AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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PRESIDENT'S REPORT

Vancouver

The meeting at Vancouver was *beautiful*. Uplifting, exhilarating, inspiring. Why am I saying all this? Well, because out of the many activities AWM and the other societies had there, one was very special: the awarding of the Alice T. Schafer Prize.

The prize for 1993, recognizing excellence in mathematics by an undergraduate woman, was awarded jointly to Cathy O'Neil and Dana Pascovici (a junior and a sophomore) and shared, as runners-up and honorable mentionees, by Melissa Aczon, Susan Goldstine, Karin Dorman, Becky Field, Ariel Glenn and Jennifer Slimowitz. Only Ariel could not attend. The other seven young women filled all of us with the good luck to meet them with pure delight.

It is easy to imagine them as the mathematicians they can become: bright, intelligent, motivated, serious and funny. Even better is imagining these mathematicians as the young women they will be in fifteen years, full of life and of zest, shyness or aggressivity transformed into assurance, boldness and integrity pushing them forward and upward.

One of the valuable things for the "golden seven," and one of the good things that AWM can provide for the young people that attend the joint meetings, was the excellent contacts they established with outstanding women and men mathematicians.

I could tell you many anecdotes. Like Susan Goldstine's exclamation when she realized that the man with whom she was discussing her interest in number theory was John Tate. Or Cathy O'Neil making me promise "to tell [her] more about Alice T. Schafer."

Individually and collectively we have much to learn from this group and other groups of young women in mathematics. They are so varied, some so totally geared into mathematics that nothing will distract them, others so full of talents and natural gifts that everything is of interest to them. Stereotypes do not apply to them. To provide mathematical education for women with such strong personalities, we have to consider all these differences. And how important it is for all of us to nourish their blooming, to be vigilant that they really have the

IN THIS ISSUE

AWM
ASSOCIATION
FOR WOMEN IN
MATHEMATICS

The Association was founded in 1971 in Boston, MA. The purpose of the association is to encourage women to study and to have active careers in the mathematical sciences. Equal opportunity and the equal treatment of women in the mathematical sciences are promoted.
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The Editor welcomes articles, letters, and announcements.
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opportunity to occupy the prominent places their talents suggest for them.

Dear new friends, we welcome you to our community, we invite you to join our efforts to secure the right of women to mathematics, and we wish you all success!

AWM-CMS Joint Activities

Of course the meeting was also beautiful because Vancouver happens to be one of the most beautiful cities in one of the most beautiful places in the world! (Expert talking here — I was able to sightsee for three whole hours!) We were all grateful to the University of British Columbia for hosting the Joint Meetings at their campus. And to the Canadian Mathematical Society for feting us with a salmon barbecue on the lawn of the university's spectacular anthropological museum, guardian of totems and other pieces of Native art.

As announced, the CMS Committee on Women and AWM jointly organized a panel on affirmative action, moderated by Asia Ivic Weiss (York University), with the participation of Joan Geramita (Queen's University), Richard Griego (Northern Arizona University), Mary Gray (American University) and Joan Wick Pelletier (York University). It was very well attended. We invited our Canadian friends, who presented a wealth of data on the Canadian situation and on the efforts done to improve it, to send their papers to the *Newsletter* [to appear].

Our first joint endeavor with the CMS Committee on Women was a success. This should be only the beginning!

Another Panel, This Time on Jobs

As a follow-up on the Vancouver panel, for the Joint Meetings next January we are planning a panel entitled "Are women getting all the jobs?"

No need to tell you that jobs for mathematicians are painfully scarce. Recently, some people have wondered if efforts to recruit women and minorities are making things worse (see the important article "Jobs, Grants and the New Ph.D." by Allyn Jackson in the July/August 1993 issue of the *Notices* of the AMS).

I am sure that all our readership has strong views on this issue! And I invite everybody who will attend the Cincinnati meeting to be at the panel session on Wednesday 12 January 1994 and participate in the discussion.

Elections

On the subject of participation: Do not forget to vote in the AWM election, so we can have our new officers in place next February.

And, since the AMS elections are contested (as ours will probably be after the next Executive Committee meeting), we call on all our members who are also members of AMS to vote before

their 10 November deadline. We have run in the previous issue and in this one statements from all the candidates that provided them.

In these times, as all mathematicians face increasing material difficulties, it is very important that we participate in the democratically elected professional bodies, and that we hold our representatives accountable for the way they work toward our common goals.

Executive Committee

Mei-Chi Shaw (Notre Dame) has resigned from the Executive Committee, due to new obligations she must attend to. The body has elected Harriet Lord (California State University at Pomona) to replace her for the remaining two years of her term.

Thanks to Mei-Chi, and best wishes to her, as well as a warm welcome to Harriet!

Federal Funding

Again I reflect on federal funding. Many ideas are being discussed at the higher levels of the national government on new ways to manage science and technology. Plans for a new body to oversee the whole U.S. scientific endeavor, the National Science and Technology Council, chaired by President Clinton himself and including Vice President Gore and the heads of NSF, NASA and other federal funding agencies, are being considered.

At the same time, Congress is discussing the bill containing the NSF appropriation for the next fiscal year. At stake are the continuation of ongoing programs and the expansion or reduction of many others. Foremost, trends are being set that will guide the largest scientific enterprise in the world for years to come.

Much is being said around Congress and the Administration on the need for a "useful" science, and for having a true cross-section of our population participating in it. Many scientists are worried that "guiding" the whole scientific enterprise may kill it. Others are positioning themselves to use the call for incorporating women and minorities as a means to preserve and increase their own endowments.

Women in mathematics are interested in the practice of a science that is both democratic and useful. But the issues are not simple, and it is necessary to have an informed opinion.

Nothing less will do. What is at stake matters to all of us: it entails the possibility of work in our chosen profession, for ourselves and for our daughters.

May All My Mistakes Be of This Caliber

My last report (in the September-October issue) includes a mistake. After congratulating both Ingrid Daubechies *and* Princeton University for a first for women in mathematics, I added that we are waiting for similar long-overdue news from other Ivy League schools. I included Cornell in the list of mathematics departments with no women full professors.

Let me start by sincerely apologizing to our members Professors Birgit Speh and Karen Vogtmann from Cornell University for inadvertently having implied that we are not aware of their existence. We are, as they know only too well, since both are active in AWM projects and are periodically asked to do even more. We appreciate their efforts and celebrate their mathematics.

What is ironic is that I received more correspondence on this than on any other issue. Such an uproar over *one* woman full professor missed! And, believe it or not, most of the correspondence was anonymous. It is quite clear that some of our colleagues feel that there are "plenty" of women in a large department with one or two female professors.

I wish all my mistakes were as dreadful. And I hope that the people who were so incensed by my unjustified *inclusion* of Cornell in the list would be equally incensed by the unjustified *exclusion* of so many good women mathematicians from their institutions.

Women Plenary Speakers at International Meetings

As we are not among those worried about women crowding the scene just too much, we sent a letter to the Council of the AMS, mentioning that no women had been invited as plenary speakers at the two prestigious international meetings the Society has co-sponsored in Europe (Cambridge 1992 and Heidelberg 1993).

The response of the AMS Council was very favorable. It was unanimously decided that future program committees will not only consider women mathematicians as plenary speakers but integrate them into the committee ranks.

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues

Regular: $40
Additional family (no newsletter): $30
  Base fees: $25 and $15
  Prize Fund add-on: $5
  General funds add-on: $10
Student, unemployed, retired: $8
Contributing: $100
Institutional:
  Level 1 (two free basic ads and up to three student memberships): $80 ($105 foreign)
  Level 2 (two free basic ads and up to ten student memberships): $120 ($200 foreign)
    additional student memberships: $8 ($16 foreign) for next 15; $6 ($14 foreign) for remainder
Affiliate: $250
Corporate: $150

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 $40/year ($48 foreign). Back orders are $6/issue plus shipping/handling ($5 minimum per order).

Payment

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

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 Executive Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the newsletter must be Affirmative Action/Equal Opportunity designated.*
Institutional members receive two free basic ads as a privilege of membership. For non-members, the rate is $60 for a basic ad (eight lines of type). Additional lines are $6 each.

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 book review material** to Anne Leggett, Department of Mathematical Sciences, Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; phone: (312) 508-3554; email: leggett@math.luc.edu; LMA24@LUCCPUA.BITNET; FAX: (312) 508-3514. Send all material regarding **book reviews** to Cathy Kessel, 2520 Etna, Berkeley, CA 94704; email: kessel@soe.berkeley.edu. Send everything else, **including ads and address changes**, to Dawn V. Wheeler, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; phone: (301) 405-7892; email: awm@math.umd.edu.

Our own community is still learning to deal with the issue of women in mathematics. It is important, then, that, when engaging in joint activities in Europe, rather than adapting to old-fashioned practices of excluding women, we stand up for more enlightened ways.

The good news: Jill Pipher and Cathleen Morawetz were invited as plenary speakers at the international meetings co-sponsored by the AMS in 1993 at Vancouver, Canada, and Merida, Mexico, respectively. So, we are faring better in the Americas than in Europe!

Needless to say, we are all waiting with great interest for the International Congress of Mathematicians in 1994 at Zurich, where it is to be expected that many women will be invited to speak!

Another Joint Activity

During the Vancouver meeting we hope to have initiated a tradition. The AWM Executive Committee invited to lunch the six women and one man working for AMS and responsible for the success of all joint meetings of the mathematical societies. It was a wonderful occasion, and many interesting and important experiences were shared.

It is not by chance that so many of the activities of this male-dominated profession of ours rest on the anonymous work of so many efficient women. We think it is the business of women in mathematics to recognize the work that women do to make mathematics meetings possible.

Thanks to Hope Daly, Janet Balletto, Allyn Jackson, Heather MacDonald, Penny Pina and Wayne Drady for sharing their very busy time with us.

Good News

Hurrah for Alice Schafer who obtained a grant from the Sloan Foundation to support the Sonia Kovaleskaya High School Days!

And also hurrah for Mary Gray, responsible for the successful AWM project that was awarded one of the NSF/EHR Model Programs grants!

Both grants will allow us to greatly expand one of our worthiest projects, at one of the levels — high school — where it is most needed. For details see page 16 of this issue.

Cincinnati

I have already told you about the panel in Cincinnati. But, as usual, much much more will be on

our program there. In the first place, the Workshop for Women Graduate Students and Postdoctoral Mathematicians will take place on Tuesday 11 January from 9 to 5. All participants in the meeting are invited to attend. The invitation will be especially useful to employers, since the people that participate are invariably first rate!

Another important AWM event at Cincinnati will be the presentation of the Louise Hay Award in recognition of an outstanding woman in mathematics education. We all look forward to it.

Please join us on all these occasions. We need you. To give your opinions, to share your experiences, to tell us what needs to be done, to cheer our common successes, to find ways to redress our grievances. To build together the right of women to mathematics.

I look forward to seeing you there!

Cora Sadosky
Washington, DC
26 September 1993

AWM ELECTION

The ballot may be found on page 32.

Statement, Chuu-Lian Terng, candidate for President-Elect, Northeastern University

Over the past twenty years, the fraction of women among new mathematics Ph.D.'s in America has remained stubbornly fixed at about fifteen percent. This is of course an unpleasant statistic, and one we should strive to change. But there is another that is even more unacceptable. While fifteen percent of the non-tenured faculty are women, only five percent of tenured faculty are. We must identify the causes for this and find concrete ways to help younger women to succeed in their careers.

We should continue our efforts to encourage young women interested in mathematics to study the subject in college and graduate school. We should continue providing support networks and encouragement to our young colleagues just starting their studies and their careers in education, industry and research. I hope through our combined efforts that the time women are no longer a minority in the mathematical sciences will soon arrive.

Statement, Naomi Fisher, candidate for Member-at-Large, University of Illinois Chicago

During the last several years, the mathematics community's interest in educational issues has grown dramatically. A host of influences, external and internal, have highlighted the problems facing mathematics education from kindergarten through graduate school. The general public's low regard for and interest in mathematics is particularly disturbing, as is the continued perception of mathematics as a strictly masculine domain. Developing an appropriate educational agenda for AWM is important for helping the membership of AWM contribute to the improvement of mathematics education.

Background: Naomi Fisher, University of Illinois at Chicago, with her colleague Philip Wagreich and Harvey Keynes, University of Minnesota, organized the Mathematics and Education Reform (MER) Network in 1988. Funded by NSF, MER has gained national recognition for its work in facilitating the involvement of mathematicians in mathematics education reform. In addition to her position of Co-Director of MER, Fisher is the Director of the High School Teacher Program of the Regional Geometry Institute (RGI) in Park City, UT. The vertically integrated design of the RGI enables high school teachers and mathematicians to develop collegial ties as part of their mutual professional development.

Fisher was the 1993 recipient of the AWM Louise Hay Award for Contributions to Mathematics Education.

Statement, Carolyn Gordon, candidate for Member-at-Large, Dartmouth College

Partly due to the influence of my older sister, I decided back in grade school that math was my

favorite subject. Her experiences made it easier for me to cope with being the only woman in my high school calculus class and to be in a small minority in college.

Starting graduate school at Washington University in 1974, I was the only woman in my entering class but was happy to see our numbers dramatically increasing in the subsequent years. I will always remember the first AWM meeting I attended during my fourth year of graduate school. I felt a real shock as I walked into a room filled with women mathematicians of all ages. I was also very surprised by my own reaction. As I had been fortunate to have very encouraging professors both in undergraduate and graduate school, I had never before realized how much I had missed contact with women mathematicians. (In fact, I don't think I had ever met a woman mathematics professor before that meeting.) It's been wonderful to see how the presence of the AWM at the annual meetings has grown since that time.

After graduate school, I spent a year on a postdoctoral fellowship in Israel and four years at Lehigh University with frequent visits to the University of Pennsylvania. I was delighted to return to Washington University in 1984, this time as a faculty member, and I remained there until my recent move to Dartmouth College.

I am continually impressed by the wide range of successful programs that the AWM has developed to provide support and encouragement to women at all stages of their mathematical education and careers and to break down barriers and negative attitudes towards women in mathematics. Since my first exposure to the AWM back in 1978, I have especially felt the importance of programs to encourage very young girls to study mathematics. I am looking forward to serving on the AWM Council.

AMS ELECTION

Sy Schuster, Carleton College

Contained in the statement I prepared for the September issue of the *Notices* of the AMS was: "... My view is that the Society should also be ministering to the community of mathematicians by attending (or continuing to attend) to matters of social-professional concern. Examples: training the next generation of mathematicians, the present job crisis (especially for young colleagues), making the profession a welcoming place for racial minorities and women, using the good offices of the Society to gain the right to travel freely to international meetings — unimpeded by political and bureaucratic restrictions...." Space restrictions permit only a bit of elaboration.

The AMS has made modest — but only modest — gains is making the profession a welcoming place for women and racial minorities who have hitherto been underrepresented in mathematics. If elected to the Nominations Committee, I would seek candidates for the higher offices and the Council of the AMS who would make the improvement of this state of affairs a high priority goal of the Society.

Of great concern to young mathematicians (as well as to many others) is the position(s) that the Society takes with regard to federal funding of research. The fact that available funds are so very limited makes it especially imperative that the AMS finally supports a) decoupling the size of grants from salaries and b) a change in the policy of setting summer grant salaries at 2/9 annual salaries. Otherwise, senior mathematicians who already enjoy high salaries will continue to get the lion's share of the available monies, leaving little for the support of research of younger mathematicians. Finally, on the matter of funding, I believe that the AMS should undertake an aggressive program of education of the U.S. Congress in order to disabuse its members of the notion that cost-effectiveness should be applied to the funding of mathematical research, especially because "cost-effective" means (to many of them) that federal funds should be supporting only research that (to them) is clearly applied mathematics. Legislators should hear from mathematical scholars that the health of mathematics (and its ultimate value to society) depends on research in both applied and pure mathematics.

With regard to my last example of how the Society should minister to the needs of its members, I suggest that — to begin with — it should be assiduous in pursuing the rights for its members to attend the Approximation Theory Conference in Cuba. Restriction of travel to Cuba has been in force since the early days of the Reagan administration, when it became a crime to spend money in Cuba. Thus, scholars may travel to Cuba but may not buy a meal, pay a hotel bill or spend a dollar in that

country. It is time for the AMS to join with other scholarly societies in support of the National Academy of Sciences' efforts to regain the right of free travel.

If elected, I would seek candidates that would be sensitive to the foregoing issues I've touched on.

James W. Cannon, Brigham Young University

I add the following to my statement for the AMS sketch.

1) Solving problems like the funding problem has to be a joint effort with lots of input from lots of people with good ideas — write to me!

2) More mathematicians deserve funding than current funds allow. Therefore, if the funding climate does not improve, I advocate the decoupling of grant size and salary to allow more people to be funded. We must do something to protect our young developing mathematicians.

AWARDS AND HONORS

CONGRATULATIONS to those listed below for their meritorious achievements.

Lee Lorch was awarded the degree of Doctor of Laws, honoris causa, by York University on June 15, 1993. Professor Lorch has been with York since 1968 where he is now a Professor Emeritus and Senior Scholar. In addition to an outstanding mathematical career, Professor Lorch has been a lifelong advocate of civil rights and has fostered the participation of women and visible minorities in mathematics. Recently, he has been honored by the Association for Women in Mathematics and has received a special award by Howard University for his contributions to civil rights and the education of Black mathematicians.

Catherine Folio of Brookdale Community College has been named to participate in the 1993-94 fellows program of the American Council on Education (ACE). The program supports involvement in academic administration.

Tamar Schlick, New York University, is a 1993 Sloan Research Fellow.

Joan R. Rosenblatt has been appointed Director, Computing and Applied Mathematics Laboratory, National Institute of Standards and Technology.

Rhonda J. Hughes has recently been appointed to the newly endowed Helen Herrmann Chair at Bryn Mawr. Herrmann was a member of the class of 1926. According to the citation, "the Chair is to be awarded to a scholar-teacher whose enthusiasm for learning, commitment to teaching and sincere personal interest in students will enhance the learning process."

NSF Minority Graduate Fellowships have been awarded. The list which follows gives name, mathematical area, baccalaureate institution, and tentative fellowship institution for each recipient. The Fellows include Luz Elean Pinzon, Operations Research, Rutgers University, Cornell University and Tonya Renae Stancil, Applied Mathematics, North Carolina Agricultural and Technical State University, University of North Carolina at Chapel Hill.

NSF Graduate Fellowships have been awarded. The list which follows gives name, mathematical area, baccalaureate institution, and tentative fellowship institution for each recipient. The Fellows include: Melissa Duldulao Aczon, Applied Mathematics, Harvey Mudd College, North Carolina State University, Raleigh; Christine Jiayou Chang, Algebra, Harvard University, Massachusetts Institute of Technology; Jennifer Marie Dean, Applied Mathematics, Wake Forest University, Virginia Polytechnic Institute and State University; Julie B. Kerr, Algebra, Washington State University, Cornell University; Susan Judith Patterson, Algebra, Oberlin College, University of Michigan; and Donna Kay Pauler, Statistics, University of Texas at Austin, Carnegie Mellon University.

The AMS gives annual prizes to recognize the best student papers presented during Pi Mu Epsilon student paper presentations. 1989 awards went to Beth-Allyn Eggens, Youngstown State University and Michele Pezet, Andrews University. In 1990, Anna Fiehler, Miami University and Lisa Hansen, Western Michigan University received awards. In 1991 awards were made to Heather DeSimone, Linda Hughes, and Marguerite Nedreberg, all of Youngstown State University. Susan Koppenol of Southeastern Louisiana University received an award in 1992.

Karl Menger Memorial Awards were presented by the AMS at the International Science and Engineering Fair. Third prizes of $250 each were won by Moon Duchin (Senior, Stamford High School, Stamford, CT), "Applications of Minkowski's Theorem to Classical Number Theory"; Sarah Ann Lord (Junior, Big Sky High School, Missoula, MT), "Congruential Relationships of Divisor Functions"; and Anna Ruth Terry (Freshman, Southside High School, Fort Smith, AR), "Comparison of Fractal Dimensions: The Ozark and Ouachita Mountains."

PHOTO I.D.: Thanks to Deborah Franzblau (Rutgers University), who has identified the graduate student in the photo on the lower left of page 29 in the last issue. She is Barbara Nostrand of Northeastern University.

If anyone knows the names of the other unidentified students or if you recognize yourself, please let us know. Help us make our archive as complete as possible!

EDUCATION COMMITTEE

During the past two years, Rhode Island has hosted three successful *Expand Your Horizons in Math and Science* Conferences using the model from the Math/Science Network for middle school girls. The goals of these conferences are "to increase young women's interest in mathematics and science, to foster awareness of career opportunities for women in math and science-related fields, to provide students with an opportunity to make personal contacts with women in non-traditional occupations, and to motivate young women to enroll in advanced math and science classes." *

On March 19, 1992, the American Association of University Women (Rhode Island Division) in cooperation with the Rhode Island Advisory Commission on Women sponsored a Math/Science Day at the Naval Undersea Warfare Center in Newport. The program was designed for seventh grade girls from ten schools in the eastern part of Rhode Island. Despite the unexpected snow and slippery roads, about 100 girls and 20 teachers enjoyed workshops, speakers, T-shirts, lunch and prizes.

In October of 1992, Lincoln School, a private school for girls in Providence, held a Math/Science Day for Girls in grades 6-9. About 175 students attended workshops on diverse topics such as "Body Detective" by a forensic pathologist, "Work Now to Save Our Planet" by a conservation educator, and "Not in my Backyard: Hazardous Waste" by an environmental scientist.

On March 6, 1993, the American Association of University Women (Rhode Island Division), the RI Commission on Women and the University of Rhode Island presented a Math/Science Day for seventh and eighth grade girls. Twenty-seven professional women including a computer programmer, a planetary geologist, an oceanographer, a research chemist, an electrical engineer, a molecular biologist and a forensic anthropologist presented hands-on workshops to about 200 girls from the southern part of the state. The students received door prizes, T-shirts, and lunch at the University of Rhode Island. Activities for teachers and parents included examining math activities from the Equals Project with David Capaldi, chairperson of the math department of Toll Gate High School, and discussing challenges and choices for young women with Dr. Karen Core, Mechanical Engineering and Dr. Catherine Roberts, Mathematics.

The Rhode Island American Association of University Women plans to sponsor another *Expand Your Horizons in Math and Science* Conference during the 1993-94 academic year. The need for such conferences is evident from the enthusiastic participation of young females throughout the state.

* For further information about conferences in other states, contact the Math/Science Network, located at the Math/Science Resource Center, 2727 College Ave., Berkeley, CA 94705.

by Ann Moskol, Rhode Island College
Any comments? Write to: AWM Education Committee, c/o Sally I. Lipsey, Chair, 70 E. 10th Street, #3A, New York, NY 10003-5102

LETTERS TO THE EDITOR

Dear readers,

At the conclusion of the Jenny Harrison tenure case we received and published two communications: one by the Support Committee for Jenny Harrison and the other by Professor Marina Ratner (Berkeley).

Since then we have received answers to both communications which express diverging positions about the case and its protagonists.

While acknowledging that important issues have been raised in what we have already published, we plan not to accept further correspondence about this or other concluded tenure cases. We will consider any letter or article dealing with issues affecting women in mathematics, including those raised by particular cases. But we intend not to discuss the personality or the intentions or the actions of individual colleagues, nor can we dissect and compare their mathematical abilities and accomplishments.

Male mathematicians have attained high academic positions even though their work may have been questioned by their colleagues; knowledge of these cases usually remains fairly local. The very small number of women in the top mathematics departments has made the Jenny Harrison case extraordinarily visible. We should direct our endeavors to increase the number of worthy women mathematicians at the top level of the profession. Then, the right of women to do mathematics will no longer become confused with the discussion of personalities.

Sincerely,

The Editorial Board

To the editor:

I have just received and read the September-October issue of the AWM *Newsletter*. It was my first encounter with AWM activities. There was a lot in this newsletter that I enjoyed. However there was one thing there about which I would like to protest.

In the report from Palestine ("AWM abroad," page 23) Mary W. Gray describes the closure of the occupied territories and what is described as "harassment" of scientists by Israeli authorities, but there is no mention of the reasons for these measures and why the Palestinian universities were closed for so long. Even as an Israeli who supports peace and collaboration with Palestinians in general and especially scientists, I feel this report was extremely unbalanced and offensive.

No wonder that after reading this, I took my time deciding whether to join the AWM or not. However, I think that not being involved and doing nothing is no way to change things. (As even our Israeli government has learned by now.) So I decided to join — and protest. I hope you publish this letter.

I wish the AWM success in promoting the issues of women mathematicians.

Sincerely yours,

Ramit Mehr

To the editor:

I would like to add my voice to Professor Sadosky's call for more tenured full professors at the elite research institutions.

It is a difficult situation. When I received my first faculty position at the University of Chicago thirty years ago, discrimination against women was rampant and open. More than one distinguished colleague vowed never to accept a woman as a student. Now discrimination is not open, if only out of fear of legal action. At the same time I wonder how much better it is for women. The top five research departments have literally less than a handful of tenured women. My department has none.

Now it clearly is not simply a matter of waiting for the advances and more enlightened attitudes of the last two decades to kick in. Permanent positions at elite institutions almost always come in the first half dozen years of a career. Given the dismal job market in the next period, the lonely situation for women at the top is only going to get worse.

My view is this situation is the result of many social and cultural factors, some of which are rather difficult to change without very deep and broad social transformation. At the same time there is no doubt that there exists an environment and attitudes at our leading mathematical institutions that many women find hostile and alienating. There is not much point in berating male mathematicians for generating such an atmosphere. We are after all products ourselves of such a background. There is no doubt however that this environment is deeply discouraging to women graduate students and is a significant factor in limiting their careers.

It appears to me that the only concrete thing that can be done to improve the situation is to have more women senior faculty at the top places. This does present a problem since competitions for such jobs is very fierce, and any attempt to appoint a women will always be open to charges of favoritism. However, in the past we have not been reluctant to give preference and priority to certain areas of mathematics to compensate for perceived weaknesses and imbalances. It seems to me we can and should regard the absence of women in our ranks as a weakness and take appropriate action. Is it okay to argue vigorously for the appointment of an applied mathematician, a logician, or an Eastern European, but not for a woman or an Afro-American because advocacy of the latter makes us P.C. "terrorists?" Qualified women will not, like cream, inevitably rise to the top. Something must be done to open the doors in our profession a bit more to women.

Sincerely yours,

Mel Rothenberg, Professor of Mathematics
University of Chicago

To the editor:

I would like to call attention to the phrase "curiosity-driven research," which appears in the item "Some Comments on Federal Funding" in the September-October '93 issue of AWM *Newsletter*. Lately, I hear this insidious phrase in many contexts, and it's used by scientists, mathematicians, administrators, politicians, and senior managers of my own laboratory! I think that we researchers should expose this phrase for the subversive newspeak that it is and then *stop using it*, with or without quotation marks.

The traditional dichotomy examined in discussions of research funding is that of "basic research" vs. "applied research." The best descriptions of these terms that I've heard go something like this:

* The purpose of basic research is to understand fundamental mathematical and scientific phenomena. A specific basic research endeavor may have no *a priori* practical motivation. However, basic research breakthroughs often have eventual practical consequences, and certain general areas of basic investigation have an excellent track record of contributing to practice.
* The purpose of applied research is to address a mathematical or scientific question the answer to which is known *a priori* to have practical consequences.

Note that both types of research address genuine mathematical or scientific questions and that both may yield practical benefits. The difference is that practical motivation must be clear up front if the research effort is properly to be called "applied."

Replacing the adjective "basic" with "curiosity-driven" demeans both types of researchers. It implies that basic researchers seek only their own intellectual amusement and are indifferent to the potential practical consequences of their work. It also implies that there is no inherent intellectual challenge and satisfaction in applied research and that the people who do it are not driven by curiosity but rather by immediate product pressure. As a working member of an organization with a strong tradition of both basic and applied research, I can assure you that both of these implications are false. The world is full of scientific and mathematical questions that present both intellectual challenge and potential practical benefit.

It is possible that whoever introduced the term "curiosity-driven" had exactly that purpose in mind: demean both types of researchers so that it will be easier politically to slash their funding or control their investigations. I propose that we researchers eschew the phrase and insist on conducting the discussion of national research priorities in terms of "basic" and "applied" research. There is a strong case to be made that both types of research are worth funding.

Sincerely,

Joan Feigenbaum
Computing Principles Research Department
AT&T Bell Laboratories

The letter below was sent to the Washington Post. *The conference referred to was held in Havana from September 26 to October 1 on Approximation and Optimization and was sponsored by the International Mathematical Union (IMU).*

To the editor:

"Travel to Cuba" [editorial, Washington *Post*, September 4, 1993] encourages a rethinking of the U.S. government's trade embargo with Cuba, praising the Treasury Department's recent grant of a license to import Cuba poster art after rejecting the request for several years.

As if to demonstrate the irrationality and arbitrary nature of the trade ban, Treasury soon after denied a group of American mathematicians a permit to participate in an internationally sponsored scientific conference scheduled to take place in Havana at the end of September. While nominally free to attend, without the permit scientists are prohibited from spending U. S. currency while in Cuba, resulting in what amounts to a travel ban as a practical matter.

The legality of an embargo that precludes citizens from travel, contacts and the free exchange of ideas in foreign countries is questionable under any circumstances. Throughout the Cold War, the U.S. government did not restrict the travel and communication of scientists to the Soviet Union and Eastern Europe, except for those engaged in classified research. Why should travel and scientific communication involving Cuba be treated any differently?

It is one thing to ban trade with Cuba to prevent this country's economic resources from being used to support a repressive regime. It is quite another to cut off travel, contacts and exchange of ideas. We are committed to the notion that free expression and association are fundamental to the American democratic system. What is the rationale for applying a different, nondemocratic standard when Americans seek to communicate or visit abroad, especially when such a ban violates our international treaty commitments under the Covenant on Civil and Political Rights (which the United States recently ratified) and the Helsinki Human Rights Accords?

As a matter of principle, many individuals may choose not to be part of contacts and scientific exchanges with countries engaging in apartheid, terrorism or other gross violations of human rights. Taking that position is their prerogative and, many would suggest, a personal obligation. That is quite different from our government's enforcing a policy that makes travel and contact subject to the capricious whim of Treasury Department officials. The Cuban trade embargo needs rethinking, especially as it applies to personal travel and academic freedom.

Mary Gray
Alice Schafer

The writers are, respectively, on the Committee on Scientific Freedom and Responsibility, American Association for the Advancement of Science, and chair of the Human Rights Committee, American Mathematical Society.

NEW NETWORKS

Young Mathematicians Network

The Young Mathematicians' Network (YMN) is (i) a mathematicians' group keeping the mathematical community honest about the job market and its future; (ii) a group providing information about job searches from both the inside and the outside; (iii) a support group for those on the job market; (iv) a group providing information on publishing, grant proposals, obtaining industry jobs, and other things which many of us did not get in graduate school and (v) a group to inform the mathematical community of the interests and concerns of the younger mathematicians.

The final form of the network is not yet determined. The Young Scientists Network [YSN; see the May 1993 *Notices*] is one possible model.

Anyone is welcome to subscribe by contacting Charles Yeomans at cyeomans@ms.uky.edu. Using the subject "subscribe" would be appreciated. Please include your e-mail address in the message body. You can also send inquiries or volunteer to serve by sending a note to the same address. The adminstrators are Ed Aboufadel, Jeff Adams, Curtis Bennett, Neil Calkin, Kalin Godev, Mark Winstead, and Charles Yeomans.

SchoolNet

Scientists, engineers, technicians and technologists: we need you! If you would like to spend a small portion of your time helping kids learn about the scientific world using the Internet, please volunteer to be an "Electronic Innovator" for the SchoolNet initiative.

The aim of the initiative is to give schools across Canada access to the vast resources that are available through electronic communications and information technology. The students exploring this technology will benefit from electronic mentors who answer questions on science, mathematics, engineering and technology through electronic mail. These people should be accessible through Internet/CA*net. Although this is a Canadian initiative, we welcome volunteers from around the world.

If you would like more information or to volunteer, please send a brief email message to Freenet Science and Engineering Consulting Group Internet: tburns@ccs.carleton.ca.

WOMEN IN ALGEBRAIC GEOMETRY WORKSHOP AT MSRI

Twenty women students, ranging from upper division undergraduate to advanced graduate students, participated in the Women in Algebraic Geometry Workshop held at the Mathematical Sciences Research Institute (MSRI) in Berkeley the last two weeks of May. The students came from sixteen colleges and universities across the country. They were joined by about twenty-five postdocs, senior mathematicians, and scientists who served as lecturers, mentors, panelists, program directors, and friends. The workshop was funded by grants from the National Science Foundation and the Paul and Gabriella Rosenbaum Foundation. This was a unique and historic event, the gathering together of a large group of women students interested in a particular field of mathematics, a field where, in the U.S., there are indeed few women.

The workshop program included introductory as well as advanced talks in algebraic geometry and number theory. During the first few days, the mentors presented informal talks about their research interests and suggested possible mini-research projects. By the end of the first week, each student had become part of a small research team working with mentors on a variety of topics such as toric varieties, algebraic curves, elliptic curves, diophantine equations, moduli spaces, and Veronese embeddings. The students had opportunities to present their work to the rest of the group during the second week.

In addition to the mathematical component of the workshop, there were panels and talks with MSRI and Berkeley women mathematicians and scientists on careers in research, computer demonstrations, various social gatherings, and many shared meals, both informal and formal.

Clearly such a workshop would be a stimulating and worthwhile experience for any budding research mathematician; and so the question arises, why have a special program for women? Is it because women have to learn mathematics in a special way? To the contrary, it is to create an environment where women have a chance to do and learn mathematics in ways that most successful male mathematicians take for granted.

Mathematics is a social and communal endeavor. Mathematicians enjoy meeting with others in their field to work, talk, and play together. That is what makes programs such as the special-emphasis years at MSRI so popular. Many male mathematicians enjoyed having friends in high school and college with whom they could jointly work on math problems. Much college mathematics is done in dormitory dining rooms and math department commons rooms. There is a natural flow between the personal and professional. For MSRI visitors to spend a day on the bay sailing with their colleagues for yet more professional bonding is not uncommon.

These experiences are rarely part of women mathematicians' experiences; the opposite is more often the rule. Women are often very isolated. Indeed, given this isolation, that women can compete at all is a wonder. An important function of the workshop was to capture some of these crucial professional experiences and have the students recognize the value of cultivating such interactions.

Most of the students, and some of the mentors, lived together in shared rooms at the Durant Hotel. The first morning that we congregated at MSRI, very few knew each other. By the second day the students had begun to study and work together, and by the end of the second week potential lifelong collegial relationships and friendships had been formed. After the workshop, almost all the students participated in the four-week Summer Geometry Institute in Utah, which provided further opportunities to consolidate professional friendships and collaborations. As anticipated by Dave Morrison, workshop friend and lecturer in the summer program, these students were among the most active and enthusiastic participants in the Utah program.

Any skepticism the participants themselves may have felt at the beginning of the program was quick dispelled as they became involved in workshop activities.

As mentor Lucia Caporaso put it on her return to Harvard, "I was curious, and maybe even a little skeptical, about the whole idea, but now I think it worked out very well; it has been a great new experience to talk about mathematics with so many women and to try to be of some help with the younger ones. My mentorees have been a stimulating, active audience, and I do regret I had to leave early. Even if we did not go sailing together, it

Lenore Blum, Deputy Director, MSRI
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seems to me that things are changing very fast and that events like the workshop are necessary not to lose momentum."

We hope to stay in touch with the workshop participants and see how they progress along their career paths.

Some immediate reactions and effects can be gleamed from the exit surveys. Practically all students commented on the importance of the mathematical contacts made during the workshop and their intent to continue collaborations. Here are some samples of their comments:

> The most important part of the workshop for me was the people. I've never been around this many mathematicians at once — male or female. So that in itself was a good experience. But more than enjoying their company for a couple of weeks, I made some friends that I think will be a good support system in the future.
>
> To meet other women in the same area of mathematics had a more positive impact on me than expected. I would like to keep in touch with the people I met during the program.
>
> There are several women in the program with whom I plan to continue e-mail dialogues on mathematical topics which we began discussing here.

An undergraduate student hopes to use her contacts in choosing a graduate program. "I think the contacts with people from various schools will be very valuable to me as I prepare my grad school application this winter. [When I apply to schools] represented in this program, I will have people to ask about details of life and work at their schools."

Many students commented on feeling more a part of the mathematics community:

> ...[L]earning about the people behind the names on articles and in textbooks is important because we become part of the mathematics community that way....
>
> Participating in this workshop and the mere fact of its existence have strengthened my belief that there is a place for me in mathematics.
>
> I feel more connected to mathematics.
>
> MSRI was a great place to have this program since there are so many people here now that are doing algebraic geometry and related work.

One students comment was very pragmatic, "I realized that I need to be more serious about my work."

How This Workshop Came To Be

During the planning meetings for the current MSRI Special Year in Algebraic Geometry, the shortage of women on the list of preliminary members was pointed out to the organizers. This prompted the Human Resources Committee of the MSRI Board of Trustees to design guidelines for future program committees outlining pro-active recruitment strategies. The Algebraic Geometry Committee conceived of the workshop as away to help increase the number of women involved in the program. The result was a proposal to the National Science Foundation written by Herb Clemens and Irving Kaplansky. I was asked to be a principal investigator. One aspect of the proposal was to coordinate efforts with the Regional Geometry Institute's (RGI) summer program. Under the direction of Karen Uhlenbeck, women students accepted to the Summer Geometry Institute were invited to attend the MSRI workshop. Clemens, RGI director, put a great deal of effort into the planning stages of the workshop. Antonella Grassi, a member of the MSRI Algebraic Geometry year, played a special role in the workshop as scientific organizer, mentor, colleague, and friend. Much of the workshop's success is due to the spectacular efforts of these people.

My Own Assessment

This has been a gratifying project for me. After all, we were working with some of the brightest and best educated women in the country. These are women who love mathematics and have very strong mathematical backgrounds. Yet they are the same women who, in the past, have disappeared from the mathematical mainstream. Very little has to be done to change the situation. Short-term intervention projects such as the MSRI workshop can have important and long-lasting effects. These young women can use their tremendous enthusiasm, energy, and talents to carry on. The workshop has already had some effect on the pipeline. Program committees will not be able to say there are not any women in algebraic geometry. One student wrote "[The workshop] made me decide to apply for a postdoc at MSRI when I'm done."

An important message we need to give these young women is that succeeding in a career in research mathematics is possible. To a large extent the students, buoyed by their collaboration with others, gained a growing self-confidence in their

own research abilities. The students also need to see successful senior women research mathematicians as role models. In future workshops I would involve the Association for Women in Mathematics (AWM) more centrally. Relying, as we did, on local academics for role models, the not-so-subtle message was a woman can be successful in academic research science but not in mathematics. By involving the AWM and more women mathematicians from across the country, we can easily change that perception.

Student Participants: Katia Consani, Chicago; Michelle Cook, UCLA; Nancy Cunningham, Rice; Sandra DiRocco, Notre Dame; Lisa Fastenberg, Yale; Karrolyne Fogel, Texas at Austin; Amy Galtman, Brooklyn College; Yoshiko Hayakawa, Maryland; Meeyoung Kim, Notre Dame; Amy Ksir, Rice; Kristin Lauter, Chicago; Ruth Michler, UCB; Maria Miles, Portland; Nina Mirishige, UCB; Jeanne Nielsen, Duke; Judy Eng, UCB; Christine Schwarz, Massachusetts; Margaret Symington, Stanford; Cheryl Taborsky, Stony Brook; Ursula Wunsch, Utah.

Senior Participants: Dan Abramovich, MIT and MSRI; Paolo Aluffi, Florida State and MSRI; Enrique Arrondo, Universidad Complutense and MSRI; Lenore Blum, MSRI; David Butler, Michigan and MSRI; Lucia Caporaso, Harvard; Deanna Caveny, College of Charleston and MSRI; Karen Chandler, Chicago; Herb Clemens, Utah and MSRI; Alessio Corti Chicago, and MSRI; Lisa Goldberg, CUNY and MSRI; Antonella Grassi, Penn and MSRI; Robin Hartshorne, UCB; Eriko Hironaka, Stanford; Elham Izadi, Harvard and MSRI; Mary-Claire King, UCB; Sydney Kustu, UCB; Eduard Looijenga, University of Utrecht and MSRI; David Morrison, Duke and MSRI; Deb Nolan, UCB; Rubi Rodriguez, Universidad Catolica de Chile; Alice Silverberg, Ohio State and MSRI; Michael Thaddeus, Oxford, England, and MSRI; William Thurston, MSRI; Lisa Traynor, Stanford and MSRI; Elinor Velasquez, UCB.

CALL FOR NOMINATIONS: ALICE T. SCHAFER MATHEMATICS PRIZE

The Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize in the amount of $1000 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. An institution may have more than one nominee.

The nominee may be at any level in her undergraduate career. The letter of nomination should include, but not be limited to, an evaluation of the nominee on the following criteria: quality of performance in mathematics, exhibition of real interest in mathematics, ability for independent work, and performance in mathematical competitions at the local or national level, if any.

Supporting materials should be enclosed with the nominations. Please send *five copies* of the letter and other materials. Nominations are due by **April 1, 1994** and should be sent to Ginny Reinhart, Executive Director, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, Univ. of Maryland, College Park, MD 20742-2461; (301) 405-7892.

NSF-AWM TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Travel Grants 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. International travel must be on U.S. flag carriers.

Eligibility. These travel funds are provided by the Division of Mathematical Sciences of NSF, and the research conference must be in an area supported by DMS. For example, this includes certain areas of statistics, but excludes many areas of mathematics education and history of mathematics. Applicants must be women holding a doctorate (or equivalent experience) and having a work address in the U.S. (or home address, in the case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years or who has other sources of external funding, such as a regular NSF grant, is ineligible. Partial institutional support does not however make the applicant ineligible.

Target Dates. There will be three award periods per year, with applications due February 1, May 1 and October 1. An applicant should send *five copies* of 1) a description of her current research and of how the proposed travel would benefit her research program, 2) her curriculum vitae, 3) a budget for the proposed travel, and 4) information about all other sources of travel funding available to the applicant, to: Ginny Reinhart, Executive Director, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; (301) 405-7892.

STATEMENT ON SEXUAL HARASSMENT OF THE ASSOCIATION FOR WOMEN IN MATHEMATICS

Sexual harassment is a sensitive issue that is becoming more visible in our society. The mathematics community is not immune. While the AWM supports local solutions to sexual harassment issues, we would like to suggest guidelines for the mathematics community.

1. Sexual harassment is extremely serious.

Sexual harassment, no matter how it may appear to the perpetrator, is ultimately about power, not sex. It is demoralizing and destructive for the victim. Sexual harassment has grave consequences for our profession, contributing to loss of talent and alienation of women from mathematical professions.

2. Sexual harassment has many forms.

Sexual harassment is *the intrusion of sexuality into inappropriate contexts.* (For legalistic definitions, see the EEOC guidelines, generally available in libraries and in whatever office deals with discrimination issues, e.g., affirmative action office.) Sexual harassment has many forms besides seduction: words, gestures, body language, office decorations (the nude calendar), jokes ... even where people focus their eyes (e.g., on breasts instead of faces).

3. Sexual harassment must be taken seriously.

Institutions should put people on notice of the seriousness of the issue and of appropriate procedures to follow in reporting violations of policy. Faculty, staff and student handbooks should cover these points, which should also be covered in other effective information dissemination (e.g., new faculty and student orientations).

4. Sexual harassment must be dealt with promptly.

Once charges are made of sexual harassment, they should be dealt with as quickly as is feasible, for the sake of the accuser, the accused, and especially the wider community. Delay in dealing with sexual harassment charges leads to a loss of trust in the institution's goodwill.

5. Sexual harassment charges must be dealt with fairly.

Procedures for dealing with sexual harassment should be not only quick but fair. They should be established with input from all segments of the institution, and peers should be involved in the judgement of peers (faculty members with faculty; students with students ...).

6. Sexual harassment charges must be dealt with compassionately.

Staff members who are expected to be the first to deal with harassment charges should be trained to be sensitive to the issue. Although long delays in reporting may adversely affect the ability to get effective redress, procedures need to provide for the reality that victims are not always able, for psychological or professional reasons, to come forward quickly. The institution's sexual harassment policy should encourage victims to come forward in a timely fashion, but should set no time limits in which charges should be brought.

7. Sexual harassment must be dealt with effectively.

Because of confidentiality, sexual harassment is often essentially not dealt with at all — a letter in a confidential file and a promise of changed behavior is simply not enough. Real consequences, such as loss of salary or termination of certain duties, may unwittingly be prematurely cancelled by new administrations. The consequences of sexual harassment should be real and should be backed up by systematized institutional memory.

8. Sexual harassment must not be tolerated.

At every large institution (and many small ones) there are those about whom reports of sexual harassment have circulated, but who have never been subjected to institutional inquiry and/or action. Supervisors need to be as concerned as they would be if the issue were bad teaching or plagiarism and need to take an active stance where this seems justified, in fairness to all concerned.

SUPPORT AVAILABLE FOR SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

Through a grant from the Alfred T. Sloan Foundation and an anticipated grant from the National Science Foundation, the Association for Women in Mathematics has funds available to support Sonia Kovalevsky 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. Follow-up studies will track whether the participants go to college, what they major in, and what they do upon graduation.

We anticipate awarding approximately 20 grants of up to $5,000 each to universities and colleges; Historically Black Institutions and Women's Colleges are particularly encouraged to apply. Programs targeted towards inner city or rural high schools are especially welcomed. All applicants will receive a module consisting of model schedules of activities, a check list for the sorts of arrangements that need to be made, suggestions for securing additional funding and for obtaining prizes to be awarded to contest winners, recruitment and publicity material to be adapted for local use, lists of possible workshop topics for students and teachers, names of possible speakers and workshop leaders, model problem-solving contest material, and guidelines for follow-up activities and evaluation.

Applications, not to exceed five pages, should include:

a) Tentative plans for activities, including specific speakers to the extent known.

b) Qualifications of the persons to be in charge.

c) Plans for recruitment, including the securing of diversity among participants.

d) Budget.

e) Local resources in support of the project, if any.

f) Tentative follow-up and evaluation plans.

The application deadline is **January 15, 1994**.

It is anticipated that decisions on funding will be made in February by the Project Advisory Committee, consisting of Mary Gray (American University), Eleanor Palais (Belmont High School, Massachusetts), and Alice Schafer (Marymount University, Virginia). It is expected that the high school days will be held in the fall of 1994. Reports on the high school days are to be made to AWM by January 15, 1995.

Please send *five copies* of your application to:

Sonia Kovalevsky Days Advisory Committee
c/o Association for Women in Mathematics
4114 Computer and Space Sciences Building
University of Maryland
College Park, MD 20742-2461.

If you have questions, please contact:

Mary W. Gray
Department of Mathematics and Statistics
American University
Washington, D.C. 20016-8050
Phone: (202) 885-3171
Fax: (202) 885-3155
E-mail: mgray@american.edu.

Please do not call the AWM office with questions on this project.

MISS AMERICA/PHYSICS

The first runner-up in the Miss America contest this September was Kara Martin, a graduate student in physics at Georgia Southern University. Her "platform" was math illiteracy, and her home video showed her tutoring youngsters in math. For those of you who don't follow the pageant, the platform was introduced in recent years to counter some of the bad publicity which beauty pageants receive. Each contestant devises a plan of action related to an area of social concern which is important to her.

SCARLETT AND BARBIE: TWO INFLUENCES

When Mattel's talking Barbie doll declared that "math class is tough," many women, including this one, were incensed. It is discouraging enough that her figure translates into something like 40"-24"-34". Surely no good comes of our little girls hearing that in spite of Barbie's obvious superiority to mere mortal women, she finds math difficult. But Barbie was born long after my girlhood. Was there, I wondered, any similar early influence on my own attitude toward mathematics?

Books, much more than dolls, were a major factor in my youth. There were several reasons for this: Cutbacks on the production of nonessential items during World War II made dolls very hard to find, but the library remained open and free. Television didn't invade our home until I was fifteen, and by that time I was already addicted to books. Finally, though neither of my parents has the advantage of a college education, both are voracious readers. My mother took me to get my very own library card when I was three. I couldn't read yet, but that didn't stop us.

I entered college in 1955, at a time when very few students, much less women students, majored in mathematics. How had I ever found the courage to decide that I loved math and just might understand it well enough to choose it as my major? Was there anything in that mountain of books I read as a girl that had anything to do with my friendly relationship with math?

While I was writing this, my June-July issue of *The American Mathematical Monthly* arrived, and there it was, a quotation submitted by Steven C. Altheon:

> ...She knew only that if she did thus-and-so, men would unerringly respond with the complementary thus-and-so. It was like a mathematical formula and no more difficult, for mathematics was the one subject that had come easy to Scarlett in her school days.

Scarlett is, of course, Scarlett O'Hara from Margaret Mitchell's 1936 novel *Gone with the Wind.*

GWTW was one of the first grown-up novels the girls of my generation in the South read. I think I was twelve when I discovered it. I am well aware that the book has received criticism in recent years because of its at best patronizing and at worst bigoted portrayal of the black characters. The last time I reread the book that aspect gave me an unpleasant jolt. I had forgotten that part, but I had not forgotten the references to math.

If we forgive Margaret Mitchell some of her unfortunate stereotypes on the grounds that she was reflecting the attitudes of the times in which she wrote, then it is perhaps even more amazing that Scarlett, that epitome of belles, liked math.

By the time the *Monthly* had arrived I had already found the quote above, as well as one that is, to me, far more interesting. You may recall that between husbands Charles Hamilton and Rhett Butler, Scarlett was briefly married to Frank Kennedy. She married him out of sheer desperation to get money to pay the taxes on Tara, but finding that he owned a general store with great money-making potential, she thrust her way into "unfeminine" business enterprises at which she was apparently very successful.

My favorite excerpt is the following, the musings of Frank Kennedy when he realizes that Scarlett is not quite the beautiful air-head he thought he had married.

> It had begun to dawn on him that this same sweet pretty little head was a "good head for figures." In fact, a much better one than his own and the knowledge was disquieting. He was thunderstruck to discover that she could swiftly add a long column of figures in her head when he needed a pencil and paper for more than three figures. And fractions presented no difficulties to her at all. He felt there was something unbecoming about a woman understanding fractions and business matters and he believed that, should a woman be so unfortunate as to have such unladylike comprehension, she should pretend not to. Now he disliked talking business with her as much as he had enjoyed it before they were married. Then he had thought it all beyond her mental grasp and it had been pleasant to explain things to her. Now he saw that she understood entirely too well and he felt the usual masculine indignation at the duplicity of women. Added to it was the usual disillusionment in discovering that a woman has a brain.

Margaret Mitchell through Scarlett was, of course, not the only person who gave me implied permission to brave those male dominated math

Shirley M. Branan, Birmingham-Southern College

classes of the fifties. As did most women in mathematics, I had a number of fine encouraging teachers and parents who supported my ambitions. But I do believe that toys and books can indeed exert subtle influences on attitudes; at least they did on mine. And I am eternally grateful that my few childhood dolls said nothing but "Mama," and that Scarlett was good at mathematics.

Reference: Margaret Mitchell, *Gone with the Wind*, Macmillan Company, New York, 1936.

CONFERENCES

IMU Travel Grants for Young Mathematicians from Developing Countries

The International Mathematical Union (IMU) will award travel grants to young mathematicians to help them to attend ICM-94. The ICM will provide a special allowance to cover grantees' registration, board and lodging. The grants are intended primarily for young mathematicians from developing countries (not necessarily members of IMU), but applications from countries with strict monetary regulations will also be considered.

The age-limit for the grantees is 35 years. The candidates should present evidence of post-doctoral research work, and they should be able to benefit from the interaction with mathematicians from other countries attending the Congress. In addition to name and address, the applications should contain a brief curriculum vitae plus a list of publications and preprints; there is no special form.

Applications for the travel grant may be sent directly to the Secretary of the Union. Applications may also be submitted through the Committees for Mathematics, which will forward the relevant information to the Secretary. All applications should reach the Secretary by January 1, 1994. IMU Secretariat: IMU, Professor Jacob Palis, Secretary, Estrada Dona Castorina, 110, Jardim Botanico Rio de Janeiro, RJ, Brazil; Fax (55) (21) 512 4112 or 512 4115; e-mail: IMU@ADM.IMPA.BR.

Women in Mathematical Sciences Conference

The University of Tennessee Mathematics Department is hosting a "Women in Mathematical Sciences" Conference on Friday afternoon and Saturday morning, November 12-13, 1993. The conference will showcase women mathematicians in a variety of industrial jobs and research positions. The invited speakers include: Kimi Bowman, Oak Ridge National Laboratory, Statistics; Stephanie Boyles, BellSouth, Head of a Laboratory Group; Melinda Harris, Public Financial Management, Recruiting Coordinator; Judy Kennedy, University of Delaware, Dynamical Systems and Topology; Kay King, Theta Technologies, Environmental Analyst; Denise Kirschner, Vanderbilt University, AIDS Modeling; Debbie Polignone, Carnegie Mellon and UT, Mechanics; Christine Shoemaker, Cornell University, Groundwater Remediation and Bioremediation Optimization; and Beverly West, Cornell University, Curriculum Development using Computers.

The conference will include a panel discussion on industrial and government jobs, a luncheon for students, and a discussion of graduate school opportunities. The conference is supported by the UT Science Alliance, Mathematics Department, and the College of Liberal Arts. For further information, contact: Suzanne Lenhart at 615-974-4270 or email lenhart@math.utk.edu; Beverly Brechner at 615-974-4314 or email brechner@novell.math.utk.edu.

Grace Murray Hopper Celebration

The Grace Murray Hopper Celebration of Women in Computing, Washington, DC (Loew's L'Enfant Plaza Hotel), June 9–11, 1994 is a technical conference presenting talks by many of the most successful women in the computing field (first two days) as well as panels, workshops and birds-of-a-feather sessions (third day).

The speakers are leaders in their fields and represent the major technical computing disciplines and the academic, government and industrial communities. Keynote speakers include: Dr. Anita Jones, Department of Defense; Dr. Fran Allen, IBM; Prof. Ruzena Bajcsy, Penn; Prof. Elaine Cohen, Utah (tentative); Prof. Dorothy Denning, Georgetown; Dr. Adele Goldberg, Parc Place; Prof. Shafi Goldwasser, MIT; Prof. Susan Graham, California; Prof. Barbara Grosz, Harvard; Prof. Mary Jane Irwin, Penn State (tentative); Dr. Karen Sparck Jones, Cambridge; Prof. Maria Klawe, UBC; Prof. Nancy Leveson, Washington; Prof. Barbara Liskov, MIT; and Prof. Mary Shaw, Carnegie-Mellon.

Speakers will comment on open problems with emphasis on possibilities for significant advances

which appear to require collaboration within and across areas of expertise. Informal sessions will give attendees the opportunity to discuss these possibilities and make contacts. We will foster lasting relationships that will help to reverse the trend of women dropping out of computing. Scholarships and travel grants will ensure participation by students and others less able to afford the cost.

The target attendance is 400 and should include: young professionals looking for role models, mentors, and inspiration; established professionals looking for key contacts outside their immediate area of expertise; and professionals with solid backgrounds in one area of computing who want to broaden their base of technical experience. The registration fee will be about $325 ($250 students).

We invite you to attend the Grace Hopper Conference and to submit proposals for the third day's events. At a workshop, attendees will delve deeply into an issue. It may be instructional in nature or attempt to generate solutions to a problem. A workshop is usually a half-day. Panel discussions are typically shorter (approximately 1-1/2 hours) and seek to bring together a group of individuals representing a variety of perspectives or backgrounds. Birds-of-a-feather sessions, like panels, are shorter gatherings for attendees with common interests. These may be technical or non-technical. While they may be less formal in structure, they should have a definite purpose.

The topics which follow are meant only to stimulate ideas, not to limit the possibilities: Professional Social Responsibility, Politics and Power, Volunteerism, The Role of the Professional Society, The Internet, A Safe Place Called Electronic Mail, In Search of Collaboration, Individual Differences in Software Design, Dealing with Sexual Harassment, Careers and Family, Encouraging Young Girls, Encouraging Young Women, Funding Advice for Junior Faculty, Graduate Students and Their Needs, Focus on Advancement in Industry, Moving to Management, Breaking the Glass Ceiling, Mentoring in Industry and Academia, and Job Sharing and Splitting: A Guide to Possibilities.

Proposals should include a clear description of objectives, the intended audience, length (1-1/2 or 3 hours are suggested, but the time frame is up to the leader), a 200-word abstract, a one-page topical outline of the content, AV equipment required, and a description of the proposer's qualifications for running the session. The proposer should plan to generate a report for inclusion in published proceedings. The cover page should include the session title with instructor names, affiliations, complete addresses, phone numbers, and email address of the principal instructor.

Proposals should be submitted to: Rachelle S. Heller, Department of Electrical Engineering and Computer Science, The George Washington University, 801 22nd Street, NW, Washington, DC 20052; email sheller@seas.gwu.edu; phone 202-994-5906. Workshop proposal submissions are due January 8, 1994. Authors will be notified March 1st.

To receive future conference announcements and eventually a poster, please send the following information (preferably via email): name, address, city/state/code, country, email, fund-raising help. Contact: hopper-info@pa.dec.com or Annie Warren, Digital Western Research Lab, 250 University Avenue, Palo Alto, CA 94301; (415) 617-3335.

We are seeking corporate and foundation funding to increase the quality and reduce the cost of the conference, to increase international participation, and to fund special related projects.

The General Chair of the conference is Anita Borg, Digital Equipment Corp.; the Program Chair is Telle Whitney, Actel Corp. The conference is cosponsored by the Computing Research Association (CRA) and the Association for Computing Machinery (ACM).

First World Congress In Computational Medicine, Public Health and Biotech

This congress will bring together a transdisciplinary group of scientists for the purposes of investigating leading edge problems in computational medicine, public health, and biotechnology. There will be invited speakers, paper sessions, workshops, and poster sessions. It will be held April 24–28, 1994, in Austin, Texas.

The Congress Chair is Matthew Witten, University of Texas System, Center For High Performance Computing, BRC, 1.154CMS, 10100 Burnet Road, Austin, Texas 78758; mwitten@chpc.utexas.edu.

For further information, use one of the following pathways: Phone: (512) 471-2472; fax: (512) 471-2445; email: compmed94@chpc.utexas.edu; ftp: ftp to ftp.chpc.utexas.edu and login as anonymous, use your address as the password, cd /pub/compmed94, and then you will see all files necessary for information; gopher: connect to the CHPC gopher and read the information under the Medicine, Public Health, and Biotech subdivision.

Twentieth Holiday Mathematics Symposium

From 1963 through 1976, and resuming in 1988, the Department of Mathematical Sciences at New Mexico State University has held a series of annual symposia during the winter recess. This year the series continues with Clifford H. Taubes speaking on Analytical Gauge Theory from January 5-9, 1994. In addition to the ten lectures by Professor Taubes, there will be sessions for contributed papers, informal talks, and discussion. As usual, some social events are inevitable.

The Department extends its invitation to all interested mathematicians. Las Cruces is a particularly attractive place to be when so much of the nation suffers from the effects of winter. Women and graduate students are encouraged to apply. We have applied for external financial support, and we provide assistance in reserving motel space at reduced rates in Las Cruces as well as transportation to and from El Paso.

Direct inquiries to: Ross E. Staffeldt, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM 88003; e-mail: ross@nmsu.edu.

BOOK REVIEW

Women and Numbers: Lives of Women Mathematicians Plus Discovery Activities, Teri Perl, Wide World Publishing/Tetra, San Carlos, CA, 1993. $15.95.

It is unusual to pick up a book intended for junior high school students and find that it would be of interest to adults. Teri Perl has provided such a book by presenting intrinsically interesting information about women mathematicians. She has included personal, sociological and professional anecdotes that give the reader a broad perspective and encourage one to read all of the essays.

The biographies include four of the historic figures from Perl's earlier book, *Math Equals*, and goes on to women who are active today. The book starts with nineteenth century mathematicians: Mary Somerville (1780-1872), who published in 1831 her first book, *The Mathematics of the Heavens*, an enhanced translation of Laplace's astronomy; Ada Lovelace (1815-1852), a computer programming pioneer; Sofia Kovalevsy (1850-1891), a Russian who was a Professor of Mathematics in Sweden; and Mary Everest Boole (1832-1916), who was active in many areas of informal education as well as joining her husband, George, in his work in logic. Emmy Noether's biography (1882-1935) provides a transition to the twentieth century and from Europe to America; she came to Bryn Mawr in 1933 when the Nazi regime forced her to leave Göttingen, Germany.

The next transition, to contemporary mathematicians, leads us to Lenore Blum, Deputy Director of the Mathematical Sciences Research Institute, Berkeley, California. In her story, many readers will find experiences that match their own, and most (if not all) will recognize events, organizations, and people. Blum is a past president of AWM and a founder of the Math/Science Network; the chronicle of her activities on behalf of women and girls is documented with familiar names and places. Her research activities are also personalized with references to women and men who shared and/or supported her work.

There are then three chapters about contemporary women mathematicians who are less in the public eye: Evelyn Boyd Granville, Professor Emerita of Mathematics and Computer Science; Fanya Montalvo, research mathematician in the field of artificial intelligence; and Edna Lee Paisano, statistician at the Census Bureau. These biographies describe the childhood and the paths to the Ph.D. taken by American women of ethnicities underrepresented in mathematics: African-American, Mexican-American and Native American. Although one can't expect profiles from every ethnic group, these essays present important concerns and problems of women out of the mainstream.

One need not have a doctorate to be included in *Women and Numbers*. A chapter about "The Wisconsin Three" features three computer programmers: Jean Darling, Sally Handy-Zarnstoff, and Kathi Duelle. The rest of the book discusses women educators, most of who are former teachers of secondary school mathematics. Theoni Pappas has established a business "to put mathematical ideas on everyday things like bumper stickers, ... T-shirts," and calendars. Women at the University of California Lawrence Hall of Science are involved

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Book Review Editor: Cathy Kessel, 2520 Etna, Berkeley, CA 94704

with "Equals," "Family Math," and "Expanding Your Horizons" as well as other supplementary mathematics education programs and events. Nancy Kreinberg, Virginia Thompson, Kay Gilliland, Jean Stenmark, Sherry Fraser, and Terri Belcher are featured; many others are recognized for their contributions. Some of their materials for students are illustrated in the activities section of their chapter.

"Numbers" in the book title points to the elementary mathematical activities that Perl includes at the end of each chapter; they are related in some way to the person(s) just discussed. At times it is a strong connection, such as Boole's Curve-Sewing Cards, and clock arithmetic as an example of group theory connected to Noether's interests. Whatever the segue, the activity is such that it can engage a young reader without outside help.

The book may well be read by girls and boys, from cover to cover. Most sections can be read with interest by adults. I recommend it to all for pleasure and enlightenment.

OBITUARY: CECILY TANNER 1900-1992

1. "You want a new research topic in mathematics? What about set theory?"

So suggested the great Göttingen mathematician Felix Klein in 1990 to his former doctoral student Grace Chisholm and her husband of four years, William Henry Young, somewhat disaffected by their recent debut in research mathematics with Italian geometry. This advice was to have momentous consequences upon its adoption, for they quickly rose to the top rank in set theory and applications to mathematical analysis for the next twenty-five years [Grattan-Guinness 1972]. Of especial note is their *The theory of sets of points* (1906), the first textbook in English on this subject.

They also became the first significant husband-and-wife partnership in mathematics. Shortly before Klein's advice was offered, their second child and eldest daughter, Rosalind Cecilia Hildegard, was born in Göttingen, on 6 February 1900, with Klein's daughter Luise as "deputy godmother" (she was not a member of the Church of England). Four more children were born, between 1901 and 1908. The family home, always on the Continent, moved to Geneva in 1908 and then to Lausanne in 1915, where Cecily gained her *licence* in mathematics and physics in 1925 (and also took courses in many other subjects, not only scientific ones). In 1919 her father was appointed professor of mathematics at the University of Wales at Aberystwyth, and she was in attendance for some of his four years there as his unofficial assistant. She helped her colleague E. (later Sir Edward) Collingwood translate into English a book on integral functions by French visitor G. Valiron, adding an appendix of her own [1925 in the bibliography].

2. In 1925 Cecily entered her mother's college Girton (Cambridge), for post-graduate work under the direction of E.W. Hobson. Soon afterwards her younger brother Lawrence came up, and he wrote a Cambridge Tract on *The theory of integration*, which was published in 1927 thanks to Cecily typing out the text. During this time she also translated into English Konrad Knopp's beautiful book on infinite series [1928g], still one of the best sources for the classical theory. In addition, she completed her thesis [1929c]; but the backwardness of the British system allowed her to gain only the title of Ph.D., in contrast to the full *Dissertation* that Grace had gained under Klein's direction in 1895. But she did obtain a Fellowship at Girton, for her research work had begun to flower with a flurry of papers in 1928 and 1929, especially with the London Mathematical Society.

Cecily worked in the family field of mathematical analysis, especially Riemann-Stieltjes integration [Medvedev 1974, 372-382]. In the course of her doctoral research she came to her best mathematical idea, elaborated as "The algebra of many-valued quantities" in the paper [1931c]. Such a quantity a can take any one of a set of finite values; but more than set theory itself is involved, since a full algebra (addition, multiplication, inequalities, and so on) was developed. In particular, the limiting values of a played a leading role, since her motivation for this theory was to simplify the needlework involved in developing Riemann-Stieltjes integration.

This lovely theory never gained the attention that it deserved, although "a certain Mr. von Neumann

By Ivor Grattan-Guinness. Reprinted by permission of the British Society for the History of Mathematics and the author from the BSHM Newsletter, *23, Spring 1993, pp. 10-15.*

of Budapest" wrote to ask for an offprint. However, it was used in a branch of numerical analysis called "interval analysis," where the many values constitute an interval [Moore 1966]; and later in the extension of the membership function of fuzzy sets [Grattan-Guinness 1976].

3. In 1932 Cecily's fellowship at Girton expired, and she toyed with the possibility of an appointment in the U.S.A. Already co-author of a paper [1933] with Norbert Wiener (six years her senior), she secured a testimonial from him in 27 September 1932 in connection with a place at the University of Michigan:

> ... She has extraordinary critical powers and much experience in research. Her critical powers do, in fact, as is so often the case, tend to hamper her originality to a certain extent, but I still consider her the equal of any woman mathematician in this country.
>
> She has as international, cosmopolitan standpoint as any person I know. I do not rate her as one of the powerfully original creative mathematicians of the time, but I definitely do believe that any school that gets her as a member of the faculty will be very fortunate indeed.

Sadly for her career, nothing came of this support.

4. After a year in limbo Cecily moved in 1933 to the Mathematics Department of Imperial College London, where she remained until her retirement in 1967. Her research publications in mathematics ceased after 1936, although three years later she won the Gamble Prize at Girton (like her mother many years earlier) with an unpublished essay on the history and significance of Schottky's theorem (a result in complex function theory). During the War and afterwards she worked with Sydney Chapman in furnishing and checking the exercises for a textbook on electricity and magnetism. The book was never finished, and some time in the 1950s was passed by Chapman to a colleague in the Eastern block, where it vanished from sight; however, Cecily preserved her own contributions. Better luck attended the publication [1951b] of her translation of a later edition of Knopp.

During the 1940s Cecily got to know Bernard Tanner, the chief maintenance engineer at Imperial College, and she ceased living in hotels in the Kensington area and moved in 1947 to the house next door to his and his family in Wallington, Surrey. After his wife's death she married him, in September 1953, she in her fifties and he in his seventies. One month afterwards he entered hospital with his terminal illness, which brought his death eight months later. All her later publications carried her married name.

5. Cecily's house was in Boundary Road in Wallington: an appropriate name, for in a few years the balance of her concerns changed quite sharply from mathematical research to its education and history. In the early 1950s she wrote some papers of an educational character, and came to recognize the central importance of inequalities in mathematics. (One motive was a powerful method in analysis called "monotone sequences" that her father had developed.) She spoke on the matter in an unpublished lecture on "Equal and unequal" at the 1958 International Congress of Mathematicians in Edinburgh.

Around that time Cecily increased her interest in the history of mathematics; with the support of Dr. G. J. Whitrow she founded a seminar in history and education at Imperial College in 1961, which ran until her retirement six years later. Its inauguration was part of Klein's legacy to her family; he had stressed the importance of the research seminar, and hers imitated the private one run after the Second World War in Frankfurt am Main by Klein's disciple the mathematician and historian Wilhelm Lorey, whom she knew well.

Concern with education and inequalities united in a study of the history of inequalities, upon which she published in the papers [1961, 1962a-b]. By this means she came to the principal inventor of the notations ">" and "<," the Elizabethan mathematician Thomas Harriot. At that time virtually forgotten, he was to be rediscovered and popularized largely by her efforts. In 1967 she financed at Oxford (his home town) the Thomas Harriot Seminar, to discuss the great man and his context. It ran intermittently until 1983, and now an annual Lecture is held there. Meanwhile activity had switched to the energetic leadership of Gordon Batho at the University of Durham, where in 1979 she also financed a Seminar which now meets alternately there and in Cambridge. Two years later the university granted her an honorary M.A.

Cecily had the surviving Harriot manuscripts photocopied, and worked extensively on them, in the hope that the circle around the Oxford Seminar would prepare a collected edition of these difficult materials. To her great irritation this project lapsed,

but she published a number of short papers on him, and also three long ones [1967a-b, 1969c]. In 1971 she participated in a Harriot Seminar held at the University of Delaware, contributing to the proceedings with a study [1974] of his associates. Her main interest in Harriot's mathematics, which centered upon his algebra, led to a paper [1977] on Pythagorean triples and then a thought-provoking pair [1980a-b] contrasting his understanding of algebra with that of his Renaissance predecessor G. Cardano.

6. My own contacts with Cecily date from the late 1960s, in connection with a study of Georg Cantor, the principal founder of set theory. She had recently attended a Cantor meeting in East Germany, where she spoke about her parents' work [1970], and she gladly opened up contacts for me with Cantor's children. Later she even brought home for me the surviving fragments of his *Nachlass*.

From Cantor it was a natural progression for me to examine the work of his first main British disciples; and so I went to Wallington to see their *Nachlass*, of which she had been the family curator for many years. She put much effort into sorting and cataloguing the mounds of her parents' letters and files, and in transcribing their correspondence. Cecily's efforts helped me greatly in my own use of these materials, which resulted principally in a biographical article [Grattan-Guinness 1972]. We also prepared an extended reprint edition of *The theory of sets of points*, which came out from the Chelsea Publishing Company, with her preface [1972] quoting letters from Cantor to her parents. Four years later the *Nachlass* was transferred to the Archives of Liverpool University (where her father had held part-time appointments from 1906 to 1916); it has been used by various scholars, including in the preparation of a forthcoming selected edition of their works. Her own papers are to be conserved with them.

These activities also involved Edward Collingwood, another Cantor enthusiast. He had important connections with the university of Durham, and after his death in 1970 she founded there an annual mathematical lecture named after him. She also gave money towards his library, which was left to the Mathematics Department [Grattan-Guinness 1975].

7. From her early years Cecily suffered seriously from deafness. This inevitably made her somewhat reclusive outside the family, although she built up a wide circle of friends and correspondents in many countries. Inheriting the linguistic gifts of her parents, she learned French, German and Italian in her childhood and always spoke them well, publishing in the first two languages. (I wonder if she learned too many languages at once when young; her English could be rather non-standard on occasion.) In the sixties Cecily's work on Harriet and his time required her to brush up on her Latin, which she effected with the help of E.A. Milne's *Winnie ille Pu*. She travelled regularly on the Continent, especially to meetings of the various societies to which she belonged. In Britain she was also a member of various mathematical, astronomical and historical societies; she was an early member of both the British Society for the History of Science and the British Society for the History of Mathematics.

Outside her work Cecily was a talented violinist, a daily poetess, a frequent reader of literature and poetry, at times a practicing Christian, a frequent benefactress (often anonymously) of institutions and organizations, and a regular conductor of mammoth phone calls until increasing deafness and tiredness cut her off further from the world of friends and relatives. She died in hospital on 24 November 1992, and was cremated at Croydon. She lived a very long life, and I guess that she enjoyed most of it.

Acknowledgments. For comments on a draft I express thanks to Cecily's brother Pat and to Gordon Batho. Permission to quote from the Wiener letter was kindly granted by the MIT Archives.

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Editor's note: I find it curious that Grattan-Guinness considers Wiener's reference letter for Tanner so supportive. At least I imagine that in 1932 the University of Michigan was looking for original creative mathematicians. And comparing her only to women mathematicians seems like faint praise.

SOME THOUGHTS ON RECRUITING WOMEN FOR NSF DIVISION DIRECTOR POSITIONS

We are concerned about the dwindling number of women who hold Division Director or other line administrative positions here at the National Science Foundation. It is our hope that the recruiting strategies given below will be helpful in turning the situation around.

Membership on Search Committees and Panels

The level of search activity is uneven across the Foundation. This being the case, it would be a good move to establish search committees in each Directorate. The new model employed in Engineering might be used. Another useful move would be to see that Assistant Directors are informed of their ability to make outside appointments to the Human Resources Management committees that are established when a permanent position is to be filled.

The presence of women on search committees and panels is very important. Equally important is the recognition that one woman serving in such a situation can become isolated and her input essentially ignored by male colleagues when it stands in contradiction to their own views. Searches inevitably narrow down to a short list; attitudes toward non-standard candidates begin to surface at that point. Where women candidates are concerned, though, these attitudes are usually camouflaged when women are present on the search committee, so that they appear to be based purely on merit. Even men who truly want to support women can fail to recognize what is happening in these situations, and will take what is being said at face value. A lone woman is at a disadvantage, even when she recognizes what is going on. Among the men who proclaim their support for women and minorities, there are some who are very skilled at disconnecting what they say from what they do. Others are genuinely supportive and will act positively. The trick is to know who is who. We recommend that women staff members be asked for suggestions when a search committee is to be appointed.

People who are experienced in search committee service may not be the best choices for changing the recruitment and hiring paradigm. Such inbreeding may serve to perpetuate older ideas about who is outstanding and who is not.

Recruitment

Active searches should be made for women candidates, since the pool is relatively small.

When there is a commitment to identifying women who meet the qualifications for an administrative position, it may be necessary to suspend some of the usual boundary conditions and to agree that this commitment takes priority over such considerations as whether the position should be filled by an in-house candidate or one from the outside, whether a specific discipline or academic degree is required of the candidate (i.e., in a manufacturing or other engineering area with a strong industry interface, the Ph.D. may not be a de facto requirement, even though most NSF Division Directors hold this degree), etc.

Labeling

It is the common experience of women that assertive behaviors appropriate to our jobs are perceived differently than the same behaviors would be when displayed by men. "Assertive" turns into the pejorative "abrasive" rather easily in our case. A woman with an abrasive style is promptly disqualified from an administrative position on grounds that she could not succeed in the job. Below please find an anecdote from the University of Washington that says it all.

In the mid-70's, civil rights movements dictated the necessity to have women and minority candidates for faculty and administrative positions and to provide written reports documenting reasons when they were not selected. Also at that time, the Faculty Senate established a new Special Committee on Faculty Women, of which I was a member. Student

Dr. Margaret (Midge) Cozzens, Director of the Division of Elementary, Secondary, and Informal Education in the Education and Human Resources Directorate of NSF (currently the only female Division Director out of 50) and Dr. Irene Peden, Director of the Division of Electrical and Communications Systems in the Engineering Directorate (until September 15, 1993

rights movements of these same years resulted in the inclusion of students on all significant university committees. While all these new ways of doing the university's business were going on, the position of provost opened up. The student body president was duly appointed to the provost search committee. The Special Committee on Faculty Women wore itself out providing nominations and documentation of the records of outstanding women whom we viewed as qualified to be provost. After the search had been completed and yet another white male had been selected for the position, the student met with the Special Committee to tell us what had happened to our nominees and how the selections were made. Women candidates had been carefully considered. In all cases, they were eliminated on either of two grounds. If viewed as good decision-makers, they were labeled as too assertive in style, and hence abrasive/unqualified because they would not be accepted in the position and would therefore fail. If viewed as not good decision-makers, they were labeled too motherly to succeed. If only this twenty-year-old story could be relegated to history! In fact, we know that it is still going on. This kind of categorizing is in the eye of the beholder and does not normally happen to men.

Letters of Recommendation and the Candidate Priority List

It is well to be aware of the subtleties of the art of recommendation letters and the effect they can have on the relative excellence of candidates as seen by the search committee. When the top candidate is a white male and one or more women are placed high on the list but not first, a flag should go up for reviewing the recommendation letters.

A good rule of thumb might be that the top candidates are all qualified to hold the position, and other factors tend to come into play when a committee generates the priority list. The woman listed as runner-up might have headed the list had she been a man with the same qualifications and stronger letters of recommendation.

Resistance Movements and Testing

Labeling has been addressed above. Another tendency requiring vigilance on the part of the senior administration is the tendency of the troops to examine with deep concern the shortcomings of a woman candidate who might become their supervisor and to dwell upon these. All candidates present both positives and negatives in their match to the requirements of the position. The downside can take on a life of its own in the eyes of those who wish not to be supervised by a woman. Reasons can be personal or they can be cultural. In any event, the objections can grow in magnitude until they swamp the candidacy. She is then viewed as unable to succeed in the job because she would be unable to overcome so much objection on the part of those she must lead. In fact, when the administrator with final decision-making powers goes forward with the offer, it is not unusual to find that the team lines up behind its new leader and life goes on. The senior administrator committed to furthering the careers of women needs to know that standing one's ground on behalf of a qualified candidate is sometimes required.

Interviews

When women candidates come for interviews and it is desired to attract them to the Foundation, some extra thought should be given to scheduling the NSF people who will talk with them. In addition to the usual considerations of common technical interests, potential collaborations, peers, subordinates, supervisors, etc., we recommend ensuring that other NSF women at the level of the position to be filled be included in the candidate's day. Their presence at the Foundation and their insights into the way things work here are as important to her as contact with other Division Directors in the Directorate. Assistant Directors and other administrators can anticipate valuable feedback from NSF women as well. We strongly encourage sending women Division Director candidates to Midge for interview, whether or not they would join Education and Human Resources after arrival.

The Two-Job Problem

A systematic way of dealing with the need for two jobs in the Washington D. C. area is not in place at NSF. This is one of the most common ways to lose the possibility of attracting a woman candidate for a professional position. Given the present and increasing number of families in which both spouses are professional people, the two-job problem can be expected to limit more and more the number of candidates of either sex who can be attracted to NSF.

EXPERIENCE WITH THE ASA/NSF FELLOWSHIP PROGRAMS

During the first six months of 1993, I was a Senior Research Fellow at the National Center for Education Statistics. First, I'll describe the Fellowship Programs, and then I will report briefly on my experience at the Center. The three paragraphs following are almost verbatim from material I received recently from the American Statistical Association office.

> The American Statistical Association (ASA) currently has six Fellowship Programs, five of which are cosponsored with the National Science Foundation — Census Bureau, Bureau of Labor Statistics, National Center for Education Statistics (NCES), National Institute of Standards and Technology, and the Sciences Resources Studies Division of NSF — and one which is fully funded by the agency itself — U.S. Department of Agriculture National Agricultural Statistics Service. From the start of the program in 1978 through the end of 1992, there have been a total of 80 Fellows and 58 Associates, about three-fourths of them at the Census Bureau.
>
> The Fellowship Programs were designed to promote the exchange of ideas and techniques between Federal government statisticians and academic users of Federal statistical data. The program enables Senior Research Fellows and Associates from universities to undertake research studies at one of the host agencies for a period of up to one year.
>
> The Fellows work on research topics of joint interest to themselves and their host agencies. They have essentially the same access to agency databases and computer facilities as regular employees doing similar work, and they are submitted to the same confidentiality requirements and penalties for improper disclosure of identifiable information. At the Census Bureau, for example, the ASA/NSF/Census Fellows receive appointments and take oaths as special sworn employees, and are subject to the same Title 13 confidentiality provisions, including penalties for violations, as regular employees.

The stipend during my tenure was the same as my regular University salary, with a small additional housing allowance. The experience as a Fellow was enlightening, has certainly broadened my horizons, and has made me aware of many interesting issues, some of which I expect to follow up on in further research, both on my own and in collaboration with some of the Government employees at the Center. However, I would recommend that anyone interested in participating in this program request a term of at least nine months and preferably a year. At the NCES, and also at other agencies, as far as I can tell from conversations, it takes quite some time to get "into the network," to find out what is taking place in various parts of the Center, and to begin working on substantive issues.

For one thing, the computer setup at the NCES and probably in most government agencies is not up to the standards at many universities, in particular at the University of California at Berkeley. The computer facilities furnished when I arrived consisted of a stand-alone 386 PC with modem and a rather old laser printer. As I was leaving, a local area network was just being established. No programming help is available to Fellows, so working out a system for carrying out research takes some time.

While the Center staff and researchers were very helpful on an individual basis, the information exchange was not well organized, and I often found out about interesting meetings and talks after they had occurred. Apparently, this is a problem for the regular staff as well as for visitors. The Center is understaffed, as are many Federal agencies now, and so there was no way of giving any individual enough time off to spend a substantial amount of time helping a visitor learn the ropes. The problem may have been greater than usual, since I arrived simultaneously with a change of Administration, and many of the top officials in the Department were being replaced. Indeed, six months later, the new top officials of the Department of Education had not yet all been officially confirmed.

The NCES, and other agencies as well, are eager to have outside researchers utilize the extensive survey data they collect for research purposes. A serious problem being faced by many agencies is the confidentiality problem mentioned in the third paragraph of the material from the Center quoted above. The Center releases some data that have been adjusted to avoid confidentiality problems in

Juliet P. Shaffer, President-Elect, Caucus for Women in Statistics; Department of Statistics, University of California, Berkeley

public use form, with no restrictions. However, for serious research purposes, it is necessary to have raw data (not including names, which are not part of even restricted files), and for this purpose it is necessary to be licensed and to keep the files under tight security. This is somewhat awkward in the university environment. Government committees are working on ways to make the data as easily available as possible while at the same time safeguarding confidentiality of respondents.

In conclusion, I would recommend experience in Government agencies for anyone with interest in the scientific areas within their jurisdictions. It would be best to be patient, to expect to take some time to become acclimated to the working conditions within the agency of interest, and to allow sufficient total time, preferably a year if possible, to get the most out of the experience.

ARTICLES OF INTEREST

The business section of a Sunday New York *Times* had an interview with one Denise Caruso, editor of a high-tech newsletter, who bemoaned the dearth of women in high tech. Alas: "... women don't have the opportunity ... to discover they can understand technology. *It doesn't have anything to do with learning higher math....* [emphasis added] There needs to be a way in the educational process to approach young women about technology in a way that doesn't have to do with, you know, vector analysis."

"Barbie's tough-math talk is worth a bundle" by Alanna Mitchell, Cleveland *Plain Dealer*, February 6, 1993. At the time the article was written, only five Barbie buyers in the United States and none in Canada had turned in dolls that said "Math class is tough." Professional toy collectors have estimated that the doll will be worth several hundred dollars by next year, due to the recall.

The Minneapolis *Star Tribune* of April 26, 1992 contains an article by Larry Oakes on the issue of sexual harassment at the University of Minnesota – Duluth. UMD recently hired its first female vice chancellor. While she was still at Temple University, she received an unsigned note reading "feminist bitch, don't come to Minnesota." Fliers from the "Imperial Council of the Deer Hunter" threatened the murder of all faculty members who had taken part in sensitivity training that she had scheduled. Several faculty members have been victims of vicious racist and sexist harassment. A secretary who testified on behalf of one of the victims "found a rear panel of her car kicked in.... While on maternity leave she received an anonymous greeting card at home saying it was too bad she hadn't died in childbirth." The head of Industrial Engineering is quoted: "Feminism is a cancer in society.... I see no good in it. They behave like Nazis in their techniques and attempts at total domination."

"Student discovers new calculus theorem by accident" by Christine Wolff, Contra Costa *Times*, January 23, 1993. 19-year-old Christy Randall, while doing her homework for Professor Plybon's accelerated beginning calculus class at Miami University (Ohio) in Fall 1991, discovered a new calculus theorem.

TEACHING EVALUATIONS

Here are a few more references on gender and teaching evaluations.

P.B. Elmore and K.A. LaPointe, "Effects of Teacher Sex and Student Sex on the Evaluations of College Instructors," *Journal of Higher Education*, 1974, 66(3), 386-389.

P.B. Elmore and K.A. LaPointe, "Effect of Teacher Sex, Student Sex, and Teacher Warmth on the Evaluations of College Instructors," *Journal of Higher Educational Psychology*, 1975, 67(3), 368-374.

M.A. Ferber and J.A. Huber, "Sex of Student and Instructor: A Study of Student Bias," *American Journal of Sociology*, 1975, 80(4), 949-962.

Nancy Hensel, "Realizing Gender Equality in Higher Education," ASHE-ERIC Higher Education Report 2, 1991.

Neal Koblitz, "Bias and other factors in student ratings," Letter to the Editor, *The Chronicle of Higher Education*, September 1, 1993, B3.

John P. Lombardo and M. Tocci, "Attribution of Positive and Negative Characteristics of Instructors as a Function of Attractiveness and Sex of Instructor and Sex of Subject," *Perceptual and Motor Skills*, 48(1979), 491-94.

Thanks to Judy Borus, Delene Perley, and Marie Vitulli for forwarding this information to us.

AMS/CMS/MAA: VANCOUVER

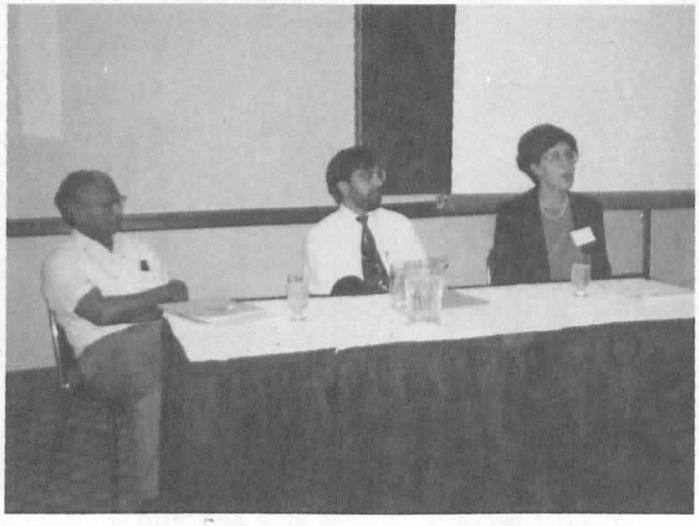
Cora Sadosky and Schafer Prize Winners (not pictured: Ariel Glenn)
Susan Goldstine, Melissa Aczon, Dana Pascovici, Jennifer Slimowitz, Rebecca Field, Karin Dorman, Sadosky, Catherine O'Neil

Asia Ivic Weiss and Cora Sadosky

Front row: Joan Wick Pelletier, Joan M. Geramita, Mary W. Grayd
Back row: Richard J. Griego, Cora Sadosky, Asia Ivic Weiss

SIAM: PHILADELPHIA

Front row: Danielle Carr, Catherine Roberts, Cheryl Hile, Beth Bradley
Back row: Reza Malek-Madani, Debbie Lockhart, Cora Sadosky, Jagdish Chandra, Shubbe Rajopadhyye, Mary Pugh, Elinor Velasquez, and Andrea Bertozzi



Jagdish Chandra, Reza Malek-Madani, and Deborah Lockhart

Marianne Huebner, Niloufer Mackey, and Ching-Ju Lee

Suzanne Lenhart, Mitsumi Nakamura, and Yue Zhang

Andrea Bertozzi, Mary Pugh, and Beth Bradley

Shubbe Rasopadhyye, Barbara Keyfitz,
Catherine Roberts, and Cheryl Hile

Karen Pao, Sharon Filipowski, and Eva Lee

Dawn Lott Crumpler, Cristina Draghicescu,
and Natalia Alexandrov

Shandelle Hensen, Danielle Carr, and Nancy Lybeck

BALLOT: Due December 1, 1993 at the Maryland office.

President-Elect:

- ☐ Chuu-Lian Terng ☐ _____

Members-at-Large (vote for three):

- ☐ Rosemary Chang ☐ _____
- ☐ Naomi Fisher ☐ _____
- ☐ Carolyn Gordon ☐ _____

ASSOCIATION FOR WOMEN IN MATHEMATICS 1993/1994 INDIVIDUAL MEMBERSHIP FORM

AWM's 1993-94 membership year started October 1, 1993. 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. Questions? (301) 405-7892, or awm@math.umd.edu

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

ADDRESS_____

_____

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Home Phone: Work Phone:
E-mail:

Please include this information in: (1) the **AWM Speaker's Bureau** (Yes/No) _____ (2) the next **AWM Membership Directory** (Yes/No) _____

PROFESSIONAL INFORMATION:

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

DEGREES EARNED:

	Degree(s)	Institution(s)	Year(s)
Doctorate:			
Masters:			
Bachelors:			

DUES SCHEDULE FOR MEMBERSHIP YEAR 1993/1994

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 MEMBERSHIP (Base dues $25 plus $5 prize fund and $10 general)..... $ 40 _____

2ND FAMILY MEMBERSHIP (Base dues $15 plus $5 prize fund and $10 general)..... $ 30 _____
(NO newsletter) Please indicate regular family member: _____

CONTRIBUTING MEMBERSHIP..... $100 _____
Indicate if you wish for this contribution to remain anonymous: _____

STUDENT, RETIRED, OR UNEMPLOYED MEMBERSHIP (circle one)..... $ 8 _____

ALL FOREIGN MEMBERSHIPS (INCLUDING CANADA & MEXICO) .....ADD $ 8 _____
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TOTAL DUES $ _____

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AGNES SCOTT COLLEGE - DEPARTMENT OF MATHEMATICS - The Department of Mathematics at Agnes Scott College invites applications for an assistant professor, tenure-track position starting August, 1994. Candidates are expected to have completed the Ph.D. by the time of appointment. Specialty in algebra or topology encouraged but applicants in all areas will be considered. Also required is a strong commitment to teaching and continued professional growth in an undergraduate setting, and interest in innovative teaching with technology. Normal teaching load in the 4-person department is three courses/semester. Agnes Scott is a Presbyterian-affiliated, liberal arts college for women in metropolitan Atlanta, Georgia. To ensure full consideration, applications should be received by December 15, 1993. Send letter of application describing teaching interests and scholarly plans; CV; and names, addresses and phone numbers of three professional references to: Larry Riddle, Agnes Scott College, Decatur, GA 30030-3797. Members of underrepresented groups are urged to apply. Agnes Scott College is an Equal Opportunity Employer.

ARIZONA STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics at Arizona State University invites applications for tenure track/tenured positions at the Assistant Professor/Associate Professor level, pending Budgetary approval, beginning in the fall semester 1994 or the fall semester 1995. Applicants are required to have a Ph.D. in mathematics and are expected to have a strong commitment to education on all levels and a strong research record. Candidates should show a strong interest in instruction on an introductory level in a large public university environment. Candidates at the Associate Professor level must have a proven record of outstanding achievements in research and teaching. Preference will be given to candidates in the areas of applied analysis, control theory and functional analysis. Applicants must send their resume and arrange for at least three letters of recommendation be sent to: Christian Ringhofer, Chair, Department of Mathematics, Box 871804, Arizona State University, Tempe, Arizona 85287-1804. Review of applications will begin December 1, 1993. The application deadline will be extended on a month-to-month basis until positions are filled. Arizona State University is an Affirmative Action/Equal Opportunity Employer.

BROWN UNIVERSITY - MATHEMATICS DEPARTMENT - J.D. Tamarkin Assistant Professorship. Three-year appointment, beginning July 1, 1994. Competitive salary. Applicants (regardless of age) should have received the Ph.D. degree before the start of the appointment, but no earlier than January 1, 1992, have a strong research potential, and have a commitment to teaching. Field of research interest will be taken into account. A curriculum vitae, a completed application form, and three letters of recommendation should be received by December 31, 1993. Requests for application forms and all other inquiries should be addressed to: Tamarkin Search Committee, Department of Mathematics, Brown University, Box 1917, Providence, RI 02912. Brown University is an Equal Opportunity/Affirmative Action Employer.

CALIFORNIA STATE UNIVERSITY, SAN MARCOS (CSUSM) - DEPARTMENT OF MATHEMATICS - CSUSM invites applications for an entry-level, tenure-track Assistant Professor position starting in August 1994, subject to final administrative authorization. The first priority for the position is geometry. Any related field of geometry, such as algebraic geometry, analytic geometry, computational geometry, convex and discrete geometry, differential geometry, finite geometry, geometric analysis, is welcome. Applications should be addressed to: Mathematics Geometer Search Committee. The second priority for the position is for candidates who can offer evidence of their ability to teach graduate statistics and courses in modeling or operations research. Applications should be addressed to: Mathematics General Search Committee. CSUSM seeks individuals with strong academic preparation who have an interest in teaching undergraduates. Experience with incorporating mathematical software into teaching is strongly desired. An application consists of a statement of interest, a complete resume, a copy of transcript, and at least three letters of reference which should comment on the applicant's credentials in teaching, research, and service. Applications should be addressed as above and sent to: California State University San Marcos, San Marcos, CA 92096-0001. Review of applications will begin February 7, 1993 and will continue until the position is filled. CSU San Marcos is an Affirmative Action/Equal Opportunity Employer. The University has a strong commitment to the principle of diversity and seeks a broad spectrum of candidates including women, members of minority groups and people with disabilities.

CARLETON COLLEGE - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - The Department of Mathematics has one tenure-track and one two-year position to begin September 1994. A Ph.D. in math or applied math is required and evidence of teaching excellence is essential. In addition to applicants with a pure math background, we are interested in candidates with applied interdisciplinary training or modeling experience in the biological or physical sciences. Review of applications will begin Dec. 1, 1993 and continue until positions are filled. Carleton faculty teach 2 courses per term, 3 terms per 9-month year. Preference will be given to candidates able to teach 1 or 2 introductory statistics courses per year. Carleton is an Affirmative Action/Equal Opportunity Employer; applications are specifically invited from women and members of minority groups. Send letter or application, resume, graduate transcripts, and three letters of recommendation to: David Appleya, Chair, Department of Mathematics and Computer Science, One North College Street, Northfield, MN 55057-4025 (e-mail: dappleya@carleton.edu). At least one letter should specifically address teaching. Carleton is a highly selective liberal arts college 35 miles south of Minneapolis/St. Paul. The department has 12 full-time members. A commitment to teaching in a liberal arts setting is essential. Research is supported and encouraged. In the Fall of 1993, the department moved into a new building with excellent facilities for learning and teaching. Computing resources available to the department include four teaching laboratories equipped with Mac Quadras, NeXts, 486 PC's, DEC microvax, Raster tech 3/85 workstation, transputer-equipped parallel processing stations, and access to a central VAX cluster. The department employs a full-time computer technician.

CENTRAL MISSOURI STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Applications are invited for a tenure-track position beginning August 1994. A masters degree in a mathematical science is required. A doctorate in Mathematics Education with the equivalent of a masters degree in mathematics is preferred. Teaching experience at the elementary or secondary levels is required. The department offers bachelors degree programs in mathematics, mathematics education, computer science, and actuarial science and a masters degree program in mathematics. The normal teaching assignment is 12 hours of undergraduate and/or graduate courses per semester. A reduced load for research is possible. Salary is competitive and negotiable. An application letter, resume, transcripts, and three professional references should be sent to: Dr. Ed Davenport, Department of Mathematics and Computer Science, Central Missouri State University, Warrensburg, MO 64093. Screening of applications will begin January 15, 1994, and continue until position is filled. Women and minorities are encouraged to apply. Central Missouri is an Affirmative Action/Equal Opportunity Employer/ADA.

COLUMBIA UNIVERSITY - BARNARD COLLEGE - DEPARTMENT OF MATHEMATICS - One or more openings for Ritt Assistant Professor - for new Ph.D.'s regardless of age. One-year appointment, normally renewable for 3 more years. Teaching load, 2 courses per semester. Send vitae and (p)reprints and have letters of recommendation sent by professors familiar with your research and teaching. First consideration will be given to applicants whose folders are complete by January 15, 1993. Send to: Columbia University, Barnard College, Department of Mathematics, New York, NY 10027, Attention: Chair. Columbia University, Barnard College is an Equal Opportunity/Affirmative Action Employer.

DARTMOUTH COLLEGE - MATHEMATICS AND COMPUTER SCIENCE - John Wesley Young Research Instructorship, 2-years., new or recent Ph.D.'s whose research overlaps department. member's. Teach 4 ten-week courses spread over 2 or 3 quarters. $34,000 for nine months; $7,556 summer research stipend. Send application letter, resume, research thesis description, graduate transcript, and 3 (prefer 4) references (1 discussing teaching) to: Phyllis A. Bellmore, Mathematics and Computer Science, Dartmouth College, 6188 Bradley Hall, Hanover, NH 03755-3551. Files complete January 15, 1993 considered first. Dartmouth is committed to Affirmative Action and strongly encourages minorities and women to apply.

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DREXEL UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Department Head - The Department of Mathematics and Computer Science invites qualified candidates to apply. Candidates should have proven ability for academic and administrative leadership and a demonstrated interest in the continuing development of a multidisciplinary department with cooperative research interests in applied mathematics, computer science, and probability and statistics. The department, with 30 full-time faculty, has active undergraduate and graduate programs (M.S. and Ph.D.) and a significant service role in engineering and science education. Curriculum reform and development is an important component of the department heads responsibilities. Evaluation of applications will begin January 15, 1994. Applications will be accepted until the position is filled. Drexel University is an Affirmative Action/Equal Opportunity Employer. Send vitae and letters of reference to: Dr. Nira Herrmann, Head Search Committee, Department of Mathematics and Computer Science, Drexel University, Philadelphia, PA 19104. Phone: 215-895-2668. E-mail: headsearch@mcs.drexel.edu.

DUKE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications and nominations are invited for one tenure/tenure track position in applied mathematics or nonlinear dynamics. Rank and salary are open; the position is to start September 1, 1994. Applicants should send a curriculum vitae, a research plan, and a completed information form (available from the department at apply@math.duke.edu); and they should arrange for three letters of recommendation to be sent. A teaching recommendation is also strongly suggested. Completed applications received by January 1, 1994 will be guaranteed full consideration. Address correspondence to: Faculty Search Committee, Department of Mathematics, Duke University, Box 90321, Durham NC 27708-0321. Duke University is an Affirmative Action/Equal Opportunity Employer.

EASTERN ILLINOIS UNIVERSITY - DEPARTMENT OF MATHEMATICS - Beginning 8/22/94. Subject to availability of funding. Two positions. Department grants undergraduate degrees in Mathematics (pure, applied, and teacher certification options), Mathematics and Computer Science, and Masters degrees in Mathematics and Mathematics Education. Duties include teaching wide spectrum of courses in support of these programs as well as service courses and general education courses. Excellence in teaching expected. Applications from all areas of pure and applied mathematics, statistics, and mathematics education welcome. Ph.D. in appropriate discipline required. Applications due 1/15/94. Send application letter, transcript, three letters of recommendation to: Ira Rosenholtz, Department of Mathematics, Eastern Illinois University, Charleston, IL 61920. Equal Opportunity, Equal Access, Affirmative Action Employer committed to achieving a diverse community.

EMORY UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - The Department of Mathematics and Computer Science invites applications for three anticipated tenure track Assistant Professorships for 1994-95. **Position 1:** A Ph.D. in Mathematics and a promising research program in Algebra are required. **Position 2:** A Ph.D. in Mathematics and a promising research program in one of Geometric, Complex or Functional Analysis are required. **Position 3:** A Ph.D. in Computer Science and a promising research program in one or more of Operating Systems, Parallel Processing, Distributed Computing, Computer Networks, and Graphics are required. As the department offers several undergraduate programs within Emory College, a Ph.D. in Mathematics, and MS in Computer Science/Mathematics, applicants are expected to have strong records, or promise, as undergraduate and graduate teachers. Applications must specify one of Positions 1, 2, or 3 and include CV's (with at least three recommenders' names). Please see that recommendation letters are sent to: Professor Dwight Duffus, Screening Committee, Department of Mathematics and Computer Science, Emory University, Atlanta, GA 30322. Screening of applications will begin on January 1, 1994. Emory University is an Affirmative Action/Equal Opportunity Employer.

GETTYSBURG COLLEGE - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Gettysburg College invites applications for a tenure-track assistant-professor position in computer science beginning August 1994. A Ph.D. in computer science or a closely related field, promise of excellence in teaching, and a commitment to continued scholarship are essential. Applicants must be qualified to teach both computer science courses and mathematics courses that support the computer science program. Gettysburg College is a highly selective liberal-arts college of about 2000 students in a beautiful and historic area of south-central Pennsylvania. It is conveniently located within an hour and a half drive of the Washington-Baltimore area. Send letter of application, curriculum vitae, statement of teaching interests and scholarship goals in a liberal-arts environment, and the names of three references) at least one of whom is qualified to address teaching effectiveness) to: James P. Fink, Chair, Department of Mathematics and Computer Science, Gettysburg College, Gettysburg, PA 17325. Please do not send letters of recommendation with your application. Applications received by December 20, 1993 will receive first consideration; other applications will be accepted until the position is filled. Gettysburg College is an Equal Opportunity/ Affirmative Action Employer with a Partner Assistance Program. Women and minority candidates are encouraged to apply.

HOWARD UNIVERSITY - DEPARTMENT OF MATHEMATICS - Assistant Professorships are anticipated for 1994-1995. Ph.D., demonstrated excellence in teaching and active participation in research required. We encourage applicants in statistics and applied mathematics but other applications are welcome. Send resume and direct three letters of reference to: Chairman, Mathematics Department, Howard University, Washington, D.C. 20059 Deadline: January 18, 1994. Howard University is an Equal Opportunity Employer.

INDIANA UNIVERSITY, BLOOMINGTON - DEPARTMENT OF MATHEMATICS - Several tenure track and 2-year visiting positions will be available in the 1994-95 academic year. Outstanding candidates in all areas of pure and applied mathematics and statistics are invited to apply. Excellent research potential as well as a commitment to teaching are required. Indiana University is an Affirmative Action Employer. Please send a letter of application to: Professor John Ewing, Chairman, Dept. of Mathematics, Indiana University, Bloomington, IN 47405.

INDIANA UNIVERSITY OF PENNSYLVANIA (IUP) - DEPARTMENT OF MATHEMATICS - Indiana University of Pennsylvania invites applications for a tenure-track position in elementary and/or secondary mathematics education to begin in the Fall of 1994. The appointment is anticipated at the Assistant Professor level. Associate Professor is possible in the case of exceptional qualifications. The department recognizes a greater need in elementary mathematics education, although those with a secondary mathematics education background are encouraged to apply. Responsibilities: (1) Teach undergraduate and graduate coursers in elementary and/or secondary mathematics education and advise students. The normal course load is 12 semester credit hours. Duties included teaching courses in mathematics content and mathematics pedagogy, and supervising field experiences. (2) Continue scholarly growth. (3) Participate in university, college, and department committees. Required Qualifications: (1) Ph.D./Ed.D. by September 1994 in an area related to mathematics education with graduate course work in mathematics education. (2) Evidence of effective teaching experiences in mathematics at the elementary and/or secondary level. (3) Evidence of successful research or research promise in mathematics education. (4) Academic preparation and evidence of ability to teach mathematics content courses for elementary and/or secondary education majors. Preferred qualifications: (1) Experience with in-service presentations and/or curriculum consultation. (2) Active participation in recognized professional organizations. Send a letter of application, resume, undergraduate and graduate transcripts, and three current letters of reference to: Dr. Jacqueline Gorman, Chair of Search Committee, Mathematics Department, Indiana University of Pennsylvania, Indiana, PA 15705, 412-357-2608, Bitnet: JGORMAN@IUP. IUP is an Affirmative Action/Equal Opportunity Employer.

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INDIANA UNIVERSITY-PURDUE UNIVERSITY @ INDIANAPOLIS (IUPUI) - DEPARTMENT OF MATHEMATICAL SCIENCES - The Department of Mathematical Sciences at IUPUI is seeking applicants for two or more tenure track positions to begin in August 1994. Rank is open depending of qualifications. Applicants must have an earned doctorate by the starting date. A strong research record or excellent research potential as well as a commitment to quality graduate and undergraduate teaching are required. Some preference may be given to applicants in scientific computing and applied statistics. However, strong applicants from all areas of mathematical sciences are encouraged to apply. IUPUI is a comprehensive urban university with over 28,000 students. The department offers programs of study leading to Purdue University B.S., M.S. and Ph.D. degrees. The university offers competitive salaries and provides excellent fringe benefits Send resume and three letters of recommendation to: Professor C. D. Aliprantis, Acting Chair, Department of Mathematical Sciences, IUPUI, 402 N. Blackford Street, Indianapolis, Indiana 46202-3216. Closing date: January 15, 1994. Late applications will be considered until positions are filled. IUPUI is an Affirmative Action/Equal Opportunity Employer. Women and minority candidates are encouraged to apply.

JOHNS HOPKINS UNIVERSITY - DEPARTMENT OF MATHEMATICAL SCIENCES - Applications are invited for an anticipated faculty position in STATISTICS. Substantial capabilities in statistical theory, applications and methodology are required. A broad mathematical and statistical background with an applied statistics specialization is desired. Selection will reflect demonstration and promise of excellence in research, teaching, and innovative applications. A Ph.D. degree is required. Applicants at all levels will be considered. Applicants are requested to send initially only a curriculum vitae with a cover letter describing professional interests and aspirations. Recommendations letters, transcripts, preprints and reprints are to be furnished only upon request. Please address applications to: Faculty Search Committee, Department of Mathematical Sciences, 220 Maryland Hall, The John Hopkins University, Baltimore, MD 21218-2689. Applications are requested by January 15, 1994. Minority and women candidates are encouraged to apply. The Johns Hopkins University is an Affirmative Action/Equal Opportunity Employer.

JOHNS HOPKINS UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for anticipated faculty positions within the general area of algebra, analysis, geometry, number theory and topology. Of particular interest is the broad area of analysis. Positions may be filled at nay level. Minority and women candidates are encourages to apply. The Johns Hopkins University is an Affirmative Action/Equal Opportunity Employer. Applicants should submit a curriculum vitae and arrange for letters of recommendation to be sent to: Appointments Committee, Dept. of Mathematics, 404 Krieger Hall, Johns Hopkins University, Baltimore, MD 21218 (Applications in probability, statistics, operations research, and numerical methods will not be considered; applicants in these areas should instead contact the Dept. of Mathematical Sciences in the School of Engineering.)

KANSAS STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Subject to budgetary approval, applications are invited for tenure-track and visiting positions commencing August 18, 1994; rank and salary commensurate with a qualifications. The Department seeks candidates whose research interest mesh well with current faculty. The Department has research groups in the areas of analysis, algebra, geometry/topology, and differential equations. Although all fields will be seriously considered, some preference will be given to candidates in differential equations. Applicants must have strong research credentials and a commitment to excellence in teaching. A Ph.D. in mathematics or a Ph.D. dissertation accepted with only formalities to be completed is required. Letter of application, current vitae, description of research, and three letters of recommendation should be sent to: Louis Pigno, Department of Mathematics, Cardwell Hall 137, Kansas State University, Manhattan, KS 66506. It is expected that offers will begin on December 14, 1993, but applications for positions will be reviewed until February 1, 1994, or until positions are closed. Kansas State University is an Affirmative Action/Equal Opportunity Employer.

LAWRENCE BERKELEY LABORATORY - CENTER FOR FUNCTIONAL IMAGING - NIH/NRSA postdoctoral position available to engage in mathematical and statistical analysis of data from PET (positron emission tomograph) and PET (single photon emission tomograph) machines. A recent Ph.D. in a relevant field is required. Appropriate fields include Mathematics, Biophysics, Computer Science, Bioengineering, or Physics. Programming experience with the UNIX operating system and the X window system is desirable. U.S. citizenship or permanent resident status required. Send resume and names of three references to: Dr. Ronald H. Huesman, c/o Lawrence Berkeley Laboratory, Staffing Office, Box #PAWM1691, Bldg. 938A, Berkeley CA 94720. Lawrence Berkeley Laboratory is an Equal Opportunity Employer. Women and minorities are encouraged to apply.

MACALESTER COLLEGE - MATHEMATICS AND COMPUTER SCIENCE DEPARTMENT - Applications are invited for a position at the rank of either associate professor or full professor in Mathematics to begin in the fall of 1994. Candidates must have experience in teaching a broad assortment of undergraduates courses, a solid and ongoing scholarly record, familiarity with the integration of computing into mathematics, and a commitment to teaching and research in an undergraduates liberal arts college. While applications in all fields will be considered, our department has a special need for someone in the areas of dynamical systems or a branch of geometry. Located in a pleasant residential neighborhood of the culturally rich twin cities of St. Paul and Minneapolis, Macalester has a student body of 1,800, 9% of whom are international and 13% of whom are American minorities. Part of a vigorous science division on campus, the Math and Computer Science Department has traditionally attracted strong students. Applicants should send a resume and a statement detailing their ideas for curricular and scholarly leadership in a combined math and computer science department in a liberal arts environment. They should also arrange for three letters of reference to be sent to: Wayne Roberts, Macalester College, Department of Mathematics and Computer Science, 1600 Grand Avenue, St. Paul, MN 56105. Evaluation of applications will begin on November 1 and will continue until the position is filled. Macalester is an Affirmative Action/Equal Opportunity Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - One or two assistant professor or higher levels in applied mathematics will probably become available in fall 1994 for persons typically about two or more years beyond their doctorates. This time we are looking especially for unusual new talent in the areas of **computation** and/or **statistics**. For further information, write to: Committee of Applied Mathematics, Room 2-345, Department of Mathematics, Massachusetts Institute of Technology, Cambridge, MA 02139-4307. M.I.T. is an Equal Opportunity/Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics may make a few appointments at the assistant professor or higher levels in pure mathematics for the year 1994-1995. The teaching load will be six hours per week in one semester and three hours per week in the other, or other combinations totaling nine hours. Open to mathematicians with doctorates who show definite promise in research. Applicants please send (a) a vitae; (b) a description of your most recent research; and (c) the research that you plan for the next few years, to: Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, Cambridge, MA 02139-4307. M.I.T. is an Equal Opportunity/Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - C.L.E. MOORE INSTRUCTORSHIPS IN MATHEMATICS - Open to mathematicians with doctorates who show definite promise in research. Teaching loads are six hours per week during one semester, and three hours per week during the other, in order that the appointees may have ample time for research. Please send (a) a vitae; (b) three letters of reference; (c) a description of the research in your thesis; and (d) the research which you plan for next year to: Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, Cambridge, MA 02139-4307. M.I.T. is an Equal Opportunity/Affirmative Action Employer.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - A limited number of instructorships in applied mathematics are available for recent Ph.D.'s. Appointments will be made mainly on the basis of superior research potential. Applications should be completed by February 15, 1994 and our decisions will be announced in the early spring. For further information, write to: Committee of Applied Mathematics, Room 2-345, Department of Mathematics, Massachusetts Institute of Technology, Cambridge, MA 02139-4307. M.I.T. is an Equal Opportunity/Affirmative Action Employer.

MEMPHIS STATE UNIVERSITY - DEPARTMENT OF MATHEMATICAL SCIENCES - The Department of Mathematical Sciences is seeking to fill the position of Chair of Excellence (Endowed Chair) in Combinatorics. The Chair will have limited teaching responsibilities, but will be expected to maintain an internationally recognized research program, supervise doctoral students, obtain outside funding, provide leadership for the existing graph theory/combinatorial research group, and attract outstanding faculty and graduate students to the Department. The Department has excellent in-house library and computing facilities and offers degrees at all levels through the Ph.D. There is substantial support for travel and for hosting visiting collaborators. Review of applications will begin on December 1, 1993. Applications will continue to be accepted until the position is filled. Women and minorities are strongly urged to apply. Successful candidates must be U.S. citizens or meet the Immigration Reform Act criteria. Applications, including a curriculum vitae, and nominations should be submitted to: Search Committee, Chair of Excellence, Department of Mathematical Sciences, Memphis State University, Memphis, TN 38152. Memphis State is an Equal Opportunity/Affirmative Action University.

MICHIGAN STATE UNIVERSITY - DEPARTMENT OF STATISTICS AND PROBABILITY - The Department of Statistics and Probability at Michigan State University has a tenure track Assistant Professorship available beginning August 16, 1994. The candidates should have a Ph.D. in the field of statistics and/or probability and a strong research and teaching potential. Please have a curriculum vitae and three reference letters sent to: Professor Habib Salehi, Chairperson, Michigan State University, Department of Statistics and Probability, East Lansing, MI 48824-1027. Selection process will begin December 1, 1993, and continue until the position is filled. MSU is an Affirmative Action/Equal Opportunity Institute. Minorities and women are strongly encouraged to apply.

MICHIGAN TECHNOLOGICAL UNIVERSITY - MATHEMATICAL SCIENCES DEPARTMENT - Mathematics Education - The Mathematical Science Department at Michigan Technological University is seeking applications for a tenure track position beginning August 29, 1994. Applicants should have a Ph.D. or Ed.D in Mathematics Education with a strong background in Mathematics. The successful candidate is expected to have a sufficient background in Mathematics to teach such courses as geometry, calculus and other selected undergraduate math courses; and a sufficient background in Education to teach such courses as math methods, computers in education, and measurement & evaluation. Teaching experience at the secondary level is preferred. A commitment to quality teaching and to the development of an active research program in mathematics education is necessary. Send curriculum vitae, transcript and 3 letters of recommendation to: Alphonse Baartmans, Head, Department of Mathematical Sciences, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931-1295. Review of applications will begin on December 1, 1993. Applications will be accepted until the positions are filled. MTU is an Equal Opportunity Educational Institution/Equal Opportunity Employer. Applications are especially invited from minorities, women an physically challenged individuals.

MILLERSVILLE STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Full-time, tenure-track assistant professorship to begin August 1994, in a department of 19 faculty and 250 majors in mathematics and mathematics education. Area of expertise in Applied Analysis. Duties include 12 semester hour teaching load, scholarly activity, student advisement, curriculum development, and committee work. Ph.D. degree (or completion within one year) in mathematics is required. Must exhibit evidence of strong commitment to teaching and scholarly activity, and must be prepared to teach a broad spectrum of undergraduate courses, from college algebra through ordinary and partial differential equations and numerical analysis. Evidence of teaching effectiveness is the primary consideration. Interest in using technology in the classroom is desirable. Salary/benefits are excellent. Send application letter, vitae, copies of all transcripts, and three letters of reference (at least two of which attest to recent teaching effectiveness) to: Prof. Robert T. Smith, Staff Search Committee, Department of Mathematics, Millersville University, Millersville, PA 17551. To assure full consideration application should be received by February 15, 1994. Millersville University is an Affirmative Action/Equal Opportunity Employer.

NEW MEXICO STATE UNIVERSITY - DEPARTMENT OF MATHEMATICAL SCIENCES - The Department invites applications for tenure-track and visiting positions in pure and applied mathematics and statistics for academic year 1994-95. New tenure-track positions will be primarily at the assistant professor level; however, appointments at a higher rank may be possible. Strong commitments to research and teaching are required. The department has 32 tenure-track positions, and offers B.S., M.S. and Ph.D. degrees. To receive consideration for tenure-track positions, applications must be received by December 15, 1993. An application consists of a vitae, short research description, and at least three letters of reference, which address both the applicants research and teaching. The letter of application should identify areas of active research and interest in a tenure-track or visiting appointment. Information should be sent to: Hiring Committee, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM 88003. Applications are kept on file through the hiring period and positions are filled as openings occur. New Mexico State University is an Equal Opportunity/Affirmative Action Employer.

NORTHWESTERN UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for one or more anticipated tenure-track positions starting September 1994. Priority will be given to young, exceptional research mathematicians; however, more senior candidates with very exceptional credentials may be considered for a tenured position. Fields of interest within the department include Algebra, Analysis, Dynamical Systems, Probability, Partial Differential Equations, and Topology. Northwestern is an Affirmative Action/Equal Opportunity Employer committed to fostering a diverse faculty; women and minority candidates are especially encouraged to apply. Candidates should arrange that at least three letters of recommendation be sent to: Prof. J. Sally, Chair, Personnel Committee, Department of Mathematics, Northwestern University, 2033 Sheridan Road, Evanston, Illinois 60208-2730. Alternatively, applications and supporting documentation can be sent via e-mail to: "hiring@math.nwu.edu." In order to receive full consideration, applications should be received by January 1, 1994. Hiring is contingent upon eligibility to work in the United States.

OHIO STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics of The Ohio State University hopes to have available several junior positions, both temporary and tenure track, effective Autumn Quarter 1994. Candidates in all areas of applied and pure mathematics are invited to apply. Significant mathematical research accomplishments or exceptional promise, and evidence of good teaching ability, will be expected of successful applicants. Please send credentials and have at least three letters of recommendation sent to: Professor Dijen Ray-Chaudhuri, Department of Mathematics, The Ohio State University, 231 W. 18th Avenue, Columbus, Ohio 43210. Review of resumes will begin immediately. The Ohio State University is an Equal Opportunity/Affirmative Action Employer. Qualified women and minority candidates are encouraged to apply.

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POMONA COLLEGE - DEPARTMENT OF MATHEMATICS - Pomona College seeks applicants for a tenure track position, at the assistant professor level. Candidates from all fields of mathematics will be considered. The strongest candidates will have post-doctoral experience and be excited about teaching our culturally and intellectually diverse student body, of which about a third of the mathematics majors are women. They should also be committed to continuing a strong research program. Send application materials to: The Search Committee, Department of Mathematics, Pomona College, Claremont, CA 91711-6348. Include a curriculum vitae and 3 letters of recommendation (which include evaluations of teaching), graduate school transcripts, and a description, written for the non-specialist, of research accomplishments and plans. Applications will be reviewed starting January 7, 1994. Let us know if you will be at the January AMS meeting. We especially encourage applicants from traditionally under-represented groups. Pomona College is an Affirmative Action/Equal Opportunity Employer.

PURDUE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Several tenure-track or two-year research assistant professorships beginning August 1994. Ph.D. by August 1994, exceptional research promise, and excellence in teaching required. Possible positions at the Associate Professor/Professor level beginning August 1994. Ph.D. and excellent research credentials required. All applicants should mention at least one Purdue faculty member with whom they expect to have common research interest. Send resume and three letters of recommendation (for assistant professorships, at least one should address teaching) by January 10, 1994 to: Leonard Lipshitz, Head, Department of Mathematics, Purdue University, West Lafayette, IN 47907-1395. Purdue University is an Affirmative Action/Equal Opportunity Employer.

RICE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Griffith Conrad Evans Instructorships - Postdoctoral appointments for two to three years for promising research mathematicians with research interests in common with the active research areas at Rice, particularly geometric topology, geometric analysis, differential geometry, mathematical physics and ergodic theory. Duties will include research and classroom teaching. Applications received by December 31, 1993 will receive full consideration. Rice University is an Equal Opportunity/Affirmative Action Employer and strongly encourages applications from women and minority group members. Inquiries and applications should be addressed to: Chair, Evans Committee, Department of Mathematics, Rice University, P.O. Box 1892, Houston, TX 77251-1892.

SOUTHERN ILLINOIS UNIVERSITY @ CARBONDALE- DEPARTMENT OF MATHEMATICS - Numerical Analysis Position - Applications are invited from qualified candidates for a tenure-track position at the assistant professor level beginning on August 16, 1994. Ph.D. in mathematics with specialization in numerical analysis required. Candidates must have demonstrated excellence in research or potential for such. Evidence of teaching effectiveness is required (foreign applicants must provide evidence of ability to teach in English effectively). Send letter of application, resume, and three letters of recommendation to: Numerical Analysis, c/o Ronald B. Kirk, Chair, Department of Mathematics, Southern Illinois University at Carbondale, Carbondale, IL 62901. The closing date for applications is December 10, 1993 or until the position is filled. SIUC is an Equal Opportunity/Affirmative Action Employer. Women and minorities are particularly encouraged to apply.

SOUTHERN ILLINOIS UNIVERSITY @ CARBONDALE - DEPARTMENT OF MATHEMATICS - Topology Position - Applications are invited from qualified candidates for a tenure-track position beginning August 16, 1994. The rank will be at the assistant or associate professor level depending on qualifications of the candidate. A Ph.D. in mathematics with specialization in topology - preferably algebraic topology - is required. Candidates must have demonstrated excellence in research or potential for such, and must be qualified to teach graduate level courses in algebraic topology. Evidence of teaching effectiveness is required (foreign applicants must provide evidence of ability to teach in English effectively). Send letter of application, resume, and have three letters of recommendation sent to: Topology Position, c/o Ronald B. Kirk, Chair, Department of Mathematics, Southern Illinois University at Carbondale, Carbondale, IL 62901. The closing date for applications is December 10, 19993 or until the position is filled. SIUC is an Equal Opportunity/Affirmative Action Employer. Women and minorities are particularly encouraged to apply.

ST. LAWRENCE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track position beginning September 1994, pending final administrative approval. A Ph.D. in one of the mathematical sciences, evidence of research potential, and a strong commitment to teaching undergraduates in a liberal arts setting are required. Computer expertise is desirable, but not required. Teaching load is three courses per semester. In addition to a regular mathematics major, the department supports combined majors in mathematics/economics and mathematics/computer science, and minors in applied statistics and computer science. Departmental research interest include: algebraic geometry, functional analysis, graph theory, Lie algebras, logic and set theory, mathematical programming, nonlinear waves, statistics, and summability. St. Lawrence University is an independent, coeducational liberal arts college located in Northern New York State between the Adirondack Mountains and the St. Lawrence River. All first year students at St. Lawrence University participate in a First Year Program which is an interdisciplinary, team-taught core course which emphasizes the development of writing skills and critical thinking. Teaching in this program is an option for St. Lawrence faculty. Applications from candidates who are interested in teaching in the First Year Program should address their qualifications for participation in this program. Review of applications will begin January 15, 1994. A resume, three letters of recommendation, and a statement of teaching philosophy should be sent to: Dr. Patti Frazer Lock and Dr. Dante Giarrusso, Co-Chairs, Search Committee, Department of Mathematics, St. Lawrence University, Canton, NY 13617-1111. St. Lawrence University is committed to fostering mulicultural diversity in its faculty, staff, student body and programs of instruction. As an Equal Opportunity/Affirmative Action Employer, we specifically encourage applications from women, persons of color, and the disabled.

TENNESSEE TECHNOLOGICAL UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track position at the rank of Assistant Professor, available August 1994. Ph.D. in the area of mathematical statistics with a background in both theory and methodology, evidence of excellent teaching ability at all levels, and strong interest in research are required. Duties include teaching undergraduate and graduate courses, directing graduate students, engaging in research activities, and participating in course development. Initial screening of applications will begin on January 15, 1994 but the position will remain open until filled. Send transcript and curriculum vitae, and have three letters of recommendation sent to: Dr. B. M. O'Connor, Search Committee Chairperson, Department of Mathematics, Box 5054, Tennessee Technological University, Cookeville, TN 38505. Tennessee Technological University is an Affirmative Action/Equal Opportunity/ADA Employer.

TRINITY COLLEGE - DEPARTMENT OF MATHEMATICS - The Department of Mathematics at Trinity College anticipates authorization to search for an assistant professor to fill a one-year position, academic year 1994-1995. If granted, the position may be twice renewable, pending approval. The teaching load is five courses per year (3/2). Requirements: Ph.D. in mathematics and ABD and strong evidence of teaching interests, three letters of reference (at least one of which addresses teaching), and one self-addressed, stamped envelope to: Search Committee Chair, Department of Mathematics, Trinity College, Hartford, CT 06106. We will review applications as they are received, and anticipate filling the position by late March. Trinity College is an Equal Opportunity/Affirmative Action Employer. Women and members of minority groups are especially encouraged to apply.

TUFTS UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for one tenure-track position at the rank of Assistant Professor, starting September 1, 1994. A Ph.D. in mathematics with specialization in numerical analysis is required. Applicants must show promise of strong research and will be expected to excel in teaching, especially at the introductory level. The teaching load will be two courses per semester. Please have a curriculum vitae and have three letters of recommendation sent by February 15, 1994 to: Todd Quinto, Search Committee Chair, Department of Mathematics, Tufts University, Medford, MA 02155. As an Affirmative Action/Equal Opportunity Employer, Tufts encourages women and minority candidates to apply.

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UNIVERSITY OF ALABAMA @ BIRMINGHAM - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure track position at the junior level to begin January 1994. Applicants should have strong research potential as well as a commitment to teaching undergraduate and graduate students. Applicants with post-doctoral experience are especially welcome. Preference will be given to candidates whose research is compatible with that of our current faculty: this includes dynamical systems, differential geometry, mathematical physics, nonlinear analysis, partial differential equations including numerical p.d.e., and topological dynamics. To apply please send a curriculum vitae, selected reprints, and at least three letters of reference. Send applications to the following address: Search Committee, Department of Mathematics, University of Alabama at Birmingham, Birmingham, AL 35294-1170. University of Alabama at Birmingham is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF CALIFORNIA, LOS ANGELES - DEPARTMENT OF MATHEMATICS - Temporary Positions - Subject to availability of resources and administrative approval: **(1) One E. R. Hedrick Assistant Professorship**. Applicants must show very strong promise in research and teaching. Salary $39,600. Three year appointment. Teaching load: four quarter courses per year, which may include one advanced course in the candidate's field. Preference will be given to applications completed by January 1, 1994. **(2) One or two Research Assistant Professorships** in Computational and Applied Mathematics. Applicants must show very strong promise in research and teaching. Salary $39,600. One year appointment, probably renewable up to two times. Teaching load: at most four quarter courses per year, which may include one advanced course in the candidate's field. Preference will be given to applications completed by January 1, 1994. **(3) One Adjunct Assistant Professorship or Lectureship in the Program in Computing (PIC)**. (a) Applicants in the first category must show very strong promise in teaching and research, preferably in an area related to computing. Teaching load: four quarter programming courses and an advanced quarter course of the candidate's choice per year. One year appointment, probably renewable once. Salary range $39,600 - $47,000. (b) Applicants for the Lectureship must show very strong promise in the teaching of programming. M.S. in Computer Science or equivalent degree preferred. Teaching load: six quarter programming courses per year. One-year appointment, probably renewable one or more times, depending on the needs of the program. Salary is based on experience and begins at $34,248. Preference will be given to applications completed by February 1, 1994. **(4) An Adjunct Assistant Professorship**. One year appointment, probably renewable once. Strong research and teaching background required. Salary $35,900 - 40,500. Teaching load: five quarter courses per year. **(5) Possibly one or more positions for visitors**. To apply, send electronic mail to: search@math.ucla.edu or write to: Thomas M. Liggett, Chair, Department of Mathematics, University of California, Los Angeles, CA 90024-1555, Attn: Staff Search. UCLA is an Equal Opportunity/ Affirmative Action Employer.

UNIVERSITY OF CINCINNATI - CHARLES PHELPS TAFT POSTDOCTORAL FELLOWSHIPS - The award carries an annual stipend of $25,000 (September-August). Additional funds to defer moving and research-related expenses are available and single coverage health insurance in included. Deadline is January 15, 1994. The application must include a plan of research, a vitae, and three letters of reference. Send the above information to: Taft Postdoctoral Fellowships, University of Cincinnati, ML #0627, Cincinnati, OH 45221-0627.

UNIVERSITY OF FLORIDA - DEPARTMENT OF MATHEMATICS - Applications are invited for at least two tenure track positions in Mathematics in the following areas: (1) applied mathematics with emphasis in numerical analysis, partial differential equations and optimization; (2) harmonic analysis; (3) algebraic number theory and algebraic geometry. Truly outstanding candidates in other fields may be considered, but the Department will give preference to candidates in these fields. Appointments commence in August 1994. Junior applicants must show strong research promise, and senior applicants should have demonstrated leadership in research. Applicants will be expected also to excel in teaching undergraduate mathematics courses. Applicants should forward a curriculum vitae and a list of publications to: Chair of Search Committee, Department of Mathematics, University of Florida, Gainesville, FL 32611-2082. Applicants should supply evidence of commitment to teaching and arrange for at least three letters of recommendations to be forwarded to the address above. The University of Florida is an Affirmative Action Employer, and the Department especially welcomes applications from women and minority candidates. Full considerations will be given to candidates whose materials arrive by December 15, 1993.

UNIVERSITY OF ILLINOIS @ URBANA-CHAMPAIGN - DEPARTMENT OF MATHEMATICS - Applications are invited for one or more junior assistant professor (tenure-track) faculty positions to commence August 1994. We are particularly interested in hiring in the area of applied mathematics, but outstanding candidates in all fields of mathematics are encouraged to apply and will be seriously considered. Salary and teaching load are competitive. Candidates must have received the Ph.D. on or after January 1, 1990 and must have completed the Ph.D. by the time the appointment begins. Candidates should send a letter of application, curriculum vitae and publication list, and arrange to have three letters of reference sent directly to the address below. Area of research should be identified using the 2-digit Mathematical Reviews subject classifications scheme. Send to: Gerald J. Janusz, Chair, Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 W. Green Street, Urbana, Illinois 61801, tel. (217) 333-3352. e-mail: search@math.uiuc.edu. In order to ensure full consideration, all application materials including letters of reference should be received by December 10, 1993. Interviews may be conducted prior to December 10, but all completed applications received by that date will receive full consideration. Candidates are expected to present evidence of excellence, or potential for excellence, in research and teaching. Applications from women and minority candidates are especially encouraged. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF IOWA - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for the following positions: **(1) Tenure-track assistant or beginning associate professorships**, starting in August 1994, in the broadly interpreted areas of Analysis, Computational Mathematics, or Geometry. Selection will be based on evidence of outstanding research accomplishments or potential, and teaching ability. A Ph.D. or equivalent training is required. **(2) Pending availability of funds, one or more visiting positions** for all or part of the 1994-95 academic year. Selection will be based on research expertise and teaching ability. Preference will be given to applicants whose scholarly activity is of particular interest to members of the current faculty. Women and minority candidates are especially urged to apply for the above positions. The University of Iowa welcomes the employment of professional couples on its faculty and staff, permits the appointment of faculty couples. Formal screening will begin December 7, 1993; applications will be accepted until the positions are filled. To apply, send a complete vitae and have three letters of recommendation sent to: Professor Richard Randell, Chair, Department of Mathematics, University of Iowa, Iowa City, Iowa 52242. The University of Iowa is an Equal Employment Opportunity and Affirmative Action Employer.

UNIVERSITY OF KANSAS - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track position at the assistant professor level and for a visiting position at the assistant professor level (pending funding) beginning August 16, 1994, or as negotiated. For the tenure-track position, preference will be given to candidates first in numerical analysis or stochastic adaptive control, then to candidates whose specialties mesh well with those already represented in the department, then to all other areas of mathematics. For the visiting position, preference will be given to candidates whose research interests mesh well with those of our faculty. Candidates must have a Ph.D. or its requirements completed by August 15, 1994. Postdoctoral experience for tenure-track position is preferred but optional. Application, detailed resume with description of research, and three recommendation letters should be sent to: C. J. Himmelberg, Chairman, Department of Mathematics, 405 Snow Hall, University of Kansas, Lawrence, KS 66045-2142. Deadlines: Review of applications will begin on December 1, 1993 and will continue until the positions are filled. The University of Kansas is an Equal Opportunity/Affirmative Action Employer.

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UNIVERSITY OF MARYLAND, BALTIMORE COUNTY CAMPUS - DEPARTMENT OF MATHEMATICS AND STATISTICS - The Department of Mathematics and Statistics at the University of Maryland, Baltimore County has been authorized to recruit for a tenure track assistant professor position for the fall of 1994. The department has strengths in control theory and optimization, ordinary and partial differential equations and mathematical modeling, numerical analysis and scientific computing, as well as probability theory and statistics, and seeks strong applicants in these or any other related field. Interested candidates should send a curriculum vitae, list of publications, and three letter of reference to: James M. Greenberg, Chair, Department of Mathematics and Statistics, University of Maryland, Baltimore County, Baltimore, MD 21228-5398. Applicants will be considered until a suitable candidate is found. The University is an Equal Opportunity Employer and specifically invites applications from women, minorities, and disabled persons.

UNIVERSITY OF MARYLAND, COLLEGE PARK - DEPARTMENT OF MATHEMATICS - Applications are invited for possible tenure or tenure track positions in all areas of mathematics (pure, applied, and mathematical statistics) to begin in August 1994. Rank and salary depend on qualifications. Joint appointments with other units, in particular with the Institute for Physical Sciences and Technology, are possible. Exceptionally strong research program necessary. The deadline for receipt of applications is February 1, 1994. Early application is encouraged since the evaluation and selection process will begin before this date. Vitae, description of current research and at least three letters of recommendation should be sent to: Professor Raymond L. Johnson, Chairman, Department of Mathematics, University of Maryland, College Park, MD 20742. The University of Maryland is an Equal Opportunity/Affirmative Action Employer.

UNIVERSITY OF MICHIGAN - DEPARTMENT OF MATHEMATICS - The University of Michigan expects to have at least two T.H. Hildebrandt Research Assistant Professorships. Three-year appointment, reduced teaching load. Also expect to have several 3-year terminal assistant professorships. Preference given to persons of any age having the Ph.D. degree less than two years, with a research interest in common with senior faculty. Applicants should have a strong research program and serious commitment to teaching. Salary competitive. Non-discriminatory Affirmative Action Employer. Starting date: September 1994. Send application to: Professor D. J. Lewis, Chairman, Department of Mathematics, University of Michigan, Ann Arbor, MI 48109-1003. E-mail: math.chair@umich.edu. Application deadline is January 3, 1994.

UNIVERSITY OF MICHIGAN - DEPARTMENT OF MATHEMATICS - The University of Michigan expects to have up to six tenure eligible positions including several as part of an interdisciplinary/applied initiative. Besides the initiative, searching broadly for individuals who would significantly broaden and strengthen areas currently represented and who cut across areas. Exceptional research and teaching experience required. Rank determined by experience. Salary negotiable. Non-discriminatory Affirmative Action Employer. Starting date: September 1994. Send application to: Professor D. J. Lewis, Chairman, Department of Mathematics, University of Michigan, Ann Arbor, MI 48109-1003. E-mail: math.chair@umich.edu. Applicants considered on a continuing basis.

UNIVERSITY OF MINNESOTA - SCHOOL OF MATHEMATICS - Several temporary or visiting positions at all levels from Assistant to Full Professor may be available for terms ranging from one quarter to two years beginning September 1994. Ph.D. or equivalent degree in mathematics by beginning date of appointment, strong research and teaching abilities are required. Preference will be given to applicants whose research interests are compatible with those of the School. Salary competitive. Consideration of applications will begin December 1, 1993. Contact: Eugene Fabes, Head, School of Mathematics, University of Minnesota, 206 Church Street S.E., 127 Vincent Hall, Minneapolis, MN 55455. The University of Minnesota is an Equal Opportunity Educator and Employer.

UNIVERSITY OF MINNESOTA - SCHOOL OF MATHEMATICS - The School of Mathematics may have available one or more tenure track Assistant Professor or tenured Associate or Full Professor positions starting Fall 1994. Ph.D. or equivalent degree in mathematics by the beginning date of appointment, outstanding research and teaching abilities are required. Applications at all levels are invited, but preference will be given to candidates whose research interests are compatible with those of the School. Salary competitive. Consideration of applications will begin December 1, 1993. Contact: Eugene Fabes, Head, School of Mathematics, University of Minnesota, 206 Church Street S.E., 127 Vincent Hall, Minneapolis, MN 55455. The University of Minnesota is an Equal Opportunity Educator and Employer.

UNIVERSITY OF MINNESOTA - SCHOOL OF MATHEMATICS - Dunham Jackson Instructorship - This is a three-year appointment from Fall 1994 to Spring 1997 with a teaching load of one course per quarter. Outstanding research and teaching abilities required. Preference will be given to candidates whose research interests are compatible with those of the School. Candidates should have received a Ph.D. or equivalent degree in mathematics no earlier than Jan. 1, 1993, and no later than Sept. 15, 1994. Summer School teaching may be available during summer of 1995 and 1996 to supplement regular stipend. Salary competitive. Consideration of applications will begin December 1, 1993. Contact: Eugene Fabes, Head, School of Mathematics, University of Minnesota, 206 Church Street S.E., 127 Vincent Hall, Minneapolis, MN 55455. The University of Minnesota is an Equal Opportunity Educator and Employer.

UNIVERSITY OF MINNESOTA - SCHOOL OF MATHEMATICS - Temporary Assistant Professor, Mathematics and Mathematics Education, for recent Ph.D.s interested in working in mathematics education in a major mathematics department. Areas include graduate training, undergraduate curriculum reform, programs for mathematically gifted secondary school students, and networking. 9-month appointment, non-tenure track, 2-year initial period, renewable for up to 2 additional years. Work with the University's Talented Youth Mathematics Program (UMTYMP), departmental initiatives, and various networking grants. Projected academic year salary $31,000-$33,000. Summer appointments may be available. Responsibilities: Teaching in the UMTYMP calculus component. Work with the Director on K-12 and undergraduate curriculum development, innovative graduate programs and activities, and systemic networking projects. Conduct research with the Director and staff leading to publications. Qualifications: Ph.D. degree in mathematics by beginning of appointment. Teaching experience at the undergraduate level required. Research experience in educationally related programs, especially with undergraduate curriculum development or innovative educational programs for talented secondary school students desirable. Send curriculum vitae, 3 letters of recommendation (including at least one letter on teaching and educational experiences), and statement of interest and background to: Dr. Harvey Keynes, School of Mathematics, University of Minnesota, 206 Church Street S.E., 127 Vincent Hall, Minneapolis, MN 55455. The University of Minnesota is an Equal Opportunity Educator and Employer.

UNIVERSITY OF MISSOURI - DEPARTMENT OF MATHEMATICS - Applications are invited for one tenure-track position at the rank of assistant professor beginning in August of 1994. The position requires a Ph.D. in Mathematics, quality teaching, and a distinguished research career. Selections for the position will be based primarily on demonstrated research achievement in hormonic analysis. Send a curriculum vitae along with a letter of application (include E-mail address) and arrange for three letters of recommendation to be sent to: Elias Saab, Chair, Department of Mathematics, University of Missouri, Columbia, MO 65211. E-mail: MATHUMC@MIZZOU1.MISSOURI.EDU. The application deadline is December 31, 1993, or until the position is filled thereafter. Applications received after February 1, 1994 cannot be guaranteed consideration. The University of Missouri is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF PENNSYLVANIA - DEPARTMENT OF MATHEMATICS - We anticipate that commencing July 1, 1994, there may be one or more tenure positions available in the following areas: algebra, analysis, geometry/topology and discrete mathematics. These positions are for candidates with outstanding, internationally recognized research achievements who are successful teachers of undergraduate and graduate students. Rank and salary will depend upon experience. Write to: Personnel Committee, Department of Mathematics, University of Pennsylvania, Philadelphia, PA 191046395. The University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer.

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UNIVERSITY OF PENNSYLVANIA - DEPARTMENT OF MATHEMATICS - Several positions will be available beginning July 1, 1994. Candidates should have strong research credentials and be recognized as potentially successful teachers of undergraduate and graduate students. Send resume and three letters of reference to: Personnel Committee, Department of Mathematics, University of Pennsylvania, Philadelphia, PA 19104-6395. These are due by December 15, 1993. The University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer.

UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CALIFORNIA - The Department of Mathematics anticipates several tenure-track or possibly tenured positions at the Assistant and/or Associate Professor level. Applicants must show strong research promise and possess excellent communications skills for teaching undergraduate mathematics courses. Visiting positions (at all levels) and postdoctoral appointments will also be available. To apply, please submit the following materials in a single package: letter of application (including your e-mail address and fax number), and a curriculum vitae. Candidates for junior positions should also provide at least three letters of recommendation. Mail application to: Chair of Appointments Committee, Department of Mathematics DRB 155, University of Southern California, Los Angeles CA 90089-1113. USC is an Equal Opportunity/Affirmative Action Employer. Women and minorities are especially encouraged to apply.

UNIVERSITY OF TENNESSEE @ CHATTANOOGA - DEPARTMENT OF MATHEMATICS - Department Head - The Department of Mathematics invites applications for the Head of the Department of Mathematics. A Ph.D. in a Mathematical Science, at least five years of college mathematics teaching experience, and qualifications commensurate with the rank of Associate Professor or higher are required. Applicants should provide evidence of leadership in curriculum development, teaching, public service and research/scholarly activities. In this primarily undergraduate institution, the faculty is expected to exhibit excellence in teaching while maintaining a strong commitment to research and public service. The mathematics department has 23 faculty members including a Chair of Excellence in Applied Mathematics. Located in a very scenic metropolitan area of 400,000, UTC has a student enrollment of 8,300. Send applications to: Dr. DeWayne S. Nymann; Chair of the Search Committee, Department of Mathematics, University of Tennessee at Chattanooga, Chattanooga, TN 37403-2598. Screening of applicants' credentials will begin on January 3, 1994, and will continue until the position is filled. Women and minorities are encouraged to apply. UTC is an Equal Opportunity Employment/Affirmative Action/Title IX/Section 504/ADA Institution.

UNIVERSITY OF TENNESSEE @ KNOXVILLE - DEPARTMENT OF MATHEMATICS - The Mathematics Department of the University of Tennessee, in an effort to significantly improve its research position, seeks to fill a tenure-track assistant or beginning associate professorship in numerical mathematics. A Ph.D. is required. Some postdoctoral experience is preferred. Candidates should be well versed in the core areas of Numerical Analysis with research interests in the numerical solution of differential equations. Preference will be shown to those candidates working in numerical fluid dynamics. Employment begins August 1, 1994. Substantial research promise as well as dedication to teaching are paramount. Interested applicants should arrange to have a vitae, three reference letters, and a research statement sent to: Professor John B. Conway, Mathematics Search, University of Tennessee, Knoxville, TN 37996-1300. (recruit@novell.math.utk.edu) Review of applications will begin December 1, 1993 and will continue until the position is filled. UTK is an Equal Opportunity/Affirmative Action/Title IX/Section 504/ADA Employer.

UNIVERSITY OF TEXAS @ AUSTIN - DEPARTMENT OF MATHEMATICS - Openings for Fall 1994 will definitely include several positions at the Instructor level and may include one at the tenure-track/tenure level. Instructorships at The University of Texas at Austin are postdoctoral appointments, renewable for two additional years. It is assumed that applicants for Instructorships will have completed all Ph.D. requirements by August 31, 1994. Preference will go to recent Ph.D. recipients, meaning to those at most one or two years beyond their doctorates. Candidates should show superior research ability and have a strong commitment to teaching. Consideration will be given only to persons whose research interests have some overlap with those of the permanent faculty. Duties consist of teaching undergraduate or graduate courses and conducting independent research. The projected salary is $32,500 for the nine-month academic year. An applicant for a tenure-track position must present a record of outstanding achievement in her or his research area and must demonstrate a proficiency at teaching. In addition to the duties indicated above for Instructor, such an appointment will typically entail the supervision of M.A. or Ph.D. students. The salary will be commensurate with the level at which the position is filled and the qualifications of the individual who fills it. Those wishing to apply are asked to send a vitae and a brief research summary to: Department of Mathematics, The University of Texas @ Austin, Austin, TX 78712 c/o Recruiting Committee. Transmission of the preceding items via e-mail (address: recruit@math.utexas.edu) is encouraged. Applications must be supported by three or more letters of recommendation, at least one of which speaks to the applicant's teaching credentials. The screening of applications will begin on December 1, 1993. The University of Texas at Austin is an Equal Opportunity Employer. Qualified women and minority group member are urged to apply.

UNIVERSITY OF WASHINGTON - DEPARTMENT OF MATHEMATICS - One or more tenure-track positions and one or more nontenure-track positions may be filled, subject to budgetary approval. Applicants should have the Ph.D. degree and be highly qualified for undergraduate and graduate teaching and independent research. Applications, including a curriculum vitae, statement of research and teaching interests, and three letters of recommendation, should be sent to: Chairman of Appointments Committee, Department of Mathematics GN-50, University of Washington, Seattle, WA 98195. Priority will be given to applications received before February 1, 1994. The University of Washington is an Affirmative Action/Equal Opportunity Employer. It is building a multicultural faculty and strongly encourages applications from female and minority candidates. Preference will be given to applicants who can serve well an increasingly diverse University community.

UNIVERSITY OF WATERLOO - DEPARTMENT OF PURE MATHEMATICS - The Department of Pure Mathematics at the University of Waterloo invites applications for a tenure-track position at the Assistant Professor level starting July 1, 1994. The Department is particularly interested in candidates whose research interests are related to Algebraic Topology, Differential Geometry, Functional Analysis or Number Theory. In order to be considered for the position, a Ph.D. is required. An appointment will be offered only to someone with very strong research and teaching qualifications. The University of Waterloo is committed to increasing the number of its female faculty, and therefore applications from women mathematicians are particularly welcome. Duties will include research, and teaching at all levels. Salary will depend on the candidate's qualifications. The closing date for applications is January 15, 1994. An application should contain the curriculum vitae of the candidate plus three letters of reference sent directly from the referees. In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents. The University of Waterloo encourages applications from qualified women and men, members of visible minorities, native peoples and persons with disabilities. The availability of this position is subject to budgetary approval. Please send applications to: Dr. J. W. Lawrence, Chair, Department of Pure Mathematics, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1.

VANDERBILT UNIVERSITY - DEPARTMENT OF MATHEMATICS - We anticipate three two-year openings at the Assistant Professor level beginning Fall 1994. These non-tenure-track positions are intended for recent Ph.D. recipients with demonstrated research potential and strong communication skills who would like to spend time in a department with a vigorous research atmosphere. To apply, send the following materials in a single mailing by December 15, 1993 to: Professor Constantine Tsinakis, Chair, Department of Mathematics, Vanderbilt University, Nashville, TN 37240 [letter of application (with e-mail address, if available), curriculum vitae and brief research summary]. It is essential for candidates to identify in their letter of application specific research areas in our department which match their research interests. Additional information, including letters of recommendation, will be requested from selected candidates after an initial screening. Only solicited letters of recommendation will be considered. Vanderbilt University is an Equal Opportunity/Affirmative Action Employer.

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VANDERBILT UNIVERSITY - DEPARTMENT OF MATHEMATICS - We anticipate a tenure-track opening at the Assistant Professor level beginning Fall 1994. This position carries an initial three-year appointment and requires a Ph.D. in mathematics or computer science. It is intended for a specialist in computer related mathematics, approximation theory, or computer aided design whose primary research involves computing. Outstanding research potential and evidence of effective teaching are required. To apply, send the following materials in a single mailing to: Professor Constantine Tsinakis, Chair, Department of Mathematics, Vanderbilt University, Nashville, TN 37240 [letter of application (with e-mail address, if available), curriculum vitae and brief research summary]. Additional information, including letters of recommendation, will be requested from selected candidates after an initial screening. Only solicited letters of recommendation will be considered. Vanderbilt University is an Equal Opportunity/Affirmative Action Employer.

VANDERBILT UNIVERSITY - DEPARTMENT OF MATHEMATICS - We anticipate a tenure-track opening at the Assistant Professor level beginning Fall 1994. This position carries an initial three-year appointment and requires a Ph.D. in mathematics. It is intended for a specialist in differential equations, operator theory, mathematical biology, or approximation theory. Outstanding research potential and evidence of effective teaching are required. To apply, send the following materials in a single mailing to: Professor Constantine Tsinakis, Chair, Department of Mathematics, Vanderbilt University, Nashville, TN 37240 [letter of application (with e-mail address, if available), curriculum vitae and brief research summary]. Additional information, including letters of recommendation, will be requested from selected candidates after an initial screening. Only solicited letters of recommendation will be considered. Vanderbilt University is an Equal Opportunity/Affirmative Action Employer.

WAKE FOREST UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Applications are invited for a position as Instructor or Visiting Assistant Professor in Mathematics. The term is one year, renewable for up to three years. Rank is dependent upon qualifications, and a Master's or Ph.D. degree in Mathematics or Statistics is required. Duties consist only of teaching three courses per semester. A strong interest and preparation for teaching calculus and introductory statistics is desirable. The department has 22 members, offers a B.S. and M.A. in mathematics, and a B.S. and M.S. in computer science. Send a letter of application and resume to: Richard D. Carmichael, Chairman, Department of Mathematics and Computer Science, Wake Forest University, Box 7388, Winston-Salem, NC 27109. Wake Forest is an Affirmative Action/Equal Opportunity Employer.

WASHINGTON UNIVERSITY IN ST. LOUIS - DEPARTMENT OF MATHEMATICS - Tenure track position open beginning Fall 1994. Rank and salary depend on experience and qualifications. Selection will be based on research experience and potential in field represented in the Department, as well as on teaching ability. Teaching load is two courses per semester. The Department is especially interested in researchers in the fields of algebra, analysis, differential geometry and differential topology. Send a letter of application and vitae (including list of publications), and have three letters of reference sent to: Gary R. Jensen, Chairman, Department of Mathematics, Washington University in St. Louis, One Brookings Way, Campus Box 1146, St. Louis, MO 63130-4899. Application deadline: January 1, 1994. Late applications will be considered until the position is filled. Washington University is an Affirmative Action/Equal Opportunity Employer and specifically invites and encourages women and minorities. Employment eligibility verification required on hire.

WASHINGTON UNIVERSITY IN ST. LOUIS - DEPARTMENT OF MATHEMATICS - Non-tenure track, post-doctoral two-year positions open beginning Fall 1994. Selection will be based on research experience and potential in field represented in the Department. The Department is especially interested in researchers in the fields of algebra, analysis, differential geometry, differential topology and wavelets. Send a letter of application and vitae (including list of publications), and have three letters of reference sent to: Gary R. Jensen, Chairman, Department of Mathematics, Washington University in St. Louis, One Brookings Way, Campus Box 1146, St. Louis, MO 63130-4899. Application deadline: January 1, 1994. Late applications will be considered until the position is filled. Washington University is an Affirmative Action/Equal Opportunity Employer and specifically invites and encourages women and minorities. Employment eligibility verification required on hire.

WAYNE STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track position in statistics or applied mathematics at the rank of Assistant Professor. There is also the possibility of Visiting positions for 1994-95. Ph.D. in mathematics required. Excellence in research and teaching expected. Applications should include a signed, detailed vitae, description of current research interests, and three letters of recommendation. Send to: Pao-Liu Chow, Chair, Department of Mathematics, Wayne State University, Detroit, MI 48202. Wayne State University is an Equal Opportunity/Affirmative Action Employer and applications from female and minority candidates are particularly encouraged.

MOVING? - WE'D LIKE TO KNOW!

Please inform us of any changes, so we can keep our database up-to-date. Let us know if you move, get a new job, change phone numbers, etc... We want to know. We don't want loose contact with you.

Because we send the newsletter by third class bulk rate, the post office will not forward mail to you or notify us of address changes. Therefore, we must rely on YOU to notify us of **ANY CHANGES.**

Just fill out the changes using the form on the **BACK COVER** or drop us a postcard or email, and we'll take care of it. Thanks.

E-MAIL: awm@math.umd.edu **ADDRESS:** 4114 Computer & Space Sciences Bldg., University of Maryland, College Park, Maryland 20742-2461 **TELEPHONE:** 301-405-7892

ASST OR ASSOC PROFESSOR DEPT OF MATHEMATICS

The Department of Mathematics of the City College of CUNY anticipates making one or more tenure track appointments beginning Fall 1994 at the Asst or Associate Profesor level. Significant achievements or outstanding potential in research and evidence of excellence in teaching are required. Strong preference will be given to candidates with at least one year of postdoctoral experience.

Applications are especially invited in active areas of departmental research. These include algebra, computational group theory, differential geometry, dynamical systems, probability, statistics, and topology. Successful candidates will be encouraged to interact with the mathematics doctoral program located at the CUNY graduate center and with campus-based doctoral programs in the sciences, engineering, and computer science. Exceptional candidates in other areas will also be considered. Women and minority candidates are particularly encouraged to apply.

The salary range is $29,931—$63,202 as of 2/1/94. The closing date for applications is February 1, 1994, but applications will be considered until the position is filled. Applicants should send a resume, including a brief description of current research interests, and have three letters of reference sent to:
Professor Jack Barshay, Chairman, Dept of Mathematics.

City College of CUNY
Convent Ave at 138th Street
New York, NY 10031
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WESTERN WASHINGTON UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for a tenure-track position in Math Education beginning Fall 1994. Responsibilities include teaching a wide range of mathematics education courses and lower division courses in mathematics, and developing inservice opportunities. In addition to being an excellent teacher, the successful candidate is expected to be professionally active and committed to the mathematics preparation (methods and content) of preservice and inservice elementary teachers. Preference will be given to candidates with recent elementary teaching experience and an appropriate advanced degree. To apply, send a letter addressing qualifications and interest in position, a vitae, transcripts, and three letters of recommendation by January 15, 1994 to: Dr. T. J. Ypma, Department of Mathematics, Western Washington University, Bellingham, WA 98225-9063. Western Washington is an Affirmative Action/Equal Opportunity Employer.

WILLIAMS COLLEGE - DEPARTMENT OF MATHEMATICS - Anticipated tenure-eligible position in statistics, beginning Fall 1994, probably at the rank of assistant professor; in exceptional cases, however, more advance appointment may be considered. Excellence in teaching and statistics, including scholarship and consulting, and doctorate required. Please have a vitae and three letters of recommendation on teaching and statistics sent to: Statistics Hiring Committee, Williams College, Department of Mathematics, Williamstown, MA 01267. Evaluations of applications will begin November 15, 1993 and continue until the position is filled. As an Equal Opportunity/Affirmative Action Employer, Williams especially welcomes applications from women and minority candidates.

WILLIAMS COLLEGE - DEPARTMENT OF MATHEMATICS - Anticipated visiting position for the 1994-95 year, probably at the rank of assistant professor; in exceptional cases, however, more advanced appointments may be considered. Excellence in teaching and research and doctorate expected. Please have vitae and two letters of recommendation on teaching and research sent to: Visitor Hiring Committee, Williams College, Department of Mathematics, Williamstown, MA 01267. Evaluations of applications will begin November 15, 1993 and continue until the position is filled. As an Equal Opportunity/Affirmative Action Employer, Williams especially welcomes applications from women and minority candidates.

XAVIER UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Applications are invited for an assistant/associate professor tenure track position in Computer Science starting Fall 1994. Teaching/research experience preferred. Applicants should have a Ph.D. in Computer Science, however, those having a doctorate in a related field with appropriate computer experience are also encourage to apply. The position requires a strong commitment to teaching at the undergraduate level, to scholarly research, and to service consistent with the mission of Jesuit higher education. Research interests must be in mainstream Computer Science. Applications will be accepted until February 1, 1994. Send a letter of application, resume, copy of graduate transcripts, and three letters of recommendation to: Janice Walker, Chair, Department of Mathematics and Computer Science, Xavier University, Cincinnati, OH 45207. Xavier University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are especially encourage to apply.

YALE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications accepted for Gibbs Instructorships/Assistant Professorships for Ph.D.'s with outstanding promise in research. Two-year appointments starting July 1, 1994. Light teaching load. Applications and supporting materials must be received by January 1, 1994. Offers will be made during February. Salary at least $38,500. Request applications from: Ms. Teresa Brown, Administrative Assistant, Gibbs Committee, Department of Mathematics, Yale University, P.O. Box 208283, New Haven, CT 06520-8283.

Wayne State University
Department of Computer Science
Faculty Positions

The Wayne State University Department of Computer Science invites applications and nominations for several anticipated, subject to budgetary approval, tenure-track positions, including one at full-professor level.

Candidates from all areas of specialization in computer science or computer engineering will be considered. However, the department anticipates filling one position in the area of computer graphics and virtual reality, and another in parallel high performance computing.

Candidates should have a Ph.D. in computer science/engineering or a closely related field, a strong interest in and commitment to both research and teaching, and demonstrated potential for obtaining external research funding. Applications from minority and women candidates are especially encouraged.

Wayne State University, located in Detroit's University Cultural Center, is an urban, comprehensive research university serving 35,000 students. The Department of Computer Science has 16 faculty members, approximately 75 Ph.D , 300 masters and 350 undergraduate students. Faculty members have ties to industries such as Henry Ford Hospitals, Ford Motor Co., General Dynamics, General Motors Corp. and UNISYS. Several research projects are currently being funded by these industries, NSF and NASA.

Applicants should send a letter of intent, a statement of research and teaching interest, a resume, and the names of at least three references, their addresses (including e-mail address) and telephone/fax numbers to:

Dr. Narendra S. Goel, Chair
Department of Computer Science
Wayne State University
431 State Hall
Detroit MI 48202
Phone: (313) 577-2478
Fax: (313) 577-6868
e-mail: ngoel@cs.wayne.edu

For full consideration, applicants should be submitted by Dec. 1, 1993. However, applications will be accepted until the positions are filled.

Wayne State University is an equal opportunity/affirmative action employer.
Wayne State University – People working together to provide quality service

CALL FOR VOLUNTEERS
CINCINNATI, OHIO
JANUARY 1994

The Association for Women in Mathematics will be in Cincinnati for the Joint Mathematics Meeting hosted by AMS-MAA on January August 12-15, 1994.

We would like to ask for volunteers who will be attending the meeting to **HELP SET-UP, STAFF, AND PACK-UP OUR INFORMATION TABLE.** If you are interested in helping out, please send you name, address, telephone number, e-mail address and arrival and departure dates (if known) by **DECEMBER 1ST** to:

Dawn V. Wheeler
Association Administrator
Association for Women in Mathematics
4114 Computer and Space Sciences Bldg.
University of Maryland
College Park, Maryland 20742-2461
Phone: 301-405-7892
E-mail: awm@math.umd.edu

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ANNOUNCEMENTS

1994 RESIDENTIAL SUMMER INSTITUTES FOR MATHEMATICALLY TALENTED UNDERGRADUATES

UNIVERSITY OF CALIFORNIA @ BERKELEY - (June 20, 1994-July 29, 1994) The sixth annual Summer Mathematics Institute (SMI) at the University of California at Berkeley (UCB) seeks applications from African American, Hispanic American & Native American undergraduate men and women who are considering research careers in mathematics and related fields. Approximately 30 students will receive room and board, a $2,000 stipend and the cost of transportation to and from Berkeley. The SMI is a cooperative project of the Charles A. Dana Center for Mathematics and Science Education, and the University of California at Berkeley and the University of Texas at Austin (UTA) mathematics departments. It is supported by a grant from the NSF. Program organizers are Uri Treisman (UTA) and Leon Henkin (UCB and Mills College).

MILLS COLLEGE - (June 20, 1994-July 29, 1994) The fourth annual intensive mathematics program at Mills College (MC) is seeking applications from undergraduate women of all ethnic groups who are considering research careers in mathematics and related fields. Approximately 20 students will be admitted to the 1994 program; each will receive room and board, a $2,000 stipend and a travel allowance. The SMI is supported by grants from the NSF, the NSA, and Genentech, Inc. Program organizers are Lenore Blum (Mathematical Sciences Research Institute), Steven Givant (MC), Leon Henkin (UCB and MC), and Deborah Nolan (UCB). Faculty members are asked to seek out candidates for the programs and to encourage them to apply. All applicants must have completed with distinction at least one year of collegiate mathematics beyond freshman calculus by June 1994. In addition, applicants to the Mills program must have completed at least one course that involves extensive exposure to discovering and writing proofs.

Institute Description - Participants explore in depth two areas of mathematics. Part of this exploration takes place in seminars consisting of approximately 12 students each and taught by active research mathematicians. The programs are designed as collaborative learning experiences. Students work together in small groups and in consultation with graduate students mentors to tackle challenging problems, and to carry out and present research projects. In addition, there are twice-weekly colloquia designed to provide participants with a broad view of current work in mathematics. Lastly, students participate in informational workshops that (1) assist them in making informed decisions about graduate school, (2) give them correct information about fellowship and financial aid opportunities to support their graduate studies, and (3) make them aware of career opportunities for mathematicians. The application deadline for both programs is **February 11, 1994**. Further information and application forms for the Berkeley SMI can be obtained by calling Olga Alvarez at (512) 471-3285, by electronic mailing OAlvarez@utxvm.cc.utexas.edu, or by writing to the Office of Special Projects, College of Natural Sciences, University of Texas, W.C. Hogg Building #204, Austin, TX 78712. Further information and application forms for the Mills SMI can be obtained by calling Kathy Guarnieri at (510) 430-2226, by electronic mailing kathyg@mills.edu, or writing to Summer Mathematics Institute, Mills College, Oakland, CA 94613.

RENSSELAER POLYTECHNIC INSTITUTE
GRADUATE FELLOWSHIPS
Department of Mathematical Sciences

Physical Mathematics and Modeling, Applied Analysis, Inverse Problems, Dynamical Systems, Scientific Computation and Numerical Analysis, Applied Geometry, Mathematical Programming and Optimization

Fellowships sponsored by the National Science Foundation are available for outstanding students starting in January or in September of 1994. Applicants should be U. S. citizens or permanent residents and must be following a Ph.D. program of study. These fellowships provide a calendar year stipend of up to $14,000 and also provide 24 tuition credits. Students entering in January 1994 should apply by November 15, 1993 and those entering in September 1994 should apply by February 1, 1994. Special consideration will be given to women and underrepresented minorities. Fellowships will be awarded for up to four years. For further information contact:

Professor Joyce R. McLaughlin
Director, NSF Traineeship Program
Department of Mathematical Sciences
Rensselaer Polytechnic Institute
Troy, NY 12180-3590
(518) 276-6349

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AWM

Newsletter Volume 23, Number 6, November-December 1993

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