AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 33, Number 1 NEWSLETTER January–February 2003

PRESIDENT'S REPORT

Happy New Year in a Prime Year 2003!

This is the 150th issue of the *Newsletter* produced by editor Anne Leggett. Congratulations, Anne!

The Executive Committee is pleased to announce the initiation of a new activity—AWM student chapters—that will give colleges and universities the opportunity to start their own AWM "group." See pages 5–6 for details on how to start a chapter. Thanks to Tamara Kolda, Carolyn Gordon, Tasha Inniss, Lea Jenkins and Jodi Novak for their work on the task force to formulate the guidelines for the chapters.

We are delighted to announce the forthcoming publication of an AWM book with working title *Celebrating Women in Mathematics*. Congratulations to the editors, Bettye Anne Case and Anne Leggett. This volume will include the proceedings of the Olga Taussky Todd Celebration of Careers for Women in Mathematics (which motivated the working title) and inspiring stories (most of them based on articles originally appearing in this *Newsletter*) about the lives and careers of doctoral women mathematicians. We are pleased to be working with Vickie Kearn at Princeton University Press on this publication, which will be available later this year or in early 2004.

A web search reminded us that nearly the same title has already been used: *Celebrating Women in Mathematics and Science*, edited by Miriam Cooney, CSC, and published in 1996 by the National Council of Teachers of Mathematics, is a well-regarded book containing 22 profiles of notable women mathematicians and scientists aimed at the middle-school population. Thus we are in search of a title for our book. If you have suggestions, please send them to Anne Leggett (alm@math.luc.edu).

If you are about to attend the January Joint Meetings in Baltimore, remember that the AWM panel discussion and business meeting, the

IN THIS ISSUE

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MATHEMATICS

The Association was founded in 1971 at the Joint Meetings in Atlantic City. The purpose of the association is to encourage women to study and to have active careers in the mathematical sciences. Equal opportunity and the equal treatment of women in the mathematical sciences are promoted.

The *Newsletter* is published bi-monthly. The Editor welcomes articles, letters, and announcements.

Circulation: 4000.

Noether dinner and the reception will be held on Wednesday, January 15th. The Noether Lecture given by Jean Taylor and the Joint Prize session are on that Thursday, and lastly the workshop for students and recent Ph.D.'s is on Saturday. This year, the AWM panel is a cooperative effort with NCTM on the topic "Mathematics educators and mathematicians working together." Hope to see you at the reception! Feel free to come up and introduce yourself to me.

This is my last column as AWM President. These two years have been filled with many celebrations and some disappointments. There are many people that I would like to thank. First of all, I thank Dawn Wheeler for her continuing service; she has now been with us for 10 years. I would like to thank our part-time staff members, Muriel Daley, Aileen Gormley, and Danielle Walton. Thanks also to Anne Leggett, Mary Ann Horn, Tamara Kolda, Renee Fister, Bettye Anne Case, Ginger Warfield, Marge Murray and Genevieve Knight for particularly strong volunteer contributions and for being extremely helpful to me personally. Carolyn Gordon, our next president, and I have been cooperating on a smooth transition, and I look forward to continuing to work with her.

In 2003, AWM will move to new office space at the same university, the University of Maryland at College Park. We are appreciative of the donation of this space to us by the University of Maryland and are glad to be a part of their campus.

Tamara Kolda is stepping down as our web editor. She was responsible for starting our webpage and has done a superb job of managing and editing it. Her contribution has meant a lot to AWM. Shunhui Zhu has enthusiastically agreed to serve as the next web editor. Shunhui was an assistant professor of math at Dartmouth College before moving into industry, taking a job at Interval. His middle-school daughter will be helping him with the webpage.

The AWM Essay Contest for Biographies of Contemporary Women in Mathematics generated a lot of interest again this year. There were many entries, and the results will be announced soon. Thanks to Vickie Howle for organizing the contest and to Sandia National Lab for their support of the contest.

The deadline for student and recent Ph.D. applications for our workshop at the SIAM meeting in Montreal is January 24th. Note that there are three deadlines in early February, the Travel Grant Applications and the Mentor Grant Applications (both February 1st) and the Sonia Kovalevsky High School Math Days (February 5th).

Lastly, I would like to thank my husband and my son, Peter and Phillip Andreae, for their patience and support during my presidency.

Suzanne Lenhart

Suzanne Lenhart
University of Tennessee
and Oak Ridge Laboratory
November 22, 2002

AWM ELECTION: CALL FOR SUGGESTIONS

In December 2003 we will be electing the following officers: President-Elect, Treasurer and two Members-at-Large. Suggestions for candidates may be made to Suzanne Lenhart or Carolyn Gordon by **February 15, 2003**, who will pass them along to the Nominating Committee. Your input will be appreciated!

The members of the Nominating Committee are Jean Taylor, Courant Institute, chair; Meghan Burke, Kennesaw State University; Sun-Yung Alice Chang, Princeton University; Ray Johnson, University of Maryland; and Carol Wood, Wesleyan University.

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues

Individual: $50 Family (no newsletter): $30
Contributing: $100 Retired, part-time: $25
Student, unemployed, developing nations: $15
Friend: $1000 Benefactor: $2500
All foreign memberships: $8 additional for postage
Dues in excess of $15 and all contributions are deductible from federal taxable income.
Institutional Members:
Level 1: $250
Level 2a: $125
Level 2b: $125
See http://www.awm-math.org for details on free ads, free student memberships, and ad discounts.
Affiliate Members: $250
Institutional Sponsors:
Friend: $1000+ Patron: $2500+
Benefactor: $5000+ Program Sponsor: $10,000+
See the AWM website for details.

Subscriptions and back orders

All members except family members receive a subscription to the newsletter as a privilege of membership. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $50/year ($58 foreign). Back orders are $6/issue plus shipping/handling ($5 minimum).

Payment

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

Newsletter ad information

AWM will accept advertisements for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Director of Marketing, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the* Newsletter *must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is $100 for a basic four-line ad. Additional lines are $6 each. See the AWM website for *Newsletter* display ad rates.

Newsletter deadlines

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

Addresses

Send all **Newsletter** material **except ads and material for book review and education columns** to Anne Leggett, Math Dept., Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; email: leggett@math.luc.edu; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Book Review Editor, AWM, 4114 CSS Building, University of Maryland, College Park, MD 20742-2461 and all **education column** material to Ginger Warfield, Math Dept., University of Washington, Seattle, WA 98195; email: warfield@math. washington.edu. Send everything else, **including ads and address changes**, to Dawn V. Wheeler, 4114 CSS Building, University of Maryland, College Park, MD 20742-2461; phone: 301-405-7892; email: awm@math.umd.edu.

AWM ONLINE

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Online Ads Info

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

Website and Online Forums

http://www.awm-math.org

AWM-Net Editor

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oleary@cs.umd.edu

AWM-Net

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

AWM DEADLINES

AWM Workshop, July 2003:
January 24, 2003

NSF-AWM Travel Grant: February 1, April 1, and October 1, 2003

NSF-AWM Mentoring Travel Grant:
February 1, 2003

Sonia Kovalevsky High School Mathematics Days: February 5, 2003

AWM EVENTS

AWM Activities at the Joint Mathematics Meetings, January 2003:
See calendar last issue.

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IN MEMORIAM: JEAN RUBIN

Jean E. Rubin, a professor of mathematics at Purdue University in Indiana, passed away on Friday, October 25, 2002, after suffering a cerebral hemorrhage.

She was an active researcher all her life. She received her Ph.D. from Stanford in 1955, working with John McKinsey and Patrick Suppes. She directed two doctoral dissertations at Purdue: Judith Harper, 1972, and Nickolas Backscheider, 1975. She and Paul Howard wrote the book *Consequences of the Axiom Choice*, Mathematical Surveys and Monographs, Vol. 59, AMS, 1998. This book is a survey of the research done on the Axiom of Choice and its consequences in the past hundred years. In September 2002, a joint paper "Metric spaces and the axiom of choice" was submitted by Rubin and co-authors Omar De La Cruz, Eric Hall, Paul Howard, and Kyriakos Keemedis. Other recent co-authors include her husband, Herman Rubin (a professor of statistics at Purdue), her son, Arthur L. Rubin, Norbert Brunner, and Adrienne Stanley.

She was an active supporter of women in mathematics and science and maintained information about and for women on her homepage. Among other things Jean did, she flew airplanes. She stopped doing that recently, but she was still taking airplane rides with her friends. She was also a volunteer for the West Lafayette Library. She had a great sense of humor, putting together a list of jokes every week, which friends enjoyed very much.

Jean Larson, University of Florida

HRUMC X

HRUMC X, the tenth annual Hudson River Undergraduate Mathematics Conference, will be held at Union College, Schenectady, NY on April 12, 2003. The conference includes presentations on mathematics by both faculty and students, and both are encouraged to participate. Conference sessions are designed so that some presentations are accessible to undergraduates in their first years of study, and others to third or fourth year undergraduate mathematics majors. This year's conference will focus on interdisciplinary talks, though talks in any mathematical area are welcome.

Those wishing to make a presentation at HRUMC X should submit an abstract via the website www.skidmore.edu/academics/mcs/hrumc.htm by **February 27, 2003**. Funding support from the Andrew W. Mellon Foundation is greatly appreciated.

WISTEM

"To ennoble, enable, empower and encourage women for science, technology, engineering and mathematics." This is the vision of WiSTEM (Women in Science, Technology, Engineering and Mathematics.) WiSTEM was established in May 2001 as a collaboration of a number of organizations, including the AWM, to advance the involvement of women and girls in STEM (Science, Technology, Engineering and Mathematics). Together these organizations include over 24,000 members and serve over 40,000 students.

On October 7, the president or representative officer of each of the collaborating organizations met together with the WiSTEM board at the home of Teri Perl. The AWM attendees were Kathy Kessel, who is the AWM representative on the WiSTEM board, and AWM President-Elect Carolyn Gordon. The objective of this ground-breaking summit was to converge on a common vision, goals, objectives and measures that will guide future activities of the WiSTEM Collaboration and lead to greater impact by all partners. All the partnering organizations reaffirmed their commitment to WiSTEM. In a brainstorming session, we considered ways the various partner organizations could collaborate to enhance each of their efforts. On a larger scale, we began to formulate the decision-making process of WiSTEM. Committees were formed to develop a plan for governance, to plan short-term activities, and to develop infrastructure.

"Imagine a place where women and girls interested and involved in science, technology, engineering and mathematics could come together, emerge from their isolation in worlds of work and education, and find others like themselves, thus allowing their creativity to flourish, unfettered by stereotypes and others' limited expectations." WiSTEM envisions a National Center for Women in STEM. The goals would be to provide a permanent home for proven nonprofit organizations to work collaboratively to increase women's representation, participation, retention and advancement, to undertake gap analysis and initiate program and policy research and center for development, to serve as a national focal point and a resource center for research, programs, and activities, to serve as a major educational center for women students, educators, researchers, and professionals, and to provide services, resources, and research for the development of new technologies, new businesses, and new models that incorporate the perspectives of women. An attractive potential site has been identified at the newly developing NASA Research Park. In 1994, NASA assumed management of the former Moffett Field Naval Air Station in Mountain, View, California, for development as a shared-use educational, research, and development campus involving synergistic nonprofit organizations. WiSTEM has signed a memorandum of understanding with NASA to discuss possibilities. Once the formal decision-making process of WiSTEM is established, WiSTEM may begin moving forward with the development of plans and funding goals.

The summit meeting on October 7 was initiated and funded by the Society of Women Engineers. In addition to SWE and AWM, the partnering organizations in WiSTEM are the Association for Women in Science, WEPAN (Women in Engineering Programs and Advocates Network), the Institute for Women and Technology, MentorNet, and the Math/Science Network.

Carolyn Gordon, AWM President-Elect, Dartmouth College

AWM STUDENT CHAPTERS

Student members of AWM now have the option of forming AWM Student Chapters. The purpose of the chapters is to give students an increased knowledge of and greater interest in the mathematical sciences, including pure and applied mathematics, statistics, and their applications; to promote a greater understanding of the contributions of women in the mathematical sciences; and to mentor and encourage women and girls as they prepare for careers in the mathematical sciences.

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

Tasha Inniss, Trinity College, D.C.

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.

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. For more detailed information on how to organize a student chapter, please visit http://www.awm-math.org/studentchapter.html.

The guidelines for the new AWM Student Chapter program were created by the AWM Task Force on Student Chapters whose members included Tamara Kolda (chair), Carolyn Gordon, Tasha Inniss, Lea Jenkins, and Jodie Novak.

SYMPOSIUM FOR JEAN TAYLOR

A one-day symposium will be held Friday January 31, 2003, at Rutgers University to honor Jean Taylor, who took early retirement last summer, and celebrate her many accomplishments. She has moved to New York and continues her work at the Courant Institute.

The symposium will begin at 9:30 A.M. in room 705, Hill Center and end with a social hour and party-dinner that evening. In between there will be lunch, beverages, cookies and camaraderie.

The symposium will consist of scientific talks. The speakers planned include A. Almgren, R. Almgren, E. Bombieri, J. Cahn, C. Carter, C. Handwerker, R. Kohn, J. Lepowsky, and F. Morgan. A detailed program will be posted at math.rutgers.edu/ events.html, along with information on hotels, directions, and parking.

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.

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 *five* complete copies of the application materials (including the cover letter) 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, 2003**.

MEMOIR: TO AGNES BERGER (1916–2002) AND OUR FRIENDSHIP

Miriam Lipschutz Yevick, Princeton, NJ

Soul Mates

Agnes and I were soul mates from the start. We had both earned Ph.D.'s in mathematics, Agnes at the University of Budapest under Professor Feher in 1939 and me at M.I.T in the fall of 1947. Agnes at 23 made her escape on her own after the war's outbreak via Berlin to take one of the last boats, the Serpa Pinta, from Portugal to the U.S. My father, transformed by panic from his usual indecisiveness, had led my family in flight from Belgium to the U.S. via Portugal in the months after the Nazi invasion of Belgium. The gruesome fate we had been spared cemented our bond. We also shared the recognition that our love of mathematics had helped to give us a new lease on life.

We met in the fall of 1947 in the Columbia Mathematics library, a four-flight climb up the rotunda. We were in the same situation: women Ph.D.'s in mathematics without a position because of our gender. Upon her arrival in the U.S. Agnes had approached von Neumann, an acquaintance from Hungary, for advice on how to further her career. He suggested—even though a decade later he wrote a letter of recommendation in which he spoke very highly of her abilities—that she should work as a housekeeper and do mathematics at night. I had a similar experience upon earning my degree at MIT. The woman in charge of placing women graduates informed me that "of course I could not get an academic position in mathematics as a woman" and that I should opt for being a technical assistant. However, not long after her arrival, Agnes had "captured" (in Erdös language) Laçzy, a successful stockbroker. "Something was happening," she told me later, so she concentrated on her goal of establishing a family, which also had interfered with her ambitions. Yet we each were determined to stay with our vocation, so we dragged ourselves uptown (I lived in Hoboken, Agnes on the East Side) and up the stairs. We faithfully attended seminars, we studied the books, we attempted to do some research on our own and we wondered about what, as women, we should do with our lives. Agnes had a two-year-old toddler at home and wanted another baby.[1] In the face of our ambivalency, we supported each other in our work.

Agnes' First Papers

In spite of the difficulties, Agnes' first paper was accepted in 1948 and appeared on page 25 of the first issue of the *Proceedings of the AMS*. "On disjoint sets of distributions" was in the company of articles by such luminaries as Fuchs, Renyi, Harischandra, Erdös, Gleason, Dieudonné, Otto Szasz.... She had begun her study of statistics; her article was motivated by a question raised to her by George Wald, the creator of Sequential Analysis. This paper already displayed her imaginative use of mathematics in tackling applied problems. At that time, many mathematicians looked upon statistics as an "inferior" discipline; Agnes applied statistical methods only after deriving an appropriate and precise mathematical foundation. Her correspondence and collaboration with Jerzy Neyman testify to her role in the development of mathematical statistics. Agnes was motivated by her strong wish "to make a contribution." She loved mathematics, but she wanted science to connect with social good. She wanted mathematicians and statisticians to have a social conscience, to relate to science and social responsibility.

I shared her outlook. I had done my thesis in measure theory, and the mathematician Yael Dowker, whom I had befriended in Cambridge, suggested that I work in probability theory to be better able to do some practical things. In fact this led me to an interest in the dichotomy between limit laws for sums of independent random variables tending either to normality or to another type of stability, a subject superbly presented by Paul Levy in his *Theory des Probabilités*. This dichotomy was based on the relation between the individual components to the sum; the first develops when the components are uniformly negligible against the sum, the second when one or a few individual components are dominant in the

[1] Laçzy maintained that he "was too old." I remember well the occasion when John, aged four perhaps, overwhelmed his gentle father who refused to give in to his demands, by exclaiming: "You are a mean lion!"

sum, as is the case in the distribution of wealth and income. I also recall that during those years while accompanying my husband to a physics symposium in Michigan, I asked Feynman to suggest a problem in probability that would be "useful." He advised me to work on problems "because they were interesting." I learned later on that the philosophy of "Science for the sake of Science," which he himself surely did not adhere to, was first espoused by Bismarck, who found it a useful tool for controlling scientists.

Vignettes

Agnes and Laçzy rented a summer cottage when Johnny was five, the *Sommerfrische* a city child needed. Agnes felt rather out of sorts as a vacation mother with no opportunity to do her own work. She invited me for a weekend. The weather was balmy and the mosquitoes out in force, the moon was full. "A great night for making love," Agnes whispered to me. However Johnny together with a group of age-mates had discovered a machine from which freely gushed Coca-Cola. The whole pack, high on the drink, rampaged all over the colony. They were eventually subdued and the night was still long.

One day I gave a lecture at the Columbia Statistics seminar in which I held my ground against some notable in the audience who did not understand me and harassed me. "I admire your courage in talking back," Agnes said to me. This critic called me to his office and sweated as I once more explained myself in greater detail. "Why must you do such hard things?" he finally lamented. A newcomer in the department, later Professor at Harvard, shared the office with this mathematician. The newcomer listened to my argument and showed the notable critic that my conclusions were correct. I met Agnes in the corridor and praised my supporter to Agnes. Agnes, who could be a flirt in the European upper-middle-class tradition, exclaimed: "Now, Miriam, *I* have an eye on him. Don't you dare!" She was equally sympathetic to my romantic dilemmas. "You must decide, Miriam, who you want to be the father of your child," she said to me at a critical juncture. Her words, spoken as we ate in the Columbia cafeteria, still ring in my ears as I think of that fateful choice.

My son, David, was born in 1954, when Johnny was nine. We lived in a small Manhattan apartment, and Agnes came with Johnny to visit. After they left, John, to whom she unsuccessfully had been trying to explain the term "bourgeois" said: "Now I understand what you mean. Miriam and George are not bourgeois."

Agnes moved to Riverdale for the sake of the "*frische Luft*" (fresh air) for Johnny. Each of our visits there was a joy. The company always was unforgettable: economists, physicists, mathematicians and philosophers. The food was unmatched, the pastry divine (we always looked forward to whatever Laçzy found in the Hungarian shops). The same was true when they moved to her apartment in the city a number of years later, when she announced: "we have come back from exile." I fondly remember my banter with Laçzy, in his eyes my naïve radicalism vs. his sensible conservative views. In fact I deeply regret not following his financial advice, since we always foresaw the demise of capitalism.

For five years after Agnes' father died she looked after her mother with a rare filial devotion. The image of Mrs. Hollow in her somewhat gloomy Lexington Ave. apartment and Agnes fussing over her, making her arrangements with the help, buying her food, trying to keep her entertained with books, is inscribed in my memory with great admiration. (And inspired me when I was in the same situation). Yet Agnes told me: "for my mother those six years after father died were wasted years." Later on I remember joining Agnes and her husband for walks in the park when Laçzy was no longer in good shape; Agnes helped him with great kindness and devotion.

Friend and Colleague

These were very fruitful and creative decades for Agnes (in spite of her family obligations). She had been appointed Instructor (1952–54), Assistant Professor (1957–64) and finally Associate Professor (1964–93) in Biostatistics at the Columbia University School of Public Health. In 1988 she was named Professorial Lecturer in Biomathematical Sciences at Mount Sinai Medical Center. Her many publications ranged over a wide spectrum of applications, while she simultaneously continued to develop theoretical methods to further her investigations. To mention but a few of these articles: "The influence of the thermal environment upon the survival of newly born premature infants," *Pediatrics*, 1958; "On the question of whether a disease is familial," *Journal of the American Statistical Association*, 1961; "On estimating recessive frequencies from truncated

samples," *Biometrics*, 1967; "Malignant melanoma in spouses," *Cancer Research*, 1979; "The relation of female polygamy to ganatrophic activity in the rook strain of Aedes Aegypti," *Mosquito News*, 1980.

Most of her work was done in collaboration with colleagues. She always stressed her preference—in contrast to my own—of talking a problem through with others, rather than writing. The mathematics was sometimes simple, more often her reasoning was based on subtle sophisticated arguments. The arguments were always rigorous; she would not brook any loose ends. She often discussed her current finds with me, but I was not well enough versed in the subject to understand without some reminders of the background of her work.

I was greatly impressed with how she mixed pure mathematics with these concrete applications. Knowing her worship of Latin, I was also quite amused by her use of the Latin expression *mutatis mutandi* in her exposition. She was an excellent expositor and teacher, if highly demanding of rigor and logical precision of thought in her students and interlocutors (like me).

I had become interested in the subject of holography as a result of my correspondence with physicist and friend David Bohm. I published "Holographic or Fourier Logic" in the journal *Pattern Recognition*, which interested Agnes very much—except that she always was pressing me for foolproof definitions. This work triggered an interest in the foundations of logic, and she gave me moral support as I attempted to get some controversial conclusions published. She knew that it was hard to break through when "thinking different," as had been the case with David Bohm. She did, however, balk at trying to understand Gödel's theorem, with the comment that von Neumann remarked that some parts of logic were the only "mathematics" which made him feel that he was going crazy.

Later Years

After Laçzy died, Agnes became much more outspoken politically, and I was delighted to see her shift in a very articulate way to the left, perhaps inspired by John, an environmental writer. She was also acutely aware of the injustices around her in the city and the world and asserted with clairvoyance: "Why should we expect that our good life in this country will go on as before while most of the rest of the world is mired in poverty? The time of reckoning will come."

She explained her deeper involvement with another unforgettable comment: "When Johnny was a baby, I came to love all babies; when he was a child, I came to love all children; when he was a youngster, I learned to love all youngsters; and now I love everybody."

For many years I drove to the City from New Jersey to visit my parents on the Upper West Side. I would call Agnes in the evening and ask: "Can I come?" She would say "yes" with delight. It was a joy to see her at her door down the long corridor and enter a scene reminiscent of my parents' home in my childhood, the solid European furniture, the fine rugs, the cyclamens and violets on her window sill, and to drink her good coffee prepared in her inimitable style: boiled till the water rose and then poured through a sieve. There was no end to what we talked about: politics, mathematics, colleagues, our research, music, science, children, grandchildren, and the lamentable state of American Culture to which they were exposed.

Agnes continued her professional work even after she retired. Her publications include several written after she turned eighty. Meanwhile I had been talking to her about the Foundations of Quantum Mechanics to which my reading had returned after almost fifty years. I told her about an error in von Neumann's proof of the non-existence of hidden variables in quantum mechanics. This proof had been of great importance in validating Bohr's interpretation of quantum mechanics among physicists versus Einstein's views. A woman physicist, Grete Hermann had pointed out this error in a publication in the late nineteen thirties, but her paper was completely ignored.[2] Agnes, in spite of her general support of those challenging orthodoxy in science, refused to believe that von Neumann could have made a mistake. It was only after I sent her one of John Bell's papers confirming the error that she admitted to her unjustified obduracy. This discussion between us took part during the last years of her life. Two years ago, in an attempt at understanding how probability is used in Quantum Mechanics, I brought her a paper on this subject by a Professor at Cornell that I could not understand. Even

[2] Hermann, G. Die naturphilosophischen Grundlagen der Quantenmechanik, *Abhandlungen der Fries'chen Schule (6)* (1935), 75-152. See also: Jammer, Max, The Philosophy of Quantum Mechanics, John Wiley & Sons, New York, 1974. Cronin, Jane, Social Influences on Quantum Mechanics, *The Mathematical Intelligencer, 23, 4*, (2001), 15.

though it was by then hard for her to read, she made the effort. "Rubbish!" was her opinion, as was my suspicion. If only in her honor, I am determined to prove her right in this matter. I am still working on it.

In Memoriam

Agnes was an intellectual in the deepest sense of the word, in the spirit of the outstanding scholars Hungarian Jewry produced. She knew that her roots were in the Jewish tradition of learning even if the learning had become secular, as were the roots of her profound social conscience. She carried the burden of the world on her shoulders, as she believed all Jews should. Agnes had an admirable scientific objectivity in all her judgments. Her voice was truly authentic. She was *ein Kultivierter Mensch*, as her parents and mine used to say.

I visited Agnes for the last time in November 2001. Somehow the conversation turned to Latin, and I told her that I never liked the Latin I studied in high school in Europe. This elicited a passionate response. She quoted Ovid at great length; she hailed the importance of teaching children to recite poetry, preferably in Latin; I was subjected to a procession of Latin quotations. Then, changing the subject, she gave me medical advice. I had a recent operation and was not feeling well. "If this was one of your family members, you would take them to the best specialist. I want you to see the best specialist." She urged me on and on until I agreed I would do so (I haven't yet).

Her vision was very bad and she knew that she needed more help. Yet she was reluctant to make other arrangements. I sent her the person who had taken care of my mother, but she was too anxious and indecisive to act. I was worried when I left her. She would not hear of giving up her independence to join John and his family in California. I did not speak to her again after that evening; she died in March 2002.

Agnes' phone numbers is one of the few stored in my head for more than forty years: Regent71523. It no longer responds. Agnes is a voice inside me, which reminds me "that we are all in all." Losing Agnes is losing a part of myself. I think that the greatest tribute her friends can pay her is to keep that voice alive.

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. For example, this includes certain areas of statistics, but excludes most areas of mathematics education and history of mathematics. 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 three deadlines for receipt of applications are **February 1, May 1**, and **October 1, 2003**.

EDUCATION COLUMN

Some people provide inspiration by making resounding speeches, and some by doing spectacular deeds. Some, on the other hand, go quietly about their business, and the inspiration they provide happens only after some circumstance calls them to one's attention. This provides fewer fireworks, but I'm inclined to think the resulting impact may endure longer.

I had the good fortune to experience this kind of inspiration last year. In the course of planning for a forum on diversity, I became conscious of Ray Johnson, longtime professor at the University of Maryland. Despite the fact that a quirk of fate prevented his actual visit, I continue to be influenced by what I learned of and from him. This column is an attempt to communicate some of the inspiration he gave me.

The first indications of his character and style are in his autobiography, found on his home page at http://www.math.umd.edu/~rlj/RJ.html. His page is entitled "You can get there even from Alice, Texas (if you're lucky and you know where there is)." With a title like that, it is not surprising to find that the story makes very good reading. His underlying theme is that "I would describe my life, including my entry into the profession, as being characterized by my coming of age on the right side of several transition points from the totally segregated society in which I grew up to the quasi-open society in which we now live." One such transition point was *Brown* v. *Board of Education*, which happened after he finished elementary school in a two-room school (one that may well have served him better than the classy all-white one he had to walk past every day would have), but before he was bussed out of town for high school. Another transition resulted from the mad scramble to improve mathematics and science education after Sputnik was launched: one of Ray's teachers attended mathematics institutes at the University of Texas. This resulted not only in Ray's getting some really good high school classes, but also in his introduction to a professor who served him as a mentor throughout his undergraduate career at UT.

Under the wing of this professor Ray went on to do his graduate work at Rice, which was in the not-too-smooth process of becoming integrated. Ray was the first African-American to receive a degree from Rice. From there, by a process that from today's vantage point looks stunningly casual, he got a position at the University of Maryland. He went on to be "promoted though the ranks at Maryland, surviving long enough to become the African-American faculty member with the longest tenure at College Park. As a reward for this, they made me Chair of the Mathematics Department; frankly, I think I deserved better, but I survived the term with some wits intact."

It was while he was chairman that he instituted some programs whose results have caused universities all over the country to sit up and take notice. The most spectacular (and widely reported) result was the granting of Ph.D.'s to three African-American women simultaneously. The programs themselves are described in the *Chronicle of Higher Education* at http://chronicle.com/free/v47/i23/23a01401.htm. That article is very interesting, but I was even more taken with an article in "Colloquy Live", also in the Chronicle of Higher Education, at http://chronicle.com/colloquylive/2001/02/math/. This one is a transcript of a phone-in talk show with Ray as the guest, and it has some comments that deserve attention. His response to the moderator's opening question is a good example. The moderator asked "What are some of the best practices that your department has developed or identified in its efforts to attract more underrepresented minorities and women?"

Ray's reply was: "Attracting students is the easy part. Getting them through to the degree despite the obstacles provided by life is the hardest part. The practices are: 1) recruit where the minority students are (frequently at historically black universities, but know which produce students who can succeed in your program), 2) get a critical mass of students to whom you have given a good experience (I don't think that necessarily means that they succeeded; that they feel well treated and that the program is fair is often enough), and 3) stay involved in the students' lives (so that you can tell their undergraduate mentors how they are doing when you see them)."

Later in the show came the question: "Do you think the needs of women and minorities in mathematics overlap? Are they different than those of white or Asian students given that they are not underrepresented in the

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

field?"

Ray replied: "No, their needs do overlap. I believe that the policies that have been practiced by the math community have been detrimental to all students, but they have had a particular impact on minorities and women, as they are such a small part of that community. My experience is that when improvements are made on the practices that detrimentally effect women and minorities, these improvements also have a significant impact on the entire mathematics population."

On the issue of blaming the situation on K–12 education Ray said: "I agree that the problem has many roots that must be attacked before it is solved. For example, I think that the education some minority students receive in college can cause them to be underprepared in graduate school. However, I think that each of us has the responsibility to deal with this issue at our level. We can't wait for the other levels to solve the problem. Otherwise, we may get stuck in the 'paralysis of analysis.' I see two roles for college faculty in dealing with the K–12 educational issues. First, we must recognize the difference between training and ability. Students come to us with different levels of training. Minority students are frequently characterized as not having *ability* when what they lack is in fact training. Second, I think we should try to prepare future math and science teachers well. The mathematics community had a high level committee prepare a report that attempts to guide mathematics departments as to how they can do a better job of preparing future teachers. So my approach is to try to improve things that are in my province. The people in K–12 should be working on things in their province and the University should help them where possible."

So why do I find Ray an inspiration, and what do I hope he will inspire in you? Part of it, I think, is his perspective. Education today has many problems, and it is easy to get overwhelmed by their magnitude to the point of feeling that a single piece of a solution is insignificant. It takes courage to hang onto the conviction that the bit that one can contribute where one is, and with one's own talents and opportunities, is worth contributing. Ray looked at what he could do at his own university for students in his own department, and did it. In fact, what he could do turned out to be lots. I also like his description of the key element of his success: not the large-scale organizational structure (though it must exist) but the personal contact with, and interest in, and responsibility for each student who responds to the department's invitation. Clearly he is not someone for whom a student will ever be just a statistic. I also like his refusal either to lay the entire of the blame for the current problems of education at someone else's feet or to have the universities shoulder it all. Each of us has some responsibility and some options for being helpful, and each should act upon them.

Every one of those issues carries a lot of weight with me. Besides, how could I possibly not be inspired by someone who came up with the notion of the "paralysis of analysis"?

AWM CONFLICT OF INTEREST POLICY

A conflict of interest may exist when the interest (financial or other) or concerns of any member of AWM, or the member's immediate family, or any group or organization to which the member has an allegiance or duty, may be seen as competing or conflicting with the interests or concerns of AWM.

When any such potential conflict of interest is relevant to a matter requiring participation by the member in any action by AWM or any of its committees to which the member belongs, the interested party shall call it to the attention of AWM or the committee and such person shall not vote on the matter. Moreover, the person having a conflict shall retire from the room in which the organization or its committee is meeting (or from a conference call) and shall not participate in the final deliberation or decision regarding the matter under consideration.

The foregoing requirements shall not be construed as preventing the member from briefly stating her position in the matter, nor from answering pertinent questions of other members, as her knowledge may be of great assistance.

The minutes of the meeting of the organization or committee shall reflect when the conflict of interest was disclosed and when the interested person did not vote. When there is a doubt as to whether a conflict of interest exists, and/or whether a member should refrain from

voting, the matter shall be resolved by a vote of the organization (or its committee), excluding the person concerning whose situation the doubt has arisen.

A copy of this conflict of interest statement passed by the AWM Executive Committee, Vancouver, 8/16/93, shall be published once a year in the AWM *Newsletter*, and any member serving as an officer or on a committee shall be advised of the policy upon undertaking her duties.

BOOK REVIEW

Sarah Flannery with David Flannery. **In Code: A Mathematical Journey**. Routledge, New York, 2001. 368 pages. ISBN 0-415-92696-3, $23.95 (paper).

Reviewed by Gretchen L. Mathews, Department of Mathematical Sciences, Clemson University, Clemson, SC 29634.

This is the true story of Sarah Flannery, an Irish teenager, and her journey to becoming European Young Scientist of the Year. It is a most enjoyable read and should appeal to mathematicians and non-mathematicians alike. This book is a human story that illustrates why discovering new mathematical ideas is important, how one might go about doing this, and how exciting the process can be. For this reason, it is a special treat for any young person interested in mathematics.

This inspiring tale is told by Sarah (with the help of her father, David Flannery) and begins with a description of her upbringing. Sarah, the eldest of five siblings, was raised by her mother and father in the countryside near Blarney, Ireland. In the Flannery home, problem solving is a prized skill, and a chalkboard hangs on the kitchen wall. This is no doubt due to the fact that Sarah's father is a lover of mathematics and is a lecturer in mathematics at nearby Cork Institute of Technology. The Flannery children are routinely given puzzles to solve. Examples are woven into the first two chapters of the text. The reader is encouraged to think about these before peeking at the solutions that follow. This is one of the most enjoyable parts of the text. The problems are exercises in logical thinking, and no mathematical prerequisite knowledge is necessary to solve them. It is clear that the Flannery family enjoys these brainteasers. A solution to one is cause for excitement and for reflection. Sarah and her siblings are encouraged not only to explain why a solution is valid but also to think about whether the same solution holds in a more general setting.

Sarah's background in problem solving and her father's advice lead her to choose a cryptography project to enter in the 1998 Irish Young Scientist Exhibition. She does an admirable job of explaining to the reader her project, which includes a description and implementation of the RSA cryptosystem, as well as the elementary number theory required. Topics such as primes, modular arithmetic, and one-way functions are discussed in lay language. These sections would provide a nice supplement to an introductory mathematics course. At this competition, Sarah wins the Intel Excellence Award and as a result will represent Ireland at the Intel International Science and Engineering Fair in the US. Before taking her project "international," Sarah wants to add originality. During this time, she spends two weeks interning at a cryptography company to satisfy the work experience required for her high school education. A cryptographer there gives Sarah a research paper. She paints a clear picture of the task of reading such a paper: looking up references ("going to the journals"), trying to check things, wanting to understand the reasoning behind each statement, but realizing there is not time for this if one intends to finish in a reasonable amount of time. In the end, she develops an algorithm based on ideas in the paper.

Sarah Flannery is to be congratulated both for her accomplishments and her honesty in communicating them. The reader will appreciate her modesty and her openness. While exhibiting enthusiasm for her project, she still makes it clear that this is one of her many interests. While reading this portrait of Sarah Flannery and her mathematical journey, one is grateful she and her father choose to share it. Upon finishing the book, one will immediately want to lend it to others and wish for more copies to share.

DUES! DUES! DUES! DUES! Please renew your membership if you have not already done so. Ask a friend or colleague to join, or give a gift membership.

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

supported by the Air Force Office of Scientific Research, the Office of Naval Research, and the Association for Women in Mathematics

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

WHEN: The next AWM Workshop, to be held in conjunction with the First Joint Meeting of CAIMS and SIAM (the 24th Annual Meeting of CAIMS/SCMAI and the 2003 SIAM Annual Meeting), will take place at the Queen Elizabeth Hotel in Montreal, Quebec, Canada, June 16–20, 2003.

FORMAT: The workshop will consist of a poster session by graduate students and one to 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 minisymposium will have a definite focus selected from the research areas of Mathematical Biology, Modeling, Control, Optimization, Scientific Computing, and PDEs and Applications. AWM will offer funding for travel, and two days subsistence for the selected participants. All mathematicians (female and male) are invited to attend the program. 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.

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 her research is required for graduate student applicants, and recommended but not required for recent Ph.D.'s. 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 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 web site.

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 24, 2003**.
Applications via email or fax will not be accepted.

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

Funded through grants from the National Security Agency and Coppin State College. 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.

We encourage you to apply to hold an SKHS Math Day. See page 21 for application information.

Hood College, Frederick, MD

At Sonia Kovalevsky Day at Hood College, our career panel was a sort of "sleeper" activity that we did not expect to be a big hit but that in fact generated lots of positive feedback. We worked hard to put together a panel that would have both a wide range of careers represented and all female speakers. The result was a four-woman panel consisting of two Hood alumnae and two people from the community at large.

Our speakers were Izzy Kyle, a Hood alumna who has an M.S. from Lehigh University and now works at the Applied Physics Lab at Johns Hopkins University; Laura Schultz, a Hood alumna currently working at the National Institute of Standards and Technology; Dr. Theresa Francis, a former mathematics professor who is now in her third year working for the National Security Agency; and Colonel Denise McCollum, Director of Resource Management at nearby Fort Detrick. Each woman spoke for about 10 minutes about the path she had taken to get to her current position and about the ways in which she used mathematics in her work, and then the floor was opened for questions.

The students asked fantastic questions about the speakers' individual jobs, about their mathematics educations, and (most impressively!) about internship opportunities with their respective employers. The rapport between the panelists and the students was so good, in fact, that at the end the panelists all listed their email addresses on the board at the front of the room and invited the students to email them with further questions. We had to end the discussion to go to lunch, but all of the panelists joined us for lunch and sat with the students to continue their conversations. It was a wonderful experience.

Kira Hamman, hamman@hood.edu

Mount Mary College, Milwaukee, WI

The activity "Cryptology" was selected because all participants were AP Calculus students. The College is most grateful to Mackichan Software for donating a free license for the workshop.

Students were paired to share an Internet-ready wireless laptop equipped with Scientific Notebook. They each received three handouts: one explaining the Caesar, Affine, Hill, and RSA ciphers; one explaining modular arithmetic; and the third explaining the properties of modular arithmetic. Students began the activity by becoming familiar with the software and commented positively on the quality of the wireless technology and the calculation power of this software.

Students then were introduced to the Caesar cipher. They immediately grasped the idea behind the Caesar cipher—two concentric circles, joined at the middle, each divided equally into 26 sectors with the alphabet written in order through the sector.

A mathematical description of the Caesar cipher followed, leading to an involved investigation of modular arithmetic. The Affine cipher was introduced, and the properties of modular arithmetic were investigated. Students then used the Internet to visit websites describing other ciphers that use rearrangements of the alphabet, such as the Jefferson cipher wheel. A brief discussion on the history of such ciphers and their roles in World War I and II ensued.

Next, the Hill cipher was introduced, followed by a discussion of the RSA public key address. Students were very interested in such ciphers and the power of prime numbers, and asked "How can anyone announce his or her RSA public key address?" This question led to a discussion about large prime numbers and factorization of the modulus into two primes. Again using the Internet, students visited websites that introduced them to large primes and gave background information on the difficulty of factoring large numbers into primes, even with today's technology.

Discussion throughout the activity was lively. The mathematics presented during the activity was varied, ranging from mathematics use that most students could follow and understand to mathematics use that was too difficult for the students to grasp at this point in their mathematics experience.

SKHS Math Day participants, Mount Mary College

Cryptology activity, SKHS Math Day, Mount Mary College

In summary, student responses to the activity were very positive, including: *I never knew math could be applied that way; Cryptology could be a possible career for me; Cryptology was very interesting;* and, *I learned how widespread math is.*

Nassau Community College, Garden City, NY

Our featured activity for the past three years has been our math contest. We saw the math contest as a time where students were asked to think, have fun and participate in some healthy competition. We did not want this competition to be between schools, so we devised the following "Contest Scheme."

We went to www.agnesscott.edu/lriddle/women and copied stories of about 20 mathematicians. We put the stories on a cardboard file folder, so we could stand them up in the middle of a table. Each table was to be "base camp" for a team.

We wanted participants to work with students from other schools. This also ensured that one school would not "bring home all the prizes." Each school would have contest winners. We decide on how large a group should be based on our enrollment numbers. Teams have typically included from six to eight students. We then decide on the breakdown of the team. We have decided that each team should have at least two girls from the same school, for comfort, and that each team should have girls from three or four different schools. We assign the groups randomly as follows: each student gets a folder at the beginning of the day that includes the program, a pad, logo pencil, logo key chain, information about AWM and a *Careers that Count* booklet. In this folder, we put a photocopy of the info for one of the mathematicians that we have put out on the tables. If the teams have six students, there are six photocopies for each mathematician randomly distributed in the folders. When the students come to the Multipurpose Room for the math contest, they go to the table that has the cardboard centerpiece of the mathematician in their folder. They then meet their teammates. We try to keep teams as even in size as possible. Due to absences, we may have to adjust some teams before we start.

Each team gets an envelope containing the contest questions. They are color coded by point value. A correct answer to any question could be worth 1, 2, 3, 4 or 5 points. There is a tie-breaker question included in the packet. We pick a tie-breaker question with an answer you can find by trial and error. It's usually a combinatorial question, so that the group does not have to answer the question correctly, but just has to come closer than any other group to getting the correct answer. The students are given 20–30 minutes (depending on the day) to finish as many questions as they can. Of course part of the strategy is to get points as well as correct answers. So the girls decide when they are better off answering five-point questions and when they are better off answering lower value questions. The girls are encouraged to work together; faculty members walk around to monitor the contest. The faculty encourage the students to work together and check each other's work.

Points are tallied while the students are at lunch and in their last sessions. We end the day with the announcement of contest winners. The high school teacher chaperones are then given the questions and answers.

We pick questions from a variety of sources. We have used in the past: The Mathematics Teacher monthly calendar, MENSA publications, textbooks used in the Math for Liberal Arts courses taught at the college, and logic puzzles. The packet includes from 10–15 questions, depending upon the number of students per team and the time spent on contests.

North Dakota State University, Fargo

One of the workshops at the sixth North Dakota State University Sonia Kovalevsky Mathematics High School Day was about finite groups, illustrated by the group-theoretic properties of Rubik's Cube. The workshop, presented by Jim Coykendall of NDSU Department of Mathematics, was very aptly titled "The Mathematics of the Rubik's Cube." The workshop was very engaging and was received enthusiastically by the whole audience, students and teachers alike. To help with the hands-on part of the workshop, each participant was given a Rubik's Cube. Furthermore, following this workshop, during each break, lunch, and (as the teachers reported later on) on the way home, the students were busy, constantly playing with their Rubik's Cubes, talking

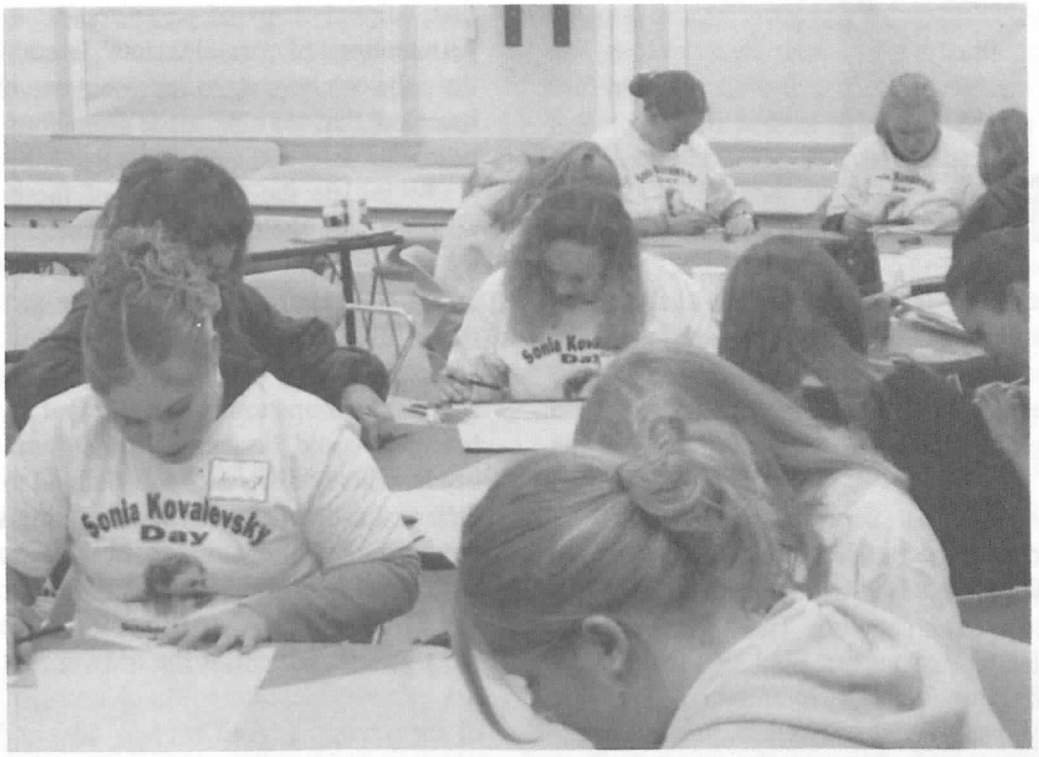
Theresa Vecchiarelli, vecchit@ncc.edu

Dogan Çömez, Dogan_Comez@ndsu.nodak.edu

about how to solve them, and trying to explain each move in mathematical terms. To Jim's and our delight, this workshop stole the show for the day, and no one minded it at all!

Jim began his "show" by explaining the permutation group of the vertices of an equilateral triangle, moving into progressively more complicated ones, ending up with the general definition and basic structural properties of finite symmetric groups. Among these, the theorem of Cauchy on the relationship between the order of a finite group and the order of any one of its members was stated without proof, but this property was observed in many of the examples exhibited. Halfway through the workshop, Jim brought out his Rubik's Cube and explained how each move of it can be looked upon as a member of a finite, non-commutative group. Using Cauchy's theorem, he explained why there is always a solution to Rubik's Cube problem, i.e. bringing all like colored squares to the same side of the cube. Then, to the amazement of many of the students, he showed a few examples and asked students to try to do the same with theirs. It turned out that Jorge Calvo, one of the organizers, is an expert in solving Rubik's Cube and can solve the cube in two minutes or less! This added an extra dimension to the extravaganza of playing with the cube, and for the rest of the day students were seen playing with their Rubik's Cubes whenever they had time from other activities. Often they could be seen surrounding Jim and Jorge to ask and then watch, with amazement, how they could solve a well-scrambled cube in just a few minutes' time. Sure enough, many of the evaluation sheets were filled with sentences like: "The Rubik's Cubes were fun," "The dude with black hair [Jorge] was really knowledgeable with the cube," or "I loved watching Jorge do the Rubik's Cube, it was amazing!" Overall, the day was lots of fun and full of learning, and the workshop on Rubik's Cube contributed to it significantly. One student evaluation sums it up: "Nothing really to add, I loved it. Jorge was interesting and I actually understood it."

SKHS Math Day participants, University of Montana



Beginning the Diagonal Cube activity, SKHS Math Day, University of Montana

University of Montana, Missoula

Our featured activity is "Diagonal Cubes—Making Polyhedra from Folded Strips of Paper." This activity was taken from the book *Build Your Own Polyhedra* by Peter Hilton and Jean Pedersen (1994). It involves paper folding and several repetitions of measuring an angle of forty-five degrees.

Each participant made her own diagonal cube. They were asked to choose four different colors of construction paper, as the activity ended with a discussion of how the six sides of the diagonal cube represent the twenty-four elements of the group of permutations.

Materials needed include the following: large pieces of medium weight construction paper in a variety of colors, scissors, protractors, pencils, and rulers.

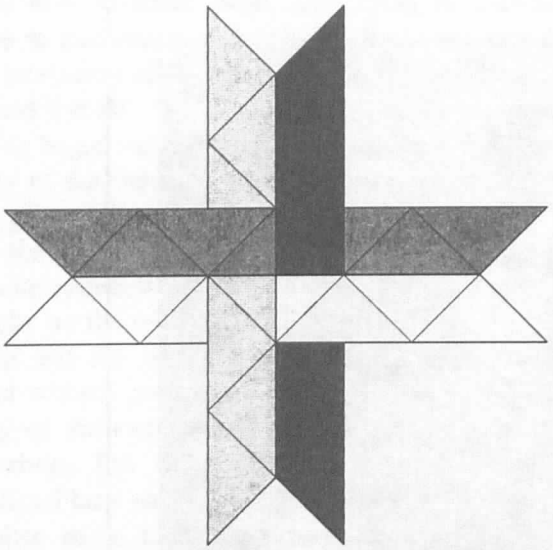
Explanation of how to construct the diagonal cube began after each student collected a pair of scissors, a protractor, and a pencil. As a group, the participants choose four colors of construction paper for each table. Each circular table had four participants sitting in a fashion whereby they faced each other and could easily work together.

Participants were instructed on how to make four strips of paper as long as the longest side of the construction paper. This involves dividing the longest side into four equal lengths that form the base for four of the seven isosceles triangles. Students were advised to measure the forty-five degree angles carefully. A great precision of measurement is required with small diagonal cubes.

Professor Libby Krussel played music while participants worked on their strips of paper. It was funny math music. The song was entitled, "New Math" by Tom Lehrer. You can listen to this song by going to the following website: curvebank.calstatela.edu/newmath/newmath.html.

Once the strips were formed, folds were made over the pencil marks by using a ruler and the edge of scissors. Then the strips were laid in a nested pattern:

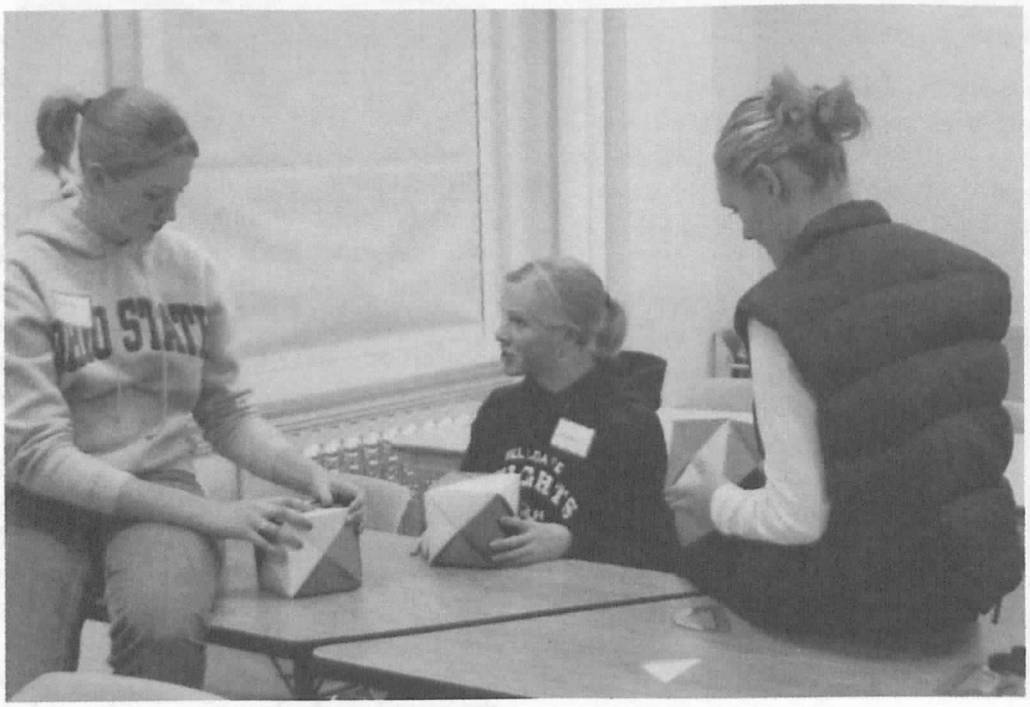
Ms. Jane Wilson, wilsonja@mso.umt.edu, and Dr. Libby Krussel, krussel@selway.umt.edu



While one person held the center down with her finger, another person wove the edges in such a way that each side has one of each color showing. The top was folded down in a circular pattern with a final tuck under the first strip. The final product was an attractive diagonal cube that proudly displays all possible permutations of four elements.

The paper cubes that the girls constructed from the four colored strips of paper represent S_4, the group of permutations of four elements. In addition, each side of the cube can be seen to represent one of the six different bracelets that may be made from four different colored beads.

To initiate the discussion of the mathematical connections with the cube, Dr. Krussel asked each group to try to figure out how many different permutations there are of four elements. Most of the groups were able to figure this out quite quickly, as they seemed to have some familiarity with counting techniques. She then asked the groups to try to figure out how many different bracelets could be formed from four different colored beads, where "different" was defined to mean colors in a different order (read around the circular bracelet), and "not different" meant colors in the same order, i.e. color order ABCD was not different from color order BCDA or CDAB or DABC. After some animated discussions, most groups arrived at the answer that it is possible to have six different bracelets of four distinct colors. Most of the groups arrived at their answer by writing out a table of possible bracelet colors.



Finished product, Diagonal Cube activity, SKHS Math Day, University of Montana

Krussel then focused the girls' attention on the side of their constructed cubes, and encouraged them to label the four different colors A, B, C and D. Then, reading the colors in clockwise order, the students were asked to write down the color pattern associated with each of the six sides of the cube. They easily saw that each side represented one of the six possible bracelets, (with four equivalent color patterns), giving, in total the twenty-four elements of S_4.

WGIT INITIATIVE

Women & Girls in Technology (WGIT) began as a local initiative in the Puget Sound area, sponsored by the Northwest Regional Office of the Women's Bureau of the US Department of Labor, to contribute to the national effort to increase the participation of women and girls in math, science, and technology. It has since evolved to include five national regions of the Women's Bureau and to partner with both Media Logic, Inc. and the Women's Center at the University of Washington.

The major components of this initiative are the national website and database and the virtual conference call series. Previously, the Women's Bureau had hosted numerous technology events and learned of many excellent programs and policies directed at increasing the participation of women and girls in science and technical fields. However, no central source of information existed for women to access these programs and policies.

In response to this need, the WGIT website was created as a centralized, virtual venue where women and girls can access national, regional, and local information

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

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

AWM anticipates awarding seven to ten grants ranging from $1500 to $2200 ($3000 maximum) each to universities and colleges; more grants may be awarded if additional funds become available. Historically Black Institutions and women's colleges are particularly encouraged to apply. Programs targeted towards inner city or rural high schools are especially welcomed. If selected, institutions will receive an information packet consisting of model schedules of activities, a check list for the sorts of arrangements that need to be made, suggestions for securing additional funding and for obtaining prizes to be awarded to contest winners, recruitment and publicity material to be adapted for local use, lists of possible workshop topics for students and teachers, model problem solving contest material, and guidelines for follow-up activities and evaluation.

Applications, not to exceed five pages, should include: a) tentative plans for activities, including specific speakers to the extent known; b) qualifications of the persons to be in charge; c) plans for recruitment, including the securing of diversity among participants; d) itemized budget; e) local resources in support of the project, if any; and f) tentative follow-up and evaluation plans. The decision on funding will be made late February to early March. The high school days are to be held in Spring 2003. 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 December 1, 2003, 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; URL: http://www.awm-math.org. Applications must be received by **February 5, 2003**; applications via email or fax will not be accepted.

to support their interest and skills development in science and technology. Users can perform searches on the website to find information regarding the numerous events, programs, and resources in their state. The online database also enables a wide group of community organizations, agencies, and employers to share information with the public and to network and collaborate with each other.

The planned series of monthly conference calls offers a more interactive approach to disseminate information to the public and to facilitate greater communication and networking among organizations, programs, states, and interested individuals. Each month, presenters will talk about different issues, initiatives, policies, programs, and events related to women and girls in science, engineering, and technology. For example, the topic of the September conference was Women of Color in Science and Technology, while the October conference covered Distance Learning. The technology virtual conference calls are scheduled for the second Thursday of each month at 3 pm EST and 12 pm PST.

To register for a conference call, search for information in the database, or learn more about WGIT, visit www.wgit.org.

ECHO SURVEY

Echo: Exploring and Collecting History Online at George Mason University has a Women in Science and Engineering project intended to document the career experiences of women scientists and engineers in recent memory. We have developed an online survey, allowing women to tell about their careers in their own words.

The ascent of women in science and engineering has been dramatic during the past decades. Even though more women than ever earn degrees and pursue careers in science and engineering, women's career experiences are still distinct, characterized by obstacles and subtle and not so subtle ways of discrimination.

We are hoping to create a rich public database, serving as an educational tool for scientists, scholars and historians, revealing the experiences that women have shared across a wide range of fields.

The URL for the survey is echo.gmu.edu/wise/survey/index.php. You may make your contributions at any time.

LONGITUDINAL STUDY OF EYH ALUMNA

As it prepares to launch its 28th year of Expanding Your Horizons in Science and Mathematics™ conferences for middle and high school girls, the Math/Science Network is asking for help in evaluating the conferences' long range impact. For many years now, the Network has heard anecdotal evidence that the conferences do indeed encourage girls to keep their future career options open by taking elective math courses in high school. One EYH alumna, who attended 16 years ago, said, "It was a fantastic experience that I remember fondly even today! Participating in the conferences helped clarify my own career goals and was an experience that shaped the engineer and woman that I am today."

Please help us collect more of this information. If you or anyone you know attended an EYH sometime in the past 27 years, whether or not it inspired you to pursue a career in science, technology, engineering, or mathematics, please go to our quick simple survey at echo.gmu.edu/surveys/contribute.php?Survey=horizons and tell us about your EYH experience. You may also reach the survey and find out more about the Math/Science Network by visiting our website at www.eyhnet.org or www.expandingyourhorizons.org.

Then and now

The Math/Science Network grew out of a group of California math educations in the mid 1970s who were concerned about "math, the critical filter" and its significance as a gatekeeper to careers in the more lucrative professions. In the mid-70s, very few girls were looking toward the kinds of career paths that are open to them today. Since then, the numbers of female students taking

Teri Perl, Math/Science Network Board President, author of Math Equals, Women & Numbers, *and* Notable Women in Mathematics

upper-division math classes has increased significantly and many more are studying science and engineering at college. As over 575,000 young women have participated in an EYH since the inception of the program, we suppose that we can take some credit for these increases. Your responses to our online survey will give us more information about the impact of EYH.

During the past 27 years, the number of EYH conferences has grown to over 100 annually—and to many locations around the country. The interactive workshops that are at the heart of the conferences provide the opportunity for girls to interact with the women scientists and engineers who lead the workshops and act as role models. The conferences as a whole emphasize the importance of making the correct math course choices in high school—and the long-range implications of such choices.

OPPORTUNITIES

Summer Math Program for Undergraduate Women

After a one-summer sabbatical the Carleton College mathematics department intends, pending renewed funding from NSF, to offer again our month-long summer mathematics program for eighteen mathematically-talented first- and second-year undergraduate women. By introducing them to new and exciting areas of mathematics that they would not see in a standard undergraduate curriculum, and by honing their skills in writing and speaking mathematics, the program leaders endeavor to excite these women about the possibility of earning advanced degrees in the mathematical sciences, and, more importantly, to increase each woman's confidence in her own abilities and connect them all into a supportive network to carry them through their undergraduate and graduate education.

At the heart of the program are two demanding, intense courses under the supervision of female faculty who are active in research and reknowned for their teaching. In past summers we have had the following instructors: Judy Kennedy (Topological Dynamical Systems), Erica Flapan (Knots and Chemistry), Laura Chihara (Algebraic Coding Theory), Karen Brucks (Low-Dimensional Dynamical Systems), Margie Hale (Fuzzy Logic), Rhonda Hatcher (Game Theory) and others. Besides the coursework, participants take part in a variety of mathematical events: panel discussions on graduate schools and careers, colloquia on a variety of topics, recreational problem-solving, and visits from at least one REU organizer and the organizer of the Budapest Semester. The mathematical part of the program is balanced with optional weekend events including canoeing, hiking, picnics, and tubing.

Past participants (through program evaluations and the list server set up for their correspondence) report increased facility with mathematics, bolstered self-confidence, and new or renewed excitement toward mathematics. If you have first- or second-year women students who would benefit from a demanding, invigorating month-long exposure to mathematics this summer (June 22–July 20), refer them to www.mathcs.carleton.edu/smp or to Deanna Haunsperger at Department of Math/CS, Carleton College, Northfield, MN 55057 (dhaunspe@mathcs.carleton.edu).

Workshop on Dynamics and Bifurcations of Patterns in Dissipative Systems

NSF and the Department of Mathematics, Colorado State University, are organizing a Workshop on Dynamics and Bifurcations of Patterns in Dissipative Systems to be held at Colorado State University, Fort Collins, CO, May 19–22, 2003.

The participation of women is strongly encouraged and we would like to announce this opportunity to your organization. More details may be found at www.math.colostate.edu/~juliana/DynBifPat.html.

TIM2S

A two-week NSF-funded summer institute, Teaching with Instructional Multimedia in Mathematics, Science and Technology, will be held July 14–25, 2003 at The Essex Campus of The Community College Of Baltimore County, Baltimore, MD, with academic year activities and a second workshop in July 2004. The purpose is to provide 20 science, mathematics, and technology college faculty and secondary teachers with an opportunity to develop their skills in using technology in teaching science, mathematics, or technology; to provide supportive

opportunities for developing course-related websites and instructional multimedia presentations using current Windows software packages; to provide in-person and online support in the use of these technologies during the 2003–2004 and 2004–2005 academic years and two-week summer institutes; and to develop and share Multimedia Learning Activities (MLAs) for classroom use.

Actively participating faculty and teachers will receive a stipend of $60 per day for the summer institute. In addition, each participant who completes two summer workshops will receive Macromedia or other software for Windows valued at $800. A very limited amount of funding is available for faculty/teachers to reside at a local hotel during the workshops. No transportation funds are available. Graduate credits are available by arrangement with the College of Notre Dame of Maryland, Department of Education; participants must pay tuition and fees and complete additional projects.

See http://student.ccbcmd.edu/immt/new.htm for the application form for the July 14–25, 2003 workshop. For additional information, phone (410) 780-6768 (CCBC Essex Mathematics Department) or email Sylvia Sorkin at ssorkin@ccbcmd.edu. Applications from women and minorities are particularly encouraged. Those from institutions serving low-income populations will be given priority. Preference will be given to applications from pairs of faculty/teachers at the same institution.

Preference will be given to applicants who apply by **March 5, 2003**. However, applications will continue to be accepted after that date for any available spaces. Accepted participants and alternates will be notified approximately April 5, 2003.

New Directions Program at the IMA

The IMA is delighted to announce New Directions Visiting Professorships for 2003-2004 and the New Directions Short Course in summer 2003. These programs offer extraordinary opportunities for the established mathematicians to branch into new directions and increase the impact of their research.

The IMA invites applications by established mathematicians for two Visiting Professorships for a period of 9–12 months including the thematic program Probability and Statistics in Complex Systems: Genomics, Networks, and Financial Engineering which runs from September 2003 through June 2004. Deadline: **March 15, 2003**.

The IMA will host a two-week intensive short course designed to provide mathematicians the basic knowledge prerequisite to interdisciplinary research in the field of mathematical biology at the cellular level. The course in Cellular Physiology will be taught by James Keener, University of Utah and Alexander Mogilner, UC Davis and will be held June 16–27. Deadline: **April 1, 2003**.

For further information and application procedures, please point to http://www.ima.umn.edu/new-directions/. The IMA New Directions Program is subject to funding, which is anticipated but currently pending.

CBMS Regional Research Conferences

The National Science Foundation has funded five NSF-CBMS Regional Research Conferences to be held during May and June of 2003. These five will bring to 295 the total number of such conferences since the NSF-CBMS Regional Research Conference Series began in 1969.

The five conferences to be held in 2003 are: Expansion Methods in Combinatorics, Christian Borgs, lecturer, May 13–17 at the University of Memphis; Free Boundary Problems in Partial Differential Equations and Applications, David Jerison, lecturer, May 18–22 at Wayne State University; Stochastic Partial Differential Equations and their Applications, Jerzy Zabczyk, lecturer, May 19–23 at the Illinois Institute of Technology; The Web of Modularity, Ken Ono, lecturer, June 3–7 at the University of Illinois at Urbana-Champaign; and Fully Nonlinear Equations in Geometry, Neil Trudinger, lecturer, June 23–27 at the University of Notre Dame.

Proposals for 2004 conferences are requested; the closing date is **April 8, 2003**. 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.

Proposals must be submitted electronically via Fastlane to the Division of Mathematical Sciences – Infrastructure Program at NSF. As with all proposals submitted to NSF, proposals should be prepared according to the current NSF Grant Proposal Guide. The NSF Fastlane website, www.fastlane.nsf.gov, contains the current version of the Grant Proposal Guide and all the necessary electronic forms and instructions.

SPWM 2003

The Summer Program for Undergraduate Women (SPWM 2003) is a five-week (June 28 to August 2, 2003) 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 travel allowance, campus room and board, and a stipend of $1,500. Applications must be postmarked by **March 1, 2003**.

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.

Tensor Grants

The MAA plans to award ten grants for projects designed to encourage college and university women or high school and middle school girls to study mathematics. The Tensor Foundation, working through the MAA, is soliciting college, university and secondary mathematics faculty (in conjunction with college or university faculty) and their departments and institutions to submit proposals. Projects may replicate existing successful projects, adapt components of such projects, or be innovative. Possible projects are to: organize a club for women interested in mathematics or mathematics and science; provide release time to allow a faculty member to prepare a course on women and mathematics, provided the host institution agrees to offer such a course; create a network of women professional mentors who will direct mathematics projects for girls; hold a conference for counselors to prepare them to encourage women and girls to continue to study mathematics; conduct a summer mathematics program for high school women; bring high school women onto a college campus for a Math Day with follow-up; structure a program for high school and/or college women to mentor younger female mathematics students with math projects or math clubs; or form partnerships with industry to acquaint women students with real-life applications of mathematics.

Grants will be up to $5,000 and will be made to the institution of the project director to be spent within the year. An institution is expected to supply matching funds or in-kind support; grants will not provide institutional indirect costs or provide fringe benefits. Unexpended funds may be carried forward; some grants may be renewed for a second year.

Proposals will be evaluated by a review committee including members of the MAA Committee on Participation of Women, Women & Mathematics Network, and a trustee of the Tensor Foundation. The three-page (maximum) proposal should be in a font that is easy to read with no attachments other than a vita and letters of support. The following should be addressed: *Concept*: What are your ideas and philosophy about mathematics and education that form a basis for your project? *Rationale:* In what way will your institution welcome hosting the project? *Objectives*: What are the objectives of your project? *Activities*: What tasks do you plan to undertake for your project? Describe the mathematics content and activities you expect to provide participants. *Personnel:* What are the name, position and qualifications of the proposed project director? Who else will be involved in the project? How? *Evaluation:* How will you judge the success of this project? *Budget*: How will your funds be spent: personnel, materials, release time, etc.? An additional budget page is requested from all proposers. *Commitment*: What is the potential for long-term commitment of the host institution? *Future funding*: What is the likelihood of institutionalization through local or state funding after start-up funding from the Tensor Foundation? *Timeline*: When will you carry out the activities?

There are some characteristics which effective projects seem to share: project goals clearly articulated and measurable; strong academic component; focus on enrichment, not remediation; teachers highly competent in the subject matter who believe that women can learn the material; heavy emphasis on every-day applications of mathematics and on careers in the field; teaching strategies that take into account the needs and cognitive development of women and girls; role models; parents, teachers, guidance counselors involved; strong directors and a committed and stable staff; development of a peer support system; and institutional commitment.

The proposal deadline is **March 3, 2003**. Please send *eight* copies of the proposal. All proposers will be notified by the end of March 2003. Please do not hesitate to contact the Program Director for assistance in preparing your proposal: Florence Fasanelli, Mathematical Association of America, 1529 Eigtheenth Street, N.W., Washington, DC 20036; phone: 202-966-5591; fax: 202-966-5591; email: ffasanelli@juno.com. The full program announcement may be found at: www.maa.org/projects/solic_99.html.

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Director, Institute for Physical Science and Technology

College of Computer, Mathematical and Physical Sciences
University of Maryland, College Park

The University of Maryland, College Park, invites applications and nominations for the position of Director of the Institute for Physical Science and Technology (IPST). The Institute currently has 35 faculty members, most of whom hold joint appointments in an academic unit such as Physics, Mathematics, Engineering, and Chemistry. The IPST faculty are internationally known and lead major research programs in Applied Mathematics, Chemical and Biological Physics, Computational Science, Optical Physics, Nonlinear Dynamics, Space and Upper Atmosphere Physics, and Statistical Physics. The Director will be an outstanding scientist who will play a leadership role in developing and implementing a vision for the Institute as a premier interdisciplinary research center on campus with high national visibility. Candidates for this position must have an established international reputation in interdisciplinary research with strong management skills. The appointment will be made at the Full Professor level and carries academic tenure. Applicants and nominees should submit a letter of interest, curriculum vitae and a list of potential references who could be contacted by the search committee. Nominations are encouraged and will be received at any time at the address below. All materials should be sent to:

Dr. John Osborn, Chair
IPST Director Search Committee
c/o Chris Fuller, 3400 A. V. Williams Building,
University of Maryland, College Park
College Park, MD 20742

For best consideration, applications should be received by March 15, 2003. For more information, please contact Dr. John Osborn at (301) 405-5129 or jeo@math.umd.edu.

The University of Maryland is an affirmative action, equal opportunity employer. Women and minorities are encouraged to apply. Applications will be accepted until the position is filled.

BOISE STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics at Boise State University in Boise, Idaho invites applications for two tenure-track positions at the Assistant Professor level, one in mathematics education and one in either statistics/probability or set theory, to begin August, 2003. Doctorate must be conferred by the starting date. Applicants must demonstrate the potential to develop a strong research program as well as a strong commitment to teaching. For further information, please consult our website http://math.boisestate.edu/ To apply, send an AMS Application Cover Sheet, letter of application containing a summary of research and teaching interests, vita, and transcripts to: **Search Committee (specify Math Ed or Stats/Math), Department of Mathematics, Boise State University, Boise, ID 83725-1555** and arrange for 3 letters of reference, at least one of which addresses, teaching ability/experience, to be sent to the same address. Screening will begin January 17, 2003 and continue until the positions are filled. Boise State is an EEO/AA institution, and applications from women and underrepresented groups are encouraged. For more information call 208-426-1172 (tty 208-426-1436) or send e-mail to mathed@math.boisestate.edu or stats-math@math.boisestate.edu.

BOSTON UNIVERSITY - DEPARTMENT OF MATHEMATICS AND STATISTICS - The Department of Mathematics and Statistics at Boston University invites exceptionally strong candidates to apply for a position in the general area of stochastic processes, at the level of tenure-track assistant professor or associate professor with tenure, to begin in September 2003. Preference will be given to candidates with some experience in the area of mathematical finance. Candidates must demonstrate strong research potential and commitment to excellence in teaching. Responsibilities include teaching, research, and involvement in the M.A. in Mathematical Finance Program. Applicants should submit a vita, the AMS Application Cover Sheet, and at least three letters of recommendation to **Prof. Eric Kolaczyk (Hiring Committee Chair), Department of Mathematics and Statistics, Boston University, 111 Cummington Street, Boston, MA 02215.** Review of applications will begin January 16, 2003 and will continue until the position is filled. Boston University is an Affirmative Action/Equal Opportunity Employer.

CASE WESTERN RESERVE UNIVERSITY – DEPARTMENT OF MATHEMATICS - Contingent on funding and staffing needs, the Department of Mathematics anticipates one or more one-year visiting faculty positions for the academic year 2003-04. The rank is open. The research interests of a candidate should complement those of the department members. The position includes a 2/2 teaching responsibility. Required: PhD in mathematics with experience in teaching and research commensurate with the position. Please submit a letter of application (including e-mail address and fax number) and curriculum vitae, along with names of three people who can write letters of evaluation. Mail all materials to: **James Alexander, Chair, Department of Mathematics, Case Western Reserve University, Cleveland, OH 44106-7058.** No e-mail or fax applications will be accepted. Screening applications will begin February 1; however applications will be accepted until positions are filled. CWRU is an Equal Opportunity/Affirmative Action Employer. Women and minorities are strongly encouraged to apply.

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CASE WESTERN RESERVE UNIVERSITY – DEPARTMENT OF MATHEMATICS – Applications are invited for a tenure-track position in Numerical Analysis to begin in August 2003 from candidates with a strong record or potential for research and effective teaching at the undergraduate and graduate level. Applicant must have a doctorate in mathematics or equivalent qualifications. Applicants should send a curriculum vita, description of research and teaching experience, and an AMS cover sheet to **Chair, Search Committee, Department of Mathematics, 10900 Euclid Avenue, Cleveland, Ohio 44106-7058.** Applicants should arrange for three confidential letters of evaluation to be sent to the same address. At least one letter should address teaching qualifications, in addition to research. No email or fax applications will be accepted. Review of applications will begin January 15, 2003. Case Western Reserve University is an Equal Opportunity/Affirmative Action employer. Women and minority candidates are encouraged to apply.

COLLEGE OF SAINT BENEDICT, SAINT JOHN'S UNIVERSITY - DEPARTMENT OF MATHEMATICS - The College of Saint Benedict/Saint John's University seeks candidates for one tenure track position of Assistant Professor in mathematics to begin Fall 2003. A strong commitment to undergraduate teaching in a liberal arts setting is essential. Some teaching experience is desirable, but not required. Those with applied interests or a background in mathematics education are especially sought, but candidates in any of the mathematical sciences are invited to apply. ABD in the mathematical sciences is required; PhD is preferred. Additional information may be found at: http://www.csbsju.edu. St. John's University, a liberal arts college for men, and the College of Saint Benedict, a liberal arts college for women, are located four miles apart in Central Minnesota just outside metropolitan St. Cloud and 70 miles from Minneapolis. Both are Catholic colleges in the Benedictine tradition, which emphasize quality teaching and a commitment to intercultural learning. All applicants must submit a letter of application, statement of teaching philosophy, curriculum vita, a copy of transcripts (originals required at the time of interview), and three recent letters of recommendation to: **Human Resources Coordinator, College of Saint Benedict, 37 South College Ave, St. Joseph, MN 56374.** Review of applications will begin January 24, 2003 and continue until filled. Women and people of diverse racial, ethnic, and cultural backgrounds are encouraged to apply. The College of Saint Benedict/Saint John's University are EEO/AA employers.

CITY UNIVERSITY OF NEW YORK, LEHMAN COLLEGE - *see classified advertisment under* ***Lehman College, City University of New York***

FRANKLIN AND MARSHALL COLLEGE - DEPARTMENT OF MATHEMATICS - Visiting Assistant Professor of Mathematics - a full-time, one-year position renewable for a second on evidence of good teaching beginning fall 2003. Ph.D. in Mathematics and/or Statistics. We seek applicants eager to teach and mentor undergraduates in a liberal arts setting. Excellence in teaching mathematics is the primary criterion for selection; other considerations include continued scholarly activity and the ability to contribute to our general education program. A normal teaching load is five courses per year. Send letter of application, AMS cover sheet, Curriculum Vita, list of courses taught, (including the applicant's responsibilities), three letters of recommendation, (at least two that address teaching ability), and copies of undergraduate and graduate transcripts, to: **Annalisa Crannell, Department of Mathematics, Franklin & Marshall College, Lancaster PA 17604-3003.** See http://www.FandM.edu/Departments/Mathematics/Mathematics.html. We will begin reading applications on February 18, 2003. An affirmative action employer, Franklin and Marshall is committed to cultural pluralism through the hiring of minorities and women.

GEORGIA COLLEGE AND STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE – The Department of Mathematics and Computer Science of Georgia College & State University invites applications for a tenure track position in mathematics. Salary and rank will be commensurate with qualifications. A doctorate in mathematics or a related field is preferred. Excellence in teaching, scholarly activity, and university/community service are requirements for tenure and promotion. More information may be found at www.gcsu.edu/facultyjobs. Please send letter of application, including statements on teaching and scholarship at a liberal arts university, current vita, copies of undergraduate and graduate transcripts, and three letters of Recommendation to: **Mathematics Search Chair, Department of Mathematics and Computer Science, CBX 017, Georgia College & State University, Milledgeville, GA 31061.** Please indicate availability for interviews at the January 2003 meeting of AMS/MAA. Review of applications will begin December 1, 2002, and continue until the positions are filled. GC&SU, Georgia's Public Liberal Arts University, is a member of the Council of Public Liberal Arts Colleges (COPLAC). An Equal Opportunity/Affirmative Action Employer.

GEORGIA COLLEGE AND STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE –The Department of Mathematics and Computer Science of Georgia College & State University invites applications for two tenure track positions in mathematics education. Salary and rank will be commensurate with qualifications. A doctorate in mathematics education or a related field is preferred. Excellence in teaching, scholarly activity, and university/community service are requirements for tenure and promotion. More information may be found at www.gcsu.edu/facultyjobs. Please send letter of application, including statements on teaching and scholarship at a liberal arts university, current vita, copies of undergraduate and graduate transcripts, and three letters of recommendation to: **Mathematics Education Search Chair, Department of Mathematics and Computer Science, CBX 017, Georgia College & State University, Milledgeville, GA 31061.** Please indicate availability for interviews at the January 2003 meeting of AMS/MAA. Review of applications will begin December 1, 2002, and continue until the positions are filled. GC&SU, Georgia's Public Liberal Arts University, is a member of the Council of Public Liberal Arts Colleges (COPLAC). An Equal Opportunity/Affirmative Action Employer.

GEORGIA COLLEGE AND STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE – Department Chair - Applications are invited for Department Chair, Department of Mathematics and Computer Science. At least five years of teaching experience is required and administrative experience is desirable. Applicants must have a doctorate in mathematics, computer science or related field. The department offers undergraduate degrees in mathematics and computer science and minors in mathematics, computer science, actuarial science and quantitative analysis and has excellent teaching and laboratory facilities. There are twenty-one faculty positions in the department distributed as follows: five computer science, two mathematics education, thirteen mathematics, and one chair. As the University System of Georgia's designated public liberal arts university and a member of the Council of Public Liberal Arts Colleges (COPLAC), GC&SU is committed to combining the educational experiences typical of esteemed private liberal arts colleges with the affordability of public higher education. GC&SU is an Equal Opportunity/Affirmative Action Employer. Review of applications will begin December 6, 2002 and continue until the position is filled. For additional information and the application procedure, go to: **http://www.gcsu.edu/facultyjobs.**

GRINNELL COLLEGE - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Tenure Track, Assistant or Associate Professor of Statistics - Tenure-track position for an applied statistician at the rank of Assistant or Associate Professor starting Fall of 2003. Ph.D. in statistics and consulting experience expected. The appointment will be in the Department of Mathematics and Computer Science. The appointee will also act as a statistical consultant for faculty and students campus-wide, for which one course release (of the standard 5 courses) will be allocated. He or she will also be expected to work with our current statistician and others on campus to develop new curriculum in statistics. Grinnell College is a highly selective liberal arts college that seeks outstanding [➔]

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[←] teacher scholars for its faculty, rewards excellence in teaching, and is generous in its support of scholarship. For more information about the position see http://www.math.grinnell.edu/2002-stat.html. To apply, send curriculum vitae, undergraduate and graduate transcripts (copies acceptable), and three letters of recommendation (at least one of which speaks to your consulting experience) to **Tom Moore, Department of Mathematics and Computer Science, 1116 8th Avenue, Grinnell College, Grinnell, IA 50112.** Please include also a statement describing your interests in teaching, research, and consulting in an undergraduate liberal-arts environment that emphasizes close student-faculty interaction and values diversity. Review of applications will continue until the position is filled. Grinnell College is an equal opportunity/affirmative action employer committed to attracting and retaining highly qualified individuals who collectively reflect the diversity of the nation. No applicant shall be discriminated against on the basis of race, national or ethnic origin, age, gender, sexual orientation, marital status, religion, creed, or disability.

INDIANA UNIVERSITY, PURDUE UNIVERESITY AT INDIANPOLIS (IUPUI) - DEPARTMENT OF MATHEMATICAL SCIENCES - The IUPUI Department of Mathematical Sciences invites applications for three tenure-track positions in mathematics, applied mathematics and statistics beginning August 2003. A Ph.D. nd a strong commitment to research and teaching are required. Send AMS form, CV, statement on research and teaching, and 4 letters of recommendations (including one on teaching) to: **Search and Screen Committee, Department of Mathematical Sciences, IUPUI, 402 North Blackford Street, LD 270, Indianapolis, IN 46202-3216.** Screening of completed applications will begin on December 1, 2002, and will continue until the positions are filled. IUPUI is an Equal Opportunity/Affirmative Action Employer and strongly encourages applications from women and underrepresented minorities. Additional information about IUPUI and the Department is available at www.iupui.edu and www.math.iupui.edu

LEHMAN COLLEGE, THE CITY UNIVERSITY OF NEW YORK - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Tenure track position(s) available starting September 1, 2003 for Assistant/Associate/Full Professors in Mathematics or Computer Science. Positions require an earned doctorate, outstanding research record or potential and commitment to excellence in teaching and service. Also possibly available is a position of Distinguished Lecturer (non-tenure track) for an individual with significant experience in the computer industry. Appointment rank and salary commensurate with qualifications and experience. Application procedure: Send curriculum vitae along with a cover letter and arrange for at least three letters of recommendation to be sent to : **Prof. Robert Feinerman, Chair, Department of Mathematics and Computer Science, Lehman College, Bronx, NY 10468.** Review of applications will begin on February 3, 2003 and will continue until positions are filled. Use of the AMS Cover Sheet for Academic Employment is encouraged. Additional information at http://www.lehman.cuny.edu. AA/EEO/ADA Employer.

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 2003-2004. 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. Applications should be complete by January 6. Applicants should arrange to have sent (a) vita; (b) three letters of reference; (c) a description of their most recent research; and (d) a research plan for the immediate future to: **Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, 77 Massachusetts Ave., Cambridge, MA 02139-4307.** M.I.T. is an Equal Opportunity, Affirmative Action Employer. (For more information about the position or institution: http://www-math.mit.edu.)

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. Applications should be complete by January 6. Applicants should arrange to have sent (a) a vita; (b) three letters of reference; (c) a description of the research in their thesis; and (d) a research plan for the next year to: **Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, Cambridge, MA 02139-4307.** M.I.T. is an Equal Opportunity, Affirmative Action Employer. (For more information about the position or institution: http://www-math.mit.edu.)

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - Applied Mathematics - Applications are invited for a limited number of positions in applied mathematics, including numerical analysis, scientific computation, and physical applied mathematics, starting fall 2003. Available positions include instructorships, lectureships, assistant professorships, and possibly higher levels. Appointments will be made mainly on the basis of demonstrated research accomplishments and potential. Complete applications should be received by January 6. To apply, please send a vita with a description of your recent research and research plans, and arrange to have three letters of reference sent. Address: **Committee on Applied Mathematics, Room 2-345, Department of Mathematics, M.I.T., 77 Massachusetts Ave., Cambridge, MA 02139-4307.** M.I.T. is an Equal Opportunity, Affirmative Action Employer. (For more information about the position and institution: http://www-math.mit.edu.)

MILLERSVILLE UNIVERSITY – DEPARTMENT OF MATHEMATICS – Full-time, tenure-track assistant professorship to begin August 2003, in a department of 20 faculty and approximately 175 majors in mathematics and mathematics education. Area of expertise in applied mathematics with experience using mathematics in the context of industry, government or an interdisciplinary program is required. Ph.D. (or completion by second year reappointment) in mathematics is required. Must exhibit evidence of strong commitment to excellence in teaching and continued scholarly activity. Must be prepared to teach a broad spectrum of undergraduate mathematics courses including numerical analysis and differential equations. Candidates must be interested in connecting undergraduate students with real-world problems originating in business, industry, or government. Must provide evidence of teaching effectiveness and must complete a successful interview and teaching demonstration. Duties include an annual 24-hour teaching load, scholarly activity, student advisement, supervision of student research, curriculum development, and committee work. Salary/benefits are competitive. Research support is available locally through released-time grants, on a competitive basis. Full consideration given to applications received by January 31, 2003. E-mail applications will not be accepted. Send letter of application addressing qualifications, curriculum vita, copies of undergraduate and graduate transcripts and three current letters of reference (at least t wo of which attest to recent teaching effectiveness) to **Dr. Zhoude Shao, Search Chair/WM0103, Department of Mathematics, Millersville University of Pennsylvania, P.O. Box 1002, Millersville, PA 17551-0302.** An AA/EO Institution.

OAKLAND UNIVERSITY - DEPARTMENT OF MATHEMATICS AND STATISTICS - Faculty Position - The Department of Mathematics and Statistics at Oakland University anticipates an opening starting 8/03 at the assistant professor level. A PhD degree in statistics or biostatistics is required. A strong commitment to research and teaching both at graduate and undergraduate levels. Preference will be given to candidates in areas such as survival analysis, longitudinal data analysis, bioinformatics and Bayesian inference. The application should be mailed to: **Ravi Khattree, Department of Mathematics and Statistics, Oakland University, Rochester, MI 48309-4485.** Please go to http://www.math.oakland.edu for detailed advertisement. Affirmative Action/Equal Opportunity Institution. Minorities and women encouraged to apply. Subject to budgetary approval.

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PURDUE UNIVERSITY – DEPARTMENT OF STATISTICS – Faculty position(s) in Statistics. The department has one or more openings for faculty positions. Screening will begin December 2, 2002, & continue until the position(s) is (are) filled. 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 18, 2003. Candidates must demonstrate potential excellence in research and teaching. Salary and benefits are competitive and commensurate with qualifications. Rank and salary are open. Candidate 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 vita, and the names of three references. Purdue University is an AA/EO employer & educator. Send applications to: **Mary Ellen Bock, Head, Dept. of Statistics, Purdue University, 150 N. University St., W. Lafayette,IN 47907-2068.**

SANTA CLARA UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - One tenure track position, Assistant Professor level, beginning September 2003. Required: Recent Ph.D. or Ph.D. with evidence of recent scholarship. Applicants must have a background and demonstrated experience in computer science. A strong preference will be given to those with advanced degrees in computer science. Undergraduate teaching only. The successful candidate would be expected to teach some lower division mathematics courses each year in addition to both lower and upper division computer science courses. Faculty are encouraged to direct students in undergraduate research projects. The Department is in the College of Arts and Sciences in a comprehensive university and emphasizes (roughly equally) excellent teaching and continuing research. The course load is seven quarter courses per year with downward adjustments for those actively engaged in research. Applications should be sent to: **Chair, Search Committee, Department of Mathematics and Computer Science, Santa Clara University, 500 El Camino Real, Santa Clara CA 95053-0290.** Further information about the University is available at www.scu.edu. Santa Clara University, a Jesuit institution emphasizing education in the liberal arts and sciences, is an equal opportunity/affirmative action employer, and welcomes applications from women, persons of color, and members of other historically underrepresented U.S. ethnic groups.

SOUTHEAST MISSOURI STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Two Tenure-track assistant professorships in Mathematics: August 2003. Requirements: Ph.D. in mathematics and successful collegiate teaching experience with full classroom responsibility. Responsibilities: teaching mathematics courses, scholarly/professional activity, curriculum development, and advising students. Application procedure: AMS Application Cover Sheet, letter of application, curriculum vita, and three current letters of recommendation, at least one addressing teaching qualifications. Mathematics Position; Department of Mathematics MS6700; Southeast Missouri State University, Cape Girardeau, MO 63701-4799. Review of applications begins immediately and continues until position is filled. EOE/M-F/Affirmative Action Employer. http://www5.semo.edu/math/

TRINITY COLLEGE, D.C. – DEPARTMENT OF MATHEMATICS – Clare Booth Luce Assistant Professor in Mathematics/Computer Science – Trinity College, Washington, DC is one of the thirteen institutions named in Clare Boothe Luce's bequest to receive funds in perpetuity to support women in Math, Science and Engineering through scholarships and professorships. Trinity College is a comprehensive University emphasizing the education of women in undergraduate programs. We invite applications from outstanding women committed to undergraduate education for a tenure-track position at the assistant professor level in Mathematics, beginning Fall 2003. U.S. permanent residency is required. The Assistant Professor will have a 9-hour teaching load each semester in relatively new and growing computer science program. Opportunities for teaching both lower and upper level courses depending upon the candidate's interests and specialization and program needs. Doctorate in Computer Science or Doctorate in Mathematics with a Bachelor's in Computer Science required. Send cover letter, resume, transcripts, a statement of teaching philosophy in a liberal arts setting, and three letters of recommendation to: **Carole King, Trinity College, 125 Michigan Ave, NE, Washington, DC 20017**; email: humanresources@trinitydc.edu; or fax to 202-884-9123. Trinity College is an EEO employer.

UNITED STATES NAVAL ACADEMY - DEPARTMENT OF MATHEMATICS - The USNA Mathematics Department anticipates at least two tenure-track positions (subject to approval and funding) at the Assistant Professor or Associate Professor level, depending on qualifications, to start in August 2003. See web site **http://www.usna.edu/MathDept/website/Hire.htm** for full information. Tel: 410-293-6700; Fax: 410-293-4883; Email: amg@usna.edu . The United States Naval Academy is an Affirmative Action/Equal Employment Opportunity Employer and provides reasonable accommodations to applicants with disabilities.

UNIVERSITY OF ALABAMA - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for one tenure-track position at the level of assistant professor in the area of Mathematics Education beginning in Fall 2003 for the purpose of building a Mathematics Education component in the coming years. Candidates must posses a doctorate in mathematics or a doctorate in mathematics education with a master's degree in mathematics (or the equivalent) by August 31, 2003. A commitment to excellence in teaching is required. Preference will be given to candidates who appear likely to establish a funded outreach program which will enhance the teaching and learning of mathematics in K-12 education or whose research interest is concerned with curriculum reform at the K-12 or college level. It is expected that the successful applicant will act as a liaison with the College of Education. The salary will be commensurate with the successful candidate's experience. All candidates should provide a curriculum vita, publication list and research/outreach plans, and arrange for three letters of recommendation to be sent to: **Dr. Martyn Dixon, Chair of the Search Committee, Department of Mathematics, University of Alabama, Tuscaloosa, AL 35487-0350.** Applications will be reviewed immediately and continue until the position is filled. The University of Alabama is an Affirmative Action/Equal Opportunity Employer. For more information about the department and university, visit our website: http://math.ua.edu/.

UNIVERSITY OF FLORIDA - DEPARTMENT OF MATHEMATICS - Applications are invited for post-doctoral positions starting Fall 2003 with a salary of $36,000 for the academic year 2003-04. Pending budget approval, we expect to have three such positions. The positions are renewable for two more years. Each position will carry a summer salary supplement of $6,500 for the first two summers following the appointment, and a $2,500 supplement for each of the three years for travel, equipment, and supplies. Each position has a reduced teaching load of one course per semester. ELIGIBILITY: Candidates must be US Citizens, US Nationals, or Permanent Residents, and should have received their PhDs within 18 months of the date of appointment. The positions are open to PhDs in all areas on mathematics. Applicants should forward curriculum vitae and list of publications to: **Chair, Post-Doc Search Committee, Department of Mathematics, University of Florida, Gainesville, FL 32611-8105.** Completed applications are due by February 15, 2003. Applicants must arrange for three letters of recommendation to be sent directly to the address above. The department welcomes applications from women and minority candidates. The University of Florida is an EEO/AA institution. For more information concerning the position or institution: http://www.math/ufl.edu

UNIVERSITY OF FLORIDA - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track assistant professorship (subject to budget approval) in the area of probability and its applications with appointment beginning in Fall 2003. Salary will be competitive. Applicants must show strong research promise and excel in teaching as well. Applicants must sent vita and papers to: **Tenure-track Search Committee, Department of Mathematics, University of Florida, Gainesville, FL 32611-8105.** Completed applications are due by February 1, 2003. Applicants must arrange for three letters of recommendation to be sent directly to the above address. The department welcomes applications from women and minority candidates. The University of Florida is an EEO/AA institution. For more information about the position or institution: http://www.math.ufl.edu

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UNIVERSITY OF MARYLAND, BALTIMORE COUNTY - DEPARTMENT OF MATHEMATICS AND STATISTICS - The Department invites applications for a tenure-track faculty position in Mathematical Sciences at the rank of Assistant Professor, starting in the fall of 2003, pending funding availability. The successful candidate should have a Ph.D. in mathematics or a related field, have an active, independent research program, strong potential for obtaining external funding, and a commitment to excellence in teaching. Preference will be given to candidates who are able to conduct interdisciplinary research, as well as those able to interact with existing groups in the Department. Current research areas represented in the Department include stochastic processes, numerical analysis, differential equations, optimization, systems theory, and mathematical modeling. The Department offers BS, MS and Ph.D. degrees in applied mathematics and in statistics. For more information, see our website at www.math.umbc.edu. Applicants should send vita and summary of their current research program, and have three letters of reference sent to: **Mathematics Recruitment Committee, Dept. of Mathematics & Statistics, University of Maryland Baltimore County, Baltimore, MD 21250**. Screening of applicants will commence December 1, 2002, and will continue until the position is filled. UMBC is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF MICHIGAN - DEPARTMENT OF MATHEMATICS - The Department expects to have a position beginning September 2003 at the advanced Assistant Professor or tenure level for a specialist in Mathematics Education. Duties will include teaching a range of courses for students seeking a teaching certificate in either elementary or secondary mathematics education, providing counseling for these students, and working with the mathematics specialists in the School of Education to develop and maintain this joint program. Outreach to schools is strongly encouraged. Candidates should have a Ph.D. in either Mathematics (preferred) or Mathematics Education and a record of publication in some area related to mathematics education. Salaries are competitive and are based on credentials. Applicants should send a CV, bibliography, descriptions of research and teaching experience, and have three or four letters of recommendation, at least one of which addresses the candidate's teaching experience and capabilities, sent to: **Personnel Committee, University of Michigan, Department of Mathematics, 2074 East Hall, Ann Arbor MI 48109-1109.** Applications are considered on a continuing basis but candidates are urged to apply by December 15, 2002. Women and minorities are encouraged to apply; the University is responsive to the needs of dual career couples. Inquiries may be made by e-mail to math-fac-search@umich.edu. More detailed information regarding the Department may be found on our web page: http://www.math.lsa.umich.edu. The University of Michigan is an equal opportunity, affirmative action employer.

UNIVERSITY OF PITTSBURGH AT BRADFORD - DEPARTMENT OF MATHEMATICS - Tenure-track Assistant Professor position to begin September 2003. Ph.D. or Ed.D. in math earned or near completion. A strong commitment to undergraduate education on a small rural campus and potential for scholarly work are essential. Applicants with math education background or a willingness to develop this expertise will be given favorable consideration. Teaching assignments will include algebra, pre-calculus, and fundamentals of mathematics. Send letter, vita, official transcripts, and 3 letters of reference to: **Dr. Yong-Zhuo Chen, Math Search Committee, University of Pittsburgh at Bradford, 300 Campus Drive, Bradford, PA 16701-2898.** The selection process will begin March 10, 2003, and continue until the position is filled. Women and minorities are encouraged to apply. Visit our website at www.upb.pitt.edu. AA/EOE

UNIVERSITY OF PITTSBURGH AT JOHNSTOWN - DEPARTMENT OF MATHEMATICS - One tenure-stream Assistant Professor position is available to begin late August 2003. A Ph.D. in Mathematics or Statistics with a specialization in Analysis, Discrete Mathematics, Applied Mathematics, Probability, or Statistics is required. The teaching load is 12 credit hours per semester (3-4 classes). Candidates must demonstrate a strong commitment to excellence in teaching, indicate a commitment to continued professional development, and express interest in providing service to the university. All applications should include a personal cover letter indicating your specific interests in UPJ, current vita include e-mail address and statement of eligibility to work in the US, official transcripts of all undergraduate and graduate degrees (originals from granting institutions only), 3 letters of recommendation (originals directly from references or university placement service), a statement of teaching philosophy, and a statement on professional development. Please send your application materials to **Attn: Tenure, Mathematics Search Committee, 130 Krebs Hall, University of Pittsburgh at Johnstown, Johnstown, PA 15904.** For full consideration, apply by February 15,2003; however, applications will be accepted until the position is filled. The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer. Women and Minority group members are encouraged to apply. Visit the UPJ Math Department online at http://math.upj.pitt.edu.

UNIVERSITY OF PITTSBURGH AT JOHNSTOWN - DEPARTMENT OF MATHEMATICS - The Department of Mathematics at the University of Pittsburgh at Johnstown seeks to fill a non tenure-track Instructor position beginning in the fall of 2003. Masters in Mathematics, Statistics or Mathematics Education is preferred; Masters in a related field and at least two years undergraduate mathematics teaching experience is acceptable. Selected candidates will teach lower-level courses required to fulfill University General Education requirements in Mathematics. Position will be offered on a three-year renewable basis depending on satisfactory job performance. The teaching load is 12 credit hours per semester. The candidate must demonstrate a strong commitment to excellence in teaching. Maintaining professional currency in one^Os field and service to the university are expected and proficient communication skills in English are essential. All applications should include a personal cover letter indicating your specific interests in UPJ, current vita (include e-mail address and a statement regarding eligibility for work in the U.S.), official transcripts of all undergraduate and graduate degrees, 3 letters of recommendation (originals sent directly from references) and a statement of teaching philosophy. Please send your application materials to **Attn: Instructor, Mathematics Search Committee, 130 Krebs Hall, University of Pittsburgh at Johnstown, Johnstown, PA 15904.** For full consideration, applications should be received by February 15, 2003; however, applications will be accepted until the position is filled. Visit the UPJ Math Department online at http://math.upj.pitt.edu. The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer. Women and Minority group members are encouraged to apply.

UNIVERSITY OF PITTSBURGH AT JOHNSTOWN - DEPARTMENT OF MATHEMATICS - The Department of Mathematics at the University of Pittsburgh at Johnstown seeks to fill a non tenure-track Instructor position beginning in the fall of 2003. Masters in Mathematics, Statistics or Mathematics Education is preferred; Masters in a related field and at least two years undergraduate mathematics teaching experience is acceptable. Selected candidates will teach lower-level courses required to fulfill University General Education requirements in Mathematics and assume the role as General Education Quantitative Reasoning Coordinator. Responsibilities of the Coordinator will include the monitoring of the Mathematics Placement Exam, follow-up assessment, and courses under this section of the General Education curriculum; the evaluation of mathematics courses transferred from other colleges and universities; addressing student concerns as related to the quantitative reasoning portion of the General Education curriculum; being part of the decision-making body for this portion of the General Education curriculum; being a liaison between the General Education Committee and other faculty not on this committee; and other General Education duties as necessary. Position will be offered on a three-year renewable basis depending on satisfactory job performance. The teaching load is 9 credit hours per semester, with a three-credit load for the duties of Coordinator. The candidate must demonstrate a strong commitment to excellence in teaching and have demonstrated organizational and supervisory skills. Maintaining professional currency in one's field and service to the university are expected and proficient communication skills in English are essential. All applications should include a personal cover letter indicating your specific interests in UPJ, current vita (include e-mail address and a statement [→]

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[←] regarding eligibility for work in the U.S.), official transcripts of all undergraduate and graduate degrees, 3 letters of recommendation (originals sent directly from references) and a statement of teaching philosophy. Please send your application n materials to **Attn: General Education Coordinator, Mathematics Search Committee, 130 Krebs Hall, University of Pittsburgh at Johnstown, Johnstown, PA 15904.** For full consideration, applications should be received by February 15, 2003; however, applications will be accepted until the position is filled. Visit the UPJ Math Department online at http://math.upj.pitt.edu. The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer. Women and Minority group members are encouraged to apply.

UNIVERSITY OF WISCONSIN, RIVER FALLS - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track position in mathematics beginning Fall 2003–2004. Earned doctorate in a mathematical discipline required by August 25, 2003. Applicant must provide evidence of excellence in teaching at the undergraduate level. Teaching duties regularly include one or more upper division courses. A strong commitment to teaching undergraduates at the freshmen/sophomore level is required as well. A normal teaching load is 12 credits per semester. The department expects a willingness to work with students in undergraduate research, as well as collaboration in research and in curriculum development with faculty from within and outside of the department. In addition to teaching and scholarly activity, this position entails campus-wide and departmental service, along with academic advising. Inquiries and applications should be addressed to: **Don Leake, Department of Mathematics, UW-River Falls, River Falls, WI 54022.** E-mail don.leake@uwrf.edu. Submit a letter of interest, specifying 1) qualifications, and 2) statement of experience, including ability to contribute to the enhancement of student awareness and appreciation of diverse cultures. Include vitae, complete transcripts (official transcripts required for appointment), and three recent letters of recommendation, including one addressing teaching effectiveness. Also include the names, addresses, and telephone numbers of at least three references who can specifically comment upon your teaching ability, experience, and professional preparation. To ensure consideration, a completed application should be received by January 20, 2003. Screening may continue until position is filled. UW-River Falls is an EO/AA employer.

WASHINGTON UNIVERSITY IN ST. LOUIS - DEPARTMENT OF MATHEMATICS - Opening for two William Chauvenet Assistant Professorships. These are two year, non tenure-track faculty positions. Applicants should be three years or less from the Ph.D. Starting date: Fall of 2003. Teaching load: three courses per year. Applicants should have research interests that mesh with those of our permanent faculty. These interests include algebraic geometry, commutative algebra, differential geometry, dynamical systems, harmonic analysis and wavelets, low-dimensional topology, operator theory, partial differential equations, real and complex analysis, and statistics. To apply, send a vita and a research plan. Have three letters of recommendation sent directly to the **Chair, Department of Mathematics, Washington University, 1 Brookings Drive, Campus Box 1146, St. Louis, MO 63130.** Contact Person: Steven G. Krantz, e-mail Address: chairman@math.wustl.edu. At least one of these letters should report on the candidate's teaching abilities. We will begin reviewing applications on December 1, 2002, and will continue reviewing applications until the positions are filled. Washington University is an affirmative action/equal opportunity employer and specifically invites and encourages women and minorities to apply. To be eligible, an applicant must have the Ph.D. degree before beginning employment. Employment eligibility verification required on hire. For more information about the position or institution: http://www.math.wustl.edu.

WESTERN ILLINOIS UNIVERSITY – DEPARTMENT OF MATHEMATICS - SIX TENURE-TRACK POSITIONS, Assistant Professor, August 2003 - Two positions are in Statistics or Applied Statistics; one position is in Algebra; two positions are open with a strong preference for Applied Mathematics/Modeling and for Analysis; and one position is open to applicants from any area. A successful applicant is expected to be effective in realization of the department's plans. For a description of the plans please see our URL: http://www.wiu.edu/mathematics/ QUALIFICATIONS: Ph.D. (or imminent) in a mathematical sciences area; demonstrated, or potential for, excellence in teaching; a record of, or potential for, research; a record of, or commitment to, service. SCREENING BEGINS December 15, 2002; continues until position filled. Preliminary interviews at the Baltimore Joint Meeting. Send letter, vita, teaching philosophy, research description, three reference letters, and transcripts (photocopies) to: **Iraj Kalantari, Chair, Mathematics Department, Western Illinois University, Macomb, IL 61455-1390.** WIU is an Equal Opportunity and Affirmative Action employer. We are especially interested in applications from women and minorities, and individuals with disabilities. All positions are subject to State funding.

WESTERN KENTUCKY UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications invited for a tenure-track assistant professor position, beginning fall 2003. Preference will be given to fields that best fit the department's interests. Candidates must have a Ph.D. in mathematics by August 31, 2003. A description of a research program, a statement of philosophy and experience, three letters of recommendation, a vita, transcripts, and the AMS cover letter should be sent to: **Search Committee, Dept. of Mathematics, Western Kentucky University, Bowling Green, KY 42101**, www.wku.edu/Mathematics. WKU is an EO/AA employer.

WILLIAMS COLLEGE - DEPARTMENT OF MATHEMATICS AND STATISTICS - The Williams College Department of Mathematics and Statistics invites applications for one position in statistics, beginning fall 2003, at the rank of assistant professor (in an exceptional case, a more advanced appointment may be considered). We are seeking a highly qualified candidate who has demonstrated excellence in teaching and research, and who will have a Ph.D. by the time of appointment. Williams College is a private, residential, highly selective liberal arts college with an undergraduate enrollment of approximately 2,000 students. The teaching load is two courses per 12-week semester and a winter term course every other January. In addition to excellence in teaching, an active and successful research program is expected. To apply, please send a vita and have three letters of recommendation on teaching and research sent to the **Hiring Committee, Department of Mathematics and Statistics, Williams College, Williamstown, MA 01267.** Teaching and research statements are also welcome. Evaluations of applications will begin on or after November 25 and will continue until the positions are filled. Williams College is dedicated to providing a welcoming intellectual environment for all of its faculty, staff and students; as an EEO/AA employer, Williams especially encourages applications from women and underrepresented minorities. For more information on the Department of Mathematics and Statistics, visit http://www.williams.edu/Mathematics.

WILLIAMS COLLEGE - DEPARTMENT OF MATHEMATICS AND STATISTICS - The Williams College Department of Mathematics and Statistics invites applications for two positions in mathematics and one position in statistics, beginning fall 2003, all at the rank of assistant professor (in exceptional cases, more advanced appointments may be considered). We are seeking highly qualified candidates who have demonstrated excellence in teaching and research, and who will have a Ph.D. by the time of appointment. Williams College is a private, residential, highly selective liberal arts college with an undergraduate enrollment of approximately 2,000 students. The teaching load is two courses per 12-week semester and a winter term course every other January. In addition to excellence in teaching, an active and successful research program is expected. To apply, please send a vita and have three letters of recommendation on teaching and research sent to the **Hiring Committee, Department of Mathematics and Statistics, Williams College, Williamstown, MA 01267**. Teaching and research statements are also welcome. Evaluations of applications will begin on or after November 25 and will continue until the positions are filled. Williams College is dedicated to providing a welcoming intellectual environment for all of its faculty, staff and students; as an EEO/AA employer, Williams especially encourages applications from women and underrepresented minorities. For more information on the Department of Mathematics and Statistics, visit http://www.williams.edu/Mathematics.

Association for Women in Mathematics

2002/2003 MEMBERSHIP FORM

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

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

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

LAST NAME **FIRST NAME** **M.I.**

ADDRESS

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

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

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

PROFESSIONAL INFORMATION:
Position:
Institution/Company:
City, State, Zip:

If **student, GRADUATE or UNDERGRADUATE (circle one)**
If not employed, leave position & institution blank

DEGREES EARNED:

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

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INDIVIDUAL DUES SCHEDULE

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

REGULAR INDIVIDUAL MEMBERSHIP.. *For NEW Individual members: JOIN at the reduced rate of $30.00 for the 02/03 membership year [valid thru 6/30/03]*	$ 50	
2ND FAMILY MEMBERSHIP (NO newsletter) Please indicate regular family member:	$ 30	
CONTRIBUTING MEMBERSHIP	$100	
RETIRED or PART-TIME EMPLOYED MEMBERSHIP (circle one)	$ 25	
STUDENT or UNEMPLOYED MEMBERSHIP (circle one)	$ 15	
ALL FOREIGN MEMBERSHIPS (INCLUDING CANADA & MEXICO)....**FOR ADDITIONAL POSTAGE ADD** **All payments must be in U.S. Funds** using cash, U.S. Postal orders, or checks drawn on U.S. Banks.	$ 8	
BENEFACTOR [$2,500] or FRIEND [$1,000] (circle one)	$	
❑ I am enclosing a DONATION to the **"AWM GENERAL FUND"**	$	
❑ I am enclosing a DONATION to the **"AWM ALICE T. SCHAFER PRIZE"**	$	
❑ I am also enclosing a DONATION to the **"AWM ANNIVERSARY ENDOWMENT FUND"**	$	

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

INSTITUTIONAL DUES SCHEDULE

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

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

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

AWM

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ADDRESS CORRECTION FORM

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

(Please Print)

Name_____

Address_____

_____

City_____ State_____ Zip_____-_____

Country (if applicable)_____ E-mail Address_____

Position_____ Institution/Org._____

Telephone: Home_____ Work_____

MAIL TO:

Database Corrections
AWM
4114 Computer & Space Sciences Bldg., University of Maryland, College Park
Maryland 20742-2461

or E-MAIL:

awm@math.umd.edu

☐ I DO NOT wish for my AWM membership information to be released for the **Combined Membership List (CML).**

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