AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

PRESIDENT'S REPORT

It is not too late to apply for the workshop **Career Options for Women in Mathematical Sciences** to be held February 4–5. This workshop is jointly organized by the Institute for Mathematics and its Applications and the AWM. See www.ima.umn.edu/cwims/ and the article on page 6 for more info on this chance to learn more about professional opportunities for mathematical scientists in industry and in government labs and to learn strategies and skills for moving into and thriving in such positions. Our thanks to the organizing committee (Natalia M. Alexandrov, Kathryn Brenan, L. Pamela Cook, Erica Zimmer Klampfl, Kristin Lauter, Suzanne Lenhart and Debra Lewis) for preparing an innovative and stimulating program.

In the previous newsletter, we announced the debut at the Joint Mathematics Meetings of the book **Complexities: Women in Mathematics**, Bettye Anne Case and Anne M. Leggett, editors. This fascinating volume is now available from Princeton University Press; see www.pupress.princeton.edu/ titles/ 7915.html.

Welcome to new **AWM Student Chapters** at Chatham College, Clarkson University, Illinois Wesleyan University, University of Montana, and William Paterson University.

2005 AWM Election; Bylaws change. In fall 2005, the AWM will hold elections for the positions of President-Elect, Clerk, and At-Large Members on the Executive Committee. You will find a Call for Suggestions on page 5 of this newsletter; please note the submission deadline of February 15. The current bylaws call for five At-Large Members, with three to be elected in the upcoming election cycle. However, at the time of this writing, we anticipate bringing to the membership a proposed change in the bylaws to increase the total number of At-Large Members. We anticipate that this proposal will first be presented at the AWM Business Meeting during the Joint Mathematics Meetings and, if approved for consideration at that time, will come before the full membership for a vote prior to the upcoming election. If the bylaws change is passed, we anticipate electing four

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At-Large Members. The officers elected will join the Executive Committee on February 1, 2006.

The motivation for the proposed bylaws change is to provide a more effective structure to the governance of the AWM by having each At-Large Member be more directly involved in a specific aspect of the AWM's work. The President, in conjunction with the other officers, will continue to coordinate the overall effort. We anticipate that the new structure (pending the bylaws change) will enable the AWM to increase its impact.

AWM Office Staff. Dawn Wheeler, Director of Development, Meetings, and Marketing, has recently decided to leave the AWM for a new position. Dawn has served the AWM with great dedication for twelve years and has seen the organization through considerable growth and program expansion. For many participants in the AWM workshops and other programs, Dawn *is* the AWM, as she brings a warm concern for their every individual need. The AWM greatly appreciates Dawn's willingness to continue working part-time (evenings and weekends) while we seek a permanent staffing arrangement. We are especially delighted that one of her first requests of her new employer was permission to attend the Joint Mathematics Meetings to support our activities. This newsletter will probably reach you only after the Joint Meetings, but I hope that you were able to take the opportunity to wish her the best in her new position.

The AWM was also sad to see Muriel Daley, AWM accountant, leave for a new position. Muriel will be missed both for her excellent service to the AWM and for her invariably positive approach. Like Dawn, Muriel graciously volunteered to continue part-time with evening work while we are in transition. Dawn and Muriel's work during this period is an immeasurable help to us.

AWM Meetings Coordinator, Bettye Anne Case, has jumped in with even more than her usual careful attention to ensure the smooth running of our activities at the Joint Mathematics Meetings. She is assisted by the newly formed Committee on Meetings and Conferences, which she chairs. Thank you, Bettye Anne!

Currently we are researching long-term staffing options, while the AWM office is being staffed by temporary employees with the important assistance of Dawn and Muriel. We are, in particular, considering the possible hiring of an Executive Director. You will find an advertisement for this position on page 27 and at www.awm-math.org/EDPosition.html.

Etta Zuber Falconer Lecture. Beginning with MathFest 2005, the AWM-MAA Lecture is being renamed the Etta Z. Falconer Lecture to honor Falconer's profound vision and accomplishments in enhancing the movement of minorities and women into scientific careers. Her many honors include Spelman's Presidential Awards for Excellence in Teaching and for Distinguished Service, NAM's Distinguished Service Award, the AWM's Louise Hay Award for Contributions to Mathematics

Education, the Giants in Science Award from the Quality Education for Minorities Network, an honorary doctorate from the University of Wisconsin. and the AAAS Lifetime Mentor Award. Quoting from her address after receiving the Louise Hay Award: *"I have devoted my entire life to increasing the number of highly qualified African Americans in mathematics and mathematics related careers. High expectations, the building of self-confidence, and the creation of a nurturing environment have been essential components for the success of these students. They have fully justified my beliefs. Perhaps the most rewarding moments have come when younger faculty have undertaken the same goal and have surpassed my efforts—reaching out to the broader community to help minorities and women achieve in mathematics."*

The AWM, in conjunction with the MAA, is honored to recognize her achievements through the naming of the annual lecture. We are delighted to announce that Dr. Fern Hunt of the National Institute of Standards and Technology will deliver the first Etta Z. Falconer Lecture at MathFest 2005.

Funding news. We are very pleased to thank the National Security Agency for renewing its support of our Workshops for Women Graduate Students and Recent Ph.D.'s. Their support, along with that of the Office of Naval Research, enable us to provide advice and encouragement to young women at the start of their careers and to present their research to the mathematics community.

We were disheartened to learn that Congress has cut the appropriation for the National Science Foundation to approximately $105 million below last year's level. Quoting Congressman Vernon J. Ehlers, chair of the Subcommittee on Environment, Standards and Technology of the House Science Committee: *"NSF has been praised as a model of administrative efficiency—over 95 percent of its funds go directly to support education and research programs. Former OMB director, Mitch Daniels, praised NSF as a model of administrative efficiency and called NSF one of the 'true centers of excellence in this government' for its low overhead costs and efficient use of tax dollars. Furthermore, NSF has earned a reputation as the premiere basic research institution, despite receiving only 4 percent of the total federal research and development budget. I am concerned about the kind of message we are sending by cutting funding of agencies, such as NSF, that succeed*

so well with already lean budgets, while rewarding less-efficient agencies by increasing their funding.

"This decision shows dangerous disregard for our nation's future, and I am both concerned and astonished that we would make this decision at a time when other nations continue to surpass our students in math and science and consistently increase their funding of basic research...."

K–12 Education: Focus of CBMS Meeting. I just returned from the winter meeting of CBMS, where we had fascinating discussions concerning K–12 mathematics education from several perspectives. First Susan Sclafani, Counselor to the Secretary, U.S. Department of Education, shared gloomy statistics; e.g., only 7% of high school students express an interest in mathematics, science or engineering, and only 50% of middle school mathematics teachers have a major or minor in mathematics. Because science is not tested at the elementary school level, many elementary schools do not teach it at all. There was, not surprisingly, more agreement on the problems than on the solutions. In response to a question, she indicated that teachers' salaries are not a primary cause of the difficulty in recruiting and retaining well-prepared teachers. There has been a much greater emphasis in recent years on the need for research to evaluate curricular effectiveness. Susan Sclafani said there is substantial funding available for such research (but see below!). We next heard from Diane Spresser, Senior Program Officer of the Math-Science Partnerships (MSP) in EHR at NSF. Some recent components of the MSP program are the funding of Teachers Institutes for elementary as well as high school teachers and the funding of research to develop tools for evaluating curricular effectiveness. However, the low funding of NSF means that the emphasis on research into curricular effectiveness comes at the expense of implementation and replication. [See pages 9–10 for more info on MSP.]

Jere Confrey discussed the extensive MSEB Report "On Evaluating Curricular Effectiveness: Judging the Quality of K–12 Mathematics Evaluations", which you may find online at books.nap.edu/catalog/11025.html. Irwin Kra, Executive Director of the recently formed organization "Math for America," described the organization's goal of recruiting college seniors or mid-career professionals with mathematics backgrounds into K–12 teaching in New York City through fellowships and stipends. You may visit their website at www.mathforamerica.org. Finally, moving from K–12 to undergraduate education, Judy Ackerman and Susan Wood, President and Past-President, respectively, of AMATYC (Association of Mathematicians at Two-Year Colleges) presented "Beyond Crossroads: Implementing Mathematics Standards in the First Two Years of College". This excellent document, available at www.amatyc.org, should be of interest to instructors of undergraduate students in all settings, not only two-year colleges.

This is my final column as President of the AWM. It has been deeply gratifying to see up close the deep commitment of the many, many volunteers who carry out the work of the AWM.

In the next issue of the newsletter, I will report on AWM activities over the past two years. This has been a time of introspection for the AWM as we have considered our strengths and weaknesses and developed a new strategic plan. This process could not have taken place without the tremendous commitment of time, ideas and hard work of each and every member of the Executive Committee. Their investment of time and energy has gone very far beyond the usual expectations of Executive Committee members. The various members have wide-ranging experiences and perspectives; it has been inspiring to see how each has contributed in an absolutely essential way to the planning process.

Serving as president would not have been possible without the support of my family and my many friends in the AWM. My eleven-year-old daughter Annalisa has the natural leadership abilities that I am constantly trying to discover; her pep talks have helped me through many difficult moments. It has been a true delight to work with President-Elect Barbara Keyfitz this past year. Although this period is intended as a time for the President-Elect to learn and prepare for the presidency, I am constantly learning from Barbara.

It has been a wonderful experience to lead an organization whose members are so dedicated to our mission. Thank you!

Carolyn Gordon
Dartmouth College
November 27, 2004

CALL FOR SUGGESTIONS

In December 2005 we will be electing the following officers: President-Elect, Clerk and three or four (depending on whether or not the anticipated bylaws changes are approved) At-Large Members. Suggestions for candidates may be made to Carolyn Gordon or Barbara Keyfitz by **February 15, 2005;** they will pass them along to the Nominating Committee. Your input will be appreciated! Suzanne Lenhart (University of Tennessee and Oak Ridge Laboratory), recent AWM president, will serve as chair of the Nominating Committee.

CURIE PRIZE

Congratulations to MARIE-FRANÇOISE ROY on receiving the 2004 Prix Irène Joliot-Curie for research. The prize was established in 2001 by the Minister for Research to reward actions favoring the presence of girls in scientific and technical studies, to promote the position of women in the research community in France, and to recognize exemplary professional accomplishments in research, both public and private.

Roy, a professor of mathematics at l'Université Rennes 1, is current president of the Société Mathématique de France. A scientist of international renown, she has worked to promote opportunities for women in mathematics and computer science and has also worked to further mathematics in Africa. First president of "Femmes et Mathématiques," she was a founding member of European Women in Mathematics and initiated the "Forum des jeunes mathématiciennes et informaticiennes."

Roy's research has involved real spectra of rings and the development of formal calculus. Her book *Géométrie algébrique réele*, with J. Bochnak and M. Coste, is the primary reference book in the area. With S. Basu and R. Pollack, she wrote the graduate textbook *Algorithms in real algebraic geometry*.

Having spent time earlier in her career in Niger, she has since worked to further cultural exchange between France and Niger. She is one of two coordinators of "Réseau Africain d'Algèbre et de Géométrie Appliquées au Développement."

IMA-AWM WORKSHOP

The Institute for Mathematics and its Applications (IMA) in cooperation with AWM is hosting a workshop, "Career Options for Women in Mathematical Sciences," February 4–5, 2005, at the institute at the University of Minnesota. This workshop aims to familiarize women in the mathematical sciences with professional opportunities for mathematical scientists in industry and government labs and to suggest strategies for not merely surviving, but thriving. The workshop is geared primarily towards graduate students and Ph.D.'s in the early stages of their postgraduate careers, but should be valuable for researchers at all stages of professional development. Invited speakers, panelists and discussion leaders are women in research and management positions in industry and government labs and women in academia with strong industrial ties.

Friday morning there will be an optional pre-meeting negotiation skills session led by Barbara Butterfield, Ph.D., Associate Vice President of Human Resources/ Affirmative Action at the University of Michigan, and Jane Tucker, Ph.D., Senior Manager, IT at Duke University. Topics to be covered include principles of negotiation, developing "best alternatives to a negotiated agreement," and understanding your negotiating style. Case practices, particularly job interview scenarios, will be used to illustrate the principles presented.

There is no fee for either the main workshop or the negotiations skills session. Participation is limited for both events. Acceptance to the main workshop does not imply acceptance to the negotiation skills session. Registrants should send a current CV and a statement of interest concisely describing the applicant's reasons for wishing to participate in the workshop. A letter of support from an advisor, postdoctoral mentor, or department chair is not required, but may be included in support of the application.

Participants are encouraged, but not required, to present a poster in the poster session Friday evening. This will be an excellent opportunity to present yourself and your research to a very broad audience, including representatives from industry and national labs.

Limited funds are available through the IMA for supporting the travel and lodging of participants. For further information or to apply for participation, see www.ima. umn.edu/cwims on the IMA website.

AWM STUDENT CHAPTERS

AWM invites you to form an AWM Student Chapter at your university.

To form a chapter, a group must have three AWM student members willing to serve as officers and a faculty sponsor who is also an AWM member. These students and the faculty sponsor must complete a petition to become a student chapter along with proposed chapter bylaws.

Becoming an AWM Student Chapter is quite easy. We can send you copies of "Pro-Forma Bylaws" and a "Petition to create a chapter" form to get started. Bylaws and the petition form are to be submitted to the AWM Committee on Student Chapters. Once the petition and bylaws are approved, the chapter is established.

Contact Suzanne Lenhart at lenhart@math.utk.edu or Tamara Kolda at tgkolda@sandia.gov if you have any questions.

AWM Student Chapters will hold regular meetings and events, open to all undergraduate and graduate students, regardless of major or gender. These meetings and activities allow students to be exposed to the world of professional mathematics, to obtain information about the varied career options in mathematics, to network with professional mathematicians, and to develop leadership skills. Suggested activities for student chapters include sponsoring a lecture series by either students or local mathematicians, site visits to major employers of mathematicians, outreach through activities such as tutoring, social gatherings such as picnics or banquets, mentoring programs for youth, and special events such as career days.

For more information see http://www.awm-math.org/studentchapter.html.

CORRECTION

The top photo caption on page 30 of the November-December 2004 newsletter is incomplete. It should read: "Donna M. G. Comissiong explaining her poster to Phillip Andreae, son of AWM past president Suzanne Lenhart."

We apologize for the oversight.

EDUCATION COLUMN

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

The Theory of Situations in Statistics

Sometimes a return to something one worked on several years before produces a feeling of "Been there, done that, let's get on." Sometimes (alas!) it even produces a "Why did I ever think that was interesting??" Occasionally, though, returning with a new perspective unveils deeper aspects that had somehow remained out of sight before, and then the resonance can be really exciting. I have just had that experience, and while it is still resonating, I want to write about it—all the layers at once, rash though the attempt be.

First, some background: I was introduced to Probability as an undergraduate at Bryn Mawr, and became addicted on the spot. The addiction has taken various forms. First came a doctoral thesis on Stochastic Control Theory. Then, as my interests turned more and more to teaching, came the creation of a course for liberal arts majors that focused mainly on Probability. This led to the gradual discovery of the degree to which Probability requires a different kind of thinking from that to which students are accustomed, and how very challenging that thinking is. As I was discovering that, the K–12 world was in the process of decreeing that the teaching of Probability really ought to begin by Middle School at least—a decree that produced a considerable demand for me to do exactly what I most enjoyed doing: expanding my repertoire of ways to entice people to learn and enjoy elementary Probability. Eventually I added one more ambition: to have people not just enjoy Probability in the classroom, but recognize the ways in which it crops up constantly outside of the classroom, and be able to apply what they have learned from me after they have left my classroom. I'm still working on that one.

Meanwhile, in a different context, I became first intrigued and then deeply involved with Didactique, a French Mathematics Education research program founded in the late sixties by Guy Brousseau. The form that the involvement eventually took was the collaboration with Brousseau himself on a series of papers, simultaneously in his French and my English. The papers go back to his early work and describe it from his current perspective, in a way that clarifies it to people who are not part of the research program (a group that includes all Anglophones). Well before we finished our first such paper, we had agreed that the second would be about an experiment in the teaching of Statistics that he had carried out decades before and been pining to revisit. I was delighted with the prospect and thoroughly enjoyed the project. In due course "An Experiment in the Teaching of Statistics" was published by the *Journal of Mathematical Behavior* [volume 20 #3, 2001], and our collaboration turned to other areas.

The article might have remained in the category of things finished and gently gathering dust, but for an outside circumstance. For a couple of years I have been working on an "Invitation to Didactique" designed to provide English speakers (and readers) with a general introduction to the foundations of the field. While I was cogitating on which basic ideas to choose and how to present them, I had a wonderful conversation with Brousseau, who was feeling quite pleased about a seminar he had just given using the Experiment in Statistics as a basis for a discussion of the concept of Fundamental Situation. Since the area of Didactique on which the "Invitation" centers is the Theory of Situations, my ears went up with a whoosh, and I dived gleefully into his seminar notes. At first I thought I could simply translate the notes and use them directly, but eventually I had to face the fact that they were written to create a discussion amongst a bunch of people who have been working together for years, not to introduce anybody to anything. So I backed off, cleared my head, and revisited the scene, working to cut through to the central ideas that would make interesting connections for my readers. That's when things began to resonate.

The Theory of Situations is based on the hypothesis that a concept is best learned when the learner is put in circumstances where there is a problem to be solved and the learner must invent the concept in order to solve the problem. Clearly this necessitates careful calibration and a lot of study, because the circumstances must be such that the invention is possible—the learner must have the appropriate prior knowledge, as well as a sufficiently high level of motivation and self-reliance. Research in Didactique has explored many Situations for many concepts. Some are relatively compact, such as the Situation for Proof I described in the October–November 2003 *Newsletter*. The experiment in Statistics was longer, comprising 20 sessions of varying lengths carried out in

the fourth grade classroom of Brousseau's wife Nadine. The article owes much to the records she kept and her loving memory for her students' learning process.

Condensing mightily, the Situation centered around three opaque containers (first sacks, later bottles set up to match them), each known to contain 5 marbles, each marble being either white or black. The bottles had transparent caps, so that when they were upended one marble's color could be seen. The class was challenged to determine the contents of each bottle. After fruitless attempts to peer into the bottle, they settled on taking turns flipping the bottle and reporting on the color of the visible marble. This netted the information that each bottle had at least some of each color, but nothing more. Then one of the kids came up with the idea of doing sequences of five flips. After discovering, with some distress, that the same bottle could produce different sequences, they decided to list the sequences for each bottle. As the lists got longer but continued to vary, one student came up with the idea of a terminating condition: if one combination appeared twice more than any other, it was the official content of that bottle. This idea was a big hit, and got them through two bottles. The third, though, gave an official winner of 3 whites and 2 blacks, despite the fact that 4 blacks and 1 white had turned up far more often than 4 whites and 1 black. Their concern over that led them to set up four bottles on their own, one with each of the interesting combinations, and start checking how they did on long sequences (no longer in sets of five). Ultimately the teacher brought in a computer that could be set to produce results for really long sequences of flips of a virtual bottle whose content could be varied, and the students came up with an informal but highly functional notion of convergence. They finished with a game where the computer's "bottle" was set up with a hidden distribution of a known number of marbles. Students were given a certain number of tokens with which to buy bunches of samples. When they felt "sure enough" they stopped buying samples and declared what they thought was in the bottle. If they were right, they doubled the number of tokens they had left. If they were wrong, they lost them all.

So that is the Situation, and a charming one it is. Now what does it mean for Brousseau to call it a Fundamental Situation for Statistics? In effect it is a bold claim that the students are creating for themselves not just the specific concepts that leap to the eye—sampling, the Law of Large Numbers and hypothesis-testing, for instance—but the central, key knowledge of Statistics itself. That's not a claim to be taken lightly. In fact, it is a claim that has no meaning unless you address the question: what is the key knowledge at the core of Statistics? It was cogitating on that that brought me back into contact with all I have observed in my years of teaching the basics of Probability. What people struggle with, and what those kids in the end had pretty clearly internalized, is the idea of reasoning about uncertainty, accepting the possibility of "knowing" an answer without ever being able absolutely to check it (the teacher never did open the bottles), and accepting that small samples may differ widely in ratio from what their Probability predicts. How many people with a lot of elementary Statistics under their belts still razz the Weather Bureau because some of the time that they say "80% probability of rain" it doesn't rain? And where would Las Vegas be if most people didn't believe that if the roulette wheel has hit red a lot of times it must be black's turn? The class acquired some vital knowledge all right. So I will accept the claim that the Situation is Fundamental, and lay claim myself to having deepened my own understanding in the process of studying it. Now I wonder what the probability is that I will be able to impart any of that new understanding to my students?

NEW SAT TEST ONLINE

The College Board (www.collegeboard.com) is introducing a new SAT test in March. It will include a student-written essay and new content from third-year college preparatory math; analogies and quantitative comparisons will be eliminated; and shorter reading passages will be added.

Practice materials and other study aids are available at the website. A sample essay topic is to discuss this passage: "A sense of happiness and fulfillment, not personal gain, is the best motivation and reward for one's achievements. Expecting a reward of wealth or recognition for achieving a goal can lead to disappointment and frustration. If we want to be happy in what we do in life, we should not seek achievement for the sake of winning wealth and fame. The personal satisfaction of a job well done is its own reward."

NSF MATH AND SCIENCE PARTNERSHIPS

Many teachers in K–12 will be able to experience a more intense learning and leadership environment as the National Science Foundation (NSF) embarks on a major effort to improve the mathematics and science education of the nation's youth.

NSF has announced that seven new *Institute Partnerships: Teacher Institutes for the 21st Century* will be formed as a result of five-year grants made to universities in the third year of competition for NSF's Math and Science Partnership (MSP) program. The new institutes represent an investment of more than $31 million over five years for NSF's newest MSP program component.

The awards for teacher institutes will be directed to disciplinary faculty of higher learning institutions to work with experienced teachers of mathematics and the sciences. This relationship is expected to deepen teachers' knowledge of content and instructional skills so they may become school-based intellectual leaders in their fields. A prototype institute is already underway at the Institute for Advanced Study at Park City, Utah.

New institute awards have been made to the University of Nebraska, Oregon State University, Tufts University and the University of Pennsylvania—each receiving $5 million over five years. Math and science teachers will study during summers or during the academic year at the new institutes being formed at these campuses. U Penn (grades 5–12) and Tufts (grades K–8) institutes will specialize in science. At U Nebraska (grades 5–8) and Oregon State (grades K–12) institutes will be for math teachers.

Three more institute awards have been made to Rice University (Houston), Virginia Commonwealth University (Richmond) and Florida Atlantic University (Boca Raton), and will focus on mathematics teaching. The Rice institute ($3.8 million) will focus on grades 9–12, Florida Atlantic will specialize at grades 5–8, and VCU will develop math specialists at K–5 levels.

"The new institute partnerships address a national need for a new generation of experienced teacher-leaders at a time when many teachers of similar stature are retiring," says Joyce Evans, MSP program director. "These multi-year programs will provide courses and experiences that enable teachers to deepen and update their content knowledge, become more effective in the classroom, contribute to the development of more challenging or advanced courses, and become leaders and catalysts for reforming the mathematics and science programs in their schools."
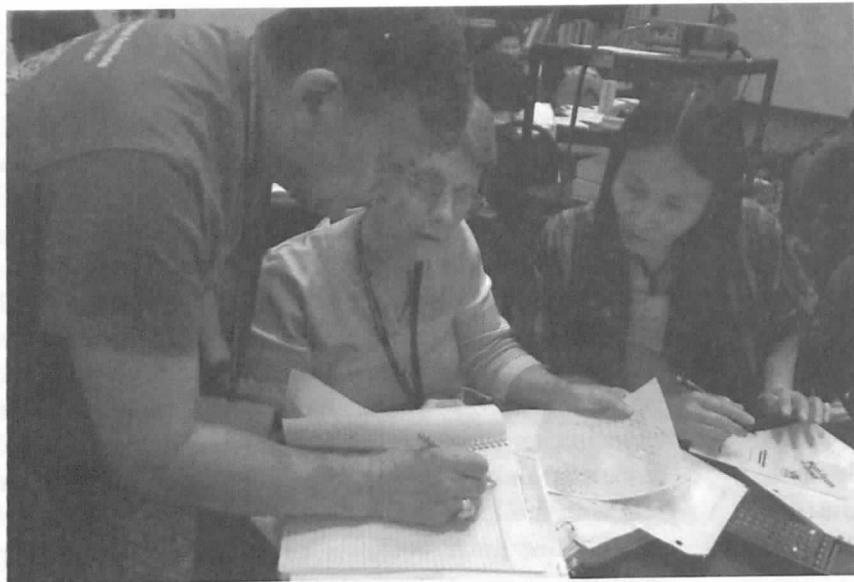
Institute participants, Evans explains further, should be able to assume increased responsibilities in their schools after successfully completing an institute program. To make that a reality, schools and districts are expected to provide the time, administrative support, resources and the recognition and rewards commensurate with this increased responsibility

NSF also announced five large Targeted Partnerships with grants amounting to a combined $60 million over five years, aimed at improving math and science performance in nationwide classrooms. Some 224,000 students will be reached through these partnerships that will unite 13 institutions of higher education with 21 local school districts to improve student achievement in specific disciplines or grade ranges.

Arizona State University and City University of New York (CUNY) are each expected to receive $12.5 million over the next five years to target science and mathematics learning at grades 9–12 by testing a model of graduate courses to deepen teachers' understanding of fundamental concepts in mathematics and science. The project will also support teachers in several Arizona school districts (Chandler, Mesa, Tempe and Tolleson) through learning communities with higher education faculty. The CUNY project will create hub high schools as "clinics" for teacher training and education excellence that will address shortages and retention rates among teachers in New York City schools, and create school cultures that emphasize research-driven classroom practices. The project also seeks to improve student performance beyond 8th grade.

The University of Massachusetts, Boston, is receiving $12.5 million over five years to improve student achievement in science at grades 6–12 in Boston's public schools by enhancing teacher content knowledge and instructional skill. The partnership includes Northeastern University, Harvard University and the College Board.

The other new targeted partnerships will focus on grades 6–8. The University of Colorado, Denver, along with several nearby college and university partners will

total number of comprehensive, targeted and teacher institute projects underway across the country.

NSF also announced other MSP awards for capacity building, including research, evaluation and technical assistance. The largest, $4.6 million to Horizon Research, Inc., will involve comprehensive "knowledge management and dissemination" for the overall MSP program. Northwestern University has received $2.3 million for a program to study, define and understand teacher leaders and the roles they play. Westat, Inc. received $900,000 to study over time the effects of university disciplinary faculty engagement with the MSP process. This is considered an important facet of MSP and the newly forged relationships that are occurring between disciplinary faculty with K–12 teachers.

Nicholas Salvatore (left), a Spring, Tex. high school teacher, Cheryl Myers (center), middle school teacher from Texas' McAllen Independent School District and Remy Poon (right), a Seattle elementary school teacher, share views on a problem presented to their group from "The Art and Craft of Combinatorial Proofs," a course offered at the prototype MSP mathematics institute at the Park City, Utah, Institute for Advanced Study. Middle- and high-school teachers are trained over three summer sessions to become disciplinary leaders when they return to their school districts.

Photo Credit: Ben Ditto

lead a $12.5 million project to improve student achievement through a combination of high quality coursework in math and science and a push to reduce the achievement gap between minority and non-minority middle school students—a program project leaders call "15 months to HQ (high quality)." One facet of this project includes an online delivery of teacher coursework that will engage teachers in the more rural regions of Colorado. Another $10 million grant to Birmingham Southern College in Alabama aims to improve middle school mathematics for students while boosting the professional development of high school math teachers. The college is working with the University of Alabama, Birmingham and the eight Greater Birmingham Alabama school districts, and will incorporate engineering modules into classrooms to help answer the age-old question, "Why do I need to know this?" Research from this project will also focus on engaging parents to be better informed about, and advocates for, high quality mathematics in schools.

NSF's newly announced MSP awards bring to 48 the

MILKEN NATIONAL EDUCATOR AWARDS

In October, California businessman Lowell Milken surprised 100 of America's best teachers, principals and specialists with $25,000 cash awards, which they may use any way they choose. The Milken National Educator Awards were created in 1985 to celebrate, elevate and activate the highest caliber professionals in our nation's schools. The awards have become the largest teacher recognition program in the U.S., to date rewarding 2,077 exceptional educators from across America with over $50 million in cash prizes from the Milken Family Foundation. "Improving American education strengthens the vitality of American democracy," said Milken. "By shining a light on the excellence of these 100 educators, and the nearly 2,000 others we have honored over the past 18 years, we hope to show how crucial their efforts are to the goal of providing every child in America with the opportunity for a high quality education."

BOOK REVIEW

Book Review Editor: Margaret Bayer,
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Women in Science. Career Processes and Outcomes.
Yu Xie and Kimberlee A Shauman, Harvard University
Press, Cambridge, 2003, ISBN 0-674-01034-5, xvii+318
pp.

Margaret Bayer, University of Kansas

In a recent column I reported on the myriad of data
on women in science available from the National Sci-
ence Foundation. This was essentially census data, pre-
sented with no analysis. In this column I review a book
that delves deeply into data from various sources to draw
some conclusions on how women progress in scientific
careers.

The book aims to get beyond the pipeline model of
women's participation in science and engineering. It
proposes a "life course approach" to the study of science
careers. Using various databases covering different
stages of life, the authors attempt to analyze the transi-
tions that girls and women go through on the way to
becoming (or not) working scientists and engineers. In
some cases the research calls into question some com-
mon beliefs about obstructions to women's participation
in science and engineering. After an introduction, the
next six chapters consider specific transition points: high
school, moving from high school to college, the under-
graduate major, proceeding from a bachelor's degree,
career paths after a master's degree, and promotion in
careers. Other chapters focus on particular career issues:
geographic mobility, research productivity, and immi-
gration.

The authors' questions could only really be answered
by long term longitudinal data on a large group of
females; this does not exist. So the authors piece
together data covering cohorts at different stages of life
to create a "virtual" longitudinal study. The research
draws on seventeen large, representative, national data-
sets. These include the National Education Longitudinal
Survey, High School and Beyond, New Entrants Survey,
Baccalaureate and Beyond Longitudinal Survey, U.S.
Census Public Use Microdata Samples, and Survey
of Natural and Social Scientists and Engineers.

Undergraduate and graduate students are considered to
be potential scientists or engineers if they are majoring
in science (not including social science) or engineering.
When considering career outcomes, a person is classified
as a scientist or engineer if he or she is in, or is seeking,
a science or engineering job, as classified, for example
by the U.S. Census.

Here are the basic findings presented in the book [pp.
208–210].

- The gender gap in average mathematics achieve-
  ment [in high school] is small and has been
  declining, although boys remain much more likely
  than girls to attain very high levels of competence.

- Gender differences in neither average nor high
  achievement in mathematics explain young men's
  higher likelihood of majoring in S/E [science and
  engineering] fields in college relative to young
  women.

- Career processes are fluid and dynamic, with exit,
  entry, and reentry all being real possibilities at any
  given point in a career.

- Most women recipients of S/E bachelor's degrees
  had actually expected to pursue a non-S/E college
  major but later shifted to the S/E track during
  college.

- Women of any marital status are not necessarily
  less mobile than their male counterparts. We
  found that gender differences arise only when
  children are present.

- Sex differences in research productivity declined
  over the time period studied ... most of the
  observed sex differences in research productivity
  can be attributed to sex differences in personal
  characteristics and structural features of employ-
  ment.

- Relative to their male counterparts, married
  women with children are less likely to pursue
  careers in science and engineering after the com-
  pletion of S/E education, less likely to be in the
  labor force or employed, less likely to be pro-
  moted, and less likely to be geographically mobile.

- Women immigrant scientists are more severely
  disadvantaged than native-born women scientists
  in employment as well as in opportunities for pro-
  motion.

The authors suggest that a high school student's

anticipation of future conflict between family and career may have a negative effect on girls' science achievement. "Even girls who plan to combine work and family may underinvest in math and science education because they view the S/E career track as inhospitable to a full family life while other career options offer more leeway." [p. 481] I question how much teenage girls know (or think they know) about careers of scientists and engineers, who are largely invisible in our society. In fact, women are becoming doctors at a significantly higher rate than scientists and engineers, even though the medical profession demands a huge time commitment in peak child-bearing years. It would be interesting to compare expectations of high school students for careers in medicine and careers in science and engineering.

The "neoclassical economic model" suggests that to maximize families' economic well-being, men will devote themselves to careers after major investments in education and career development, while women will curtail investment in careers and concentrate on the household and family. This model is not supported by the data, which show that many women invest significantly in careers, even if they leave those careers (at least temporarily) for child-rearing responsibilities.

The number one factor in women leaving, or decreasing participation in, the science and education profession is children. The authors find that the fact that women leave science and engineering after a master's degree at a greater rate than after a bachelor's degree is explained statistically by the fact that women with master's degrees are more likely to have children than women with bachelor's degrees.

The use of the existing national databases puts limitations on the analysis, of course. I mention here a couple of specific weaknesses. Figure 7.1 graphs the percentage of women among bachelor's degree recipients over time (1965–1995), divided into the biological sciences, engineering, mathematical sciences and physical sciences. The graph shows similar patterns of increase for all but the mathematical sciences, in which the percentage of women holds steady. Presumably this is because, while the percentage of females among math majors increased over those 30 years, the field of mathematical sciences broadened to include computer science, where women's participation has been problematic.

COLLABORATIVE RESEARCH GRANTS FOR WOMEN

Dedicated to the memory of Ruth Michler

AWM will continue to offer Collaborative Research Grants to enable women who are already tenured to carry out collaborative research at other institutions. (Women who are not yet tenured are referred to the Mentoring Grants Program.) We anticipate offering one or two grants for amounts up to $2500 in 2005. Each grant may be used to fund travel, accommodations, and other required expenses for a tenured woman mathematician to travel to an institute or a department to do research with a specified individual. All travel must be completed within one year of the award. For foreign travel, US air carriers must be used (exceptions only by prior approval from AWM).

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

An application should consist of: 1) a cover letter; 2) a curriculum vita; 3) a research proposal (approximately five pages in length) which specifies why the proposed travel would be particularly beneficial; 4) a supporting letter from the proposed collaborator (who must indicate his/her availability at the proposed travel time), together with the curriculum vita of the proposed collaborator; 5) a proposed budget; and 6) information about other sources of funding available to the applicant. A final report will be required from each awardee. Awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM.

Send *five* complete copies of the application materials (including the cover letter) to: Collaborative Research Grant Selection Committee, AWM, 4114 Computer & Space Sciences Building, University of Maryland, College Park, Maryland 20742-2461. For further information: phone 301-405-7892, email awm@math.umd.edu, or visit www.awm-math.org. Applications must be received by **February 1, 2005**; applications via email or fax will not be accepted.

Chapter 7 seeks to compare the demographics of the science and engineering labor force with the supply, that is, the percentage of women among recipients of bachelor's, master's and doctoral degrees in science and engineering. The labor force information comes from census figures that do not identify the degree held, but rather the number of years of schooling. The authors translate 16 or 17 years of schooling into a bachelor's degree, 18 years into a master's degree, and 19 or more years into a doctoral degree. I would expect this to overstate the number of jobholders with the Ph.D. In particular, women with children could be expected to take more years to attain degrees. Persistence in mathematics at the transition from education to job is difficult to measure with the databases used, because of the classification of science and engineering careers. Computer science and actuarial science jobs are classified as S/E jobs, but jobs in finance are not. Finance is becoming an increasingly popular area of concentration in mathematics, with a number of specialized master's programs in mathematics departments.

Chapter 8 concerns the mobility of scientists and engineers, and differences by gender. The authors' analysis of the data does not support the hypothesis that scientists in two-career families are less likely to migrate than scientists in one-career families. Nor does it support the hypothesis that women's mobility is more negatively affected by marriage than men's in two-career families. It does find that parenthood has a differential effect by gender. The problem is that the data does not distinguish reasons for migration. The assumption is that geographic mobility is good for a science and engineering career, and that migration itself is evidence of a positive effect on career. Personal experience, however, tells us that academic women, at least, often move for family reasons, and take a less desirable job in order to keep the family together. Men in two-career families do the same, but one would guess that there is a gender differential in this. The authors bring up this issue only with regard to immigrant scientists and engineers, suggesting a distinction between spouses as primary and secondary immigrants.

One of the authors' criticisms of the pipeline model is that it does not recognize the great variety of career trajectories in science and engineering. The form of the data does not lend itself to studying gender and alternative career paths. It does come up explicitly in a couple of places, however. One (as mentioned in the basic findings) is that women are much more likely than men to switch from a non-S/E major to an S/E major while in college. The other is in time between bachelor's degree and Ph.D. Women are 50% more likely to take 11 or more years between bachelor's and Ph.D. This is correlated with women scientists' lower rates of research productivity after the Ph.D.

In the end we have to review the question, "Why do women leave the science and engineering professions in greater numbers at each career stage?" The authors avoid speculation for the most part. They do point out, however, that past gender career differentiation has lingering effects. As women advance through education and jobs, they find themselves more and more in a male-dominated environment, where they may be more likely to experience an unsupportive work environment and/or patent discrimination. The authors conjecture [p. 215], "over the life course men and women may react differently to career setbacks, with women more likely than men to forgo their career goals altogether and to replace them with family responsibilities."

I would add that women may also react differently to career successes and recognition of excellence, and that deserving women are less likely than deserving men to receive such recognition.

AAAS SYMPOSIUM

Amy Cohen, Symposium Organizer

"Finding and Keeping Graduate Students in the Mathematical Sciences" is the title of a symposium offered 8:00–9:30 A.M., Sunday, February 20 as part of the AAAS 2005 Annual Meeting in Washington, DC. The speakers will be Lenore Blum (Carnegie-Mellon University), Abbe Herzig (SUNY Albany), Carlos Castillo-Chavez (Arizona State University), and Ray Johnson (University of Maryland at College Park). Abbe Herzig's topic will be issues affecting persistence and completion of doctoral studies. The other speakers will describe successful programs to enhance participation and success by members of groups underrepresented in the mathematical sciences.

Additional information may be found at the AAAS website www.aaas.org.

THE EDGE SYMPOSIUM: FROM ASSESSMENT TO ACTION

Diana Campbell, EDGE Program Coordinator

You've heard the statistics. In 2004, thirty-three years after the AWM began addressing the concerns of women in mathematics and sixty-three years after the first Ph.D. in mathematics was earned by a black woman, women make up about 30% of Ph.D. recipients in the mathematical sciences. [1] In this same day and age, Blacks, Hispanics/Latinos and Native Americans represent a fourth of the U.S. population but less than 5% of doctoral degrees in mathematics. [2] And, at ten of the most highly rated graduate mathematics departments (Berkeley, Caltech, Chicago, Columbia, Harvard, Michigan, MIT, Princeton, Stanford and Yale), women currently hold only 16 of 302 tenured faculty positions. [3] For these reasons, the rate of success, the retention, and the overall challenges of women in graduate programs in the mathematical sciences are subjects still worthy of intense deliberation. In response, Rhonda Hughes of Bryn Mawr College and Sylvia Bozeman of Spelman College, the Co-Directors of the Enhancing Diversity in Graduate Education (EDGE) program, with help from a planning committee, organized an invited symposium entitled "The Graduate School Experience for Women in Mathematics: From Assessment to Action." The EDGE program, conceived by Hughes and Bozeman, is a mathematics program for women designed to help them negotiate the transition to Ph.D. programs in the mathematical sciences. It has two major components: a four-week summer program and post-summer mentoring. This past June, during the EDGE Program's seventh summer session, Spelman College hosted two days of addresses, panel discussions, and breakout sessions about the experiences of women in graduate programs in the mathematical sciences. As an outcome of this gathering, the organizers envisaged critical examination of departmental practices that would result in measurable institutional change of benefit to all students.

The symposium was highly successful and critically important in three respects. First, many constituencies in the mathematics community were represented, as well as members of other disciplines. This eclectic ensemble contributed to a dynamic and comprehensive dialogue. Second, as a result of the symposium, participants were empowered with self-directed, viable plans for effecting personal and institutional change. Finally, it reunited about 60% of the one hundred and four EDGE students, mentors and instructors, fertilizing seeds of future partnerships.

The Symposium planning committee (Leslie Cheng, Teresa Edwards, Suzanne Lenhart, and Monica Stephens) understood the importance of bringing together a truly diverse cross section of mathematics scholars and professionals. Symposium participants varied from undergraduate math majors serving as NSF interns to full professors at Research I universities. A few participants worked outside of academia in organizations such as the Southern Regional Education Board, Environmental Protection Agency and the NSF. Geographically, participants came from twenty-four different states, representing historically black colleges and universities (HBCU's) and small liberal arts colleges, as well as large comprehensive universities. Of the approximately one hundred participants, a small but important handful was from outside the mathematics discipline. They were Cecelia Conrad, an economist from Pomona College who runs a program similar to EDGE for aspiring minority economists; Beverly Tatum, psychologist and President of Spelman College; and Chris Golde, a senior scholar from the Carnegie Foundation for the Advancement of Teaching who works on the Carnegie Initiative on the Doctorate project.

Golde gave the opening address, "Creating Visions of the Possible." Attendees were charged first to define an intellectual community, and second to identify specific activities that contributed to their home institution's intellectual community. This was particularly useful in identifying strengths and areas of improvement for one's department. However, it was also a self-reflective exercise as discussion led to how individuals were or were not enhancing their own community. Another important theme in Golde's address was that of individuals and departments having a clear and purposeful vision for achieving the Ph.D., an issue that resonated with Clint McCrory, a professor at the University of Georgia. "I found Chris Golde's perspective on transparency—the principal that a math department should make crystal clear to its students what is expected of them and exactly what has to be done to achieve the Ph.D.—particularly helpful." This issue should be salient to all students,

often unaware of how many options and loop holes there are within formal departmental guidelines, and often victims of self-inflicted pressures and expectations.

Cecilia Conrad is the director of the Economics Pipeline project, a program not dissimilar to EDGE that supports students traditionally underrepresented in economics as they progress toward the Ph.D. Conrad observed that there was no discourse on actual mathematics. She commented that the discussions she heard could easily have occurred during a Pipeline Project conference, for example those affirming that issues of retention aren't rooted in student ability to learn. Conrad and Lewis, a professor at the University of Nebraska, Lincoln, co-led a breakout session, "Persistence and Retention from the Perspective of Departments, Students, and Funding Agencies." Lewis was able to share impressive statistics about UNL's success: 41% of their Ph.D. recipients were women during the same eight-year period (1995–2002) that women made up only 26% of doctorates in mathematics across the nation. Since some of the nation's largest and most highly rated math

departments graduate significantly lower percentages of women, he suggested that undergraduate students and faculty critically examine a graduate department's success in graduating women.

The final address was given by Beverly Tatum. In "The ABC Approach to Creating Climates of Achievement: Affirming Identity, Building Community and Cultivating Leadership," she spoke of considering the subtle and unassuming messages conveyed through imagery (pictures, posters, and decorations) displayed in a department or one's office. Such peripherals could be tools for affirming the identity of the department and its student members, especially when the faculty is not diverse. This is surely a topic under-explored in the mathematics community and a perfect example of the value of cross-disciplinary synergism.

Diversity in thought as well as experience has been a trademark of the EDGE program since its inception in 1998. Roughly half of the students, of the graduate student mentors, and of the instructors were from groups underrepresented in the mathematical sciences. After

NSF-AWM MENTORING TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Mentoring Travel Grants is to help junior women to develop a long-term working and mentoring relationship with a senior mathematician. This relationship should help the junior mathematician to establish her research program and eventually receive tenure. AWM expects to award up to seven grants, in amounts up to $4000 each. Each grant will fund travel, accommodations, and other required expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. Awardees may request to use any unexpended funds for further travel to work with the same individual during the following year. In such cases, a formal request must be submitted by the following February 1st to the selection committee, or the funds will be released for reallocation. (Applicants for mentoring travel grants may in exceptional cases receive two such grants throughout their careers, possibly in successive years; the second such grant would require a new proposal and would go through the usual competition.) For foreign travel, US air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

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

Each applicant should submit five copies of each of the following: 1) a cover letter (if a prior AWM-NSF mentor grant has been awarded, indicate so); 2) a curriculum vita; 3) a research proposal, approximately five pages in length, which specifies why the proposed travel would be particularly beneficial; 4) a supporting letter from the proposed mentor (who must indicate his/her availability at the proposed travel time), together with the curriculum vita of the proposed mentor; 5) a proposed budget; and 6) information about other sources of funding available to the applicant. A final report will be required from each awardee. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. Send all application materials to: Mentoring 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 deadline for receipt of applications is February 1, 2005.

seven years there are now one hundred and four members of the EDGE family, with seventy-seven students affectionately called EDGERs, fifteen mentors (six of whom were previously students), and eighteen instructors. Sixty-three of them, some from each year, reunited at the symposium. This was a particularly awesome experience for the first cohort of EDGErs—who couldn't have predicted what they'd begun—and for the 2004 cohort who were, not so gradually, inducted into a huge extended family.

Jennifer Slimowitz, the first algebra instructor in 1998, and now a program officer for the National Academies remarked: "Wow, you can really see what a great impact EDGE has by looking at the sheer number of young mathematicians at this symposium. I can only guess that a significant percentage of African American women Ph.D. recipients will have been affiliated with EDGE."

In fact, during the five years from 1997 through 2001, thirty-three African American women completed a Ph.D. in the mathematical sciences. [4] At roughly that rate, if over the next five years the nineteen African American EDGE women currently enrolled in a Ph.D. program complete their degrees, they will account for more than half the total number of African American women obtaining a Ph.D. in the entire country. This doesn't even factor in the African American EDGE graduate student mentors who have received their Ph.D.'s, or un-enrolled EDGErs who might return to graduate programs, such as Katrina Harden-Williams, a former EDGE student. Harden-Williams, who teaches and directs a mathematics tutorial facility while she charts her course back to a Ph.D. program, commented, "I am trying to implement study sessions during the year prior to returning to graduate school for myself, another EDGEr in Mississippi as well as a third woman in Rochester, New York."

The importance of reuniting EDGErs lies in the natural fertilization that occurs when relationship are reinforced. Even better than random networking, where initiating relationships can seem contrived, EDGErs are instantly comfortable with each other because they are bound by a rich common experience. Undoubtedly the diversity fostered in the EDGE program will have a profound impact on these future leaders' ability and inclination to collaborate.

At the conclusion of the symposium, there was a flood of anecdotal evidence affirming its success. For example, in regards to her return-to-graduate-school-preparation plans, Katrina Harden-Williams remarks: "I was able to share a target date for returning to graduate school, and I even got ideas about funding this endeavor." On the institutional level, Sylvia Bozeman shared that as a result of the symposium, the Spelman mathematics department would start to facilitate better matches between their graduates and perspective graduate programs by keeping closer ties with their alumnae who are currently in graduate school.

Besides the tangible effect of many persons implementing their plans of action, there is another important aspect of the symposium: the opportunity to think and talk broadly about the Ph.D.

> ...The Ph.D. is expected to serve as a steward of her discipline or profession, dedicated to the integrity of its work in the generation, critique, transformation, transmission and use of its knowledge. *Lee Shulman*

While the idea of stewarding one's discipline and profession sounds lofty, the fact is that neither the pursuer nor recipient of the Ph.D. can passionately deliberate over the graduate school experience without self (and institutional) examination of the integrity with which one generates, critiques, transforms and transmits knowledge.

For more information about the Symposium events and breakout sessions, visit the EDGE website www. edgeforwomen.org and click on Symposium. Pending funding, the EDGE program will embark on its eighth year in summer 2005. Applications are now available.

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MELBA PHILLIPS, PHYSICIST, 1907–2004

press release, University of Chicago

University of Chicago physicist Melba Phillips, a leading science educator who lost two jobs from New York institutions during the McCarthy era for refusing to testify against friends and colleagues before a U.S. Senate subcommittee, died Monday, November 8, in a nursing home in Petersburg, IN. She was 97.

"She was a spectacular teacher," said Stuart Rice, the Frank Hixon Distinguished Service Professor in Chemistry at the University of Chicago, who was an undergraduate student of Phillips' at Brooklyn College. "What really distinguishes people who do interesting work in science is taste: how to smell an interesting problem. Somehow or other she managed to teach that without being explicit about it. That's perhaps the most important thing I learned from her."

As an educator, Phillips developed and implemented training for physics teaching at all grade levels and led a movement to improve physics teacher preparation. From 1966 to 1967 she served as the first woman president of the American Association of Physics Teachers. In 1981, the association presented her the first Melba Newell Phillips Award, which was created in her honor. The award is given "for exceptional contributions to physics education through leadership in the American Association of Physics Teachers."

Phillips forged a career in science at a time when few women did so, and even took on leadership roles among her peers both as an educator and as a scientist with a social conscience. In 1945, representing a group called the Association of New York Scientists, she helped organize the founding of the Federation of American Scientists at a meeting in Washington, D.C. Also playing a key role in forming the group were Manhattan Project scientists such as Francis Bonner, a longtime friend of Phillips who met her at that meeting.

"That was a very important meeting because it forged a strong bond within the entire scientific community, and we went to work on civilian control of atomic energy," said Bonner, a professor emeritus of chemistry at the State University of New York, Stony Brook.

Phillips' career got off to a fast start after she became one of the first doctoral students of J. Robert

Melba Phillips

Oppenheimer, who led the effort to build the first atomic bomb. She received her doctoral degree in physics under Oppenheimer's supervision in 1933 at the University of California, Berkeley.

In 1935, Phillips and Oppenheimer offered an explanation for what was at the time unexpected behavior of accelerated deuterons (nuclei of deuterium, or "heavy hydrogen" atoms) in reactions with other nuclei. This explanation became known as the Oppenheimer-Phillips effect. "It's considered one of the classics of early nuclear physics," Rice said.

Normally, a young scientist who had produced such a prominent piece of work could have expected to receive a junior-level faculty appointment at a research institution, Bonner said. "But no, there was none. There was a depression and jobs were scarce, although probably much more so for a woman than for a man at the time."

After leaving Berkeley in 1935, Phillips held a series of temporary positions at Bryn Mawr College in Pennsylvania, the Institute for Advanced Study in Princeton, N.J., and the Connecticut College for Women.

In 1938, Phillips obtained a long-term faculty position at Brooklyn College. She also began working part-time in 1944 at the Columbia University Radiation Laboratory. She lost both jobs in 1952 for refusing to testify before the U.S. Senate's Internal Security subcommittee, chaired by Nevada Sen. Pat McCarran to investigate alleged communist activities.

Brooklyn College publicly apologized for its action in 1987, although Phillips' firing had been required by a

law designed to prevent wrongdoing in city government.

"It provided that any New York City employee who invoked the Fifth Amendment in a duly constituted hearing was automatically severed from his job," Bonner said. "McCarran was a specialist at putting people in the position in which they had to invoke the Fifth Amendment. It was a deliberate expression of the McCarthyism of the time."

The school made further amends in 1997, when its physics department held a day-long symposium in her honor and established a student scholarship in her name.

Brooklyn College was not a research institution but was known for the high quality of its students, and Phillips made her presence felt primarily through teaching. "She came to be a major figure in science education," Bonner said. "She stimulated many students who went on from there to very stellar careers." Rice, for example, went on to receive the National Medal of Science in 1999.

After losing her jobs, Phillips remained unemployed for several years. During that time she wrote two textbooks, *Principles of Physical Science*, with Bonner, and *Classical Electricity and Magnetism*, with W.K.H. Panofsky, which became widely used for undergraduate and graduate physics training.

In 1957, Edward Condon at Washington University appointed Phillips associate director of the university's Academic Year Institute, a teacher-training institute. Condon, a former director of the National Bureau of Standards and science adviser to Brian McMahon, chair of the special Senate committee on atomic energy, had himself been labeled a security risk by the House Un-American Activities Committee in the early 1950s.

Phillips left Washington University to join the University of Chicago faculty in 1962, and retired as a Professor Emerita in 1972. Under her influence the University began teaching physical science courses for non-science majors, a tradition that continues today. She continued to work after leaving Chicago, serving as a visiting professor at the State University of New York, Stony Brook, until 1975, and as a visiting professor at the Graduate School of the University of Science and Technology, Chinese Academy of Science, Beijing, in 1980.

Phillips was born February 1, 1907, in Hazleton, IN. She graduated from high school at the age of 15, and by 1926 had already earned her bachelor's degree in mathematics from Oakland City College of Indiana. She received her master's degree in physics in 1928 from Battle Creek College of Michigan, and her doctorate from the University of California, Berkeley, in 1933.

The American Physical Society presented its 2003 Joseph Burton Forum Award to Phillips. The society cited her "for tireless efforts in physics education, for continued work in preserving the history of physics as well as other service to the physics community, for her role in founding the Federation of American Scientists, and as a model of a principled scientist."

Other honors include the Guy and Rebecca Forman Award for Outstanding Teaching in Undergraduate Physics from Vanderbilt University, 1988; the Karl Taylor Compton Award of the American Institute of Physics for distinguished statesmanship in science, 1981; the Oersted Medal of the American Association of Physics Teachers, for notable contributions to the teaching of physics, 1974; an honorary degree from Oakland City College, 1964; and a Distinguished Service Citation, American Association of Physics Teachers, 1963. She also was an elected fellow of the American Physical Society and of the American Association for the Advancement of Science.

Phillips is survived by five nieces, Judy Wier, Cincinnati, Ohio; Ellen Vinson, Hazleton, Ind.; Sharon Phillips, Ferndale, Calif.; Joan Birch, Sebastopol, Calif.; and Gladys Emerick, Pompano Beach, Fl.; as well as a nephew, Ralph Phillips, Hephzibah, Georgia. The family plans no public memorial service, in accordance with her wishes.

WOMEN IN THE SCIENCES: LEFT OUT, LEFT BEHIND

press release

National women's groups The National Women's Law Center (NWLC) and Women's Prerogative (WP) have launched "Women in the Sciences: Left Out, Left Behind," a nation-wide public education and letter-writing campaign addressing the underrepresentation of women on the science faculties at major research universities. The campaign's website, www.womensprerogtive. org/womeninsciences, provides students, parents, faculty, and alumni with valuable resources to help deal with this problem.

"The underrepresentation of women on science faculties shortchanges students, faculty, and the university community as a whole," said Jocelyn Samuels, Vice President for Education and Employment for the NWLC. "Students are deprived of role models and mentors, qualified women are denied professional opportunities, and universities lose out on talented people at a time when progress in the sciences is particularly critical. University officials must address this persistent underrepresentation of women on their faculties."

The campaign is based on a landmark study, *A National Analysis of Diversity in Science and Engineering Faculties at Research Universities* by Donna Nelson and Diana C. Rogers of the University of Oklahoma. That study evaluates the fifty universities that receive the most federal funding in several different scientific disciplines. The report showed startling underrepresentation of women faculty in the sciences at major research institutions across the country. For example:

- The percentage of women among full professors ranges from only 3% to 15%.

- There are no African-American, Hispanic, or Native American tenure-track women professors at the top 50 computer science departments in the country.

- The number of women receiving Ph.D.'s in the sciences is much higher than the number of women going into academia, a troubling indicator that women are not encouraged to pursue academic careers.

"With Left Out, Left Behind, we can all contact the universities and the government directly to let them know that they must act to address the fact that women are under-represented on science faculties," said Sharon Levin, Founder and Executive Director of Women's Prerogative. "This is a problem that deserves national attention, so that women will no longer be denied the educational and professional opportunities they deserve."

From the website, people can send letters to university officials highlighting the underrepresentation of women in their sciences departments, as well as to officials at federal enforcement agencies urging them to enforce Title IX of the Education Amendments of 1972, which bans sex discrimination in federally-funded education. The site also contains educational and advocacy materials that can help members of the campus community spread the word about issues of underrepresentation of women faculties in the sciences.

WOMEN IN ACADEMIA: ARE WE ASKING THE RIGHT QUESTIONS?

An article by Allyn Jackson in the August 2004 AMS *Notices* was headed by an editor's note from Andy Magid: "Beginning with our 1991 'special issue' on women in mathematics, the *Notices* has featured coverage of diversity and underrepresentation in mathematics. This tradition continues in the present issue with articles by Allyn Jackson, Carolyn Gordon and Barbara Keyfitz, and Herbert Medina." Gordon, AWM President, and Keyfitz, AWM President-elect, wrote "Women in Academia: Are We Asking the Right Questions?" Gordon and Keyfitz comment on the Nelson-Rogers study which underlies the national campaign discussed in the preceding article. Medina's article was entitled "Doctorate Degrees in Mathematics Earned by Blacks, Hispanics/Latinos, and Native Americans: A Look at the Numbers." Jackson's piece was "Has the Women-in-Mathematics Problem Been Solved?" All these articles may be found online at www.ams.org/notices and are recommended reading.

AWM WORKSHOP FOR WOMEN GRADUATE STUDENTS AND RECENT PH.D.'S

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

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

WHEN: An AWM WORKSHOP is scheduled to be held July 11–12, 2005 in conjunction with the Society for Industrial and Applied Mathematics (SIAM) 2005 Annual Meeting at the Hilton New Orleans Riverside Hotel, July 11–15, 2005.

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

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

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have begun work on her thesis problem, and a recent Ph.D. must have received her degree within approximately the last five years, whether or not she currently holds a postdoctoral or other academic or non-academic position. All non-US citizens must have a current US address. All applications should include a cover letter, a summary of research work (one or two pages), a title and abstract (75 words or less) of the proposed poster or talk, and a curriculum vitae. A supporting letter of recommendation from a faculty member or research mathematician who knows their research is required for graduate student applicants and recommended but not required for recent Ph.D.'s. Additional letters of support are encouraged. All selected and funded participants are invited and strongly encouraged to attend the full AWM two-day program. Those individuals selected will be notified by the AWM Office and will need to submit a final title and abstract with name, affiliation, address, etc. by mid-February to SIAM for the meeting program; AWM will provide instructions with the notification. For some advice on the application process from some of the conference organizers see the AWM website.

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

Workshop Selection Committee
Association for Women in Mathematics
4114 Computer & Space Sciences Building
University of Maryland
College Park, Maryland 20742-2461

Phone: 301-405-7892
Email: awm@math.umd.edu   URL: www.awm-math.org

APPLICATION DEADLINE: Applications must be received by **January 26, 2005**.
Applications via email or fax will not be accepted.

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

Funded through grants from the National Security Agency and Elizabeth City State University. Thanks to our funding agencies!

The organizers of each program are asked to submit an activity report, to provide a valuable resource for others to consider when setting up their own programs.

The Mathematics of Voting

Benton Duncan, Benton.Duncan@ndsu.nodak.edu

During our October 9 Sonia Kovalevsky High School Day, Benton Duncan presented a timely workshop, "The Mathematics of Voting." Using the example of a three-candidate race, Dr. Duncan demonstrated how three different voting strategies would pan out. As a first example, using the majority system, the students saw that whoever received the most votes would win.

Under this system, the students considered a candidate who was pairwise preferable to all other candidates. They saw that this candidate could still lose by failing to receive the majority of first place votes. A candidate who is pairwise preferable to all other candidates is called a Condercet winner.

The next example outlined the Borda Count system, where each candidate received points based on the ranking by the individual voters. For instance, if a voter ranked candidate A first, candidate B second, and candidate C third, then candidate A would receive 3 points; B, 2 points; and C, I point. Unfortunately, this system does not guarantee that a Condercet winner actually wins. An

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

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

An additional selection cycle will be held in February 2005 for Spring 2005 using funds remaining after the August 2004 selection cycle. AWM anticipates awarding up to six additional grants ranging on average from $1500 to $2200 each ($3000 maximum per school) to universities and colleges. Historically Black colleges and universities are particularly encouraged to apply. Programs targeted toward inner city or rural high schools are especially welcome.

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

The decision on funding will be made in late February for high school days to be held in Spring 2005. If selected, a report of the event along with receipts (originals or copies) for reimbursement must be submitted to AWM within 30 days of the event date or by June 1, 2005, whichever comes first. Reimbursements will be made in one disbursement; no funds can be disbursed prior to the event date.

Send *five* complete copies of the application materials to: Sonia Kovalevsky Days Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, Maryland 20742-2461. For further information: phone 301-405-7892, email awm@math.umd.edu, or visit www.awm-math.org. Applications must be received by **February 4, 2005**; applications via email or fax will not be accepted.

example illustrating this was described. The students were able to calculate the winners and find a Condercet winner.

The third example outlined pairwise voting, where candidates are paired in races for a "tournament-style" race. This is one of the few voting methods where a Condercet winner is certain to win. On the other hand, the students saw that pairwise voting is easy to manipulate by changing the order of voting. They worked through an example with four candidates where, depending on the order of "matches," each candidate was a winner.

The girls saw that each system could be manipulated to increase the probability of a certain outcome, and that for elections with more than two candidates there is no one "perfect system."

Here are two websites with further information about voting methods: www.maa.org/devlin/devlin_11_00.html and mathforum.org/t2t/faq/election.html.

EHLERS AND THE NSF

press release

Saying he is "concerned and astonished" that Congress decided to cut funding for the National Science Foundation (NSF), Congressman Vernon J.Ehlers said he voted in favor of the FY 2005 Omnibus Appropriations bill "under protest." The legislation was approved by a 344–51 vote.

Ehlers, who chairs the Subcommittee on Environment, Standards and Technology of the House Science Committee, submitted a statement for the Congressional Record expressing his displeasure that the legislation included $227 million less for the NSF than requested by President Bush's budget request and $60 million less than NSF received last year. Ehlers, R-Michigan, said he was especially disappointed because he had lobbied hard for increased funding and had gathered the signatures of more than 150 of his colleagues supporting the position.

Chairman Ehlers' complete statement, with slight editing, follows:

Mr. Speaker, I rise today to express my displeasure with the current state of the appropriations bills.

First, I regret that we are using an omnibus bill to finish the appropriations process for FY 2005. It is not a good procedure, under any circumstances, when we are required to vote on a bill with insufficient time for review, especially a bill as important as appropriations for most of government funding other than Defense and Homeland Security.

My most serious concern with the omnibus bill is the appropriation for the National Science Foundation, (NSF), which is $227 million below the President's request for FY 2005. The amount is even $60 million lower than last year's appropriation, primarily in the critical areas of research and education, and even reduces the support for basic research. (This cut is before accounting for the .80 percent across-the-board reduction to all accounts, meaning the cut is actually larger than $60 million.) In the last 20 years this has happened only twice, and I am sorry to see that this year we will make it a third.

While I understand the need to make hard choices in the face of fiscal constraint, I do not see the wisdom in putting science funding far behind other priorities. We have cut NSF despite the fact that this omnibus bill increases spending for the 2005 fiscal year, so clearly we could find room to grow basic research while maintaining fiscal constraint. But not only are we not keeping pace with inflationary growth, we are actually cutting the portion basic research receives in the overall budget.

NSF has been praised as a model of administrative efficiency—over 95 percent of its funds go directly to support education and research programs. Former OMB director, Mitch Daniels, praised NSF as a model of administrative efficiency and called NSF one of the "true centers of excellence in this government" for its low overhead costs and efficient use of tax dollars. Furthermore, NSF has earned a reputation as the premiere basic research institution, despite receiving only four percent of the total federal research and development budget. I am concerned about the kind of message that we are sending by cutting funding of agencies, such as NSF, that succeed so well with already-lean budgets, while rewarding less-efficient agencies by increasing their funding.

This decision shows dangerous disregard for our nation's future, and I am both concerned and astonished that we would make this decision at a time when other nations continue to surpass our students in math and science and consistently increase their funding of basic

research. We cannot hope to fight jobs lost to international competition without a well-trained and educated workforce. If we want to remain competitive in the international marketplace, we must provide funding that stimulates innovation and supports education. Within our borders, NSF supports technological innovation that has been, and remains, crucial to the sustained economic prosperity that America has enjoyed for several decades. This innovation is made possible, in large measure, by NSF support of basic scientific research, particularly in the physical sciences. Research at NSF not only underpins physical science research, but lays the foundation for work in the health sciences and medicine as well. Reducing this funding is extremely shortsighted.

While I strongly oppose the reduced budget for the National Science Foundation, I recognize that the omnibus bill contains many important pieces of legislation that are necessary to pass. Therefore, under protest, I will vote for the bill, but my vote does not in any way represent my approval for the funding cuts to the NSF.

USWCC™ FILES COMPLAINT

press release

The U.S. Women's Chamber of Commerce filed a complaint in October 2004 against the U.S. Small Business Administration (SBA) and SBA Administrator Hector Barreto in U.S. District Court for the District of Columbia, under the Administrative Procedure Act to compel the SBA to implement the Women's Procurement Program, Public Law 106-554, codified at 15 U.S.C. § 637(m).

As part of the SBA reauthorization in 2000, Congress passed what was originally titled the "Equity in Contracting for Women of 2000" Act. The purpose of this Act is to "allow contracts, in industries historically underrepresented by women-owned small businesses, to be reserved for competition by women-owned small businesses."

Congress issued this mandate on December 21, 2000. Nearly four years have passed and the SBA has unreasonably delayed its response to this mandate. The SBA

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 **February 1** and **May 1, 2005**. *Funding is pending for the latter application cycle.*

has set, orally and in writing, a series of deadlines for accomplishing the steps necessary to implement this program, and all of these deadlines have been missed. And, the Administrator of the SBA recently informed leaders of the U.S. Women's Chamber of Commerce that he has no intention of implementing the program.

The USWCC, the pre-eminent national women's chamber of commerce network representing more than 150,000 members and nearly 10 million women business owners across the U.S., has watched and waited for the SBA to act on this legislation, says CEO Margot Dorfman.

"We have heard directly from thousands of our members that their ability to gain access to government contracts has been harmed by the ongoing delay in implementing this congressional mandate," Dorfman explains.

"We needed to let the SBA leaders know our members are tired of waiting, and are losing business opportunities every day because this law has not been enacted," says Dorfman.

"For years, we have tried to work in a cooperative fashion with the SBA to get the program implemented. The agency's intransigence requires us to resort to the courts to ensure that women small business owners get the opportunities they deserve in federal contracting," she adds.

The U.S. Women's Chamber of Commerce is represented by Covington & Burling, a prominent law firm in Washington, D.C.

"The SBA has done everything possible to stop the implementation of this important program to assist women business owners," notes Terry Williams, president of the USWCC.

"At a recent meeting, Administrator Barreto told leaders of the USWCC the current administration has no intention of implementing P.L.106-554 even though it is law. Barreto has not budgeted or requested the necessary funds, nor has he included the establishment of regulations for this program in his biannual listing of proposed regulatory actions," Williams adds.

Instead, the SBA recently reported strong growth and support for women-owned firms in federal contracting and record-breaking performance for lending to women. The details tell a very different story. Even though privately held women-owned businesses represent 30 percent of the businesses in the U.S., they still receive just 2.98 percent of federal contracts. The federal government has never achieved its extraordinarily low goal of five percent contracting with women-owned businesses. In FY 2003 alone, this failure represented a loss of $5.6 billion for women-owned businesses.

"Our members have watched this lack of progress, and they've asked us to help," Dorfman explains. "The foot-dragging, excuses and misleading statistics have to end, and our leaders in Washington have to get serious about delivering real support for women-owned firms."

OPPORTUNITIES

Seventh Annual Nebraska Conference for Undergraduate Women in Mathematics

The Conference, to be held February 4-6, 2005, will give outstanding undergraduate women the opportunity to discuss their own research and to meet other women who share their interest in the mathematical sciences. Conference activities will occur on the university's city campus, a short walk from downtown Lincoln.

Plenary speakers will be Margaret Wright, New York University and Susan Friedlander, University of Illinois at Chicago. Claudia Polini, Notre Dame; Alissa Crans, Loyola Marymount; and Dora Matache, University of New Orleans, will be guest faculty, while Dorea Vierling-Claassen, Boston University; Carina Curto, Duke; and Emiko Dupont, SUNY-Stony Brook are invited graduate students. Panel discussions will have the topics "Going to Graduate School?" "Careers in Mathematics," and "Life as a Mathematician."

The Organizing Committee gratefully acknowledges generous support from the National Science Foundation (through our Mentoring Through Critical Transition Points grant) and the National Security Agency

Registration and further information is available online at www.math.unl.edu/~ncuwm/. There is a $30 registration fee ($20 for UNL students), and the registration deadline is **January 21, 2005**.

Request for Proposals for 2006 Conferences

To stimulate interest and activity in mathematical research, the National Science Foundation intends to support up to seven NSF-CBMS Regional Research

Conferences in 2006. A panel chosen by the Conference Board of the Mathematical Sciences will make the selections from among the submitted proposals. In the thirty-six year history of this NSF-CBMS Regional Research Conference Series, a total of 299 such conferences have been held.

Each five day conference features a distinguished lecturer who delivers ten lectures on a topic of important current research in one sharply focused area of the mathematical sciences. The lecturer subsequently prepares an expository monograph based upon these lectures, which is normally published as a part of a regional conference series. Depending upon the conference topic, the monograph is published by the American Mathematical Society, the Society for Industrial and Applied Mathematics, or jointly by the American Statistical Association and the Institute of Mathematical Statistics.

Support is provided for about 30 participants at each conference and the conference organizer invites both established researchers and interested newcomers, including postdoctoral fellows and graduate students, to attend.

Applications are due **April 8, 2005**. See http://www.cbmsweb.org/NSF/2006_call.htm for more information.

2005 NSF-CBMS Regional Research Conferences

The three conferences to be held in 2005 are:

New Perspectives for Boundary Value Problems
Athanassios Fokas, lecturer
May 16–20 at the University of Texas – Pan American
Lokenath Debnath and Andras Balogh, organizers

956-381-3459, debnathl@utpa.edu
956-381-2119, abalogh@utpa.edu
http://www.math.panam.edu/cbms2005.html

Nonlinear Dispersive and Wave Equations
Terence Tao, lecturer
June 13–18 at New Mexico State University
Joseph Lakey, Tiziana Giorgi, Cristina Pereyra, Adam Sikora, and Robert Smits, organizers
505-646-2417, jlakey@nmsu.edu (Lakey)
505-646-2323, tgiorgi@nmsu.edu (Giorgi)
505-277-4147, crisp@math.unm.edu (Pereyra)
505-646-6269, asikora@nmsu.edu (Sikora)
505-646-2884, rsmits@nmsu.edu (Smits)
http://www.math.nmsu.edu/~jlakey/cbms.html

Algebraic and Topological Combinatorics of
    Ordered Sets
Anders Björner, lecturer
August 8–12 at San Francisco State University
Joseph Gubeladze and Serkan Hosten, organizers
415-338-7722, soso@math.sfsu.edu (Gubeladze)
415-338-7723, serkan@math.sfsu.edu (Hosten)
http://math.sfsu.edu/gubeladze/cbms.html

SPWM 2005

SPWM 2005 is a five-week (July 2 to August 6, 2005) intensive program for mathematically talented undergraduate women who are completing their junior year and may be contemplating graduate study in mathematical sciences.

Sixteen women will be selected. Each will receive a

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.

travel allowance, campus room and board, and a stipend of \$1,500. Applications must be received by **March 1, 2005**.

For further information, contact the director, Professor Murli M. Gupta (mmg@gwu.edu, 202-994-4857) or visit http://www.gwu.edu/~math/ spwm.html. Application material may be printed from the website.

Budapest Semesters in Mathematics Program

This program allows third and fourth year undergraduates to spend a semester or year studying mathematics in Budapest, Hungary. Admission criteria are high, but the rewards are great. A semester immersed in the mathematical culture of Budapest is an intellectual adventure of the very first rank. Information, including pictures and an electronic application form, is available online at www.stolaf.edu/depts/math/budapest. Presently, the program can accommodate about 60 students per semester. The application deadlines for fall 2005 and spring 2006 are **April 30, 2005** and **November 1, 2005** respectively; early applications (by as much as a year) are encouraged.

Budapest Semesters Twentieth Reunion

In celebration of its twentieth year, Budapest Semesters in Mathematics will host a gala reunion and mathematics conference in Budapest June 15–23, 2005 for BSM alumni, mathematicians who wrote letters of recommendation for them and those people who have supported the program over the past 20 years. Keynote lectures will be delivered by Ron Graham and László Babai, and there will be six plenary speeches and talks by BSM alumni. A remarkable variety of parallel reunion and non-mathematical events, excursions and day trips including hikes, a film festival, folk dancing, a dinner cruise on the Danube and much much more are being planned. Register at www.stolaf.edu/depts/math/ budapest.

AMS-MAA-MER Special Session on Mathematics and Education Reform

This year's sessions come in four parts: "Using the CUPM Guide 2004: Introducing Contemporary Concepts," co-sponsored by CRAFTY and CUPM; "Mathematical Logic Across the Undergraduate Curriculum," co-sponsored by Association for Symbolic Logic (ASL);

"Faculty Resources for Improving the Mathematical Education of Teachers," co-sponsored by COMET; and "Understanding Underrepresentation in Mathematics," co-sponsored by AWM. They will take place at the JMM in Atlanta on January 5–6. The session co-sponsored by AWM will meet Thursday, January 6, in the afternoon.

PUBLICATIONS OF INTEREST

The Mathematicians and Education Reform website now has some past newsletters available in .pdf format. See www.math.uic.edu/MER/pages/.

A GAO report to Congressional requestors of July 2004 was "Gender Issues: Women's Participation in the Sciences Has Increased, but Agencies Need to Do More to Ensure Compliance with Title IX." The title is, I think, self-explanatory! The conclusion states:

> Over the past three decades, women have made substantial gains as professionals in the sciences, particularly in the life sciences. A review of their numbers and roles today in the educational pipeline suggests, however, that women will continue to fall short of equal participation. Their lower levels of participation also suggest that they remain a less than well tapped resource in the nation's growing demand for scientists.

For the full report, see http://www.gao.gov/new.items/ d04639.pdf.

The letter-writing campaign reported in this issue on page 19 is based on the study *A National Analysis of Diversity in Science and Engineering Faculties at Research Universities* by Donna Nelson and Diana C. Rogers, University of Oklahoma. The full report is available at cheminfo.chem.ou.edu/faculty/djn/diversity/ briefings/Diversity%20Report%20Final.pdf.

Science for the 21st Century was produced under the direction of the National Science and Technology Council's Committee on Science. A snip on math: "Mathematics is a powerful tool of insight and a unifying force across science and engineering." For the full report, see http://www.ostp.gov/nstc/21stCentury.

AWM EXECUTIVE DIRECTOR

The Association for Women in Mathematics is seeking applicants for a possible position of Executive Director.

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.

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BOWDOIN COLLEGE – DEPARTMENT OF MATHEMATICS - A three-year position in applied mathematics starting Fall, 2005 at the Instructor or Assistant Professor level. Ph.D. preferred, ABD considered. Evidence of excellence in undergraduate teaching is required. Normal teaching load is two courses per semester. Review of complete applications begins January 15, 2005 but applications will be accepted until the position is filled. Send AMS application cover sheet (www.ams.org), curriculum vitae, 3 letters of recommendation, and evidence of teaching excellence to **Rosemary Roberts, Chair, Mathematics, Bowdoin College, 8600 College Station, Brunswick, ME 04011-8486.** Bowdoin College is committed to equal opportunity through affirmative action. Women and minorities are encouraged to apply. Bowdoin College is a private, highly selective, undergraduate institution located half an hour from Portland and two hours from Boston. More information about the Department and College can be found at www.bowdoin.edu.

BOWDOIN COLLEGE – DEPARTMENT OF MATHEMATICS - A one- or two-year position starting Fall, 2005 at the Instructor or Assistant Professor level. Open to all applicants. Ph.D. preferred, ABD considered. Evidence of excellence in undergraduate teaching is required. Normal teaching load is two courses per semester. Review of complete applications begins March 30, 2005 but applications will be accepted until the position is filled. Send AMS application cover sheet (www.ams.org), curriculum vitae, 3 letters of recommendation, and evidence of teaching excellence to **Rosemary Roberts, Chair, Mathematics, Bowdoin College, 8600 College Station, Brunswick, ME 04011-8486.** Bowdoin College is committed to equal opportunity through affirmative action. Women and minorities are encouraged to apply. Bowdoin College is a private, highly selective, undergraduate institution located half an hour from Portland and two hours from Boston. More information about the Department and College can be found at www.bowdoin.edu.

BOWLING GREEN UNIVERSITY - DEPARTMENT OF MATHEMATICS AND STATISTICS - Applications are invited for three tenure track positions beginning in Fall 2005. Please see **www.bgsu.edu/dept/math** for full details. 1. Director of Service Mathematics. Open rank. PhD or EdD required; experience coordinating multi-section service courses and a willingness to experiment with innovative approaches to entry level courses. Starting date July 1, 2005. Eleven month contract. 2-3. Assistant Professor in statistics, algebra. PhD required and ability to broaden or complement current research strengths in the department. Applications must be postmarked by January 14, 2005. BGSU is an AA/EO employer.

BRANDEIS UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for a three-year instructorship (non tenure-track), beginning in the fall of 2005. A Ph.D. in Mathematics, excellence in research and demonstrated excellence in teaching are required. Applicants should send a vita and four letters of recommendation, one of which should address teaching effectiveness, to: **Hiring Committee, Department of Mathematics, MS050, Brandeis University, Waltham, MA 02454-9110.** First consideration will be given to applications received by January 26, 2005. As an Affirmative Action/Equal Opportunity Employer, Brandeis University is committed to building a diverse faculty and encourages applications from women and minorities.

CALIFORNIA STATE UNIVERSITY, CHICO - NSF REU (Research Experience for Undergraduates) in Statistics and Mathematical Modeling at California State University, Chico. Dates: June 20 - July 29. Support: $1800 plus travel and housing. Application Deadline: March 15. Applicants must be US Citizens or permanent residents intending to continue undergraduate studies in the fall. Women and students from underrepresented minorities are particularly encouraged to apply. See **http://www.csuchico.edu/math/mattman/REUT.html** or contact Thomas Mattman, TMattman@CSUChico.edu Funded by NSF REU award 0354174.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS –The Department of Mathematics may make appointments at the level of lecturer and assistant professor or higher, in pure mathematics for the year 2005-2006. The teaching load will be nine hours for the academic year (eight hours for assistant professor appointments). These positions are open to mathematicians with doctorates who show definite promise in research. Applicants should (a) submit a vita and a description of their most recent research and future plans; and (b) arrange for three letters of reference to be sent directly. Deadline: January 10, 2005. Address: **Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, 77 Massachusetts Ave., Cambridge, MA 02139-4307.** MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY – DEPARTMENT OF MATHEMATICS - Applied Mathematics - The applied mathematics group is seeking to fill possible positions at the level of instructor, assistant professor or higher, beginning September 2005. Appointments will be made based on demonstrated outstanding research qualifications. Candidates in all areas of applied mathematics, including physical applied mathematics, computational molecular biology, numerical analysis and scientific computation, will be considered. Current activities of the group include: combinatorics, operations research, theory of algorithms, numerical analysis, astrophysics, condensed matter physics, computational physics, fluid dynamics, geophysics, nonlinear waves, theoretical and computational molecular biology, quantum computing, quantum field theory and material science; but new hiring may involve other areas. Applicants should (a) submit a vita and a description of their most recent research and future science; but new hiring may involve other areas. Applicants should (a) submit a vita and a description of their most recent research and future plans; and (b) arrange for three letters of reference to be sent directly. Deadline: January 10, 2005. Address: **Applied Mathematics Committee, Massachusetts Institute of Technology, Room 2-345, 77 Massachusetts Ave., Cambridge, MA 02139-4307.** MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY – DEPARTMENT OF MATHEMATICS - C.L.E. Moore Instructorships in Mathematics - These positions are open to mathematicians with doctorates who show definite promise in research. The teaching load will be nine hours for the academic year. Applicants should (a) submit a vita and a description of their most recent research and future plans; and (b) arrange for three letters of reference to be sent directly. Deadline: January 10, 2005. Address: **Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, Cambridge, MA 02139-4307.** MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY – DEPARTMENT OF MATHEMATICS – Statistics - The Department of Mathematics may make appointments at the level of instructor or higher in STATISTICS or APPLIED PROBABILITY starting September 2005. Open to doctorates with strong research and teaching qualifications. Applicants should (a) submit a vita and a description of their most recent research and future plans; and (b) arrange for three letters of reference to be sent directly. Deadline: January 10, 2005. Address: Statistics Committee, Massachusetts Institute of Technology, three letters of reference to be sent directly. Deadline: January 10, 2005. Address: **Statistics Committee, Massachusetts Institute of Technology, Room 2-263, 77 Massachusetts Ave., Cambridge, MA 02139-4307.** MIT is an Equal Opportunity, Affirmative Action Employer.

MICHIGAN TECHNOLOGICAL UNIVERSITY- DEPARTMENT OF MATHEMATICAL SCIENCES - The Department of Mathematical Sciences at Michigan Technological University invites applications for a tenure-track position at the rank of Assistant Professor in the area of biostatistics starting August 2005. Candidates must have a Ph.D. at the time of appointment and show excellent promise in research, a strong potential for obtaining external funding, and evidence of teaching effectiveness. Preference will be given to applicants in statistical genetics. To apply, send a letter of application, curriculum vita, transcript, and three letters of recommendation to: **Search Committee-Biostatistics, Department of Mathematical Sciences, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931-1295.** Review of applications will begin on January 15, 2005 and continue until the position is filled. Michigan Technological University is an equal opportunity educational institution/equal opportunity employer. Minorities and women are encouraged to apply. For more information on the position or the institution/company: http://www.math.mtu.edu.

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 CALUMET – DEPARTMENT OF MATH, COMPUTER SCIENCE AND STATITSITCS. - The Dept. of Math., CS, & Stat at Purdue University Calumet in Hammond, IN, is searching for an Assistant Professor of Mathematics Education to begin August 2005. See **http://www.calumet.purdue.edu/hr/employment** for more information on the position, including application procedures. Review of applications will begin January 24, 2005, and will continue until position is filled. Purdue University Calumet is an Equal Access/Equal Opportunity/Affirmation Action employer.

SOUTHERN OREGON UNIVERSITY – DEPARTMENT OF MATHEMATICS - Tenure-track Assistant Professor, Southern Oregon University, starting Fall 2005. One tenure-track position anticipated depending on availability of funding. Application review begins February 15, 2005 and continues until position is filled. Requirements: Doctorate in Mathematics Education or Mathematics (Mathematics Education preferred), excellent teaching record, strong commitment to teaching undergraduate mathematics, potential for strong professional activity including publication, speaking and grant writing. Applicants must be willing to work cooperatively with teachers locally and state-wide. See http://www.sou.edu/math/position for complete position description. Send vita, statement of teaching philosophy, description of professional goals, summary of teaching evaluations, transcripts, and three letters of recommendation to: **Dr. John Whitesitt, Department of Mathematics, SOU, Ashland, OR 97520.** SOU is an Affirmative Action/Equal Opportunity Employer.

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Association for Women in Mathematics
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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:
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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**

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JF_05

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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.**

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