encourage you to submit your ideas. We are interested in links, articles, and suggestions for new topics for web pages—along with feedback on what you find on the site.

On the topic of feedback, did you know that the AWM *Newsletter* has a "Letters to the Editor" column? It appears, of course, only when letters are received. The best format is email to the editor, but hard copy and fax are also fine. One kind of letter we would find particularly interesting is reports by graduate students, and people who have recently completed their degrees, on supportive departments. Let's keep track of best practices, give credit to groups that are helping students, and advertise innovations that are effective in encouraging women students.

We are also now in the Nomination Season. The AWM nominating committee, chaired by former president Suzanne Lenhart (lenhart@math.utk.edu), will be forming a slate of officers for the Fall 2005 election. Please send your suggestions to Suzanne, and be involved in AWM!

For me, twenty months after I first accepted the nomination to be President of AWM, the first President's Message is a chance to share with readers some goals for AWM. Both my situation and that of AWM have changed since June 2003. I am serving for three years as Director of the Fields Institute in Toronto—an assignment I have been able to accept through the generosity of the University of Houston, which continues to pay part of my salary. And AWM has said goodbye to Dawn Wheeler and Muriel Daley, who, as headquarters staff, have ably served AWM members for longer than most of us remember. We wish them well as they move on to new opportunities, and thank them for their service, not least in continuing to work for us part-time as we adapt to the change. My first goal is to manage the transition to a stable headquarters operation that will manage the many projects that are our responsibility (and delight): newsletter, travel grants, workshops, lecture awards, SK days and all the things that AWM means to our members and to the community.

A second goal is to take advantage of my new location in Canada to increase AWM membership here, and to foster ties between AWM and the Women in Mathematics Committee of the Canadian Mathematical Society, the principal resource in Canada for women students and faculty in the mathematical community. A first opportunity will occur quite

soon, as this committee is hosting a retreat at BIRS (the Banff research centre in mathematics) in July and wants to welcome a few AWM student members (inquiries and nominations welcome). In fact, the Banff centre, a wonderful facility supported by the Canadian, US and most recently Mexican governments, is proposing to dedicate one week each year to a meeting at the BIRS site in support of "networking, communication, and collaborations between women in mathematics in North America"; they have asked AWM to help organize it. We have also offered to sponsor a networking lunch at the Winter Meeting of the Canadian Mathematical Society (Victoria, BC, December 2005).

A related goal is the broader one of increasing membership. We will be asking members to make sure that institutional member student memberships are fully subscribed, to encourage their friends to join AWM, and to remember that men who support the goals of AWM are among our most valued members—men currently form 7% of the membership of AWM.

As Carolyn Gordon has been reporting in these pages, AWM has been involved in an examination of our volunteer leadership structure, and I have been working with her for the past six months on our Infrastructure Task Force. One recommendation is enlargement of our leadership structure. The Membership Meeting at the JMM voted to accept the recommendation of the Executive Committee to put to the vote amendments to the Bylaws, both to increase the number of At-Large Members on the EC and to make it possible to hold electronic elections in the future. If these changes are approved, you will be seeing a longer list of candidates on the ballot this fall. Many hands make light work, and we are looking forward to seeing new faces and greater diversity in this body. (For those of you who, like me, had not paid much attention to the bylaws in the past, AWM is governed by a single body, the Executive Committee, with both elected and appointed members, which combines the functions performed in the other mathematics societies by Council, Board, Vice-Presidents and the like. This model has served AWM well, but we feel that there is a need for more people to be involved.) Making the transition to this new structure is another goal. You can help by remembering to return your ballot (see page 30) by the deadline of April 15th.

As I write this, the air is full of clamor about Harvard President Lawrence Summers' remarks that, however

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues

Individual: $50 Family (no newsletter): $30
Contributing: $100 Retired, part-time: $25
Student, unemployed, developing nations: $15
Friend: $1000 Benefactor: $2500
All foreign memberships: $8 additional for postage
Dues in excess of $15 and all contributions are deductible from federal taxable income.
Institutional Members:
Level 1: $250
Level 2a: $125
Level 2b: $125
See http://www.awm-math.org for details on free ads, free student memberships, and ad discounts.
Affiliate Members: $250
Institutional Sponsors:
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 $50/year ($58 foreign). Back orders are $6/issue plus shipping/handling ($5 minimum).

Payment

Payment is by check (drawn on a check with a US branch), US money order, or international postal order. Cash payment will be accepted if necessary, but only in US currency.

Newsletter ad information

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

Newsletter deadlines

Editorial: 24th of January, March, May, July, September, November
Ad: 1st of February, April, June, August, October, December

Addresses

Send all **Newsletter** material **except ads and material for book review and education columns** to Anne Leggett, Math Department, Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; email: leggett@members.ams.org; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Bayer, Math Department, University of Kansas, 405 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523; email: bayer@math.ukans.edu; fax: 785-864-5255 and all **education column** material to Ginger Warfield, Math Department, University of Washington, Seattle, WA 98195; email: warfield@math.washington.edu. Send everything else, **including ads and address changes**, to AWM, 4114 CS&S Building, University of Maryland, College Park, MD 20742-2461; phone: 301-405-7892; email: awm@math.umd.edu.

AWM ONLINE

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Online Ads Coordinator

Aileen Gormley
/www.awm-math.org/ads/form.html

Online Ads Info

Classified and job link ads may be placed at the AWM website. Detailed information may be found there.

Website and Online Forums

http://www.awm-math.org

AWM-Net Editor

Dianne O'Leary
oleary@cs.umd.edu

AWM-Net

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

AWM DEADLINES

NSF-AWM Travel Grant:
May 1 and October 1, 2005
(pending funding)

Hay Award, January 2006:
April 30, 2005

Sonia Kovalevsky High School Mathematics Days: August 4, 2005

AWM Workshop, January 2006:
September 1, 2005

Schafer Prize, January 2006:
October 1, 2005

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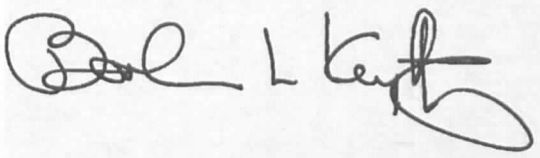
they were intended, were heard by much of his audience to state that he found it plausible that women were failing to make the top ranks in academia because of biological factors, including lifestyle choices unique to women. Summers seems to have apologized for his thoughtless remarks, though he admitted that he did so only under pressure. By the time this column appears, the issue will have moved to another place (see pages 17–21 for a recap of the story up to press time), but I mention it as a preface to a fourth goal, which Carolyn Gordon and I began to develop when the AMS *Notices* asked us to contribute an article (our first joint publication) on the Nelson-Rogers report on underrepresentation of women and minorities in high faculty ranks in research-intensive institutions. One of the things for which we commended that report is that, unlike Summers, it did not place the blame on women for this situation. (Absent from the discussion, so far, has been any comment on the self-serving nature of the Harvard administrator's remarks.) We know of no studies giving documentable and testable criteria for institutions to use in assessing their academic climate for women scientists (and indeed for women in all disciplines). Suggestions for workable, imaginative strategies for changing the way institutions go about their business are also in short supply. I would like to use my term as AWM President to find a way to begin a dialogue on this topic. Here are some thoughts that come to mind.

The body of scholarship on women in science continues to grow. For example, Margaret Bayer reviewed *Women in Science: Career Processes and Outcomes* by Yu Xie and Kimberlee A. Shauman (published by Harvard University Press!) in the January–February 2005 AWM *Newsletter*. Articles by Allyn Jackson and by Carolyn Gordon and myself appeared in the August 2004 *Notices* of the AMS, and there is the study by Nelson and Rogers on which our article was based. Jackson, in particular, wonders why there is rather little discussion of the situation of women in mathematics today, when the changes from a decade ago have been only incremental. Many aspects seem ready for continuing study. These include better documentation of rates of Ph.D. attainment and progress through the tenure track at different schools (what is the effect of not separating mathematics from mathematics education?) and study of the effect of programs like stopping the tenure clock for family reasons. (An article in *Science*, 17 December 2004, referred to the "Fear Factor.") A topic I have seen discussed only anecdotally is why some subfields seem to attract more women than others. If this is in fact the case, then there is scope for subtle marginalization of the contributions of women as long as men still dominate the leadership of the profession. The academic establishment is in many ways conservative: departments tend to replicate themselves in matters of hiring and awarding tenure, and people tend to see a greater potential for success in people who look like themselves. In this discussion, should some attention be paid to the risk factors in hiring men (women have babies, men may have

more health problems in midlife), as well as to documenting the historical lack of accuracy in predictions of success in men? (Now that there is some history, how have women in science performed throughout their careers compared to men who were tenured at the same time at the same institutions?) It is not hard to find flaws in the studies that have been done, and most of us, educated as mathematicians and not as sociologists or economists, would not be able to do authoritative research in this area. However, AWM members can help by reading, encouraging and cooperating with such studies, and by making the results known to our members and to colleagues. I hope we shall see more of such research.

Does AWM exist only because women have historically faced immense difficulties in establishing successful careers in mathematics, and will there be no further need for the Association if these difficulties cease? My last goal is to help answer this question in the negative, by encouraging activities that AWM runs, that exist independent of discrimination, of handicaps and of what is called "whining." Much of the energy behind our workshops, lecture series and other programs comes from the fact that we are building a community of women and supportive men who enjoy doing things together, and who meet to create and celebrate traditions. At the AWM membership meeting at the JMM, as I received the silver bowl, the emblem of leadership, from Carolyn, what I was thinking, more than anything else, was, "Isn't this *fun!*"



Barbara L. Keyfitz
Toronto, Canada
January 24, 2005

FROM THE PAST PRESIDENT

It has become traditional for the president to end her term with a summary of the activities that took place during her tenure. I would like to thank the many volunteers—too many to name—whose ideas and tremendous energy went into all the AWM programs.

At the recent Joint Mathematics Meetings, the AWM was thrilled to announce the publication of the anthology *Complexities: Women in Mathematics*, edited by Bettye Anne Case and Anne M. Leggett and published by Princeton University Press.

One of our themes the past two years (as in the book above) has been the diversity within the community of women mathematicians, diversity both in their career trajectories and in their personal lives. Ginger Warfield has fascinated and inspired us with her regular newsletter column featuring the biographies of women mathematicians in non-standard careers. The AWM panel at the Joint Mathematics Meetings last year, organized by Marianne Korten, Helen Moore, Christina Sormani, and myself, addressed ways to support the diverse community of women mathematicians, touching on issues of ethnicity, sexual preference, family, etc. within the context of a mathematical career. The panel launched a web forum run by Sormani (see www.awm-math.org/cgi-bin/ikonboard/ikonboard.cgi.)

A second focus was the needs of women who have already made it through the initial career stages, e.g., women who are just past tenure. Many of the support systems in place for women at earlier stages evaporate at this point, just at a time when women may especially need advice and mentoring in order to begin taking on leadership positions. Last year, the AWM held a workshop, "After Tenure: Women Mathematicians Taking a Leadership Role," dedicated to the memory of Ruth Michler. Many thanks to my co-organizers Ruth Charney, Rebecca Herb, and Gail Ratcliff, who brought great energy and ideas into this program. I hope this will be the first of many such leadership workshops. The AWM also introduced a small program of Michler Collaborative Research Grants to enable tenured women to visit research collaborators. This program complements the ongoing Mentoring Grants program, which provides travel funds for untenured women mathematicians to visit research mentors, and our conference travel grants program for women at all career levels.

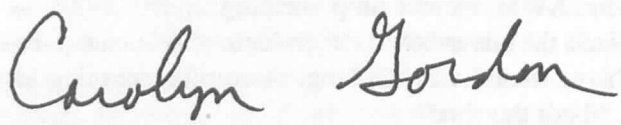
The AWM has also had an internal focus these past two years as we went through a process of strategic planning. In order to implement our strategic plan, we have begun strengthening our governance structure. Each member-at-large of the Executive Committee, the governing body of the AWM, will take on one of eight identified "portfolios," such as Student Support, Policy and Advocacy, Meetings and Workshops, Membership and Community Relations, etc. Accordingly, in this issue of the newsletter, you will find a ballot to approve changes in our bylaws to increase the number of members-at-large of the Executive Committee. Outside the Executive Committee, we have formed two new standing committees: the Committee on Committees to recommend volunteer appointments and the Institute Liaison Committee. Following the unanticipated recent departure of our two full-time staff members, Dawn Wheeler and Muriel Daley, we decided to delay hiring new employees (other than temporary ones) for a few months while exploring potential new staffing models. We are grateful to Dawn and Muriel for helping us out evenings and weekends during this time of change.

The AWM Student Chapter program, launched during the presidency of Suzanne Lenhart, has grown to about a dozen chapters. The AWM Essay contest for students from middle school through college undergraduates, coordinated by Victoria Howle, continues to grow in popularity and attracts entries from around the world. For the Sonia Kovalevsky High School Days, the AWM has been pleased to partner with Elizabeth City State University, with Linda Hayden at the helm. We express our appreciation to Coppin State University, and especially Genevieve Knight, for the initial partnership that launched this very successful program. MentorNet, coordinated by Rachel Kuske, continues to provide a wonderful opportunity for mentoring students and young mathematicians at all levels.

The AWM was delighted to collaborate with NAM in a two-part panel discussion at the recent Joint Mathematics Meetings on improving the retention of women and minorities in graduate school. The Workshops for Women Graduate Students and Recent Ph.D.'s, held annually at both the Joint Mathematics Meetings and the SIAM Annual Meetings, are attracting ever-growing audiences.

Linda Petzold delivered the first annual AWM-SIAM Kovalevsky Lecture at the SIAM Annual Meeting in 2003; Joyce McLaughlin followed in 2004. The Emmy Noether Lectures the past two years were presented by Svetlana Katok and Lai-Sang Young. The AWM-MAA lecture at the MathFest is being newly named the Etta Z. Falconer Lecture, beginning with the 2005 Mathfest. The past two AWM-MAA lectures were presented by Katherine Layton Puckett and Bozenna Pasik-Duncan. We were pleased to honor Bozenna Pasik-Duncan and Susanna Epp with the Louise Hay Award for Contributions to Mathematics Education and Kimberly Spears and Melody Chan with the Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. This past year, we introduced a new annual award for the highest scoring women in each region on the AMATYC (The American Mathematical Association of Two-Year Colleges) mathematics competition.

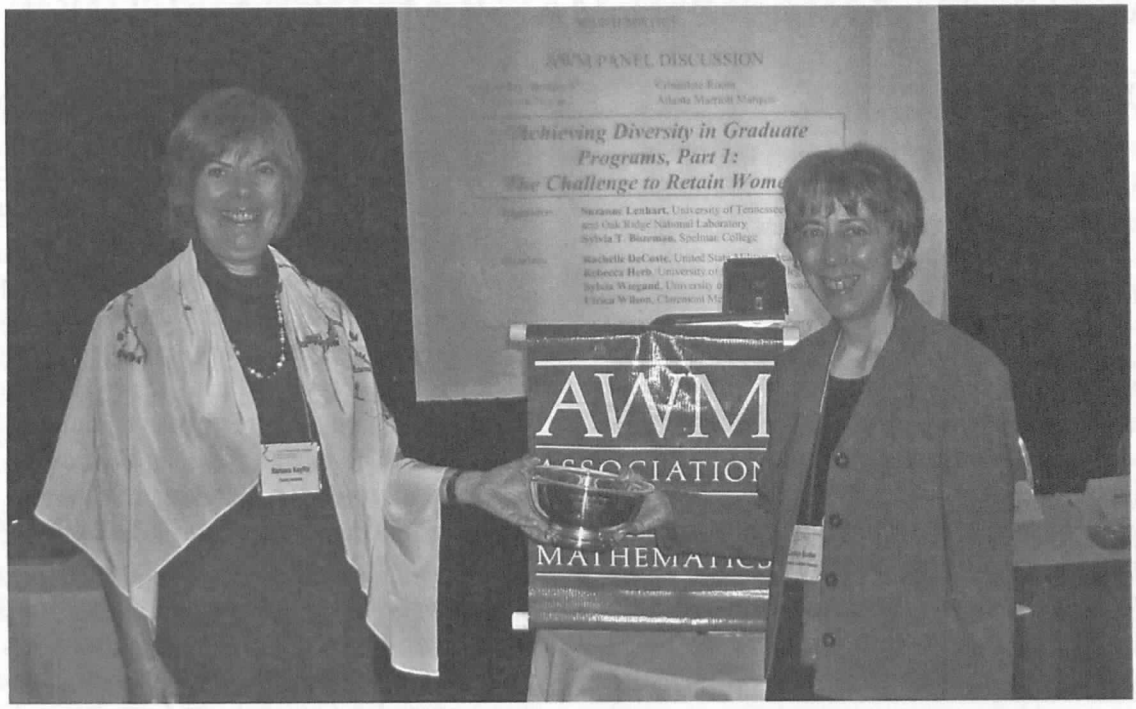
During the past two years, the AWM has enjoyed the support of the National Science Foundation, the National Security Agency, the Office of Naval Research, the Department of Energy, the Exxon-Mobil Foundation, and Sandia National Labs. The AMS, MAA and SIAM have been very supportive both of our programming at the Joint Mathematics Meetings, SIAM Annual Meeting and MathFest and of our strategic planning process.



Carolyn Gordon
Dartmouth College
January 23, 2005

EDITORIAL EMAIL ADDRESS CHANGE

Recently my email address has changed at Loyola. Email will be forwarded for some indeterminate period of time, but please note that I am now using the AMS forwarding service to provide my editorial email address: leggett@members.ams.org. On the whole, not a bad change for me—much better spam protection!!



Barbara Lee Keyfitz receives AWM's silver bowl from Carolyn Gordon

NSF-AWM TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Travel Grants program is to enable women to attend research conferences in their fields, thereby providing a valuable opportunity to advance their research activities and their visibility in the research community. By having more women attend such meetings, we also increase the size of the pool from which speakers at subsequent meetings may be drawn and thus address the persistent problem of the absence of women speakers at some research conferences.

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

Eligibility. These travel funds are provided by the Division of Mathematical Sciences of NSF, and the research conference must be in an area supported by DMS. (See http://www.nsf.gov/od/lpa/news/publicat/nsf03009/mps/dms.htm#1 for the list of supported areas.) Applicants must be women holding a doctorate (or equivalent experience) and having a work address in the US (or home address, in the case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years is ineligible. Anyone receiving significant external governmental funding (more than $1000 yearly) for travel is ineligible. Partial travel support from the applicant's institution or from a non-governmental agency does not, however, make the applicant ineligible.

Target dates. There are three award periods per year. An applicant should send *five* copies of 1) a cover letter, including the conference name, conference dates and location (city/state/country), and amount of support requested, 2) a description of her current research and of how the proposed travel would benefit her research program, 3) her curriculum vitae, 4) a budget for the proposed travel, and 5) a list of all current and pending travel funding (governmental and non-governmental) and the amounts available for your proposed trip to: Travel Grant Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. If you have questions, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu). Applications via email or fax will not be accepted. The next two deadlines for receipt of applications are **May 1** and **October 1, 2005**. *Funding is pending.*

AWM AT THE ATLANTA JOINT MATHEMATICS MEETINGS

AWM NOETHER LECTURE

The 2005 Noether Lecture, "Unraveling the Mystery of Strange Attractors," was delivered by Lai-Sang Young, Courant Institute of Mathematical Sciences, New York University. She was introduced by Barbara Keyfitz, soon to be AWM President.

Abstract: I will discuss the emergence of chaotic behavior when external forcing is applied at periodic time intervals to very simple dynamical systems. This leads to the question "what exactly is a strange attractor?" which I will attempt to answer. Geometric and statistical properties of strange attractors will be discussed. The audience will catch a glimpse of very recent developments in the theory of chaotic dynamical systems.

Biographical Information

Lai-Sang Young was born in Hong Kong and emigrated to the United States to pursue higher education in mathematics at the University of Wisconsin, Madison (B.A., 1973) and the University of California, Berkeley (M.S., 1976; Ph.D., 1978). She published her first paper as a graduate student in 1977 and conducted doctoral research under the direction of Robert Bowen, resulting in a dissertation entitled "Entropy and Symbolic Dynamics of Certain Smooth Systems." She began her illustrious academic career at Northwestern University and in 1980 moved to Michigan State University, where she was promoted to Associate Professor in 1984. She then moved to the University of Arizona in 1987, where she became Professor of Mathematics in 1990, spent nine years at UCLA, and in 1999 joined NYU's Courant Institute of Mathematical Sciences. She visited the University of Warwick in England, the Mathematical Sciences Research Institute at Berkeley, Universität Bielefeld in Germany, the Institute for Advanced Study at Princeton, and the Collège de France, among others.

Lai-Sang Young has done pioneering work on dynamical systems. Her interests in geometric ergodic theory include applications and connections to probability and mathematical physics. Chaotic dynamical systems are her specialty; the main themes of her research interests are measurements of dynamical complexity, strange attractors, cumulative effects of small random perturbations ("noise") on long-term behavior of dynamical systems, and probabilistic laws for chaotic systems. Lai-Sang has authored or co-authored over 50 scholarly publications as well as numerous expository articles and has been an invited plenary lecturer for meetings of the AMS, SIAM, and IMA, as well as for the ICM and ICMP (International Congress of Mathematical Physics). Her work has been supported by the National Science Foundation from 1979 to the present and has garnered wide respect and acclaim. In 1985, she was awarded an Alfred P. Sloan Foundation Fellowship, an award reserved for individuals within six years of the Ph.D. who demonstrate "the most outstanding promise of making fundamental contributions to new knowledge." In 1993 she was awarded the Ruth Lyttle Satter Prize for sustained outstanding research contributions over a five-year period by a female mathematician. She was awarded a Guggenheim Foundation Fellowship in 1997 and was elected in 2004 as a Fellow of the American Academy of Arts and Sciences, "an international learned society composed of the world's leading scientists, scholars, artists, business people, and public leaders."

In response to the presentation of the Satter Prize over a decade ago, Lai-Sang Young poignantly recognized the gains as well as the obstacles for women in mathematics, and her comments are just as relevant today: "There is no doubt that our situation has improved; life in academia for women is easier for my generation than the generation before. I feel that more institutional support is still needed for women who try to juggle career and family, and a conscious effort on our part is necessary if we are to rid ourselves of the cultural prejudices that have existed for so long."

AWM PRIZES

Louise Hay Award for Contributions to Mathematics Education

In 1990, the Executive Committee of the Association for Women in Mathematics (AWM) established the annual Louise Hay Award for Contributions to Mathematics Education. The purpose of this award is to recognize outstanding achievements in any area of

mathematics education, to be interpreted in the broadest possible sense. While Louise Hay was widely recognized for her contributions to mathematical logic and for her strong leadership as Head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, her devotion to students and her lifelong commitment to nurturing the talent of young women and men secure her reputation as a consummate educator. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

Citation for Susanna S. Epp

In recognition of her exemplary and broad range of contributions to mathematics education, the Association for Women in Mathematics presents the Louise Hay Award to Susanna S. Epp of the Department of Mathematical Sciences at DePaul University.

Dr. Epp's career began when she earned her Ph.D. from the University of Chicago under the direction of Irving Kaplansky in 1968. She taught briefly at Boston University and the University of Illinois at Chicago and then joined the faculty of DePaul University. In 2004, she was named a Vincent de Paul Professor, one of the first group of professors so honored.

After initial research in commutative algebra, Professor Epp became interested in cognitive issues associated with teaching analytical thinking and proof. For the past twenty-five years, she has committed herself to helping students come to understand the unspoken logic and language that underlie mathematical thought. This theme runs throughout her well-known and very popular textbook, *Discrete Mathematics with Applications*, about which students write her glowing emails from such far-flung countries as Japan, England, Sweden, and Australia. For instance, one computer science student wrote, "I would like to take the opportunity to congratulate you on your fantastic book.... I believe that this is the best-written textbook I have ever seen." Conveying the nature of mathematical reasoning is also a primary theme of the book *Precalculus and Discrete Mathematics*, which she co-authored as part of the University of Chicago School Mathematics Project (UCSMP) Secondary Series (edited by Zalman Usiskin).

Epp has also raised awareness of issues in the teaching of logic and proof through a series of articles in the *American Mathematical Monthly*, the *Mathematics Teacher*, the NCTM Yearbook *Developing Mathematical Reasoning in Grades K–12*, the DIMACS volume *Discrete Mathematics in the Schools* (edited by Joseph G. Rosenstein, Deborah S. Franzblau, and Fred S. Roberts), and the volume *Mathematical Thinking and Problem Solving* (edited by Alan H. Schoenfeld).

From 1999 to 2004, Professor Epp worked as a member of the writing group that produced the Mathematical Association of America publication *Undergraduate Programs and Courses in the Mathematical Sciences: CUPM Curriculum Guide 2004*. The *Guide* urges mathematics departments to tailor courses and programs to meet their students' real needs, help all students develop analytical, critical reasoning, problem-solving, and communication skills, convey the breadth and interconnections of the mathematical sciences, and promote interdisciplinary cooperation. Recently, Epp was named co-editor of *CUPM-IR*, the online Illustrative Resources that accompany the *Guide*.

Epp has given many colloquium lectures, student talks, and talks at national MAA meetings. She has organized and moderated panels, workshops, and MAA sessions. She has served as a reviewer for textbooks and NSF proposals and as a consultant for Educational Testing Service and the College Board. She has judged high school mathematics contests and served on school advisory boards. In 1996, she jointly organized an international symposium on teaching logic and reasoning held at Rutgers University. In 2004 she spoke at the 10th International Congress on Mathematics Education and was one of eight mathematicians invited to participate in the Research for Better Schools Project to help develop the TIMMS videos for use in teacher education.

For Project NExT Epp has been both a speaker and mentor. Emily Hynds of Samford University, a Project NExT fellow, used Epp's discrete mathematics book as an undergraduate and became acquainted with her at a Project NExT presentation. Hynds wrote: "I have been most touched by her abilities as a teacher and communicator ... she is both a scholar and a nurturer."

At DePaul University, Epp developed more than a dozen successful courses, including two in discrete mathematics and one in mathematical reasoning. Perhaps her most innovative course is "Mathematical Pedagogy: Theory and Practice." As part of that course, each student works as a tutor—an extremely valuable

experience for undergraduate majors. In all of her courses, she encourages students to pursue teaching as a career, and over the years she has inspired many to become teachers.

When serving as chair of the Department of Mathematical Sciences, she developed a joint computer science-mathematics major and a "pure mathematics" concentration, and she did much to promote upper-level mathematics courses to a broader audience. Her colleague, Jeanne LaDuke wrote, "This fall there are about thirty students enrolled in our first quarter abstract algebra course as compared to fewer than a dozen just a few years ago." She also introduced a new calculus course sequence to enable students lacking precalculus skills to complete the one-year sequence during a one-year period by incorporating precalculus material along the way. Michael L. Mezey, Professor and Dean at DePaul, wrote that she is a faculty leader who "invariably takes a leadership role because she always comes prepared to meetings, has thought carefully about the issues, and has the ability to find common ground among people of differing views."

Epp served as an Associate Editor of the *Mathematics Magazine* and as a referee for numerous journals. She also served on many MAA Committees, including the Committee on the Evaluation of Teaching, the Committee on Curricular Renewal Across the First Two Years, the Committee on the Undergraduate Program in Mathematics (CUPM), and the President's Task Force on the *NCTM Standards*. Of her work on the Task Force, former MAA President Kenneth A. Ross wrote, "... if I had to identify the most valuable members [of that Task Force], Susanna would be on any short list."

For her selfless contributions to mathematics education, her role as a mentor, her scholarship, her administrative skills, her human qualities of kindness, her absolute honesty and trustworthiness, and her willingness to listen, the Association for Women in Mathematics is pleased to designate Susanna S. Epp as the Fifteenth Annual Louise Hay Awardee. She most fittingly evokes the memory of all that fellow Chicagoan Louise Hay exemplified as a teacher, scholar, administrator, and human being.

Response from Epp

I am honored to have been chosen to receive the Louise Hay Award for Contributions to Mathematics Education from the Association for Women in Mathematics. I became acquainted with Louise during the time my husband was her colleague at the University of Illinois at Chicago, and I remember her as a person of great intelligence and a warm and vibrant personality.

I grew up as a "faculty brat." Both my parents were English teachers, my father at Northwestern University and my mother (typical of the times) at a local junior college. After receiving my doctorate, I expected to continue a career as a research mathematician. However, my plans slowly changed when, a few years after joining the faculty of DePaul University, I became concerned about the difficulties students were having in our post-calculus courses and became involved in creating a course for our majors to serve as a "bridge" to more sophisticated mathematical thinking.

CALL FOR NOMINATIONS: 2006 LOUISE HAY AWARD

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

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. *Five* complete copies of nomination materials for this award should be sent to: The Hay Award Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. Nominations must be received by **April 30, 2005** and will be kept active for three years. For more information, phone (301) 405-7892, email awm@math.umd.edu or visit www.awm-math.org. Nominations via email or fax will not be accepted.

Working with the students in the course in an intensely interactive way was, perhaps, the most profound educational experience of my life. The attempt to address the difficulties they were having actually led me to deepen my own understanding of and appreciation for the role of logic and language in mathematical thought. And trying to figure out concrete ways to help them develop their understanding turned out to be much more of an intellectual challenge than I had anticipated. When explanations are too complex, students capable of comprehending them don't need a special course, but when they are not sufficiently detailed, students aren't able to act on them. I am still working to try to find the best balance, and I continue to be grateful to my students for the stimulation they have provided me and for all that I have learned from them.

My involvement with the course led me to explore new and fascinating territory—mathematical logic, cognitive psychology, and mathematics education research. In addition, a talk I gave about the course in an MAA session organized by Anthony Ralston proved to be the gateway to participation in the larger community of mathematicians with a special interest in mathematics education. By giving the talk I became acquainted with him and with Martha Siegel and the excellent work they did to involve the MAA in the effort to determine what a course in discrete mathematics should look like, and I was invited to participate in the Tulane Conference on calculus reform and to join my first MAA committee. My life has been greatly enriched ever since by the many thoughtful and dedicated people I have had an opportunity to work with through national organizations, most especially the MAA.

The older I get the more I realize the debt I owe my own teachers. In this connection, I should start by mentioning my parents, whose keen interest and careful attention to language and whose evident commitment to good teaching surely shaped my own sensibility. My eyes were first opened to the view that mathematics is a subject with ideas as well as formulas and techniques by my husband, Helmut, who on a high school date (!) introduced me to the power and beauty of the field axioms. As a student at Northwestern and the University of Chicago, I benefited from uniformly high-quality mathematics instruction. Although I can't list all the fine teachers I had, I would particularly mention Izaak Wirszup, Daniel Zelinsky, Ralph Boas, Ky Fan, Arunas Liulevicius, Antony Zygmund, I. N. Herstein, and Irving Kaplansky, all of whom, in their own ways, helped lead me to appreciate the elegance, rigor, and excitement of mathematics. I hope that I have been able to pass on some of this appreciation to my own students.

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

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

AWM is pleased to present the Fifteenth Annual Alice T. Schafer Prize to Melody Chan, Yale University. Also, Margaret I. Doig, University of Notre Dame and Elena Fuchs, University of California, Berkeley, were recognized as runners-up and Annalies Vuong, University of California, Santa Barbara, as an honorable mention recipient.

Citation for Melody Chan

Melody Chan is a senior at Yale University where she excelled in a wide variety of mathematics courses and was awarded the prestigious Hart Lyman Prize. She has made presentations at the Yale Math Club, earned an honorable mention on the Putnam Competition and is Vice President of the Yale chapter of Phi Beta Kappa. Melody also did outstanding work in advanced courses at the Budapest Semester in Mathematics in Hungary.

Melody participated in an REU at East Tennessee State University where she investigated the pebbling number problem. Her approach to the problem was described as "ingenious," and she was able to significantly improve on the bounds for the pebbling number of a graph with n vertices. She gave a well-received talk on this work at the Joint Mathematics Meetings in 2003, and her results have been submitted for publication.

In the summer of 2004, Melody participated in an REU at the University of Minnesota at Duluth during which she wrote three professional level papers on the concept of the distinguishing number. In the first paper, she was able to answer a long-standing open question, dating from the paper in which the distinguishing number was introduced. In her subsequent papers, she took a group-theoretic approach to the distinguishing number problem. This work exhibited a mastery of groups acting on sets. Various experts in the field described her papers as "remarkable" and "beautiful work" and a "foundational contribution" to the field that will likely be frequently cited.

Response from Chan

I am truly happy to be able to accept the 2005 Alice T. Schafer Prize from the Association for Women in Mathematics. I view this prize as both an honor and a responsibility. The AWM fills an invaluable role in encouraging women to pursue mathematical careers, and I can only hope to contribute to the pursuit of its commendable goals.

So many people deserve my most profound thanks for their support. In particular, I would like to thank Richard Beals and Dana Angluin, two of my professors at Yale without whose guidance and excellent teaching I would be a very different person and mathematician. I would also like to thank Anant Godbole and Joseph Gallian for their wonderful REU programs at East Tennessee State University and at the University of Minnesota Duluth. Finally, I would like to thank my research advisors at Duluth, Melanie Wood and Philip Matchett, who have helped me so much at every stage of the mathematical research process.

Citation for Margaret I. Doig

Margaret I. Doig is a senior honors hathematics major at the University of Notre Dame. Her impressive credentials include being the 2001 Notre Dame high scorer on the Putnam, receiving the Goldwater Scholarship, and spending a year at Oxford University being tutored by, among others, number theorist Susan Howson and topologist Wilson Sutherland.

Doig's research at the University of Minnesota at Duluth REU during the summer of 2003 resulted in the paper "Maximum Run Length in a Toroidal Grid Graph." She presented this work at the 2004 Joint Mathematics Meetings in Arizona. Next, she spent the summer of 2004 doing research on braid groups with Frank Connolly. Specifically, they worked on the Right Angled Artin Conjecture of Abrams and Ghrist, which they believe they have solved. Doig made a particularly substantial contribution by developing a crucial technique. This work will result in two papers, one by Doig alone that will detail the technique, and one coauthored with Connolly.

For her senior thesis, supervised by Claudia Polini, Doig further extends her areas of mathematical expertise

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, 2004. She must either be a US citizen or have a school address in the US. The fifteenth annual Schafer Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in Atlanta, Georgia, January 2005.

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

With letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks given by members of student chapters, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. Send *five* complete copies of nominations for this award to: The Alice T. Schafer Award Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. Nominations must be received by **October 1, 2005**. If you have questions, phone 301-405-7892, email awm@math.umd.edu, or visit www.awm-math.org. Nominations via email or fax will not be accepted.

to include commutative algebra and algebraic geometry. Not only are Doig's mathematical interests broad, but she excels in a variety of academic pursuits as well. She has a second major in philosophy for which she is also writing a senior thesis.

Response from Doig

I am very grateful to the Association for Women in Mathematics for this honor. The encouragement and care of the organization are tremendously important, and I hope to be able to make an equivalent return someday. I am thankful to Joe Gallian and the rest of the Duluth REU for teaching me what it means to do math, and I greatly appreciate the excellent education I have received from the Notre Dame community, especially from Frank Connolly. Not to be overlooked is the contribution of my high school mentors Wright Vermilya and Tom Brieske.

Citation for Elena Fuchs

Elena Fuchs is a senior at the University of California at Berkeley. Her coursework, which includes a number of graduate courses, has been called "especially incisive" and "quite clever." Her instructors comment on her advanced mathematical maturity.

During the summer of 2003 she attended the Penn State University MASS program. One outcome of her work was a paper coauthored with Paul Baginski on modular invariants of elliptic curves. Her work at the University of Minnesota at Duluth REU during the summer of 2004 resulted in a paper entitled "Longest Induced Cycles in Cayley Graphs," which has been submitted for publication. For her senior thesis, she returns to the impressively complicated topic of elliptic curves. Under the direction of Ken Ribet, she will study endomorphisms of the Jacobian of hyperelliptic curves.

Response from Fuchs

It is a great honor to be selected as runner-up to the Alice Schafer Prize. I would like to thank the Association for Women in Mathematics for the encouragement and recognition they offer young women pursuing math—this award is only one of the many ways in which it promotes emerging female mathematicians. I am also deeply grateful to Professor Ken Ribet, who has truly inspired me in my research and studies, for his invaluable teaching, as well as his patience and guidance. Thank you to Professor Joe Gallian and everyone at the wonderful Duluth REU, which has been one of the most rewarding experiences in my mathematical career thus far. As always, I want to thank my family and friends for supporting me in all of my endeavors. A special thanks to my father, who has been more than just a mathematical role model to me for many years.

Citation for Annalies Vuong

Annalies Vuong is a senior at the University of California at Santa Barbara. She is the founding president of the UCSB Mathematics Student Association and already a regular attendee of the graduate students seminars in topology and differential geometry. Annalies is proving to be a rising star, excelling in coursework and in the research setting.

In summer 2001, Vuong participated in the Carleton/St. Olaf College Program for Undergraduate Women in Mathematics. During summer 2004 at the East Tennessee State University REU program, she came into her own. She worked on four different problems in combinatorics and graph theory, which led to three (perhaps four) papers submitted for publication. One recommender described her as fearless, focused, and unrelenting and furthermore as knowing exactly when to stop a particular line of investigation and explore other avenues. Annalies Vuong combines talent, energy, determination and a passion for mathematics.

Response from Vuong

I would like to thank the Association for Women in Mathematics for this honor. I am tremendously grateful for their support, as well as for the support of the mathematics department at UCSB and the College of Creative Studies. I've been very lucky to have so many people encourage my love of math and help me to succeed in mathematics; in particular, I'd like to thank Anant Godbole for his East Tennessee State University REU. I had an amazing experience doing math there, thanks to his boundless enthusiasm and belief in his students. I'm also indebted to Kasri Rafi, John Ennis, and Jeffrey Stopple for their encouragement and to everyone involved with the Carleton Summer Math Program for Women.

AWM WORKSHOP

The workshop talks, poster session and panel were open to the entire math community attending the Meetings. Selected graduate students and recent Ph.D.'s presented and discussed their research and met with other mathematicians. Thanks to Dawn A. Lott (Delaware State University), Claudia Polini (University of Notre Dame) and Judy L. Walker (University of Nebraska) for organizing this successful workshop and to ONR and NSA for their support of the AWM workshop program. Thanks also to the volunteers who served as mentors, discussion group leaders and panelists.

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

Eliana S. Antoniou, William Paterson University
"A Theoretical Simulation of Hematopoietic Stem Cells during Oxygen Fluctuations: Prediction of Bone Marrow Responses during Blood Loss"

Kathrin Bringmann, University of Wisconsin, Madison
"Lifting Maps from a Vector Space of Jacobi Cusp Forms to a Subspace of Certain Elliptic Modular Forms"

Leah H. Gold, Texas A&M University
"The Cayley-Bacharach Theorem and Coding Theory"

Tara S. Holm, University of California, Berkeley
"Distinguishing Chambers of the Moment Polytope"

Virginia Naibo, University of Kansas
"Strichartz Estimates for Solutions of Schrödinger Equations with External Fields"

Allison M. Pacelli, Williams College
"Unit Rank and the Rank of the Class Group of a Global Function Field"

Lisa Perrone, Tufts University
"Linear Algebra and Image Restoration"

Rebecca L. Sanders, Marquette University
"Hypercyclic and Supercyclic Operators in the Weak Topology of Banach Spaces"

The recent Ph.D.'s and graduate students who presented posters are listed next. Recent Ph.D.'s names are marked with asterisks.

Karen T. Ball,* Indiana University, Bloomington
"Monotone Factors and Stochastic Domination"
Lisa Orloff Clark,* Dartmouth College
"Classifying the Type of Groupoid C*-algebras"

Corina D. Constantinescu, Oregon State University
"Decay of the Probability of Ruin under Certain Investments"

Christine K. Cumming, Purdue University
"Residual Intersections in Cohen-Macaulay Rings"

Donna Ann Dietz,* Mansfield University
"Finding Rational Cubic Spirals"

Brooke Evans,* Morgan State University
"Success in University-Required Mathematics Courses: An Investigation of Students with Learning Disabilities"

Joan R. Lind, University of Washington
"The Geometry of the Loewner Equation"

Kelly L. McKinnie, University of Texas at Austin
"Extensions of Noncyclic p-Algebras with an Application to Indecomposable Division Algebras"

Anna Mummert, Pennsylvania State University
"Almost-Additive Thermodynamic Formalism"

Norma L. Ortiz, Louisiana State University
"A Decoupling Technique and Necessary Conditions for the Neutral Problem of Bolza"

Mihaela Predescu,* Bentley College
"Stability in Some Nonlinear Difference Equations"

A. Deniz Sezer, Cornell University
"Filtration Shrinkage and Compensators"

Maria T. Sloughter, Cornell University
"Realizability of Graphs"

Holly M. Swisher, University of Wisconsin, Madison
"Stanley's Partition Function and Its Relation to $p(n)$"

Nicoleta E. Tarfulea, University of Minnesota
"A Mathematical Model for Signaling in Early Stages of Tumor-Induced Angiogenesis"

More next issue

In the next issue, we will include information on other AWM events. Also, citations and responses for AMS and MAA prizes and awards will appear.

AN INTERVIEW WITH HARRIET MOSER

Joan Birman, Barnard College, Columbia University

Harriet Moser received her Ph.D. at Columbia University in February 2005, at the age of 64, exactly 42.5 years after she first entered Columbia as a Math graduate student! I was on her thesis committee in mid-December 2004. Harriet's thesis, which was written under the supervision of Professor Walter Neumann, concerned a computer program, Snap Pea, that is used widely in 3-manifold topology. Snap Pea gives an approximate solution to the question of whether a 3-manifold has a complete hyperbolic structure. In her thesis, Harriet developed a method that uses the approximate solution and then proves conclusively that an exact solution exists nearby. It seems clear that her thesis will be noticed, because it solves an open problem in a straightforward and instantly usable manner.

I met Harriet in 2002, a year after she started some catch-up courses, with the goal of completing the Ph.D. studies that she had abandoned so many years earlier. We talked often as she moved (rapidly) through undergrad analysis, topology and algebra and a few first year grad courses, was admitted as a grad student, passed her oral exams, and began increasingly serious work on her thesis. I have always suspected that there were other women out there who might love to do what Harriet has done, but have no idea how to get started, and think that it's impossible. Therefore, I thought, readers might be interested in Harriet's story, which she and I put together in the form of a series of questions that I asked, with her answers.

JB: Can you tell us about your early experiences with mathematics?

HM: I majored in math at Wellesley, probably because I was comfortable with it and could do it well, but there was no passion for it. Going to graduate school was more a choice than the result of a commitment. It was only in graduate school at Columbia that I really began to love math and take it very seriously.

The emphasis at Wellesley had been strongly toward the humanities, and (even in the sciences) math was peripheral, but Columbia was completely different. There was an excitement about mathematics at Columbia that got to me.

JB: Did you do well the first two years?

HM: When I started graduate school, I thought that I was not as well prepared as the male students, who seemed to know much more than I did, but Wellesley must have done something right because I did very well the first two years and was awarded a University Fellowship. In those days, all math graduate students became TA's, except for a few who received the University Fellowship, which paid more and had no work responsibilities.

JB: Were there other women students?

HM: There was one other woman in my class, Phyllis Cassidy. She completed her studies and went on to an academic career. There were very few other female students in the department.

JB: Did your parents support your choice of career?

HM: Both of my parents were very supportive of my continuing my education, though my father would have preferred for me to become a lawyer, as he was. My mother was in full support of mathematics. She came from a family that reveres academic achievement above all else, so she was bursting with pride that I was going to be a mathematician. Once it became clear that I would not go to law school, my father supported my choice of mathematics also. They both wanted me to get married and have a family, but we never discussed the conflicts of marriage, family and career. Maybe this was their unspoken signal that I should get a Ph.D. but not do anything with it, since they probably could not relate to the idea of their daughter being a career woman.

JB: Did you like your first thesis problem?

HM: I took my orals first semester of my third year, as was the custom then, and began reading with Ellis Kolchin. I never got to the point of choosing a thesis problem.

JB: When did you meet your future husband, and when did your commitment begin to waver? Did you make a conscious decision to stop working on your thesis, or just drift away?

HM: I met my husband toward the end of my second year and remember spending many days with him where I was studying for my orals and he was reading medical

journals, so there was no hint of his not supporting my career in mathematics. We got married in the middle of my third year and started a family immediately, since Harvey is 12 years older than I am. I had every intention of continuing with my work, but felt overwhelmed once our first child, Andrea, was born. I kept telling Professor Kolchin, "I just need a little more time, and then I will be able to get back to work." I think it must have been the memory of this that made me almost never put off anything during the last few years, no matter how bad it got with my parents' health problems.

I was not very introspective in my younger years, so I attributed everything to having a baby. But there was more to it. I didn't have a sense of entitlement that my needs counted also. I think it was fairly common for women to feel that way in those days. I drifted along for a few years, expecting eventually to return, but never doing so. After a few years of this, I came to feel that it was impossible to return and stopped talking about going back. By this time, I was making a conscious effort to erase math from my life.

JB: Did you discuss these issues with the other graduate students? With friends? Did anyone on the faculty take enough of an interest to talk to you about specifics? What got in the way of your sitting down for a few hours every day and "doing math"?

HM: I don't recall discussing any of these issues with other graduate students. Even though I was quite friendly with the male students in my class, I can't imagine discussing such a topic with them. I think that only women could understand the conflicts, and the female grad students I knew (including my best friend) never discussed such things.

There was an added issue: my life was very different from that of other graduate students. Harvey is quite a bit older than I and was already well established in his dermatology practice. Once married, I was immediately faced with furnishing a large apartment, entertaining referring doctors, and preparing for a baby—hardly the life of a typical graduate student. It's that old issue of: the woman's needs come last. If I knew then what I know now, I would not have allowed it to happen.

Harvey's role in all this was on two levels. On the surface, he spoke about the importance of my caring for our children and home. He also felt that since he was supporting the family, he should not have any responsibility for household chores. The other, unspoken issue, was that like most men of his generation prior to the women's movement, he was threatened by the thought of a wife with a career, particularly as a mathematician, because pop culture attributes superior ability to mathematicians. I was very passive in those days, and the result was my giving up my identity. Getting a babysitter was not the issue. The problem was with my emotional inability to protect my interests.

JB: Can you tell us, briefly, what you did during those many years between the end of your first stabs at grad school and your return to grad school many years later?

HM: Until about 1980, I lived the life of a Great Neck housewife with two children.

I was becoming very restless, but still did not have the courage to try math again, so I started to take computer science courses at Hofstra. For the next ten years I worked at Sperry, a small software house in Great Neck, Prodigy (the online service), and an IBM subsidiary, moving from programming to project management. I was part of the big layoffs of the early 90s and decided not to look for another job since computer work was okay, but I never loved it; it could never be as good as math, for me. For the next few years I filled my time by computerizing Harvey's office, buying and renovating apartments for Andrea and Michael in Manhattan, and planning first for Michael's wedding and then Andrea's wedding. After several years of this mindless activity I decided that I had to do something just for me, and that was fulfilling my dream of being a mathematician.

How the old isssues play today

Over the years, I have thought a great deal about why I am the way I am, and how I can change that which I do not like. It has not been easy, but I have made dramatic changes in my life. And with that, have come changes in Harvey. He is a wonderful person, and I must give him a lot of credit for wanting to do his best for his family, and trying to change accordingly. We are both products of our generation and background, and we have tried to overcome it. Fortunately, we have done very well with this. I have become much more assertive, and maybe because Harvey has had a full career, he is no longer threatened by me. Also, he has learned that life for him is best when he is supportive of me because of all the positive feedback he gets from me. As a result, we now have a wonderful marriage. My children have also had to

make adjustments. They don't always come first. My commitment to my work limits my availability, but they are still very proud of me. I also think they respect me more because I show more respect for myself.

JB: When you returned to Columbia there were surely problems when, as a "senior citizen," you were in classes with students who were many years younger than you. Was it smooth sailing? Or were you simply more determined?

HM: When I first returned to Columbia, I started with undergraduate courses. The students looked at me as an oddity, but my professors for those courses took me seriously. I was particularly fortunate to be a student of Professor Walter Neumann at this time. He took an interest in me and has been an outstanding supporter since then, as well as being my thesis advisor. Based on my performance that first semester, he introduced me to you, and that began another wonderful experience for me. By the time I took graduate courses, the other students started to take me more seriously as a student, but it still took a few years for them to treat me as a colleague instead of a mother figure. It's hard to say if the department has changed since the 1960s, because I am looking at it as two different people. In the 60s there was a distance between faculty and students, but that could be a function of age as well as the times. In terms of life experience, I now have more in common with senior faculty members than postdocs and grad students, so I feel much more comfortable talking to faculty now than when I was younger. I suspect that when I first came back to Columbia there were faculty members who thought I would not last, but I am very grateful to the department for giving me the chance to prove myself and finally to admit me as a doctoral student. Eventually, many professors were nice to me, but both you, Joan, and Walter Neumann have been very caring and special for me. In the end, though, I would not have succeeded had I not been so determined. When I returned I had not looked at a math book for about 35 years, so in the beginning it was as if I didn't know any mathematics. I didn't find the undergraduate courses difficult, but my first semester of graduate courses after only one year of undergraduate classes was very difficult, and it took determination to survive. By the second semester I was okay.

JB: How did you feel when you realized that you had done a piece of original, creative work?

HM: I was thrilled when I got my result and it was confirmed by others to be valid. I was probably most excited the first time I applied my test to an example and it worked. I was like a young child jumping up and down with excitement. I am definitely looking forward to many more such experiences. I have already started working on another problem and intend to continue for many more years. My goal has been to create a satisfying productive life for myself, and the Ph.D. is a landmark along the way.

JB: Do you have any advice for other women (and men) who may be coping with the same issues, but in the context of 2005?

HM: Yes. You are entitled to fulfill your needs, even if you are a wife and/or mother. There is no one way to do it, and if your career gets sidetracked for any reason, it is never too late to return when you want to. Other than developing dementia, your brain can do the same thing later in life as when you are young, only a little more slowly. Initially, people may not take you seriously, but if you are determined and prove yourself, you can succeed.

SUMMERS

Anne Leggett

As Barbara said in her inaugural president's report, "the air is full of clamor about Harvard President Lawrence Summers' remarks." According to Marcella Bombardieri in the *Boston Globe*, January 17, he "sparked an uproar at an academic conference Friday [January 14] when he said that innate differences between men and women might be one reason fewer women succeed in science and math careers. Summers also questioned how much of a role discrimination plays in the dearth of female professors in science and engineering at elite universities." The conference organizer said that he had asked Summers to be "provocative." (www.boston.com/news/education/higher/articles/2005/01/17/summers_remarks_on_women_draw_fire/) Indeed he was! Not surprisingly, many reacted negatively to his remarks. Fairly

quickly, he issued a "clarification," followed by a letter of apology on January 19th (www.president.harvard.edu/speeches/2005/women_and_science.pdf). Among other things, he said: "The many compelling emails and calls that I have received have made vivid the very real barriers faced by women in pursuing scientific and other academic careers. They have also powerfully underscored the imperative of providing strong and unequivocal encouragement to girls and young women interested in science." On January 26th, he announced that two task forces would be formed. In the February 3rd online *Harvard Gazette* (www.news.harvard.edu/gazette/daily/2005/02/03-women.html), we learn:

- The Task Force on Women Faculty will be charged with making recommendations for a series of specific institutional measures—including the creation of a new, senior position at the center of the University—to strengthen the recruitment, support, and advancement of outstanding women faculty in the University.

- The Task Force on Women in Science and Engineering will analyze and make recommendations concerning effective ways to build and sustain the "pipeline" of women pursuing academic careers in science, from undergraduate studies to graduate and postdoctoral work to advancement through faculty ranks.

Whatever one may think about Summers, it is possible that these task forces will produce positive results. Unfortunately, Summers' apology and the news about the task forces are unlikely to receive the amount of press occasioned by reactions to initial reports on his remarks at the conference. In some articles, it was suggested that Summers was a victim of "political correctness." As reported, Summers' remarks might easily be taken to mean that women don't do as well in the academic arena in math and other sciences, because, well, science/math is hard and takes a lot of time, and those of us with wombs (*pace* George S. Will and his "hysteria" column) maybe don't have the brains and likely don't have the time (given our lifestyle choices) to be tenured professors at the top ten universities. Resisting the urge to preach to the choir, I'll just suggest here that the truth is more complex than this.

There was a flurry of emails in AWM circles, leading Carolyn Gordon, during the last days of her presidency, to combine three sets of correspondents into one large discussion group. Thanks to everyone involved for their contributions to the discussion! Carolyn's resulting letter to the editor was printed in the *New York Times*, January 28, 2005; her letter was endorsed by the Executive Committee as an AWM statement. The letter follows; it is also available online at www.awm-math.org/response.html.

To the Editor:

Regarding Lawrence H. Summers's remarks on the underrepresentation of women in mathematics and science, the real news is that despite cultural barriers, women are entering these fields in greater and greater numbers.

About a third of all United States citizens who have received Ph.D.'s in mathematics recently are women. About half of all undergraduate mathematics degrees in the United States go to women.

Yes, there is still a shortage of women on the mathematics and sciences faculties of many American universities, including Harvard. So universities should hire more of these excellent women and then treat them as if they value them.

We call on Lawrence Summers, as well as the leaders of all educational institutions, to take positive action to encourage the influx of women and minorities into mathematics, science and engineering.

Carolyn Gordon Hanover, N.H., Jan. 22, 2005

The writer, a professor of mathematics at Dartmouth College, is president of the Association for Women in Mathematics.

Other AWM members have also written letters to the editor and op-ed pieces. A number of institutes and other professional societies have made statements or issued press releases. Barbara Keyfitz, now AWM President, is Director of The Fields Institute for Research in the Mathematical Sciences. From the Fields Institute press release:

Keyfitz and John Gardner, Chair of the Institute's Board of Directors, reiterated today the Institute's commitment to the advancement of women in the mathematical sciences and equal opportunity for all scholars, regardless of gender. Commenting on recent discussion in the press concerning Harvard President Summers's comments on the suitability of women for advanced work in the mathematical sciences, Keyfitz and Gardner said: "In executing its

mandate to advance ground-breaking research in the mathematical sciences and to provide Canadian universities, industry and public sectors with access to the world's leading academics and practitioners, The Fields Institute's experience testifies to the exceptional accomplishments of women at all levels of mathematical research. There is no reason to doubt the ability of women to achieve at the highest scientific levels, and mathematical science is no different."

Citing the participation of women professors, graduate students and industrial researchers in numerous Institute programs attracting the top international scholars and researchers on topics of pure, applied and industrial mathematics, Gardner added: "We need to examine even more of the assumptions that lie behind our evaluation of the potential of young people. To help young women, we need a better, deeper understanding of how women succeed. When successful women participate in our programs, as happens more and more, then everyone benefits by learning how varied are the faces of talent."

Keyfitz noted well-known institutional and cultural obstacles to the acceptance and promotion of women in many scientific environments and pointed to The Fields Institute's programs and policies aimed at mitigating and overcoming those obstacles. "We are vigilant to ensure that women scholars are afforded the same financial and teaching-release support to enable them to attend and present their research at our year-long thematic programs, our short courses, our summer schools and our other scholarly initiatives. Our program organizers do not overlook these scholars when designing their programs and engaging speakers. For too long, women have faced an uphill battle in gaining acceptance for their work and their accomplishments in the mathematical sciences. The Fields Institute does not countenance discrimination, overt or covert, of this kind."

From the AMS website (www.ams.org):

Recent comments by Harvard University President Lawrence Summers about women's success in math and science have generated considerable controversy. Although Summers has posted an apology on the Harvard University website, AMS President David Eisenbud and President-elect James Arthur feel strongly about this matter and issued the following statement:

"The speculations made by Lawrence Summers, President of Harvard University, at a conference on January 14, 2005 about the causes of the current shortage of women in science were inappropriate. His high position at Harvard places on him a high burden of responsibility. His remarks may be damaging and counterproductive to a cause he and all educators should support. We who strive to make our subject areas attractive and accessible to all express our dismay at such remarks."

The PIMS Position on Women and Mathematics, from the Pacific Institute for the Mathematical Sciences (www. pims.math.ca), Ivar Ekeland, Director, reads:

One of the most severe brain drains impeding progress throughout the world, in developed and underdeveloped countries alike, is the fact that women are turning away—or are being turned away—from studies and research in science and technology. An academic authority in the United States has again raised the possibility that it may be due to "innate differences," "innate ability," or "natural ability". Such remarks simply serve to perpetuate and legitimize the exclusion of women from fields where they are sorely needed, and to deprive society of one-half of its workforce, not to mention the indignity of branding some of us as unable to understand science. They are certainly not supported by the history nor the current practice of science. Even in the most distant past, some women have been able to overcome the tremendous difficulties put in their way by a male-dominated academic world and to make their mark in history as great mathematicians. Nowadays, girls and women in schools, colleges and universities, perform at least as well as boys and men in scientific programs, even if they are less in number. We at the Pacific Institute for the Mathematical Sciences (PIMS) are determined to increase the presence of women in mathematics, by breaking down social stereotypes of the kind we have just heard, and by encouraging female participation in our activities. We thank our female colleagues in the mathematics departments of PIMS universities for the substantial contributions they are making to mathematics, and we hope there will be more of them in the future.

From the statement of the International Council for Industrial and Applied Mathematics (ICIAM) (www.iciam.org/Women-in-Mathematicx.pdf), Ian Sloan, President:

Recent remarks of the President of Harvard University have led to media speculation that innate differences in the mathematical abilities of men and

women make it less likely that women will succeed in science and mathematics. ICIAM does not accept this notion.

ICIAM members are well aware that there are many barriers (whether financial, cultural, or practical) that face women who want to pursue mathematical or scientific careers at the highest levels. The unbroken career paths that are typical of successful male careers in mathematics take no account of the specific responsibities of women related to child bearing and family.

As an international organisation representing the world's applied mathematicians, ICIAM is committed to removing the educational inequalities in mathematics that exist in many parts of the world, and to improving the access to careers in the mathematical sciences for all men and women. ICIAM highlights the accomplishments of all applied mathematicians, women and men, at our quadrennial International Congress, the premier event world-wide in applied and industrial mathematics.

Many newsmagazines and newspapers have included feature stories, columns, and op-eds about the Summers affair. At press time, the excellent "Diminished By Discrimination We Scarcely See" by Meg Urry appeared in the February 6 *Washington Post*. Urry is a professor of physics and the director of the Yale Center for Astronomy and Astrophysics. What she has to say is oh, so true: "Discrimination isn't a thunderbolt, it isn't an abrupt slap in the face. It's the slow drumbeat of being underappreciated, feeling uncomfortable and encountering roadblocks along the path to success. These subtle distinctions help make women feel out of place."

Here is another evocative snip from her article:

Hey, bad things happen. But feeling out of place over and over again eventually soaks in; it did for me. About a decade ago, frustrated and alienated, I approached the director of my institution to ask about special management training for women: Maybe there were tips that would help me navigate the foreign waters in which I found myself. He didn't seem to understand. I said, "You know, it's like being the red fish in the sea of blue fish—I want to understand the blue-fish rules." "Oh," he answered. "Maybe it's not your lack of training, Meg, maybe it's just your difficult personality."

The *Post* also printed "Raise Your Hand If You're A Woman in Science ..." by Virginia Valian on January 30th. Valian, professor of psychology and linguistics at Hunter College and the CUNY Graduate Center in New York and author of *Why So Slow? The Advancement of Women* (MIT Press), says:

Nor is Summers alone in being unaware of the large set of experiments showing that well-intentioned people, intelligent people, people who believe in a meritocracy—people, in short, just like many successful college presidents—consistently underrate women's abilities and overrate men's.

The finding that emerges from the research, in experiment after experiment, is that bias is a problem not because it is deliberate, but because it is the outcome of assumptions of which we are not consciously aware....

Thus, in evaluating a woman in a male-dominated field, both male and female observers see her as less competent than a similarly described man unless there is clear information that she is a top performer. And in that case, they see her as less likable than a comparable man.

Our own Lenore Blum was quoted in the *Wall Street Journal*, in Sharon Begley's Science Journal of January 28th. From "Harvard Chief's Words on Innate Differences Lack Basis in Science":

That's odd, mathematician Lenore Blum thought. At a math institute where she once served as deputy director, Mondays seemed to bring more than their share of announcements of new theorems, the gold rings of mathematical discovery.

Prof. Blum, of Carnegie Mellon University in Pittsburgh, quickly figured out why. Male mathematicians hanging out together on weekends wound up doing math, inspiring each other in a way that produced breakthroughs. Women were rarely included in these get-togethers; they weren't invited and felt awkward inviting themselves.

There are far too many articles out there for me to recount them all. The Women in Science & Engineering Leadership Institute, University of Wisconsin–Madison, is doing an excellent job of listing media response to Summers. See wiseli.engr.wisc.edu/news/Summers.htm.

I can't resist naming one more, from the *New York Times*, February 1, 2005, it has such a great title (not to mention being spot on): "For Some Girls, the Problem With Math Is That They're Good at It" by Cornelia Dean. In her first paragraph, she says: "Anyone who

thinks that sexism is no longer a problem in science has never been the first woman science editor of the *New York Times*."

Other excerpts from this article:

> [As] as a seventh grader [I] was scarred for life when my class in an experimental state school for brainiacs was given a mathematics aptitude test. The results were posted and everyone found out I had scored several years ahead of the next brightest kid. A girl really good in math! What a freak! I resolved then and there on a career in journalism....
>
> [As] researchers have abundantly documented, women continue to suffer little slights and little disadvantages, everything from ridicule in high school to problems with child care, to a much greater degree than their male cohorts. After 10 or 15 years, these little things can add up to real roadblocks.

BOOK REVIEW

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

The Two-Body Problem: Dual-Career-Couple Hiring Policies in Higher Education, Lisa Wolf-Wendel, Susan B. Twombly, and Suzanne Rice, Johns Hopkins University Press, Baltimore, 2003, ISBN 0-8018-7451-3, 196 pp.

Margaret Bayer, University of Kansas

Many of us are only too familiar with the "two-body problem." The book under review, written by three faculty members in the School of Education here at the University of Kansas, looks at the issue from the institutional perspective: what policies do universities have to help dual-career couples? Besides a review of the literature, the authors conducted a survey of provosts (with 360 responses out of a possible 617), telephone interviews with deans of 15 small colleges, and case studies of five colleges and universities.

The survey of provosts found that 80% consider spouse and partner accommodation important. Only 24% reported having written or unwritten dual-career accommodation policies, however. At the other extreme, only 8% said they would give no employment assistance to the spouse or partner of an employee or job candidate. The importance of responding to the needs of dual-career couples is rated highest by research universities; these institutions are more likely to have policies in place than comprehensive universities or small colleges. Universities believe dual-career accommodation policies make it easier for them to be competitive in hiring, to attract minority faculty, women faculty and "stars," and to compensate for location.

The type of assistance offered to couples fell into five categories [p. 47]: 1) offering relocation services primarily targeted to assisting spouses and partners in finding employment off campus; 2) providing temporary, adjunct faculty positions; 3) creating opportunities for shared positions; 4) advertising positions jointly with nearby institutions; and 5) helping accompanying spouses and partners find tenure-track positions. Universities vary, of course, in how formal the policies are, in which types of assistance are stressed, and in who is offered the services. Some policies explicitly include "domestic partners" along with spouses. Some universities use the terms "spouse" in their written policies, but extend benefits to same-sex and unmarried heterosexual partners, yet they prefer not to call attention to this. Some universities are willing to go further in accommodating partners of senior faculty or administrative hires, while doing less for new assistant professors.

Five colleges and universities were selected for in-depth studies. They were institutions that exemplify the five categories of assistance listed above and represent a variety of location, size and type of college or university. The five are identified by pseudonyms in the book. Relocation services are modeled after programs offered by many businesses and include resources on housing, schools, etc. Most relevant to this study are personalized career services for the spouse or partner. Besides providing information and advice to the applicant, the university relocation coordinator may send letters of introduction to local employers and even set up interviews. In some cases the relocation assistance programs result in strong networks with area employers, and the university offers services to participating businesses as well.

The main focus of this book, however, is on policies to help spouses and partners find employment, particularly academic employment, within the university. The

most common form for this employment is a temporary teaching position. One of the five case-study institutions has a Faculty Fellows Program for spouses and partners. A Faculty Fellow appointment supports the person for one year at a low salary with office space and some benefits; duties are in teaching, research, or administration. Essentially, it provides time and an affiliation from which someone can apply for grants or for a job. Such a program seems most useful if there are other academic job opportunities within commuting distance. As with many of the dual-career accommodation policies, the salary of a Faculty Fellow is shared by the central administration, the department hiring the tenure-track spouse, and the Faculty Fellow's department.

Small colleges may face the greatest challenges in accommodating dual-career couples. They typically have few positions and little flexibility for opportunity hires or temporary hires. The authors describe some consortia of small colleges that use joint advertisements to communicate combined opportunities to dual-career couples. Of course, each institution makes independent hiring decisions; at best, a department may factor in prospects for retention when considering a spousal candidate.

Another option for a small college is to allow a couple in the same field to share a single faculty position. (This occasionally happens at larger institutions as well.) Different implementations are found, but typically two people each have half the job responsibilities and half the salary, but perhaps full benefits. The two may be judged independently for tenure and promotion; in other cases, tenure is only awarded if both members of the couple meet the standard. Among the case studies in this book is a small college where currently four couples are in shared positions (another four married couples are on the faculty). Some institutions fear the complications of shared positions, but this college has recognized the benefits. It is an added tool in recruitment, the college gets more work from the two faculty members than from one, and departments can call upon these faculty members to teach extra courses when they have a temporary need. One concern in the profession is that couples in shared positions are exploited: almost surely each contributes more than half a typical workload while getting half the pay. One advantage for the couple is the equal status of the two faculty members. This is in contrast to many cases in which a university hires a spouse full-time (a "trailing spouse") in order to get a first-choice hire, and the spouse is regarded as a second-rate citizen.

For many academic couples the ultimate goal is a pair of full-time, tenured positions at the same or neighboring universities. The route to this goal depends a great deal on chance. For the spouse of a most highly sought candidate, an institution will occasionally create a tenure-track position. More commonly, an administration may encourage a department to hire the spouse of a strong candidate in another department, or may allow a department to accelerate a hiring plan in order to hire both members of a couple at the same time. In all cases, the universities say that jobs are offered only to candidates who meet the hiring standards of the department. But when a spouse is hired without an open search, he or she is not being compared to other candidates in the same field. This could mean that he or she is held to a higher, or a lower, standard. Of course, the noncompetitive nature of this hiring decision is shared by various other kinds of "opportunity hires." The administration must take a lot of responsibility to make this work and to prevent resentment on the part of the spouse-hiring department.

The number of couples who seek accommodation is still increasing. McNeil and Sher, who conducted a survey of dual-career couples in physics (see www.physics.wm.edu/~sher/survey.html), estimate that 35% of women physicists in the US are married to scientists. Universities do not have unlimited resources to hire spouses with specialties outside the departments' hiring goals. If a spouse hired in a temporary position does not find permanent employment, the university faces a morale problem and may lose the tenure-track spouse. Some institutions have experienced a backlash when departments feel that spousal hires have interfered with their goals.

The primary concerns raised in opposition to dual-career accommodation policies are: "1. fairness in treatment of spouses and partners; 2. legality of preferential hiring of spouses and partners; 3. decrease of faculty quality; 4. sacrifice of overall personnel goals; and 5. loss of faculty autonomy in hiring." The issue of fairness comes up in two ways. A spouse hired either in a temporary or in a tenure-track position may feel that he or she is not treated as well as other people in the same job category. Interviews found couples who felt that their salaries were deflated because the university knew the couple was not likely to find jobs elsewhere. On the other hand, colleagues may feel that the spouse had an unfair advantage in the hiring process. The authors

found no evidence of illegality in the dual-career accommodation policies. In particular, they found no lawsuits challenging the policies. Marital status is not a protected class in discrimination law. However, some universities have their own policy of nondiscrimination in hiring based on marital status. A challenge to an accommodation policy based on such a policy would have to show that the policy led to discriminatory hiring practice by marital status.

The other three concerns are, of course, inextricably linked. If an individual department has the final say in hiring a spouse, then it is responsible for evaluating the candidate's potential contributions to the department. The same can be said for any opportunity hire. In real life, things are not clear-cut. The department may face pressures it regards as unfair; it may be pushed into a hasty decision, perhaps with incomplete information; and the department itself may be seriously divided over the hiring issue.

The greatest obstacle to evaluating these issues in dual-career accommodation policies is the lack of formal assessment of the existing policies. We do not have figures on the success in recruiting initial hires due to accommodation policies or on the retention of faculty hired under such policies. Universities considering instituting or changing policies have no guidance on the relative value (or the negative aspects) of different types of assistance.

WOMEN & IT

www.ncwit.org

The National Center for Women & Information Technology is a grassroots, mobilizing organization. Our coalition continues to grow, and now includes over 40 academic institutions and corporations focused on significantly improving the number of girls and women choosing IT disciplines and careers. Change is our overarching goal; using effective practices based on solid evidence, our fundamental strategy is to create and resource a national multi-year implementation plan to finally turn the corner on this troubling issue.

Women's lack of participation threatens our ability to compete and lead in a global marketplace, because we are missing the input of half of our society. Technology designed without women is one-dimensional. From classrooms to computer labs, from clean rooms to boardrooms, girls and women are opting out of participation in information technology.

Why? What can we do about it?

The mission of the National Center for Women and Information Technology is to ensure that women are fully represented in the influential world of information technology. Through a nationally connected effort of programs, networks and research, the Center will work to guarantee that women's perspectives and skills contribute significantly to the creation and application of information technology.

The National Center for Women and Information Technology will be the only coalition to focus its information technology efforts on a nationwide scale, across the entire K–12, higher education and industry pipeline. The National Center will help existing programs measure their success, help create new programs where they are needed, and help successful programs grow into stronger, broader sustainable programs with increased visibility. The National Center will provide a landmark set of resources to forward its goals, including: increased funding and publicity; innovative measurement, assessment, and dissemination tools; and research on topics such as gender-specific technology, effective curricular approaches, and the advancement of women into industry leadership positions. The National Center will coalesce current efforts to increase women's participation in information technology with a strong, united voice in the media, in schools, at home, and in Washington, DC.

We must recognize that women's participation is essential in building an information technology workforce that is creative, innovative, diverse and responsive. We must recognize that it is the responsibility of educational institutions, parents, industry, and government to ensure that women have opportunities in information technology. We must recognize that current efforts to advance opportunities for women are not keeping pace with our country's rate of development, and require united efforts of a national scale. We must recognize that this is not a women's issue, because women's lack of involvement in information technology affects all members of our society. We must recognize that this is an issue we cannot wait any longer to address.

See www.ncwit.org for more information.

EDUCATION COLUMN

Column Editor Ginger Warfield, Department of Mathematics, University of Washington, Seattle, WA 98195; warfield@math.washington.edu.

"Explicitification"

I have just been ambushed by an idea. It's not a new one—I have met it from time to time for a number of years—but at the Joint Meetings in January it seemed to be lurking behind every third talk that I went to, ready to pounce on me in a new guise. Needless to say, I have been thinking a lot about it since.

The idea first came into my consciousness in the mid-eighties in an article that put words to a vague worry I had been carrying with me since I first ran into math "manipulatives"—physical objects designed to enable a child to learn a variety of concepts. Many of these objects are wonderful, and to a mathematically inclined adult they clearly produce physical manifestations with deep connections to significant mathematical concepts. The question is: are those connections going to be made by the child? Answer: not necessarily. Seeing children engaged and successfully carrying out the relevant tasks can produce a great sense of satisfaction, and with it the temptation to assume that the task of the teacher is done. That assumption is false—if the connections are not made explicit, then by and large they will not happen, and the learning produced by the physical manipulations, not being part of any intellectual network, will swiftly fade out.

One of my early bits of bonding with *Didactique* occurred when I found this same idea in Guy Brousseau's writing. He was discussing the impact of Zoltan Diénes's "blue blocks" and maintained that the ideas they produced, while sometimes pretty sophisticated, rarely fed into children's overall learning. Not only did this give me a bond, it gave me a verb that English lacks: *expliciter*. I envy the French that one, so much more emphatic than "to make explicit." That's what needs to be done about the connections between the manipulations and the concepts.

After that I began making some connections on my own. For instance, there is an issue that can produce serious difficulties in doing professional development for teachers. A mathematician planning to teach a workshop or institute wants to offer an intellectually exciting experience which he or she knows will enrich the teachers' understanding of some mathematical concepts, thereby strengthening their capacity to teach those concepts. When the teachers fail to get excited, the mathematician tends to decry their lack of curiosity and/or ability and finish up in an (intellectual) huff. It's very easy to say "All they want is something to take into the classroom next Tuesday." Sometimes (let's be honest!) it's even true. On the other hand, a workshop that begins with an explicit discussion of how the topics undertaken will directly strengthen what the teachers can do for their students stands an excellent chance of being thoroughly successful without a single make-it-and-take-it item.

On to the January meetings. The first session I got to was one sponsored jointly by MER (Mathematicians and Educational Reform) and the MAA's COMET (Committee on the Mathematical Education of Teachers). It had a number of excellent talks, but the moment that grabbed me came in a talk by Cameron Sawyer. She was describing a capstone course for future high school teachers that she has developed at Southwestern University with COMET support. The course focus is well represented by the title of its textbook, Zalman Usiskin's *High School Algebra from an Advanced Standpoint.* And the capstone project for this capstone course is to find three sets of problems, each set consisting of one from the course itself, one from a different college level course and one from a high school text book, and to show how each element of the set connects to the other two. Explicit? Yes, indeed!

Avoiding a laundry list format, I shall skip to the last and most dramatic example. That one came in a pair of sessions entitled *Using mathematically rich activities to develop K–12 curricula.* The curriculum under discussion, which is still a work in progress, developed out of the work of Bob Moses, author of *Radical Equations: Math Literacy and Civil Rights.* Moses' contention is that mathematical literacy is the major gatekeeper shutting people off from escaping poverty. In support of that theory he has worked for many years in a school in Mississippi. First, with indefatigable patience and energy (not to mention good teaching) he earned the trust of the school administration. Then he began to introduce and work on a curriculum that would enable many more students from that school, with a largely African-American, economically distressed population, to learn enough to handle college admission tests and college itself. The idea, of course, is to make that curriculum available

ultimately to many more such students. The design of the curriculum has now become a project involving a number of people besides Moses, and it was to that design that we were introduced.

We started off taking part in one of the actual activities. A simple set-up where we moved between "buildings" (pieces of paper labeled 1, 2, 3, 4) taped to the floor according to a couple of specific rules led into a puzzle that my group definitely had to think about. Other groups did, too, and came up with solutions not at all similar to ours. A great activity, in short. And then the presenter said, "And you can all see that this is a perfect setup for understanding composition of functions," thereby setting all manner of alarm bells jangling in my head. They continued their jangling until the next session, when we found out just how the lessons progressed. Allowing for a little reconstruction from slightly sketchy notes it looks like this:

"Set up a chart that shows what happens when I require you to make move A. Now do a chart for move B. Now see what happens if you do A and then B. Confused? Go back to the buildings on the floor and walk it through. Now see if you can come up with a notation for what the charts are telling us so that we can describe things more compactly. Let's look at everybody's notations and see how they work. Here, practice the one this group came up with. Now practice the one from that group. OK, mathematicians call this a function and here's the notation they generally use. Let's practice that one, too. Why don't you walk through the movements that this function over here would indicate? Now what happens if you do this function and then that function? Walk it!"

Now that's what I call explicitification raised to a high art!

GENDER EQUITY

press release

The American Association of University Professors (AAUP) has released an update on gender equity in academia. The sad story is that the 2003–04 figures show little improvement in the salary gap over twenty-five years of higher education history.

Among full-time faculty, for example, 38 percent are women. But among full professors, only 23 percent are women. Conversely, women are well represented among the lower ranks; women are 58 percent of all instructors, 54 percent of all lecturers, and hold 51 percent of all unranked positions.

The report on earnings shows a similarly skewed picture. On average among full-time faculty, across all ranks and all types of institutions, women earn 80 percent of what men earn. While this disparity can be explained in part by the uneven distribution across ranks, as described above, there's more to the story. At the full professor level, for example, women earn about 88 percent of what their male counterparts earn.

Apparently, the higher the institution's prestige, the greater the gender gap. At community colleges without faculty ranks, women earn on average 96 percent of what men earn. The gap grows at baccalaureate and master's institutions, where women earn 89 and 87 percent, respectively, of the male average. At doctoral-level institutions, women earn only 78 percent of the average male faculty salary.

These and other figures are provided in the "Faculty Salary and Faculty Distribution Fact Sheet, 2003–04," available at www.aaup.org/research/sal&distribution.htm and prepared by Dr. John W. Curtis, research director at the AAUP. Dr. Muriel Poston, chair of AAUP's Committee on the Status of Women in the Profession, welcomed the updated analysis. "The 'Faculty Salary and Faculty Distribution Fact Sheet' is an important resource for understanding the status of women faculty with regard to salary equity and progression through rank. Faculty members will find this document a useful tool in planning for female faculty recruitment or salary equity improvements. The committee is pleased to have updated figures published now on a regular basis."

The analysis is based on the results of the AAUP's annual faculty compensation survey, a comprehensive study of faculty salaries, benefits, and tenure status, published in April 2004, and relied upon by institutions throughout the country to evaluate their compensation of faculty relative to peer institutions. Excerpts from the "Annual Report on the Economic Status of the Profession" are available online at www.aaup.org/surveys/zrep.htm. The full report is available from AAUP, 1012 Fourteenth Street NW, Suite 500, Washington D.C. 20005 for $68.00 including shipping and handling. Order online, by mail, or by phone at 202-737-5900.

MATHEMATICS AWARENESS MONTH 2005

The American Mathematical Society, the American Statistical Association, the Mathematical Association of America, and the Society for Industrial and Applied Mathematics announce that the theme for Mathematics Awareness Month 2005 is Mathematics and the Cosmos.

Mathematics is at the core of our attempts to understand the universe at every level from the most theoretical to the most mundane. Modern cosmology is based on the ideas of Riemann regarding the nature of space, along with the notion of curved spaces of three and more dimensions, adapted by Einstein to four-dimensional space time, and encapsulated in Einstein's fundamental insight that gravity is geometry. From this, and his justly famous field equations, Einstein deduced on theoretical grounds the bending of light as it passes a massive object, the precise amount of precession of Mercury's perihelion, the expansion of the universe, the existence of black holes, the behavior of binary stars, and the existence of gravitational waves, all of which led to experiments to confirm their validity.

In cases not subject to direct experimentation, other mathematical methods are vital for carrying out simulations of the motions within galaxies and star clusters, the collision of galaxies and black holes, and other large-scale gravitational interactions. At the level of the solar system, the mathematical methods initiated by Newton and continually elaborated over the ensuing centuries have explained or predicted the action of the tides, the bulge of the earth around the equator, the existence of previously unknown planets, the orbits and return times of comets, and just in the past decade, the existence of planets orbiting other stars.

In the realm of practical space exploration, mathematical techniques allow the planning of efficient trajectories to reach the moon, Mars and the outer planets, and the means to communicate with those satellites, both for navigation and to encode, compress, and transmit images across many hundreds of millions of miles of space, as in the recent spectacular photographs from the Cassini mission to Saturn.

A sample press release that mathematics departments may adapt for public awareness activities is available at the Mathematics Awareness Month website, www.mathaware.org.

NON-STANDARD CAREERS

Ginger Warfield

For the past several years we have been running a series of mini-biographies or autobiographies of women who are enjoying mathematical careers that in one manner or another do not follow the most visible academic trajectory from degree to tenure. Many have been provided by the women themselves, others have resulted from suggestions made to me. It has been a great pleasure for me to have the chance of making (virtual) acquaintance with a number of really interesting women. The only downside has been lack of a back-up for the issues when no one has come forward with an idea. Now Bettye Anne Case and Anne Leggett have taken care of that. Their newly published book, *Complexities: Women in Mathematics* (Princeton University Press), just introduced me to a whole collection of absolutely fascinating women. I'm still hoping that most issues of the newsletter will result from stories or suggestion sent by you readers (that's a broad hint! Send any such to warfield@math.washington.edu), but in months like this one when none materialize, I will introduce you to some of the women to whom *Complexities* just introduced me.

My first choice results from a legacy of my youth. My father, who was president of the AMS and of the MAA, and was on the original National Science Board—i.e., who had contact with enormous numbers of mathematicians and scientists—would sometimes speak of Mina Rees. The combination of respect, admiration and affection in his voice so impressed me that I remembered her name even though I picked up nothing at all about who she was. I was therefore particularly delighted to find her autobiographical remarks in the book. What follows is a summary of those remarks, with some bits extracted directly.

Mina Rees finished her Ph.D. at Chicago in 1931 and then took up what she terms "the usual duties associated with academic life" at Hunter College. The jump from standard career to non-standard came in 1943, when she accepted an invitation to join the staff of Warren Weaver, chief of the Applied Math Panel (AMP) of the Office of Scientific Research and Development. The panel carried on a broadly based and successful effort to bring mathematics to the service of the war effort. Her duties involved contact with the work going on under all contracts and attendance at all meetings of the AMP.

There were trips to military installations to clarify the problems they had been asked to help solve, to determine whether they could do something useful, and to formulate recommendations to the panel. There were also reports to prepare on progress, or lack thereof, on the projects undertaken. Apparently she took to all this like a duck to water, because by the end of the war, when the Office of Naval Research was established she was the natural candidate to head its mathematics component ("although my being a woman raised some serious doubts").

After seven more years, she returned to academia, to be dean of Hunter College. As she says, her course was set. She was committed to administration, not research, but administration with a heavy orientation towards science. She went on to become central administrator of the newly developed City University of New York and to serve on multitudinous national committees and boards.

Her final two paragraphs are so relevant in today's climate that I shall quote them in their entirety:

> I believe it is fair to say that, in the navy and while I was active in graduate education, I had some impact on the growing acceptance of women both in graduate education and in administrative and policy-making posts. In 1972, in a paper presented at a meeting of the American Council on Education, I reported that at CUNY, in contrast to several other universities, there was strong evidence that women's performance as graduate students was about the same as that of men. This was true with respect to all three parameters used to measure the performance in other studies: completion of the first or qualifying examination, completion of all requirements for the degree except the dissertation, and completion of the degree. Moreover, at our graduate school, women's admission to graduate study, access to fellowships, and acceptance on the faculty and in the administration seemed to be substantially without discrimination. At ONR, other women have been appointed to top administrative positions.
>
> I have enjoyed and cherished my associations with mathematicians, but I made no significant contributions to the corpus of mathematical work. When I was young, my only ambition was to be a research mathematician. In retrospect, I don't believe that was ever possible for me, although it is for some women. It is clearly essential that we provide opportunities for women as well as for men to find the satisfactions and the rewards of research careers if their talents and commitments make such careers possible. And other women are now showing the way.

OPPORTUNITIES

People to People Ambassador Delegation

"Friends of Women in the Mathematical Sciences" will be held December 4–16, 2005, in Beijing, Shanghai, and ??. We will meet with mathematicians and others in China who are interested in encouraging and promoting women in mathematics. We will compare notes on our countries' opportunities, perceptions, etc. This is a goodwill trip, to promote international cooperation, led by Sylvia Wiegand (swiegand@math.unl.edu). Please contact Sylvia if you are interested, if you would like more details, or if you have suggestions.

HRUMC XII

The 12th annual Hudson River Undergraduate Mathematics Conference will be held at Williams College in Williamstown, Massachusetts on April 30, 2005. The conference includes presentations on mathematics by both faculty and students, and both are encouraged to participate. Conference sessions are designed so that some presentations are accessible to undergraduates in their first years of study, and others are accessible to third or fourth year undergraduate mathematics majors.

The keynote speaker for this year will be Ken Ribet, Professor of Mathematics, University of California, Berkeley. You may find out more about HRUMC by visiting the conference website, www.skidmore.edu/academics/mcs/hrumc.htm.

Infinite Possibilities Conference 2005

The Infinite Possibilities Conference is a conference designed to support, empower and encourage underrepresented minority women in the mathematical sciences. It will take place April 1–2, 2005 on the campus of Spelman College in Atlanta, GA.

This unique and historic event will assemble women mathematicians from underrepresented minority groups from all over the country for a two-day mathematics

conference. The goal of the conference is to make all participants aware of the unlimited number of ways in which mathematicians can make valuable contributions to the mathematics community and society at large. The need for increased representation of minority women in the mathematical sciences cannot be overstated. This exciting and enriching conference will increase participation of underrepresented minority women in the mathematical sciences by allowing conferees to discover the infinite possibilities mathematics can offer them in their academic and professional journeys. Specifically, the conference aims to:

- Encourage undergraduate students to pursue advanced degrees in mathematics.
- Provide necessary information and resources for graduate study of mathematics and professional development.
- Highlight innovative research in various branches of mathematics.
- Create a forum to discuss experiences unique to minority women mathematicians.
- Facilitate the partnering of mentoring relationships between students and professionals.
- Increase awareness of existing organizations and programs that support women and underrepresented minority groups.
- Celebrate and honor the achievements of women from underrepresented minority groups in mathematics.

We are thrilled to feature invited speakers Fern Hunt and Cleopatria Martinez, both doctoral mathematicians. Other highlights include research roundtables, student poster session and panels, workshops and discussions on Professional Development, Mentoring and Networking, Preparing for Graduate School, Career Options in Mathematics, and The Balancing Act: Balancing our Professional and Personal Lives. A special banquet will honor the late Dr. Etta Falconer.

The conference organizing committee is comprised of mathematicians from around the country, all with masters or doctoral degrees in the mathematical sciences, who have demonstrated leadership abilities, a commitment to excellence, and a desire to motivate and inspire others to excel in mathematics throughout their academic and professional careers. Representing different fields of mathematics and different stages of professional growth, the organizing committee believes that by working together a great difference can be made. Our aim for the Infinite Possibilities Conference is to educate, empower and create new frontiers by building on the undaunted spirit of women in the mathematical sciences.

Leona Clark and Tanya Henneman are co-chairs for IPC 2005. For more information, see www. ipc2005.com or email ipc@spelman.edu.

AAUP Award

The Iris Molotsky Award for Excellence in Coverage of Higher Education is given for outstanding analytical and investigative reporting on higher education. The award is intended to recognize and stimulate coverage of higher education nationally and to encourage thoughtful and comprehensive reporting of higher education issues. Entries will be judged on the basis of their relevance to issues confronting higher education.

Entries for the award must have been published in a newspaper or magazine between January 1 and December 31 of the prior year. Entries may be single articles or a series, but editorials and columns will not be considered for the award.

Submissions may be made by media organizations or employees. Applicants may be self-nominating. The application deadline is **April 15**. Each application must be accompanied by an entry form. Contact Robin Burns (rburns@aaup.org) at the AAUP's Washington office for more information.

James Madison Scholarships

The James Madison University Mathematics and Computer Science programs are offering two-year scholarships to new and transfer students beginning this fall. These scholarships, funded by the National Science Foundation, provide students $3,125 per year for tuition and expenses. Applicants must be US citizens or permanent residents. Scholarships are awarded on the basis of financial need and academic potential. Students from groups underrepresented in the sciences are especially encouraged to apply. For more information, see www. math.jmu.edu/csems.

AWM EXECUTIVE DIRECTOR

The Association for Women in Mathematics is seeking applicants for a possible position of Executive Director. *(Please check the AWM website, www.awm-math.org, to see if the position is still open before applying.)*

The AWM is dedicated to achieving full participation and equity for women and girls in the mathematical sciences. In support of this mission, AWM seeks to promote awareness and recognition of women's achievements in the mathematical sciences, to administer programs that encourage women and girls, and to build community among all mathematical scientists.

This position requires a Ph.D. in any field of the mathematical sciences. The successful candidate will be responsible for administrative activities supportive of the mission and programs of our organization; experience handling federal grants would be helpful. The Executive Director will work closely with the AWM President and Executive Committee. The Executive Director will be the spokesperson or "public face" of AWM and will serve as liaison between volunteers, staff, and funding agencies. Experience with fundraising and development would be a valuable plus.

We are open to more than one model for structuring this position, and ask that candidates clearly state how they feel they could best contribute to the AWM. This could be a part-time position, possibly combined with an existing academic appointment. While the AWM currently maintains offices in the Baltimore/D.C. area, the geographic location of the Executive Director is flexible. Ultimately, we seek an outstanding individual who is passionate about supporting women in mathematics.

Early inquiry is encouraged. Review of applications will begin as they are received. Applicants are asked to describe why they feel well-suited to this position and how this position could best fit with their existing plans. Please include salary requirements, the date when work could commence and any special considerations. Letters of application, a curriculum vitae, and contact information for at least three people willing to be called upon to provide a reference should be sent as a single PDF file to awm@fields.utoronto.ca.

For more information about AWM, please visit our website at http://www.awm-math.org/.

Questions about this position should be directed to AWM President-Elect Dr. Barbara Lee Keyfitz at awm@fields.utoronto.ca.

AWM is an Equal Opportunity, Affirmative Action Employer.

TEXT OF PROPOSED BYLAWS CHANGES

New text is in **boldface** type, and language to be removed is ~~over struck~~.

4.2 Number and Election or Appointment of Officers

The Officers shall consist of the Executive Committee. The Executive Committee shall consist of the President, President-Elect (in even years) or Past President (in odd years), Treasurer, Newsletter Editor, Clerk, Meetings Coordinator, Web Editor, and ~~five~~ **eight to ten** At-Large Members. The Officers shall be elected or appointed as follows:

In the fall of even-numbered years, the Officers shall determine whether four or five At-Large Members are to be elected in the fall of the next odd-numbered year. In the fall of years 2005+4n, elections will be held by ~~mail~~ ballot of the general membership for the President-Elect, Clerk, and ~~three~~ **four or five (determined as above)** At-Large Members; ~~and~~ the Executive Committee shall appoint a Newsletter Editor, a Web Editor, and a Meetings Coordinator. In the fall of years ~~2003+4n~~ **2007+4n**, elections will be held by ~~mail~~ ballot of the general membership for the President-Elect, Treasurer, and ~~two~~ **four or five (determined as above)** At-Large Members; ~~and~~ the Executive Committee shall appoint a Newsletter Editor, a Web Editor, and a Meetings Coordinator. The Directors shall automatically appoint the President-Elect to be President immediately following her term of office, and the President to be Past President for the year immediately following her term of office.

4.13 Vacancies

If the office of any officer becomes vacant, the Executive Committee may elect **or appoint** a successor. Each such successor shall hold office for the unexpired term, and in the case of the President, Treasurer and Clerk until her successor is elected and qualified, or in each case until she sooner dies, resigns, is removed or becomes disqualified.

If changes in these Bylaws create a position or positions that cannot be filled immediately under the rules for election and appointment herein, the Executive Committee may elect or appoint an officer to fill each such position. Each such officer shall hold office until the next regularly scheduled election or appointment for her office, or until she sooner dies, resigns, is removed or becomes disqualified.

Ballot:

I approve of the Bylaws changes as presented on page 30 of the March–April 2005 AWM Newsletter.

☐ Yes

☐ No

Use this ballot or a facsimile thereof, or print a copy at www.awm-math.org. Return your ballot to AWM Ballot, 4114 CS&S Building, University of Maryland, College Park, MD 20742-2461 by **April 15, 2005**. You must validate your ballot by placing your signature and printing your name on the envelope flap. If you wish, you may enclose your ballot in an inner envelope.

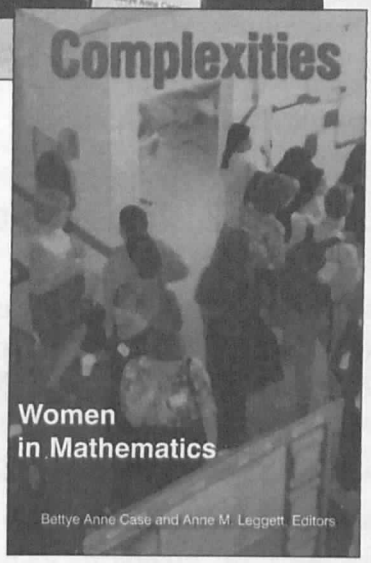
ADVERTISEMENTS

Complexities

Women in Mathematics

Bettye Anne Case and Anne M. Leggett, editors

PHOTO BY VICKIE KEARN



This eye-opening book presents the stories of dozens of women who have pursued careers in mathematics, often with inspiring tenacity. The contributors offer their own narratives, recount the experiences of women who came before them, and offer guidance for those who will follow in their career paths. The one thing they share in common is a genuine passion for mathematics.

"This book contains a wealth of inspiration for women in the mathematical sciences, with real life advice on how to weather the tough times, find joy in the good times, and at the same time experience excitement and love for the subject."
—Alison Marsden, Stanford University and Jerry Marsden, California Institute of Technology

"This astounding book provides a wealth of important information on women in mathematics ... exploring how they entered the field, what excited them about it in their youth, what excites them now, and the many ways these women have advanced the frontiers of mathematics, or have used mathematics to the benefit of society.... How wonderful that this is all gathered in one volume of easy reading."
—Mildred Dresselhaus, MIT

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MEMORIAL UNIVERSITY OF NEWFOUNDLAND
Department of Mathematics and Statistics

The Department of Mathematics and Statistics at Memorial University of Newfoundland invites applications for an NSERC University Faculty Award (**UFA**) directed at increasing the representation of Women and Aboriginal Peoples in Science and Engineering. A successful candidate will be appointed as a regular tenure-track faculty member at the **Assistant Professor** level in the Department of Mathematics and Statistics, starting September 1, 2006. A PhD in Mathematics or Statistics with evidence of outstanding research and excellent teaching is required. All areas of **Pure and Applied Mathematics and Statistics** will be considered. Duties will include teaching at the graduate and undergraduate levels.

Review of applications will begin June 1, 2005, and continue until a candidate is identified for submission to NSERC by October 15, 2005. Candidates should submit a Curriculum Vitae, a description of research interests. They should also arrange for the names and addresses of three referees be sent to:

Interim Head of Department
VPA-MAST-2004-002
Department of Mathematics & Statistics
Memorial University of Newfoundland
St. John's, NL, A1C 5S7 Canada

E-mail: mathstat@math.mun.ca, Internet: www.math.mun.ca

You MUST use the code VPA-MAST-2004-002 on all correspondence.
You MUST also indicate the appropriate discipline; Applied Mathematics, Pure Mathematics, or Statistics

Memorial University is the largest university in Atlantic Canada. As the province's only university, Memorial plays an integral role in the educational and cultural life of Newfoundland and Labrador. Offering diverse undergraduate and graduate programs to almost 18,000 students, Memorial provides a distinctive and stimulating environment for learning in St. John's, a very safe, friendly city with great historic charm, a vibrant cultural life, and easy access to a wide range of outdoor activities.

In accordance with NSERC UFA eligibility requirements only Canadian citizens and permanent residents of Canada should apply. Partners of candidates for positions are invited to include their resume for possible matching with other job opportunities.

-more-

ADVERTISEMENTS

The Cornell Topology Festival
May 6-9, 2005 — Ithaca, NY
http://www.math.cornell.edu/~festival/

This year's Festival features 3-manifolds, Geometric Group Theory, and a mini concentration in symplectic geometry and topology. The conference consists of one-hour talks by leading speakers with much time for interaction. There will be two instructional lectures near the beginning of the Festival.

The speakers: **D. Auroux** (MIT); **A. Banyaga** (Penn State); **P. Biran** (Tel Aviv); **T. Delzant** (Strasbourg); **Y. Eliashberg** (Stanford); **E. Ghys** (ENS-Lyon); **Y. Karshon** (Toronto); **J. Morgan** (Columbia); **S. Mozes** (Hebrew Univ.) (to be confirmed); **Y. Ollivier** (ENS-Lyon); and **B. Owens** (Cornell).

Financial support will be available: Young researchers (including graduate students) as well as members of underrepresented groups are especially encouraged to apply. If interested, please fill out the form on the webpage given above.

BRONX COMMUNITY COLLEGE
OF THE CITY UNIVERSITY OF NEW YORK (CUNY)

FULL-TIME TENURE-TRACK FACULTY POSITIONS 2005

Visit our website http://www.cuny.edu/abtcuny/cunyjobs/ or http://www.bcc.cuny.edu

Mathematics & Computer Science: The **Mathematics & Computer Science** Department of Bronx Community College, City University of New York, seeks to fill out six tenure-track positions in the ranks of Lecturer/Assistant/Associate Professor.

LECTURER/ASSISTANT PROFESSOR

Description and Duties: Full-time tenure-track faculty position to teach developmental and upper level Mathematics and Computer Science courses. Evening, Saturday, and Sunday teaching required.

Qualification Requirements: Assistant Professor: Doctorate in Mathematics/Computer Science or Mathematics Education required. Lecturer: Master's degree preferred. Record of commitment to excellence in teaching desired. Knowledge of databases and/or instructional technologies and grant writing an asset. Good interpersonal skills required. Must be available for evening and weekend work.

Salary Range:

Lecturer: $32,997 - $53,113 Assistant Professor: $35,031 - $56,014

ASSISTANT/ASSOCIATE PROFESSOR

Position Description and Duties: Full-time tenure-track faculty position teaching mathematics courses, participating in interdisciplinary course development; commitment to improving student's writing and thinking skills; student recruitment; student advisement; research in mathematics education; and service to the college and community. Evening, Saturday, and Sunday teaching required.

Qualification Requirements: Ph.D. or Ed.D. in Mathematics or Mathematics Education, with a research agenda in Mathematics Education. Candidates with experience in teacher preparation for secondary school mathematics instruction will be given special consideration.

Salary Range:

Assistant Professor: $41,974 - $61,111 Associate Professor: $45,651 - $73,028

Send cover letter and resume, listing current salary and three letters of reference by 04/08/05 to: **Ms. Shelley B. Levy, Director of Human Resources, Office of Human Resources, Bronx Community College, University Avenue & West 181st Street, Bronx, NY 10453.**

EEO//AA/IRCA/ADA Employer.

-more-

ADVERTISEMENTS

PURDUE UNIVERSITY - DEPARTMENT OF STATISTICS - Faculty Position(s) in Statistics - The Department of Statistics at Purdue University has one or more openings for faculty positions. Screening will begin December 1, 2004, and continue until the position(s) is (are) filled. See http://www.stat.purdue.edu. The department also plans to fill, in a school-wide effort, several faculty positions in multidisciplinary areas. Within this effort, the department seeks to fill positions in the areas of bioinformatics, statistical computing and spatial statistics. Applicants in these fields should address the multidisciplinary contributions of their work in their research statement. For more information see http://www.science.purdue.edu/COALESCE/. Essential Duties: Conduct advanced research in statistical sciences, teach undergraduate and graduate students and maintain service in the Statistics Department. Essential Qualifications: Require Ph.D. in Statistics or related field, in hand or expected by August 15, 2005. Candidates must demonstrate potential excellence in research and teaching. Salary and benefits are competitive and commensurate with qualifications. Rank and salary are open. Candidates for assistant professor should send a letter of application, curriculum vita and three letters of reference. For senior positions, send a letter of application or nominations, curriculum vitae, and the names of three references. Purdue University is an AA/EA/EO employer and educator. Send applications to: **Mary Ellen Bock, Head, Department of Statistics, Purdue University, 150 N. University Street, West Lafayette, IN 47907-2067, USA.**

PURDUE UNIVERSITY - DEPARTMENT OF STATISTICS - Faculty Position(s) in Statistics – - Faculty Position in Spatial Statistics - As part of Purdue University's enhancement of excellence in climate change research, outreach, and education, the Department of Statistics in the School of Science invites applications for an open rank, tenure-track or tenured position in the area of Spatial Statistics. This position, to begin August 2005, is part of a School of Science cluster hire initiative involving many departments across campus. Reflecting the interdisciplinary and collaborative nature of climate change research, it is expected that this position will be a joint appointment between the Department of Statistics and a department in the School of Agriculture. Applicants should have a Ph.D. in Statistics or related field and must demonstrate potential excellence in collaborative research and teaching. Purdue University has already made major investments in this initiative, including the establishment of the Purdue Climate Change Research Center http://www.esei.purdue.edu/pccrc, which will coordinate the existing and developing resources and activities in climate change research. In the last two years, several new faculty have been hired in related areas, with growth expected to continue. Research focus areas include but are not limited to regional and global scale climate modeling, climate policy analysis and/or risk assessment, climate-land interactions, agricultural and ecosystem health impacts, biogeochemical flux measurements, biogeochemical modeling, and aerosols, radiation and climate. Please submit curriculum vitae, representative publications, descriptions of research and teaching interests and names and contact information of at least four references. **Electronic submission provided below is strongly preferred.** Applications will be reviewed beginning Jan. 10, 2005, and will continue until the position is filled. For additional information or clarification, please contact **Bruce Craig at spatial@stat.purdue.edu** or (765) 494-6043. Purdue University is an Equal Opportunity/Equal Access/Affirmative Action employer.

WESTERN KENTUCKY UNIVERSITY - DEPARTMENT OF MATHEMATICS – Applications are invited for the position of Head of the Department of Mathematics starting July 1, 2005. Applicant must have a doctorate in mathematics or a mathematical science with appropriate credentials for a tenured appointment at the rank of professor. We are seeking a dedicated and effective leader who can help promote and strengthen the department's academic, research, and service programs. Qualified candidates must have a commitment to recognizing and encouraging excellence in teaching, have a familiarity with current issues involving the mathematics curriculum, and technology, and have an established record of research/scholarly activity and a commitment to encouraging such activity, and have a history of significant professional service. Evidence of additional administrative expertise is also desired. Mathematics is one of the nine departments in the College of Science and Engineering. With 34 full-time positions (23 tenured/tenure-track), the department offers baccalaureate and masters programs in mathematics. In addition, mathematics is included in the university general education requirements for all undergraduate degrees. Western Kentucky University enrolls approximately 18,000 undergraduate and graduate students, including more than 1300 minority and 500 international students, and has a strong commitment to achieving diversity among faculty, staff, and administration. The university is in Bowling Green, between Nashville, TN and Louisville. Review of applications will begin February 1, 2005 and will continue until the position is filled. Please send a letter of application, vita, a statement of administrative leadership philosophy, and at least three letters of recommendation to: **Dr. Frank Conley, Interim Chair, Search Committee, Department of Mathematics, Western Kentucky University, 1 Big Red Way, Bowling Green, KY 42101.** e-mail: frank.conley@wku.edu. For more information about the Department of Mathematics at Western Kentucky University, visit our web page at www.wku.edu/math. Western Kentucky University is an EO/AA employer

AWM Gift Memberships

If you would like to give a gift membership to a student, friend or colleague, please fill out the membership form on **PAGE 35** with the pertinent information and indicate that it is a gift membership. AWM will send a notice to the individual informing of their membership and that it is a gift from you.

SEND MEMBERSHIP DUES AND/OR CONTRIBUTIONS TO: **AWM Membership, 4114 CSS Bldg., University of Maryland, College Park, Maryland 20742-2461.** Any questions, please contact us at: 301-405-7892 or awm@math.umd.edu

Address Change? Position Change? Please let AWM know!

Please inform us of any changes, so we can keep our database up-to-date. Just fill out the changes using the **form on the BACK COVER** or drop us an **email**. THANKS.

EMAIL: **awm@math.umd.edu**

Advertising Deadline* for the *May/June 2005* issue is *April 1, 2005

A W M

Association for Women in Mathematics

2004/2005 MEMBERSHIP FORM

LAST NAME FIRST NAME M.I.

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AWM's membership year is from October 1st to September 30th. Please fill-in this information and return it along with your DUES to:

AWM Membership
4114 Computer & Space Sciences Building
University of Maryland
College Park, MD 20742-2461

The AWM Newsletter is published six times a year and is part of your membership. Any questions, contact AWM at awm@math.umd.edu; (301) 405-7892 or refer to our website at: **http://www.awm-math.org**

❑ I **DO NOT** wish for my AWM membership information to be released for the **Combined Membership List.**

Email: **Home Phone:** ❑ **do not** publish home number **Work Phone:** ❑ **do not** publish work number

Date of Birth (optional):_____ (MMDDYYYY) [the date of birth field is to strictly help prevent duplicate entries]

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Institution/Company:
City, State, Zip:
If **student,** GRADUATE or UNDERGRADUATE (circle one)
If not employed, leave position & institution blank

DEGREES EARNED:

	Degree(s)	Institution(s)	Year(s)
Doctorate:			
Master's:			
Bachelor's:			

MA_05

INDIVIDUAL DUES SCHEDULE

Please check the appropriate membership category below. Make checks or money order payable to: **Association for Women in Mathematics.**
NOTE: All checks must be drawn on U.S. Banks and be in U.S. Funds. AWM Membership year is **October 1st to September 30th.**

REGULAR INDIVIDUAL MEMBERSHIP..... *For NEW Individual members: JOIN at the reduced rate of $30.00 for the 04/05 membership year [valid thru 9/30/05]*	$ 50	
2ND FAMILY MEMBERSHIP.....	$ 30	
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CONTRIBUTING MEMBERSHIP.....	$100	
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❑ I am also enclosing a DONATION to the **"AWM ANNIVERSARY ENDOWMENT FUND"**.....	$	

Indicate if you wish for your **contribution(s)/donation(s)** to remain **ANONYMOUS** ⇨ ❑
Dues in excess of $15 and all cash contributions/donations are deductible from federal taxable income.

INSTITUTIONAL DUES SCHEDULE

❑ CATEGORY **1** (includes 10 student memberships; 1 free ad; 25% off additional Newsletter & online ads∗)..	$250	
❑ CATEGORY **2A** (includes 3 student memberships; 1 free ad; 10% off additional Newsletter & online ads∗)....	$125	
❑ CATEGORY **2B** (includes 6 student memberships; 10% off Newsletter & online ads∗).....	$125	

ADVERTISING: Institutional members on Categories 1 and 2a receive ONE FREE job link ad **or** ONE FREE Newsletter ad (up to 4 lines) for the membership year Oct. 1st to Sept. 30th. All institutional members receive discounts on other eligible∗ advertisements (25% off for Category 1 and 10% off for Categories 2a and 2b). ∗Eligible advertisements: The institutional discount applies to both classified and job link online ads as well as classified *Newsletter* ads, but it does not apply to *Newsletter* display ads. If institutional dues have not been received by the invoice date, the full advertising rate will be charged. *Newsletter* advertising deadlines are the 1st of every EVEN month. All institutions advertising are Affirmative Action/Equal Opportunity Employers. **STUDENT NOMINEES**: Institutions have the option to nominate students to receive the newsletter as part of their membership. List names and addresses of student nominees on opposite side or attach a separate page. [ADD $15 ($23 for foreign members) to listed institutional rate for each student add-on over the initial 10 students for Category 1; over the initial 3 students for Category 2a & over the initial 6 students for Category 2b]. For more advertising/membership info see **www.awm-math.org**

❑ Indicate if **GIFT membership FROM:** _____ **TOTAL ENCLOSED $** _____

Volume 35, Number 2, March–Apr

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- ☐ Please change my address to:
- ☐ Please send membership information to my colleague listed below:
- ☐ No forwarding address known for the individual listed below (enclose copy of label):

(Please Print)

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