AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 34, Number 4 NEWSLETTER July–August 2004

PRESIDENT'S REPORT

We congratulate and welcome the newly formed society **Korean Women in Mathematical Sciences** (KWMS), inaugurated on June 21. The AWM looks forward to possible collaborations with the KWMS. On a visit to Korea four years ago, I had the opportunity to discuss the AWM with a group of women mathematicians who were then exploring the possibility of creating such an organization. As someone who has enjoyed the impact of the AWM without having been involved in its initial courageous founding, I felt excited and humbled to meet with this group of visionary women and am now thrilled to learn of the founding of the KWMS. We wish the KWMS great success in encouraging women in mathematics and strengthening their representation in the mathematical community.

We are delighted to welcome **AWM student chapters** at Hood College, University of Utah, University of Kansas, University of Illinois at Chicago, Texas A&M University, and Duke University. As the new academic year approaches, we encourage you to consider a student chapter at your institution. See the AWM website for information.

We thank the National Security Agency for renewing its support of the **Sonia Kovalevsky High School Days** program. We look forward to beginning a collaboration with Elizabeth City State University on this program. We thank Coppin State College, and especially Genevieve Knight, for working with the AWM over many years on the SK Days program. The next deadline to apply for an SK Day is already upon us: August 4.

Students from middle school to college undergraduates are invited to submit biographies of contemporary women in mathematics or statistics to the **AWM Essay Contest**. The deadline is October 29. This very popular contest attracts competitors from around the world. Please encourage your students to enter.

IN THIS ISSUE

AWM
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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 and girls to study and to have active careers in the mathematical sciences. Equal opportunity and the equal treatment of women and girls in the mathematical sciences are promoted.

The *Newsletter* is published bi-monthly.

The Editor welcomes articles, letters, and announcements.

Circulation: 4000.

The Sonia Kovalevsky High School Days and the Essay Contest are two of our primary outreach programs. Public outreach is essential both for encouraging young people to study mathematics and for increasing public (and federal) support for mathematics. The CBMS meeting this past May focused on public awareness and public policy activities of the various CBMS constituent organizations, along with discussions of ways in which we can collaborate and/or support each other's efforts. We enjoyed fascinating and encouraging presentations of the extensive outreach efforts of the AMS, INFORMS, SIAM, MAA, and ASA.

Summer is an especially active time for research conferences. Most conference organizers are cognizant of the importance of supporting attendance by graduate students and recent Ph.D.'s. Too often, however, the younger participants are hesitant to approach the senior ones, who may be interacting primarily with their longtime associates. At the leadership workshop held this past spring by the AWM in memory of Ruth Michler, I discussed ways that conference organizers can promote livelier interactions between the senior and junior participants. Effective methods can be casual—e.g., making sure that the junior participants are introduced, one on one, to any senior participants that they would like to talk with—or more structured—e.g., matching junior participants with senior "mentors". Another method was especially effective one morning at a recent conference. The morning began with a single featured lecture, not in a classroom but in a lounge set up both with rows of chairs for the lecture and with tables for discussions and refreshments. After the lecture, senior participants were asked to stay and make themselves available to any of the young mathematicians who might want to talk with them. The ensuing lively discussions lasted throughout the morning and, in many cases, through lunch.

Many AWM programs have deadlines in the early fall: The AWM Workshop for Women Graduate Students and Recent Ph.D.'s, to be held at the Joint Mathematics Meetings in Atlanta, has an application deadline of September 1. The day-long workshop includes research presentations by the selected participants, mentoring, and a panel discussion on issues concerning launching a mathematical career. October 1 is the fall deadline to apply for an AWM travel grant to attend a research conference. Also due on October 1 are nominations for the Alice T. Schafer Award for excellence in mathematics by an undergraduate woman and the Louise Hay Award for contributions to mathematics education. Both of these awards are presented at the Joint Mathematics Meetings. (Please note that after this year, the deadline for nominations for the Louise Hay Award will be moved up to spring.) Noether Lecturer nominations for 2006 are due October 15. As already mentioned above, October 29 is the deadline for the AWM Essay Contest.

The Exxon-Mobil Foundation has given an unrestricted gift to the AWM for the seventeenth consecutive year. We are deeply grateful to Exxon-Mobil for its continued support of our mission.

I wish all of you an enjoyable and productive end of the summer.

Carolyn Gordon

Carolyn Gordon
Dartmouth College
May 30, 2004

REPORT FROM HRUMC XI

Aatekah Owais '05, Mount Holyoke College.

As HRUMC enters its second decade, it has taken on a life of its own: on April 3, 2004, more than four hundred and fifty faculty and students came to Mount Holyoke College, South Hadley, MA for the eleventh annual Hudson River Undergraduate Mathematics Conference. This year there were 178 talks from 43 institutions. The talks were mostly by undergraduate students, but some faculty spoke as well. As usual, each talk was 15 minutes long and was indicated as either Level I (accessible to all students and faculty) or Level II (accessible to advanced students and faculty) in the program.

A sampling of the talks includes: Continued Fractions and Pell's Equation (Laura Rieber, Mount Holyoke

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Friend: $1000 Benefactor: $2500
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Dues in excess of $15 and all contributions are deductible from federal taxable income.
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See http://www.awm-math.org for details on free ads, free student memberships, and ad discounts.
Affiliate Members: $250
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See the AWM website for details.

Subscriptions and back orders

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

Payment

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

Newsletter ad information

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

Newsletter deadlines

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

Addresses

Send all **Newsletter** material **except ads and material for book review and education columns** to Anne Leggett, Math 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 Marge Bayer, Math Dept., University of Kansas, 405 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523; email: bayer@math.ukans.edu; fax: 785-864-5255 and all **education column** material to Ginger Warfield, Math Department, University of Washington, Seattle, WA 98195; email: warfield@math.washington.edu. Send everything else, **including ads and address changes**, to Dawn V. Wheeler, 4114 CSS Building, University of Maryland, College Park, MD 20742-2461; phone: 301-405-7892; email: awm@math.umd.edu.

College), Lie Algebra Orbits for Borel Subgroups of Semi-Simple Groups (David Wiygul, Skidmore College), The Simpsons' Math (Ahmed Khazee, Colgate University), and Bioinformatics: A Crossroads (Ana Paula Sales, Bard College).

The keynote speaker this year was Nancy Kopell of Boston University. Her talk was "Dynamical Systems of the Nervous Systems: Do Rhythms Help Us Think?" She discussed how dynamical systems ideas and methods can be used to explore hypotheses about how the brain uses rhythms to accomplish cognitive tasks.

Lunch had an added twist. During registration in the morning, everyone picked a blue, red, green or yellow ticket, and accordingly went to one of four residential dining halls. The visitors were able to enjoy a slice of the community that is a central part of the Mount Holyoke campus.

HRUMC included something new this year. From 12:45 to 1:30, a Mathematics Career Panel met in Hooker Auditorium. The panelists included: Jennifer Dimmick, VP, Marketing and Planning Systems; Olga Zhushma, Hudson Valley Community College; Professor Rod Little, University of Michigan; and Professor Victor Roytburd, Rensselear Polytechnic Institute. The panelists talked about the career possibilities open to students with a degree in mathematics and/or statistics. The panel is a valuable addition to HRUMC, giving students a better chance to network.

This year, the Steering Committee was headed by Professor Margaret Robinson, Mount Holyoke College. The XII HRUMC will be held in April, 2005, at Williams College, Williamstown, MA. Please visit www.skidmore.edu/academics/mcs/hrumc.htm for dates and further information.

UNDER THE MICROSCOPE

The American Association of University Women (AAUW) Educational Foundation released its newest report, *Under the Microscope: A Decade of Gender Equity Projects in the Sciences*, in April. The publication evaluates progress made during the last decade through programs designed to increase the participation of girls and women in science, technology, engineering, and mathematics, the STEM subjects. *Under the Microscope* examines projects designed to improve gender equity in STEM subjects by asking the following: What can we learn from a decade of gender equity efforts in the sciences? What types of gender equity projects in the sciences have been supported and promoted during the past decade? Which STEM subjects and project approaches have been favored and which have been overlooked? Additional information and free downloadable copies are available at www.aauw.org/research/microscope.cfm.

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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

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AWM-Net

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

AWM DEADLINES

NSF-AWM Travel Grant: October 1, 2004 and February 1, 2005

Sonia Kovalevsky High School Mathematics Days: August 4, 2004

AWM Workshop, January 2005: September 1, 2004

Schafer Prize, January 2005: October 1, 2004

Hay Award, January 2005: October 1, 2004

Noether Lecturer nominations for 2006: October 15, 2004

AWM Essay Contest: October 29, 2004

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EDUCATION COLUMN

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by Erica Dakin Voolich

Back in January 2001, I was honored to be included on the AWM panel in New Orleans discussing "K–8 Education: What Should We Do?" As the only classroom teacher on the panel, I was the "view from the trenches" and chose to interpret the title literally: What *should* we do in support of K–8 mathematics education? I spoke first about what mathematicians *shouldn't* do and then gave a list of possible activities.

In the March–April issue of the AWM *Newsletter*, Virginia Warfield printed a list of my suggestions and then challenged her readers of the column to carry out any one of my suggestions. So, as a service to my readers, I've reprinted the list here: 1) Volunteer time at your local school.... 2) Talk to middle school teachers about your specialty in mathematics, and volunteer to come as a guest speaker when the class is studying a topic you are expert on.... 3) Offer an after-school or lunch-time mathematics club. 4) Provide monthly family math problem-solving questions for the school newsletter.... 5) Organize monthly family mathematics nights. 6) Organize a day at your university for middle school girls to see what is happening in mathematics and science.... 7) Work with teachers to offer a family project day. What follows is a description of what I have done since then to follow my own suggestions.

I teach in a Jewish parochial school, but I live in a much different place, Somerville, MA. The city of Somerville is a blue-collar immigrant community near Boston, built on 4.1 square miles of land with a population density of 18,543 people per square mile. Only 30.6% of the housing is owner-occupied. At Somerville High School, 64.7% of the students receive free or reduced price lunches, 52.3% are minorities, 17% have limited English skills, 36% of the graduates attend a four-year college, and 32% of the graduates attend a two-year vocational school or junior college.

I was inspired to give back to the community in which I live by sharing my joy and passion for mathematics. Using the funds from some teaching awards I received as seed money and with the help of my family and friends, I started The Somerville Mathematics Fund (a 501(c)(3) charity) in the fall of 2000 with the purpose of celebrating and encouraging mathematics achievement. When I spoke in January 2001, this charity was in its infancy, so I only spoke of things people could do based on my experience as a classroom teacher and not about what I hoped to do. Now, I want to talk about The Somerville Mathematics Fund (SMF) in hopes that it will encourage others to start a similar organization in their own community or to at least try some of the activities.

The SMF was chartered by Dollars for Scholars in September 2000 as a scholarship organization in a community where most parents are not college educated. We are proud to say that as of June 2004, we have awarded a total of $40,000 in mathematics scholarships to ten students (five to women, five to men). Our scholarships go to outstanding mathematics students who live in Somerville while in high school. The scholarships are for $1,000 a year, renewable for up to four years of college as long as the student continues to take mathematics or science courses and maintains a B average. We are pleased that all seven of our previous scholarship winners had their scholarships renewed this spring.

Scholarships are great for deserving students, but there is much work to be done in this blue-collar town to prepare students to qualify for careers in the years to come. So, the other focus of the SMF involves creating enthusiasm for mathematics; as our mission says, we celebrate and encourage mathematics achievement; and we do this by awarding teacher grants, sponsoring family mathematics nights, and writing mathematics problems for families to solve in the local newspaper.

When I spoke in New Orleans, before making suggestions about what we should do, I was very specific about what we should *not* do. All of the examples I gave can be summarized as: Do not tell people how they should be teaching when you offer to help them—the adage "Before criticizing someone, walk a mile in the other person's moccasins" definitely applies here. I take this approach very seriously as I try to find ways to support and work with the teachers and students in Somerville.

The SMF awards grants of up to $500 each to teachers to fund exciting projects in their classrooms. We pay for materials, not salaries, for teacher-designed activities. So far we have funded fourteen classroom projects,

totaling $6,313 over three years. Among the projects have been classroom resource libraries, backpacks filled with math activities for kindergarten and first graders to take home to do with their parents, family mathematics nights, algebra manipulatives, and art materials for a geometric transformation project. I am convinced that when teachers are excited about what they are doing and feel supported, their students will catch their passion. We try to empower the teachers by supporting their creative ideas.

The SMF also sponsors Family Mathematics Nights for middle school students and their families. We work with teachers to plan and run the mathematical theme evenings. So far we have celebrated Pi Night, Metric Mania, and Pattern Party. Starting about three months prior to each event, I meet with interested teachers outside of school, since I am unavailable during school hours. We all share ideas and suggest potential activities for the multiple stations in the lunchroom. What is finally used comes from these very fruitful discussions. The evenings are not in any way a predetermined "packaged" program that is supplied by us and imposed upon the school community. Rather, what I provide is a potential theme, some beginning ideas, a husband who loves to solicit some donations once we identify what we need, and the willingness to plan and work that evening.

We would not be able to do what we did without the enthusiasm of the three wonderful, participating teachers who not only donate many hours outside of school to do planning and purchase (or beg donations of) some of the materials for the evening, but excite their middle school students to come to school on a Friday night with their parents (whom middle school students usually do not want to be seen with)—for an event at a school in a neighborhood possibly different from their own. We also could not have done this project without the wonderful assistance of the high school volunteers from the Mathematics Team, Computer Club, and French Honor Society at Somerville High School, all of whom ran each of the activites the night of each event. In fact, two high school students from Pi Night joined us over the summer to plan the metric activities and recruited the other volunteers for the metric and pattern events. The teachers had activities in their classrooms leading up to the evenings: for Pi Night and Metric Mania, students wrote songs to be performed; for Pi Night, students made posters and tee-shirts; for Pattern Party, students wrote dance and drumming routines of number patterns to perform; for Pattern Party, students made tessellation posters. Each of our evenings were held at different schools. Students from the other two schools came to the one where the event was held. We told teachers from all of the Somerville schools about the event; however, in order for students to participate, a teacher from their school needed to be involved. For each evening, we had numerous volunteers, mainly from the high school, but also from The SMF board and the wider community. Since the participants were from the poorest neighborhoods in town, we served dinner (pizza one night and hot dogs the other two) along with the mathematics. We also received support from local businesses with generous in-kind donations, so we were able to keep our costs to a minimum.

When planning activities, we needed to remember that they had to be self-contained, related to the theme, interesting to middle schoolers, doable while challenging, quickly teachable to the volunteers, and in at least some cases be somewhat competitive—all this and mathematical. Pi Night included computing π by dropping tooth picks, estimating circumference by feeling the size of an object in a mystery box, Pi facts quiz, predicting how far a bicycle tire would roll in one revolution, solving math problems in order to putt in miniature golf, and predicting and testing which had a better chance: tossing a chip into a circle inscribed in a square or into a square inscribed in a circle. Metric Mania included estimating the size of Bill Rodger's shoe print and Joan Benoit Samuelson's shoe print to the nearest square centimeter, estimating the weight of a handful of marbles, estimating the volume of water squeezed from a sponge, estimating how far a cotton "shot-put" and a drinking straw "javelin" were thrown in centimeters. Pattern Party included solving mirror puzzles, completing words using mathematical transformations, building toothpick polyhedra, drawing the next picture in a geometric pattern, naming the next number in a sequence and giving the rule, completing a pattern quiz, finding multiple patterns in Pascal's Triangle, solving tangram puzzles with Fibonacci-design pieces, and talking to the football coach about patterns in football.

Finally, the other thing the SMF is doing to encourage mathematics in Somerville is writing problems for the *Somerville Journal*. I am writing problems quarterly. The paper publishes the problems one week and then the problems with the answers the next week. I have had a couple of folks tell me they were working on the

problems—one a grandmother with her grandson, and another who emailed me when her colleagues at work wanted to check their solution. My hope is that parents and children will try the problems together, although I have no way of assessing whether or not anyone beyond these people are even reading the column.

I hope that other members of AWM will take the leap and reach out to their community. What I have provided here are some of my ideas and experiences. I am definitely learning as I go along. I would reiterate what I said in New Orleans, that if you are going to reach out and do something, be sure to start by offering to help, and not by telling the teachers what they ought to be doing.

For additional information about The Somerville Mathematics Fund, go to www.Somervillemathematics fund.org. I can be contacted at voolich@aol.com and would love to hear others' experiences working in the community.

BOOK REVIEW

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

The Door in the Dream: Conversations with Eminent Women in Science, Elga Wasserman, Joseph Henry Press, Washington, D.C., 2000, ISBN 0309065682, xiv+254 pp.

Helen Moore, Associate Director, American Institute of Mathematics, Research Conference Center, 360 Palo Alto, CA 94306; moore@aimath.org

The Door in the Dream contains inspirational, well-told stories about women scientists who are members of the National Academy of Sciences (NAS), a distinguished group to which 72 (previously 60) new members are elected each year. The book also contains a contextual analysis of the common characteristics author Elga Wasserman noted in her subjects and of circumstances that hindered or advanced their careers. A total of twenty-six profiles are included, as are excerpts from other interviews and letters. When Wasserman sat down to write in the mid-1990s, there were eighty-six women in the NAS, or 5% out of a total of about 1600 natural science members in the US. The numbers have improved since then, with almost twice as many women members, or more than 8% of about 2000 active members, as of April 2004. Notably, no women in the cohort Wasserman examined are members of underrepresented minority groups. (There are two women who are of Asian descent.) [p. 10] This is interesting to me, as I can think of several African-American and Hispanic women myself who I expect will be nominated for election in the near future.

For the profiles alone, the book is a welcome addition to the small collection of quality biographies of contemporary women in science and math. Included here are profiles of Cathleen Morawetz and Nancy Kopell, both in the applied mathematical sciences. Karen Uhlenbeck and Marina Ratner were also members of NAS at the time, in mathematics, but are not included in the profiles. (Note: since the time of Wasserman's interviews, there have been three additional women elected to the NAS in the mathematical sciences. Ingrid Daubechies was elected in 1998, and Dusa McDuff in 1999, in mathematics. Marsha Berger, a computer scientist, was elected to the NAS in 2000 in the applied mathematical sciences.)

The profiles are grouped into chapters by birth decade. At the end of each of these chapters, there is a summary of the parallels found among the profiles in that chapter, as well as the contrasts with profiles in earlier chapters.

The most striking differences among the profiles are seen before and after the early 1970s, when affirmative action eliminated much of the overt discrimination experienced by women before that time. Although the women members who started their careers during or after the 1970s certainly experienced fewer overt obstacles, the majority of them struggled with the conflict between time demands of small children and those of maintaining an active research career. Many of these women avoided full-time academic responsibilities when their children were young. They worked as research assistants in someone else's laboratory, they worked in government institutions, or they had part-time academic positions, with some of them shifting to full-time academic positions when their children were older. Others, mostly before the 1970s, avoided this difficulty, as they

did not have children. There is no mention of different struggles for lesbian members of the NAS.

For the most part, the academic environment still retains a structure that was put in place at a very special (and brief) time in history: when scientists typically had full-time partners running their households and did not spend much time with their families. The expectation of extraordinarily long work weeks remains in place and has not kept pace with the changes in family and lifestyle structures. Many current institutional policies developed largely in the absence of scientists who wished to spend significant time on non-science activities.

Regarding details of the book, there are a few errors which strike the scientific reader. One is a mistake that appears in the profile of Cathleen Morawetz. Here the definition of "transonic speed" is given as a speed that is close to "the speed of the local air," when it should have read "the speed of sound in the local air." A more serious type of error occurs in chapter two. For example, Wasserman compares the percentage of Ph.D.'s in the physical and mathematical sciences that were earned by women in 1985 (15.8%) to the percentage of tenured faculty in those fields who are women in 1995 (6.4%). Her claim is that since the average time to tenure in science is 10 years from the Ph.D., the difference in these two percentages indicates disproportionate attrition of women. However, this neglects those faculty who had tenure in 1995, but received it before 1995. According to the NSF report *Women, Minorities, and Persons With Disabilities in Science and Engineering: 2000*, the percentage of Ph.D.'s in the physical and mathematical sciences that were earned by women in 1966 through 1985 is approximately 9%. Assuming that tenured faculty stay that way for (on average) at least 20 years, this indicates that Wasserman has significantly overstated the disproportionate attrition of women.

Attrition of women from academia is of concern since academic faculty are the scientists most visible to students training in science. Also, the fundamental research that garners awards such as election to the NAS is mostly performed in academic settings. It is also of concern because of the loss of potential role models, which could help correct the imbalance. Mistakes like the one above are regrettable because they might make the reader wonder about this and other claims Wasserman makes, which takes the focus away from the point of the book. However, other than some scattered errors of this sort, the book is extremely useful and reliable.

The last four chapters examine common difficulties for top women scientists today and suggestions of ways to overcome these. Refreshing in these chapters is the careful avoidance of overgeneralization. There are several relevant studies that are mentioned and referenced in these chapters, which serve to provide data and context for the opinions of the NAS members interviewed here. The clear analysis provided, and the judicious use of data, give the book an overall tone of quality science, despite the errors mentioned above.

The topics and suggestions in these chapters could easily fill the entire discussion at a weekly brown-bag lunch meeting of women in math. (Don't have such a meeting? Why not start one? Not enough women in math? Try starting a women in science group.) In the following, I will focus on a handful of the interesting topics and suggestions Wasserman considers.

Common traits among the profiles of women in the NAS include talent, willingness to work hard, luck, and persistence. There are implied lessons such as: if you have the resources to be able to afford good childcare, mentors who will guide and support you, a supportive partner, and unusually high persistence, then you, too, can succeed (if you are a talented, well-trained, hard-working woman in science). How do we change the situation so that talented women can succeed in science without requiring special realignments of the stars?

There are three major suggestions in Chapter 10 for improving the numbers and conditions of women in science. These are: encouragement of more girls to go into science and to overcome their internalized traditional expectations; family-friendly policies that make raising children more compatible with an academic career in science; and promotion of more women to senior positions and inclusion of women in all decision-making opportunities.

To address the first suggestion, there are summer programs for girls and young women interested in science and math. These include the Tech Trek run by the Association of American University Women (AAUW) and the Sally Ride science camps. More widespread are the single-day events, such as the Sonia Kovalevsky Days for high school girls in math, organized by AWM, and the Expanding Your Horizons workshops, for middle school girls in math and science, run by the Math/Science Network. Elsewhere, I've written about

the inspiration and hence potential benefit provided even by one-time encounters with women scientists, so I won't say more here than to express my support of this, especially since it leverages such a limited and precious resource (the spare time of women in science and math). Wasserman also suggests that giving more attention to science teacher training might help girls avoid stereotyped expectations of their performance in those areas. Many have convincingly argued that expectations greatly affect performance. (See, for example, *Pygmalion in the Classroom*, by Robert Rosenthal and Lenore Jacobson, 1968.) It is believable that they also affect a student's desire to enroll in more math and science courses.

For the second suggestion, the closer coupling of incentives with performance might speed up the overdue reforms in academia. Friends of mine in industry praise such policies as making a difference in their workplaces. If academic departments bore the entire cost themselves of losing a valued faculty member and having to search for and mentor a replacement, they might have more personal incentive and work harder at retaining faculty members they have already deemed worthy of hiring.

In the third case, Wasserman advocates the appointment of women from outside institutions to committees at institutions without enough women to go around. This seems like a good idea to me, especially if this is given ample prestige and compensation. The NAS has itself recently implemented such a system to make sure women and other underrepresented groups are not overlooked in the nomination process. They have appointed external committees to provide names of potential nominees who may not be known to current NAS members. These committees were first used for the 2004 election and were clearly helpful.

I am reminded of a response I almost used with a former dean of mine (but, luckily, did not need). The next time the dean came to me and said he needed me on another committee, I planned to ask if he was genuinely serious about this need. If he answered yes, my response was going to be, "then you obviously need to hire another woman."

Overall, Wasserman's book is excellent. The profiles are interesting, and the discussion of commonalities is thought-provoking. I recommend this book as well worth your time.

NSF-AWM TRAVEL GRANTS FOR WOMEN

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

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

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

Target dates. There are three award periods per year. An applicant should send *five* copies of 1) a cover letter, including the conference name, conference dates and location (city/state/country), and amount of support requested, 2) a description of her current research and of how the proposed travel would benefit her research program, 3) her curriculum vitae, 4) a budget for the proposed travel, and 5) a list of all current and pending travel funding (governmental and non-governmental) and the amounts available for your proposed trip to: Travel Grant Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. If you have questions, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu). Applications via email or fax will not be accepted. The next two deadlines for receipt of applications are **October 1, 2004** and **February 1, 2005**.

NON-STANDARD CAREERS

We continue our series of articles about women in mathematics whose careers have taken some unexpected twists and turns but have wound up satisfying. And we repeat our invitation: if you or someone you know has had such a career and would like to write about it, or to talk on the phone and have somebody else write about it, please get in touch with Ginger Warfield (warfield @math.washington.edu).

A few months ago I got a note from Raffaella Pavani in Italy asking if I would be interested in an international non-standard career. I said that I would indeed, and asked for some details, expecting to use them to write a column. What she sent me turned out to be absolutely unimprovable, so here it is.

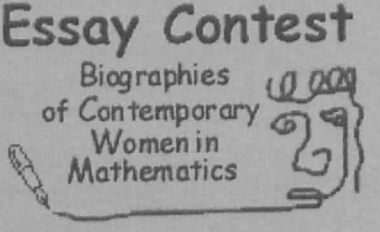
Raffaella Pavani

My degree in mathematics was with full marks. When I was at the very beginning, I spent one year in the States as visiting researcher: at first at the University of Kansas in Lawrence, then in Baltimore, at the Johns Hopkins University. My research was in the field of numerical analysis applied to quantum chemistry (I was employed in a chemical company). I persuaded my fiancé to get married before leaving for the States, but then it was very hard doing research in the US and having my husband in Italy. So I came back, but I went on doing research. Then, after about ten years, my company decided to finish the theoretical research activity, and I had to choose between a new job in marketing or resigning. I resigned, because I loved mathematics not marketing, and became a computer science consultant, as I have been using computers of different types for so many years. They needed a computer consultant at the Department of Mathematics in the Politecnico di Milano, a huge technical university. So I went in the Academy from the back door, but I was enthusiastic about mathematics and I succeeded in starting a new career. I won some competitions and now I am Associate Professor at the Politecnico di Milano in the field of numerical analysis.

My husband was one of the main reasons for my successful career. He always encouraged me, and even when I wanted to give up, he persuaded me to go on. He was right.

Now my first daughter is a M.D., as her father is. On the contrary my son loves mathematics as I do.

And I still love mathematics more than everything else.



To increase awareness of women's ongoing contributions to the mathematical sciences, the AWM is (*pending funding*) sponsoring an essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers.

The essays will be based primarily on an interview with a woman currently working in a mathematical career. This contest is open to students in the following categories: **grades 6–8**, **grades 9–12**, and **undergraduate**. At least one winning entry will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM website. Additionally, a grand prize winner will have his or her entry published in the AWM *Newsletter*. For more information, contact Dr. Victoria Howle (the contest organizer) at vehowle@sandia.gov or see the contest web page: www.awm-math.org/biographies/contest.html. The deadline for receipt of entries is **October 29, 2004**. (*To volunteer as an interview subject, contact Howle at the email address given.*)

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

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

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

WHEN: The next AWM Workshop to be held in conjunction with the Joint Mathematics Meetings will take place in Atlanta, GA, January 5–8, 2005. The workshop is scheduled to be held on Saturday, January 8, 2005 with an introductory dinner/discussion group on Friday evening, January 7.

FORMAT: Twenty women will be selected in advance of the workshop to present their work; the graduate students will present posters and the recent Ph.D.'s will give 20-minute talks. AWM will offer funding for travel and two days subsistence for the selected participants. The workshop will also include a panel discussion on areas of career development, a luncheon and a dinner with a discussion period. Participants will have the opportunity to meet with other women mathematicians at all stages of their careers. All mathematicians (female and male) are invited to attend the program. Departments are urged to help graduate students and recent Ph.D.'s who do not receive funding to obtain some institutional support to attend the workshop presentations and the associated meetings.

MENTORS: 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: Applications are welcome from graduate students who have made substantial progress towards their theses and from women who have received their Ph.D.'s within approximately the last five years, whether or not they currently hold a postdoctoral or other academic position. Women with grants or other sources of support are still welcome to apply. All non-US citizens must have a current US address. All applications should include a cover letter, a concise description of research (two or three pages), a title of the proposed poster or talk, a curriculum vitae, and at least one letter of recommendation from a faculty member or research mathematician who knows the applicant's work. In particular, a graduate student should include a letter of recommendation from her thesis advisor. Nominations by other mathematicians (along with the information listed above) are also welcome. For some advice on the application process from some of the conference organizers see the AWM website.

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

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

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

APPLICATION DEADLINE: Applications must be received by **September 1, 2004**.
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 the next page for application information.

Auburn University, Montgomery

Tuval Foguel and Joan N. Powell

Fun with Cryptography: A Fun Workshop at AUM

At the first AUM Sonia Kovalevsky Mathematics Day, March 13, 2004 we held six different workshops, some in duplicate sessions. Three of the most popular according to the evaluations were "Coding Theory in Your Mailbox," "Sonia Kovalevsky: Who, what, when, why," and "Fun with Cryptography." Enthusiastic and friendly presenters are a must in making your workshops work well and we certainly had that in each of these. Hands-on activities are helpful as well and all but the history of Sonia Kovalevsky were extensively hands-on. And finally, presenting material that is accessible to a variety of ages and mathematical backgrounds but still interesting to those with lots of experience makes a great topic for a workshop. Our mathematics majors who volunteered at the event reported that to be true in each of our workshops and in particular at the one we highlight below.

Tuval Foguel presented the workshop titled "Fun

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R
B	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U
C	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X
D	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A
E	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D
F	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G
G	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J
H	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M
I	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P
J	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S
K	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V
L	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y
M	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B
N	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E
O	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H
P	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K
Q	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N
R	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q
S	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T
T	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W
U	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z
V	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C
W	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F
X	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I
Y	U	D	M	V	E	N	W	F	O	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L
Z	X	G	P	Y	H	Q	Z	I	R	A	J	S	B	K	T	C	L	U	D	M	V	E	N	W	F	O

with Cryptography," using Power Point for the presentation in order to be able to add graphics and sounds. The presentation took about 25 minutes, and the hands-on activity at the end took another 25 minutes. The presentation began with some history and explanations of cryptography and Latin squares. Then the table on the preceding page was introduced; it is a crossed inverse Latin Square. In such a table if a row α is used for encrypting the letters of a plaintext message, then the column α' is used to decrypt the message.

For this particular table, the correspondence between rows and columns is given by: A′ =A, B′ = Z, C′ = Y, D′ = X, E′ = W, F′ = V, G′ = U, H′ = T, I′ = S, J′ = R, K′ = Q, L′ = P, M′ = O, N′ = N, O′ =M, P′ = L, Q′ = K, R′ = J, S′ = I, T′ = H, U′ = G, V′ = F, W′ = E, X′ = D, Y′ = C, and Z′ = B.

We first gave them a short example of encrypting and decrypting with the word HI. We used row C and column C′ = Y. In row C, the letter H falls above R and the letter I falls above A. (Refer to the square on page 12 to confirm this.) So HI→RA. Afterwards we used the C′ = Y column to decrypt RA→HI.

World Mathematics Year 2000 campaign was launched to improve the position of mathematics and to promote worldwide understanding that mathematics is a strategic keystone for the economic and cultural development of a nation. The vital role of mathematics has for too long been hidden from the public. Mathematics is the unseen engine that powers much of our modern world; it needs to be brought to the forefront and celebrated as a key creative industry.

Next we challenged the students to decrypt the following three lines of lyrics and give the title of the song which includes these lyrics. They of course needed to know that we used the B row to encrypt the lines of lyrics.

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

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

AWM anticipates awarding 12 to 20 grants ranging on average from $1500 to $2200 each ($3000 maximum per school) to universities and colleges. Historically Black colleges and universities are particularly encouraged to apply. Programs targeted toward inner city or rural high schools are especially welcome

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

The decision on funding will be made in late August. The high school days are to be held in Fall 2004 and Spring 2005. If selected, the organizer(s) must submit a report of the event along with receipts (originals or copies) for reimbursement to AWM within 30 days of the event date or by June 1, 2005, whichever comes first. Reimbursements will be made in one disbursement; no funds can be disbursed prior to the event date. An additional selection cycle will be held February 4, 2005 for Spring 2005 *only if* funds remain after the August 2004 selection cycle.

Send *five* complete copies of the application materials to: Sonia Kovalevsky Days Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, Maryland 20742-2461. For further information: phone 301-405-7892, email awm@math.umd.edu, or visit www.awm-math.org. Applications must be received by **August 4, 2004**; applications via email or fax will not be accepted.

MXF TONNYJ PNNI ZQ SBAQXQF
VDAAL HN OZHN SZ JNN HL PXQ
JXQFXQF JZQFJ DMZBS SON JZBSOYDQE

The student that was first to give the song title which included these lyrics got to click on a link in the presentation that played the song.

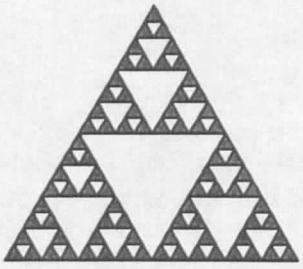
The decoded lyrics were:

BIG WHEELS KEEP ON TURNING
CARRY ME HOME TO SEE MY KIN
SINGING SONGS ABOUT THE SOUTHLAND (from the song "Sweet Home Alabama").

At the end of the presentation we asked students to choose a letter corresponding to a row of the Latin Square and use that row to encrypt the name of a favorite movie, then to give the letter and the encrypted message to the person sitting across from them to decrypt. We walked around to help them encrypt and decrypt. It was nice to see that they also got help from fellow students. Without question the highlight of this 50 minute workshop was the hands-on experience.

Hollins University

Trish Hammer, SK Math Day Chair, Hollins University; phammer@hollins.edu or (540) 362-6599

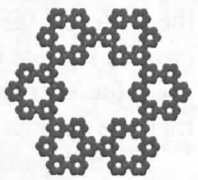


"It is impossible to be a mathematician without being a poet in soul."
Sonia Kovalevksy

Our activities focused on the beauty, fun, and applicability of mathematics as well as the importance of mathematics in a variety of careers. Students participated in three fifty-minute mini-classes chosen from "Beauty in Mathematics?" "Mathematics in Sports," "Secret Codes," "I Want Candy!" and "Scavenger Hunt."

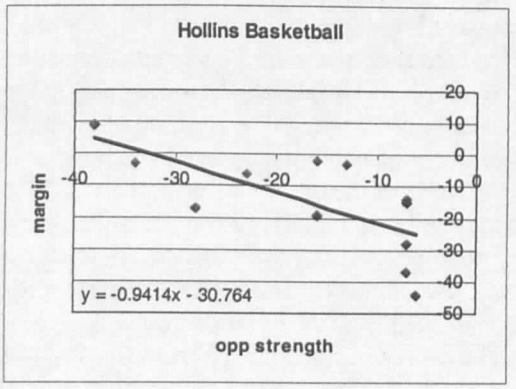
Beauty in Mathematics?

A fractal is an intricate geometric figure that contains infinitely many smaller copies of itself. These images have long been appreciated for their striking beauty and mathematical complexity. In this mini-class, students were introduced to many fractals including Sierpinski's Triangle (below title). They then used simple mathematical methods to generate fractals (e.g. Fractal "X", Fractal Kite, Sierpinski Hexagon, Sierpinski Carpet). The deterministic methods (seed and rule) were carried out using MS PowerPoint. The random methods were carried out using an interactive window from math.bu.edu/DYSYS/applets/fractalina.html. Nature's fractals (e.g., ferns, snowflakes, clouds) were also discussed. Fractal posters were created for each school using images created by the students. See http://www1.hollins.edu/homepages/hammerpw/SKMDAY/beauty.htm.

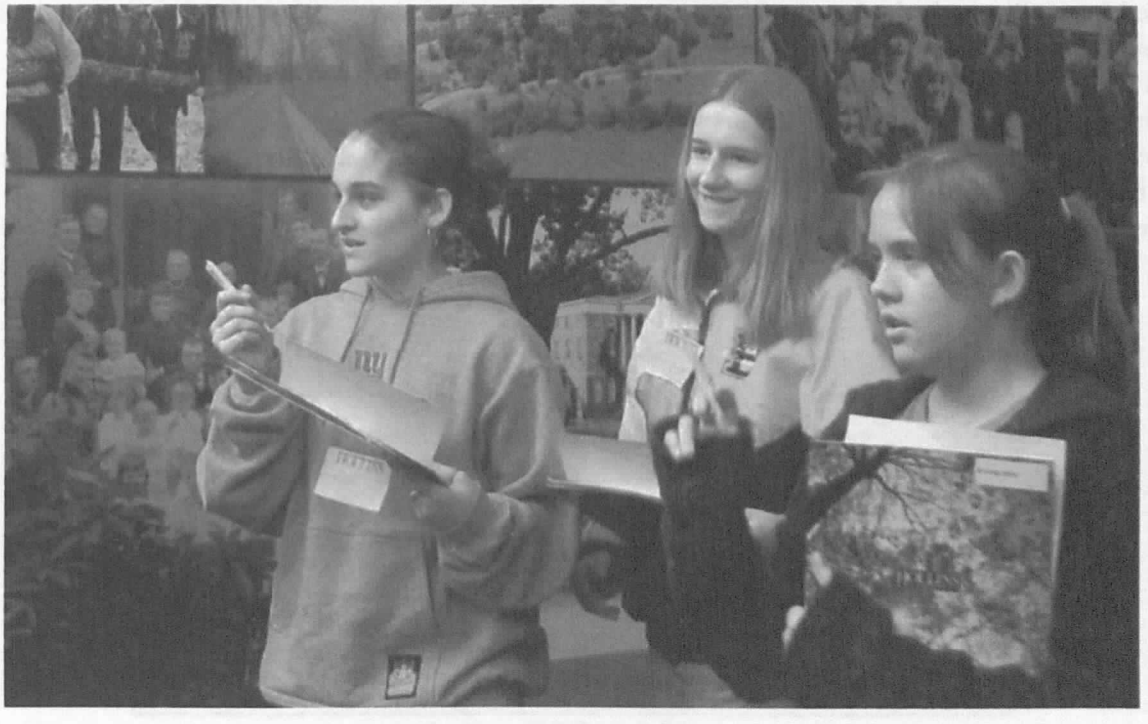


Mathematics in Sports

Mathematical formulas play an important role in the sports world today. In this mini-class, students used linear models to explore the mathematics behind women's college basketball. Using results from Hollins, Virginia Tech and Duke basketball games, students defined dependent and independent variables and then plotted the data. Next, students drew in best fit lines and interpreted slope and y intercept in the context of the application. Using these linear models, students were able to make predictions for hypothetical matchups between Hollins, Virginia Tech and Duke.



Scavenger Hunt at Hollins SKHS Math Day



Scavenger Hunt at Hollins SKHS Math Day

Secret Codes

Cryptography is an important application of mathematics. In this mini-class, students were introduced to cryptography and several simple mathematical cipher methods. Working in groups, students coded and decoded secret messages using transposition and monoalphabetic substitution.

For example, in the cryptogram below, students used Maple9 to generate a character frequency analysis as the first step in decryption.

Coded Message: & ?*--&"\ ;~ ")[*\#)")! %&")\# +?$\{[%%~)>\ ;!;\#))>\~ *\+&*\ )!)?=\ #! ;!$\ ;?)>\;?)&+" +![$"\")>\~ ;&@>) }\ ?}%\ )! >\?$)>\ "![#* !{ +%!"&#@ *!!$" ^\?$% " }[+=

Decoded Message: "I advise my students to listen carefully the moment they decide to take no more mathematics courses. They might be able to hear the sound of closing doors." — Pearl S. Buck

See www1.hollins.edu/depts/math/DeptWeb/SKMathDay/secretcodes.htm.

I Want Candy!

In this mini-class (based on "Candy Sharing" by Glenn Iba and James Tanton in the January 2003 issue of *The American Mathematical Monthly*), students actively investigated the same questions that motivated the authors: What happens when a group of people, each with a pile of candy, sits in a circle and trades pieces of candy with their neighbors according to a prescribed set of guidelines? Will the number of candy pieces in everyone's pile stabilize (as below)? Oscillate? Or will the process go on forever? Will everyone end up with the same amount of candy in the end? Students experimented with different starting amounts and different fractions for passing.

Scavenger Hunt

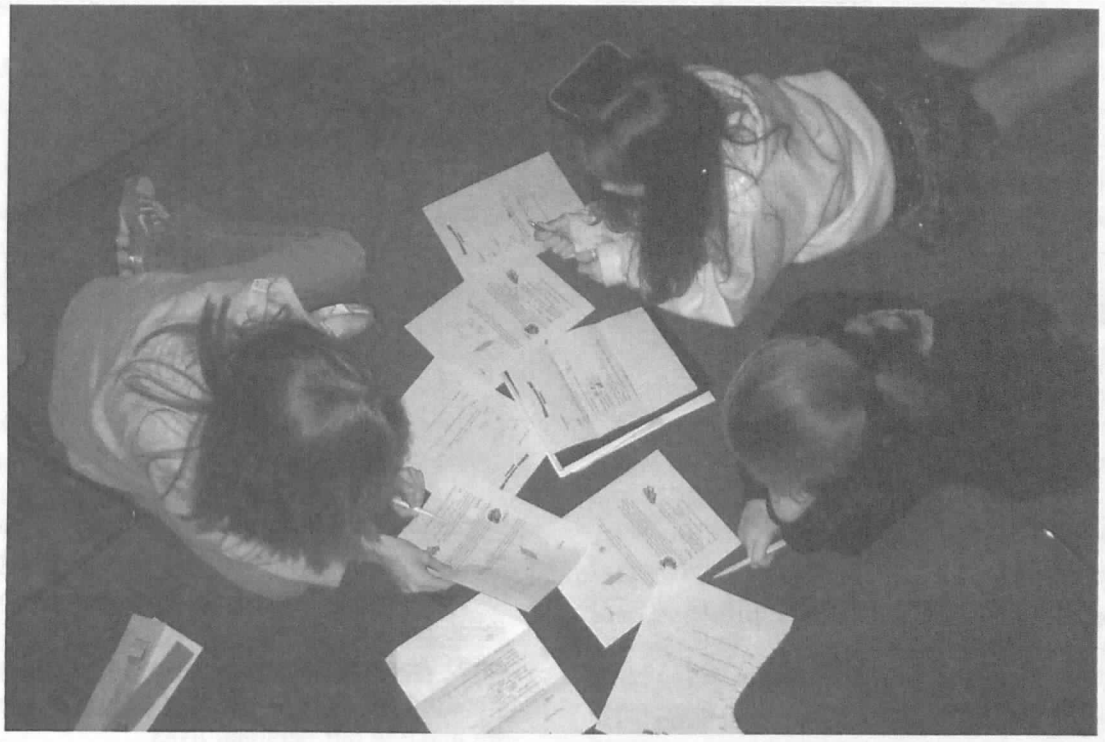
Students "hunted" through Dana Science Building to uncover mathematical clues and to solve challenging geometry and algebra tasks which involved similar triangles, volume, calories in a cheeseburger and sales commission. Working in groups of three, students competed for correct answers and fast times! An example is given below.

Clue #4: To find the number of milligrams of cholesterol per ounce in cheddar cheese for Task 4, find the office door (on the second level) with a picture of Sonia Kovalevsky. Using this door's number, add the first two digits to get the "ten's-place" of the number you're looking for. Use the third digit of the door number as the "one's-place" of the number you are looking for.

Task #4: Cheddar cheese has x milligrams of cholesterol per ounce, and lean ground beef has 27 milligrams of cholesterol per ounce. A cheeseburger made with ½ an ounce of cheese that contains a total of 123 mg of cholesterol has how many ounces of lean ground beef? In other words, if y = ounces of ground beef, then $\frac{1}{2}x + 27y = 123$. Find y.

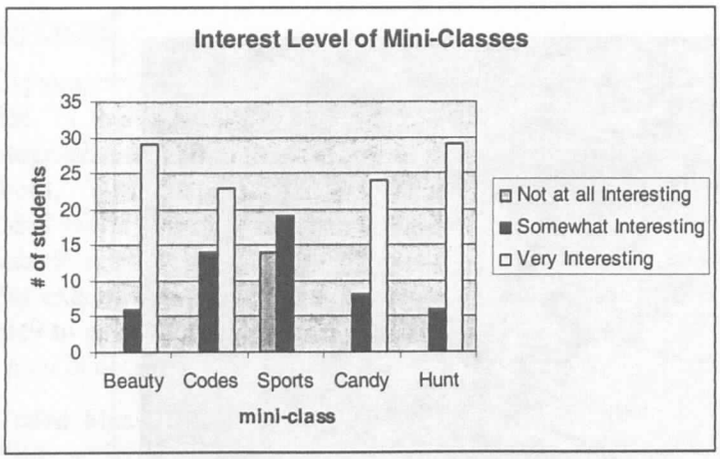
Trish Hammer and Julie M. Clark have been invited to lead a two-hour "Math Day" session at the annual meeting of the Virginia Association of Independent Schools in November 2004. Congratulations!

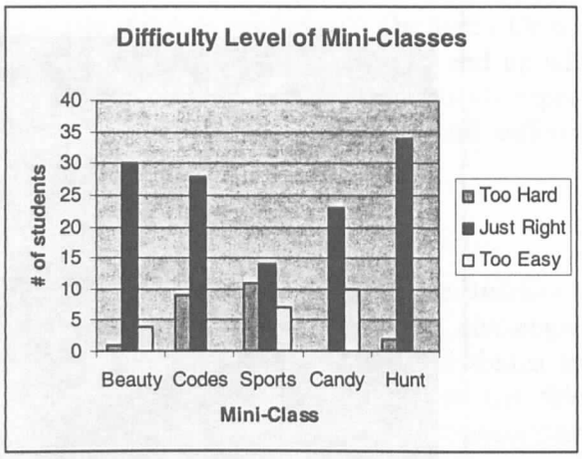
Rules and Results (5-player)					
player	A	B	C	D	E
fraction passed	1/3	2/5	1	1/2	3/4
round UP multiple	3	5	1	2	4
initial amount	12	10	3	4	8
round 1 amount	15	10	3	6	4
round 2 amount	15	10	4	8	4
round 3 amount	15	15	4	8	8
round 4 amount	18	15	6	10	8
round 5 amount	18	15	6	12	8
round 6 amount	18	15	6	12	8



Hollins SKHS Math Day

Idaho State SKHS Math Day





Idaho State University

Cathy Kriloff, ISU; Tracy Payne, ISU; Carole McWilliam, retired public school teacher, principal, and administrator

Having experience in secondary education, Dr. McWilliam provided a perspective that complemented those of Drs. Kriloff and Payne. She consulted various sport schedules to avoid scheduling conflicts in setting the date for Sonia Kovalevsky Day, found the data on the demographics of local high schools, used her contacts in the public schools to recruit girls and teachers, and provided suggestions on what factors would make high school students and teachers likely to attend. We suggest trying to get organizers for future Sonia Kovalevsky Days with experience and contacts in high school education.

The American Association of University Women (AAUW) awarded us a grant to fund a small reception that we held for workshop presenters, career panelists, and organizers the evening before the workshop. This way we all got to know one another in advance, and we organizers were able to thank the volunteers in a way that was more meaningful than simply giving honoraria. The attendees had many questions about Sonia Kovalevsky, the AWM, the planning of the day itself, the demographics of the girls coming, etc., and we were glad to be able to provide this information in advance in an enjoyable context.

The featured activity for our Sonia Kovalevsky Day is the workshop on everyday economics given by Cindy Hill of ISU's Department of Economics. The goal of the workshop was to introduce students to the mathematics of compound interest. By working through a handout on the overhead projector, Hill discussed saving for retirement and what happens if you do not pay off your credit card. A secondary goal was to show how an understanding of mathematics can influence the decisions that we make in our personal lives.

Hill first told the story of the student who went out shopping and bought a pair of Dr. Martins, an MP3 player, five CDs, and various other things that high school girls are likely to buy. The total cost was $1500, and the student put it on her credit card. Hill then explained the mathematics behind the credit card balance computations, showing that of the $30 in the first minimum payment on the credit card, the majority goes to interest instead of principal. She worked out for the girls what would happen if the student continued to pay only the $30 minimum payment each month, showing that it would take 35 years to pay off the balance.

She provided a commented table of the payoff schedule, in year 30 noting the total interest paid up until then is $5,152.18, and concluding in year 35, "The Bottom Line: If you make just the minimum payment each month, it will take you 429 payments to pay off the $1,500. You will be about 52 years old. Over the course of 35 years, you'll spend at least $155.40 on postage."

Having surprised and motivated her CD-buying audience, she then turned to deriving the compound interest formula. It turned out that many of the girls had learned about exponential functions in school that very week and the girls were able to fill in many of the blanks for Dr. Hill.

Hill distributed small four-function calculators to the girls and put some sample problems on the overhead. The girls used the calculators at their seats to solve the problems. The girls liked the little calculators so much that Hill let them keep them, although she had not intended to do so.

She concluded by explaining tables in the handout giving the balances in retirement savings plans over time, comparing contributions of $18,000 at starting at age 22 to contributions of $70,000 starting at age 31 (a total difference of over $100,000 by age 65, in favor of early investment!).

After the Sonia Kovalevsky Day was over, a parent of one of the girls said that when she asked her daughter what she learned at Sonia Kovalevsky Day, the response from the girl was, "Don't use credit cards." Even if this girl doesn't become a mathematician or scientist, this is a lesson potentially with a great impact on her life!

For more information on this activity, contact Dr. Cindy Hill, Department of Economics, Box 8053, Idaho State University, Pocatello, ID, (208) 282-4945, hillcynt@isu.edu.

Missippi University for Women

Jane Wenstrom, jwenstro@muw.edu

One of the most popular workshops was the session on the mathematics behind Web search engines led by Dr. LeRoy Wenstrom from the Mississippi School for Mathematics and Science. This particular workshop was presented at a level that was suitable for all participants.

Web search engines like Google and Yahoo sort through millions of web sites and rank them for the user. The success of these search engines depends on their ability to find the most relevant web sites for the criteria provided by the user. In this workshop, Wenstrom used simple examples to show how directed graphs and matrix methods can be used to rank to a web site. The motivation for this workshop was a paper titled "The PageRank Citation Ranking: Bringing Order to the Web" by Lawrence Page, Sergey Brin, Rajeev Motwani, and Terry Winograd (Page and Brin are founders of Google). The text of the article may be accessed at jamesthornton.com/search-engine-research/paper?paper_id=26.

Wenstrom started with a simple directed graph with two vertices A and B. There were edges from A to B and from B to A and a loop edge from A to A. The students counted by hand the number of paths from A to A of length 1, 2, 3, etc. They then learned how to use an adjacency matrix to compute the number of paths of length n between two vertices of a graph. The students used graphing calculators to compute the powers of the adjacency matrix.

Once they were comfortable using an adjacency matrix, the edges of the directed graph were assigned probabilities. The edge from B to A had probability 1 and each of the edges leaving vertex A had probability ½. The result was a simple Markov chain, and the students then looked at the corresponding transition matrix. Once again they used graphing calculators to compute

CALL FOR NOMINATIONS: LOUISE HAY AWARD

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

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. *Five* complete copies of nomination materials for this award should be sent to: The Hay Award Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. Nominations must be received by **October 1, 2004** and will be kept active for three years. For more information, phone (301) 405-7892, email awm@math.umd.edu or visit www.awm-math.org. Nominations via email or fax will not be accepted. (*Please note that beginning next year the deadline for nominations for this award will be moved to April, so that nominations for the 2006 award will be due April 30, 2005.*)

powers of the transition matrix to determine the probabilities of being at a particular vertex after traversing n paths.

In the context of web pages, the vertices of the graphs are the web pages and the directed edges are links. The higher the probability associated with a particular vertex, the higher the ranking of the corresponding web page. The final example of the workshop was designed to illustrate the notion of a sink, i.e., a web page with no links to other pages. If a Happy Meal has one of three different prizes, what is the probability of obtaining all three prizes with five Happy Meals? The directed graph that models this scenario was constructed by the students and the edges were weighted with the appropriate probabilities. The vertex that corresponds to the state of having all three prizes is a sink—once you arrive at state 3, you cannot go to any other state. The transition matrix was determined and the original question was answered by raising the matrix to the fifth power. By computing even larger powers of the transition matrix, the students saw that no matter where one started, the probability of reaching state 3 approached 1. Various techniques used by web search engines to overcome the difficulties caused by sinks were discussed.

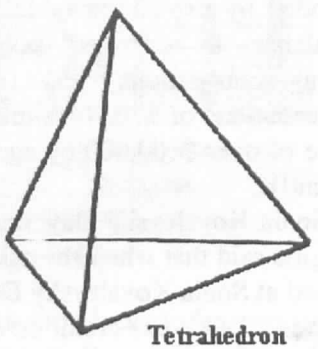
Valdosta State University

Jennifer's Puzzle by Denise Reid, dtreid@valdosta.edu

A polygon in the plane is a flat, closed figure that is made up of at least three line segments. Some examples of polygons are triangles, rectangles, and hexagons. These are all examples of two-dimensional figures. A polygon is convex if the line segment connecting any two points inside the polygon is itself entirely inside the polygon. A regular polygon is a convex polygon in which all of the angles have the same measure and all of the sides have the same length. We can extend this idea to three-dimensional figures called polyhedra. A polyhedron is a solid figure bounded by polygons or faces. A regular polyhedron is a convex polyhedron if all of the faces are congruent, regular polygons and the same number of faces meet at each vertex of the polyhedron.

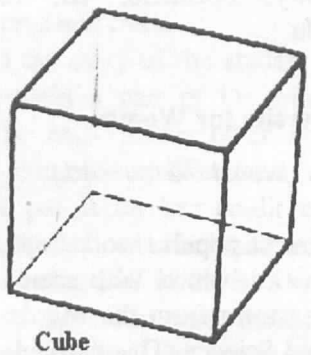
Regular polyhedra are also called the Platonic solids. They are named after Plato, who described them in his work *Timaeus* ca. 350 B.C. While there are infinitely many regular polygons, there are only five platonic solids. The five platonic solids are shown below.

- Tetrahedron, made of 4 congruent equilateral triangles



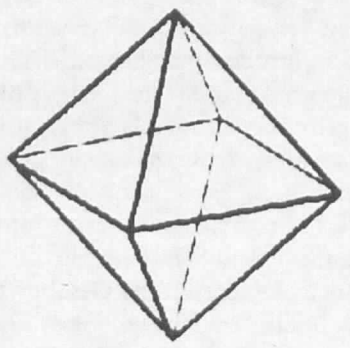
Tetrahedron

- Hexahedron or Cube, made of 6 congruent squares



Cube

- Octahedron, made of 8 congruent equilateral triangles



Octahedron

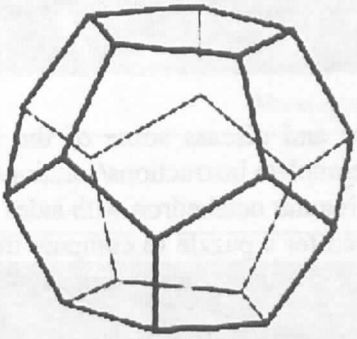
CALL FOR NOMINATIONS: ALICE T. SCHAFER MATHEMATICS PRIZE

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominee may be at any level in her undergraduate career, but must be an undergraduate as of October 1, 2004. She must either be a US citizen or have a school address in the US. The fifteenth annual Schafer Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in Atlanta, Georgia, January 2005.

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

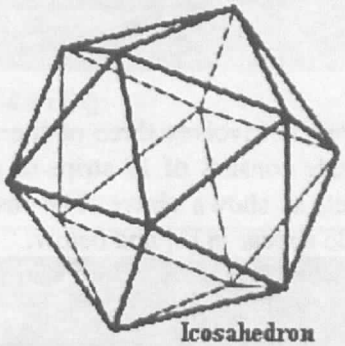
With letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks given by members of student chapters, recommendation letters from professors, colleagues, etc.) should be enclosed with the nomination. Send *five* complete copies of nominations for this award to: The Alice T. Schafer Award Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. Nominations must be received by **October 1, 2004**. If you have questions, phone 301-405-7892, email awm@math.umd.edu, or visit www.awm-math.org. Nominations via email or fax will not be accepted.

- Dodecahedron, made of 12 congruent regular pentagons



Dodecahedron

- Icosahedron, made of 20 congruent equilateral triangles



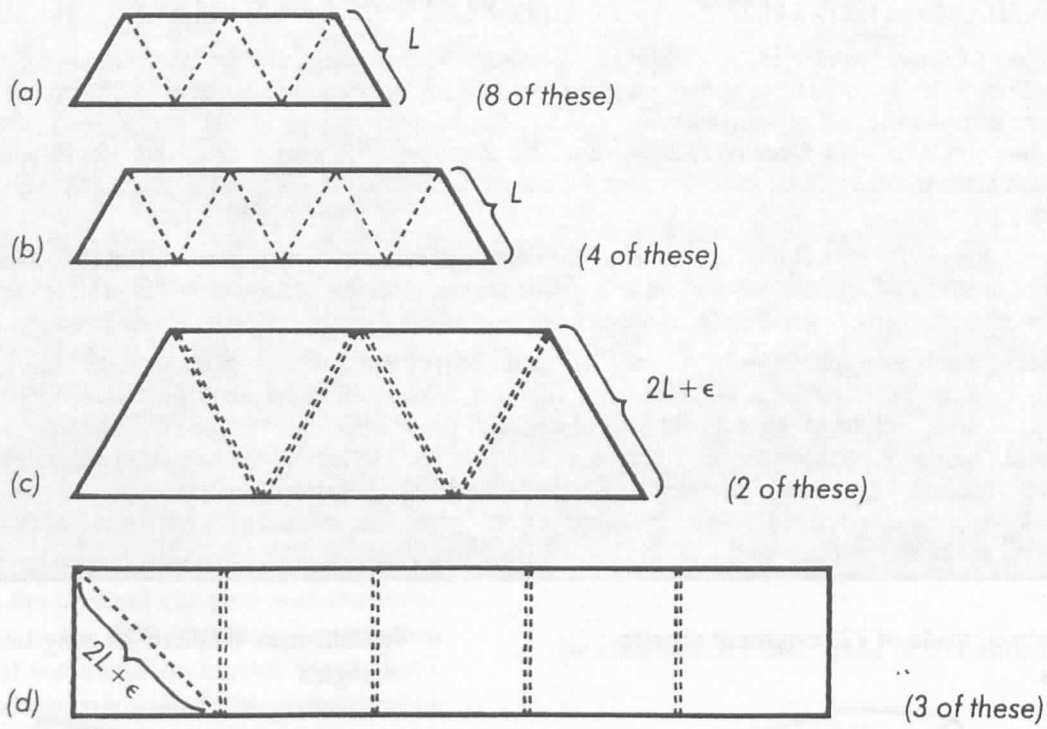
Icosahedron

CALL FOR NOMINATIONS: THE 2006 NOETHER LECTURE

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

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

The letter of nomination should include a one-page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. *Five* copies of nominations should be sent by **October 15, 2004** to: The Noether Lecture Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; phone: 301-405-7892; email: awm@math.umd.edu.



Jennifer's Puzzle involves three of the five Platonic solids. The puzzle consists of 17 strips of paper and an instruction sheet, as shown above. The instructions for Jennifer's puzzle appear in [1] and below.

In today's workshop, we will construct Jennifer's puzzle together and discuss some of the mathematics behind it. For complete instructions/solutions, see [1].

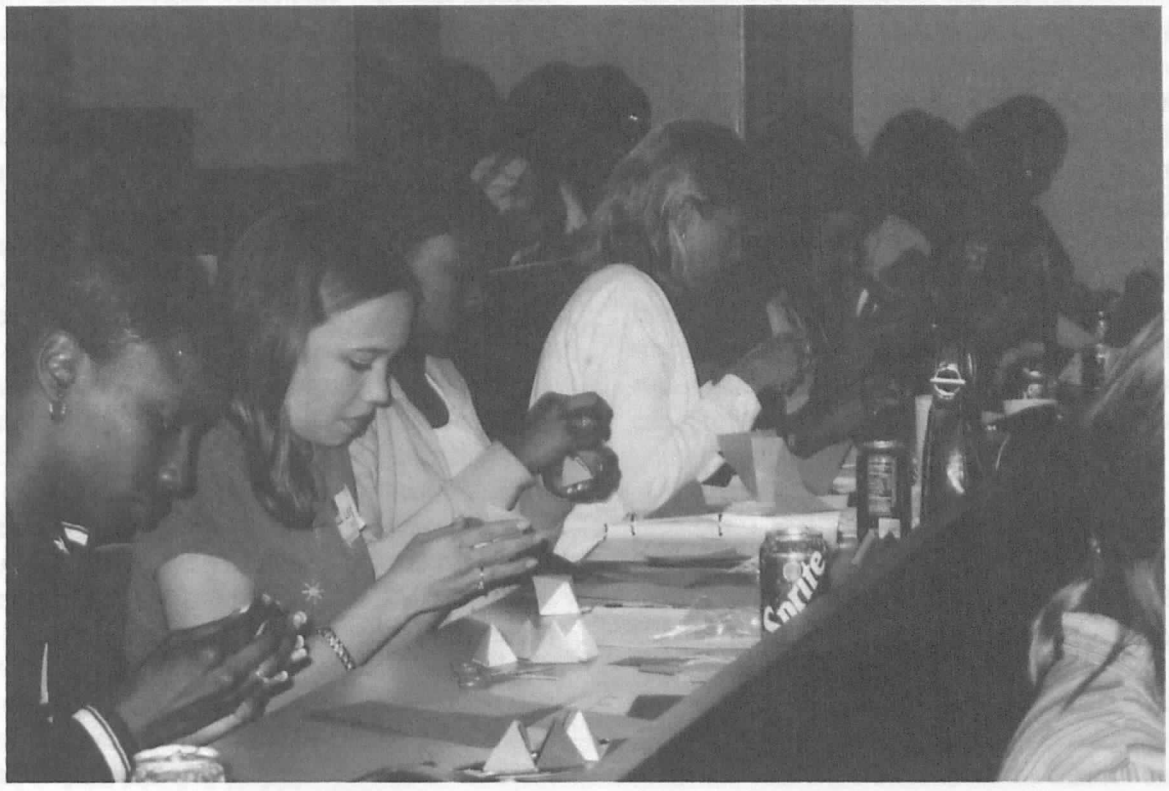
Consider a regular octahedron with sides of length a. We can use Jennifer's puzzle to compute the volume of this solid. We know that placing four regular tetrahedra

INSTRUCTIONS FOR JENNIFER'S PUZZLE: TRY IT!

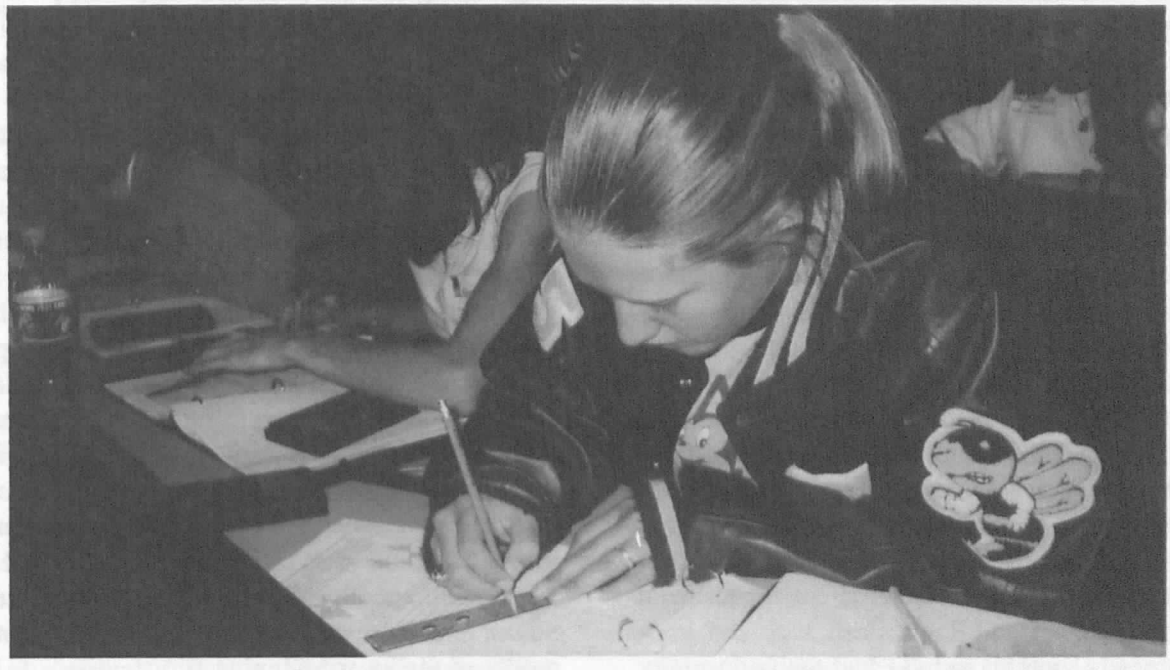
1. You get all the little strips of 5 triangles each (there should be 8) and braid them into 4 tetrahedra.
2. Then you get the 4 strips of 7 triangles each and braid an octahedron (that is, an 8-faced polyhedron).
3. Now you take the 2 big strips of 5 triangles each and braid a large tetrahedron as before, but in this one you put the 4 little tetrahedra and the octahedron.
4. Finally, take the 3 strips of 5 squares each and braid a cube, into which you put the large tetrahedron.

GOOD LUCK!

Jennifer Pedersen
9th Grade Geometry Project
Castillero Junior High School
San Jose, California



Working on Jennifer's Puzzle, Valdosta SKHS Math Day



Modular Arithmetic Workshop, Valdosta SKHS Math Day

(with side length a) on the four faces of the regular octahedron will result in a regular tetrahedron with side length $2a$. Let VO(a) denote the volume of the octahedron with side length a; VT($2a$), the volume of the tetrahedron with side length $2a$; and VT(a), the volume of the tetrahedron with side length a. Then, O(a) + 4 VT(a) = VT($2a$). Thus, finding the volume of a regular octahedron is reduced to finding the volumes of regular tetrahedra.

There are many more topics that can be discussed with respect to Jennifer's Puzzle, but due to time constraints these will be omitted in today's workshop. For more mathematics on this topic, see [1].

References

1. Hilton, Peter and Jean Pedersen, *Building Your Own Polyhedra*, Addison-Wesley, 1994.
2. http://mathworld.wolfram.com/PlatonicSolid.html
3. http://www.friesian.com/polyhedr.htm

COLWELL RETIRES FROM NSF

press release

National Science Foundation Director Rita R. Colwell assumed the position of Chairman of Canon U.S. Life Sciences, Inc. upon her retirement from the Foundation in February. Canon U.S. Life Sciences is a newly created, Washington-based subsidiary of Canon U.S.A., Inc. whose goal is to identify and develop life-science solutions with potential applications in diagnostics and medical instrumentation.

Colwell, a microbiologist and internationally recognized expert on cholera and other infectious diseases, will also serve as Distinguished University Professor at the University of Maryland, College Park, and on the faculty of The John Hopkins Bloomberg School of Public Health, where she will help develop a new international center for the study of infectious diseases, water, and health in conjunction with scientific colleagues from Sweden, Norway, Japan, and Bangladesh.

"I am extremely grateful to have had the opportunity to lead NSF through two Administrations and major transformational changes," Colwell said. "During the past five and a half years, our budget has increased by 68 percent, our merit review system has been recognized throughout government as the gold standard for responsible use of public funds, and our programs have helped U.S. science and engineering evolve into the flexible, robust and diverse endeavors that they must become to keep America preeminent at the frontier of research and education."

"Thanks to Dr. Colwell's leadership, vision and dedication, the National Science Foundation has become a model for management excellence among federal agencies," said President Bush. "I deeply appreciate her service to the nation, and am pleased that American science will continue to benefit from her talent."

Among the highlights of her tenure, Colwell championed increases in grant size, which rose from an annual average of $80,000 in 1998 to $142,000 at present, and promoted innovative collaborations across traditional disciplines such as biocomplexity in the environment, nanoscale science and engineering, bioinformatics and information technology. She initiated programs to increase NSF's investment in mathematics and to integrate mathematics with the life and social sciences, urged and obtained substantial increases in graduate-student stipends, and called for expanded opportunities for minorities and women in the nation's science and engineering communities.

Colwell, the third-longest-serving Director in NSF's 54-year history, also created a program to place promising science and engineering graduate students directly in K–12 classrooms. In the highly successful and widely praised "GK–12" program, school children benefit from the energy and enthusiasm of the graduate students, and the graduate students learn first-hand the challenges involved in science and math education.

During Colwell's term, NSF received the highest achievement ratings of any federal agency in performance on the President's Management Agenda and was named a "model" agency by the White House. Colwell took office at NSF in August of 1998. Previously, she held many advisory positions in the U.S. Government, non-profit science policy organizations, and private foundations, as well as in the international scientific research community. She has authored or co-authored 16 books and more than 600 scientific publications. She produced the award-winning film *Invisible Seas* and has served on editorial boards of numerous scientific

journals. She is the recipient of numerous awards and honorary degrees, including the Medal of Distinction from Columbia University, the Gold Medal of Charles University, Prague, and the UCLA Medal from the University of California, Los Angeles. Colwell has previously served as Chairman of the Board of Governors of the American Academy of Microbiology and also as President of the American Association for the Advancement of Science, the Washington Academy of Sciences, the American Society for Microbiology, the Sigma Xi National Science Honorary Society, and the International Union of Microbiological Societies. She is a member of the National Academy of Sciences, American Academy of Arts and Sciences, and The American Philosophical Society. Born in Beverly, MA, Colwell holds a B.S. in Bacteriology and an M.S. in Genetics from Purdue University and a Ph.D. in Oceanography from the University of Washington.

AWARDS AND HONORS

CONGRATULATIONS to all those named below for their meritorious achievements!

Keyfitz Named Director of Fields Institute

press release

BARBARA LEE KEYFITZ, Professor of Mathematics, University of Houston, has been appointed Director of the Fields Institute for Research in Mathematical Sciences, beginning July 1, 2004.

Keyfitz has made profound and original contributions to applied mathematics, particularly in the study of nonlinear partial differential equations such as those arising in the study of fluid flow or transonic shock waves. She has a distinguished record of research, mentoring, and service to her profession. Her undergraduate training took place at the University of Toronto, and she obtained her Ph.D. from New York University's Courant Institute, prior to holding positions at Columbia University, Princeton University, and Arizona State University. She continues as the John and Rebecca Moores Professor at the University of Houston. She is a Fellow of the American Association for the Advancement of Science and is chair elect of their Mathematics section. She is an officer of the International Council for Industrial and Applied Mathematics and has made numerous contributions as a reviewer and advisor to the Canadian Natural Sciences and Engineering Council. She was recently awarded the Canadian Mathematical Society's Krieger-Nelson Prize, has served as a Vice President of SIAM, and is President-Elect of the AWM.

The Fields Institute is a center for mathematical research activity with the mission of providing a supportive and stimulating environment for mathematics innovation and education. The institute promotes mathematical activity in Canada and helps to expand the application of mathematics in modern society.

Case Earns Named Chair

BETTYE ANNE CASE has been named the Olga Larson Professor of Mathematics at Florida State University. Case and her department chose to name the new professorship to honor Olga Larson, who joined the faculty of Florida State College for Women (FSCW) in 1915 and remained there after the institutional transition to Florida State University. Larson retired as an associate professor in 1954 after 44 years with the institution, having earned her B.S. in 1914 and M.A. in 1915 from FCSW. She earned a second master's degree in 1920 from the University of Missouri.

Case received a Distinguished Service Award from AWM in 1991 for her service as Meetings Coordinator and has received multiple awards for both teaching and advisement at her university. She has been actively involved in planning both meetings activities and AWM conferences. She edited *A Century of Mathematical Meetings*, AMS 1996. *Complexities: Women in Mathematics*, co-edited and -authored with Anne Leggett, to appear early 2005, Princeton University Press, is the latest of her books and had its genesis in AWM's Taussky Todd Celebration.

Case's Ph.D. and early work was in complex analysis; for a decade in the 80s and 90s her writing paralleled her departmental responsibilities with teaching assistants and junior faculty; see, e.g, *You're the Professor, What Next?* MAA 1994. Her primary research attention these days is devoted to the history, biography and sociology of mathematics.

Case initiated FSU's programs in actuarial science and financial mathematics and nurtured them into

thriving programs; the first Ph.D. in financial math was awarded this May.

She has served on numerous committees for the professional societies. Currently she is involved in the early planning stages for activities at the Madrid ICM and in learning more about Olga Larson's life and work.

Other Awards and Honors

MAA 2003 Distinguished Teaching Awards: REBECCA BERG, Bowie State University; SUE GOODMAN, University of North Carolina at Chapel Hill; OLYMPIA NICODEMI, SUNY Geneseo; EMMA PREVIATO, Boston University; JANET M. MCSHANE, Northern University; and JUDY L. WALKER, University of Nebraska – Lincoln.

MAA 2003 Writing Prizes. Trevor Evans Award: LAURA TAALMAN and EUGENIE HUNSICKER, "Simplicity is not Simple," *Math Horizons*, September, 2002. Lester R. Ford Award: ELEANOR ROBSON, "Words and Pictures: New Light on Plimpton 322," *American Mathematical Monthly*, February 2002, 105–120.

2003 AMS Awards for Outstanding Pi Mu Epsilon Student Paper Presentations: EMILY KING, Texas A&M University, "A Matricial Algorithm for Polynomial Refinement"; MARTA KOBIELA, Texas A&M University, "Knots in a Cubic Lattice"; BRENDA RUSSO, Salisbury University, "Algebraic Structures and the Long-term Behavior of Discrete Dynamical Systems"; MARIA SALCEDO, Youngstown State University, "Crystallographic Fractal Tilings"; and BARBARA SEXTON, Sam Houston State University, "Means of Complex Numbers."

2003 Trijitsky Memorial Awards: THIDA S. AYE, Bryn Mawr College; MARIA CHRISTIN LLEWELLYN, University of Maryland at Baltimore County; and SARAH DEIWART and ENGELA MARTINHO, California State University, Hayward.

AMS Menger Prize, 2003 Intel-International Science and Engineering Fair. Third Place: "Game Theory in Action: Proving and Computing Winning Strategies for 'Nim' and Its Variants," HYEYOUN CHUNG, Saint Paul's Girl's School, London, UK; Honorable Mention: "New Bounds for the Diameters of k-Path Graphs," JEREMY T. WARSHAUER, ALAN C. TAYLOR, and HANNAH CHUNG, Lyndon B. Johnson High School, Austin, TX.

EILEEN L. POIANI, Vice President for Student Affairs and Professor of Mathematics, Saint Peter's College: 2003 New Jersey Woman of Achievement Award; 2003 Alumnae Recognition Award from Douglass College; and 2003 Humanitarian Award, National Conference for Community and Justice, New Jersey Region, Hudson County Chapter.

ELEANOR DODSON, University of York, fellow of the Royal Society of London, 2003.

The first Information-Based Complexity Young Researcher Award: FRANCES KUO, University of New South Wales, Sydney, Australia.

NSF CAREER Awards. 2002: BROOKE SHIPLEY, Purdue University, Realizing Derived Equivalences; 2003: DONATELLA DANIELLI, Purdue University, Analytic and Geometric Aspects of Partial Differential Equations; RAMANI PILLA, Case Western Reserve University, New Directions in Mixture Models and Their Applications; CHIARA SABATTI, University of California at Los Angeles, Statistical and Computational Tools for the Analysis of High Dimensional Genetic Data; SYLVIA SERFATY, New York University, Statics and Dynamics of Singularities in Some Models from Material Science; and KONSTANTINA TRIVISA, University of Maryland at College Park, Systems of Conservation Laws and Related Models in Applied Sciences—Math Awareness and Outreach.

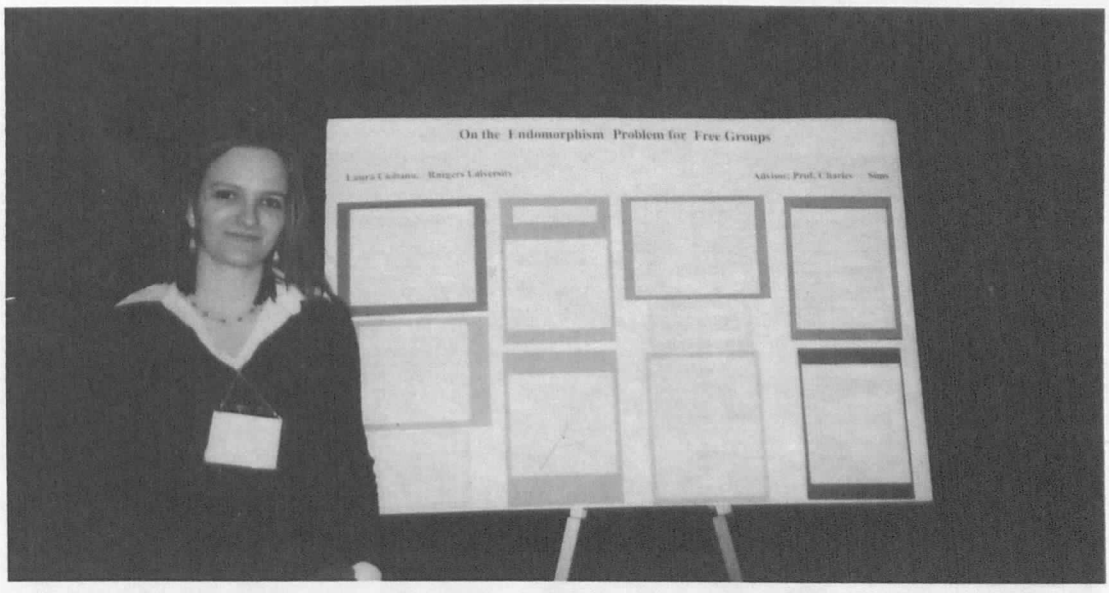
National Defense Science and Engineering Graduate Fellowships, Department of Defense: KATHLEEN GRUHER, Air Force Office of Scientific Research and CAMILLIA SMITH, Office of Naval Research.

MAA Officers. 2003 Section Governors: ELIZABETH G. YANIK, Emporia State University, Kansas section; LAURA L. KELLEHER, Massachusetts Maritime Academy, Northeastern section; and LUISE-CHARLOTTE KAPPE, SUNY Binghamton, Seaway section. 2004–2005: BARBARA T. FAIRES, Westminster College, First Vice-President; and JEAN BEE CHAN, Second Vice President.

2003 AMS Election: LINDA KEEN, Lehman College, CUNY, Trustee; BEVERLY DIAMOND, College of Charleston, Member-at-Large of the Council; ANNALISA CRANNELL, Franklin and Marshall College, Nominating Committee; and EMMA PREVIATO, Boston University, Editorial Boards Committee.

AWM WORKSHOP IN PHOENIX

Ph.D. Presenters: Katherine J. Mawhinney, Christine Heitsch, Vicky Williams, Haohao Wang, Lisa Bloomer, Marian K. Hukle, and Natasha Dobrinen (Kathryn Nyman not pictured)



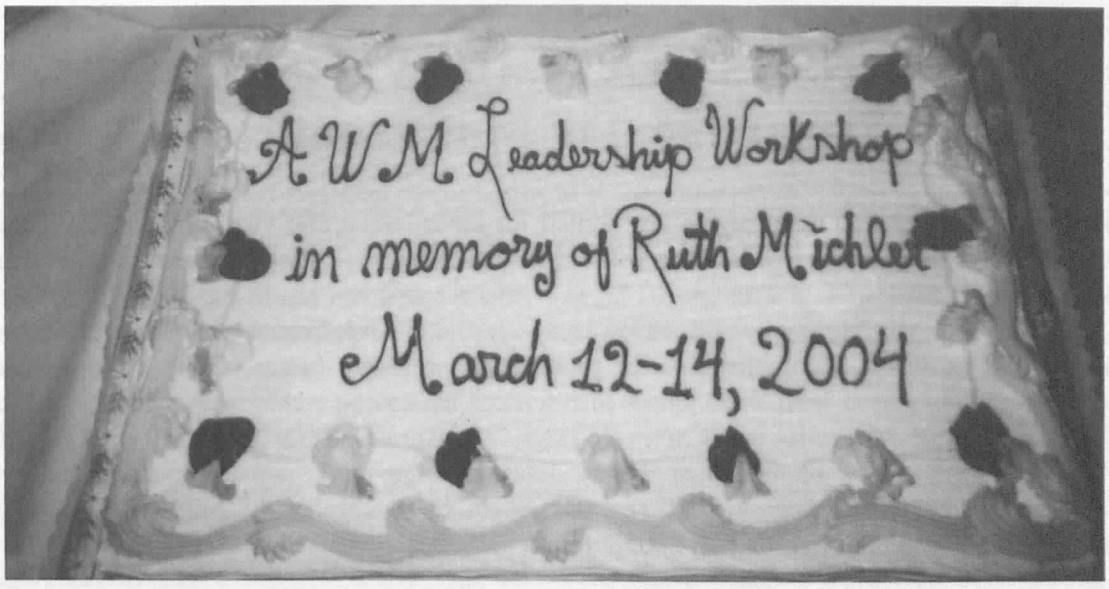
Laura Ciobanu (Rutgers University) at her poster

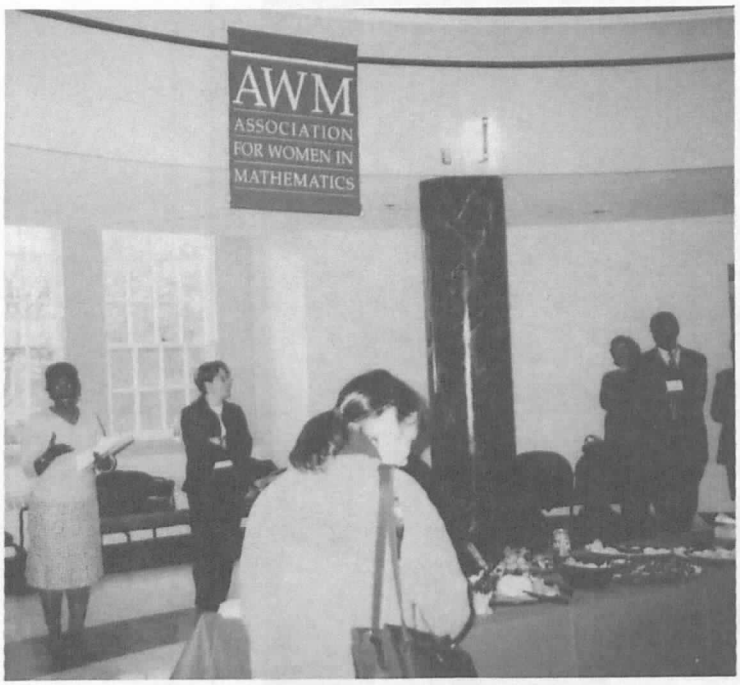
AWM LEADERSHIP WORKSHOP

"Leadership in professional societies and the research community":
Seated: Tina Straley (MAA) and Jean Taylor (Courant Institute, NYU);
Standing: Joan Feigenbaum (Yale University) and
Carolyn Gordon (Dartmouth College

The participants at the AWM Leadership Workshop

Presentation by Carolyn Gordon, AWM President, to Dr. Gerhard Michler, Ruth Michler's father





Presentation by funding agencies: Jackie Smith (NSA), Michelle Wagner (NSA), Lloyd Douglas (NSF), Hank Warchall (NSF), and Deborah Lockhart (NSF)

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Association for Women in Mathematics

2003/2004 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.**

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

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

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

DEGREES EARNED:

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

JA_04

INDIVIDUAL DUES SCHEDULE

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

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

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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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