

FOCUS

1991 United States and International Mathematical Olympiads

Dr. D. Allan Bromley, Assistant to the President for Science and Technology, gave the keynote address at the Twentieth United States Mathematical Olympiad Awards Banquet, held at the State Department in Washington, DC last June. Also present were US Senator J. Robert Kerrey, National Science Foundation (NSF) Director Walter E. Massey, and numerous other representatives of the NSF, the National Academy of Sciences (NAS), the Mathematical Sciences Education Board (MSEB), the Joint Policy Board for Mathematics (JPBM), the American Association for the Advancement of Science (AAAS), the American Mathematical Society (AMS), and, of course, the MAA, who hosted the awards.

Speaking to an audience most of whom were still marvelling at their surroundings, the magnificent banquet room on the top floor of the Department of State, overlooking the nation's capital, Dr. Bromley began by noting that whereas the top US mathematics students rank amongst the best in the world, as evidenced by past performances in the International Mathematical Olympiad (IMO), the majority of our students do not perform nearly as well as their counterparts overseas. "This country can no longer afford its present level of innumeracy," he said. "We are building a nation that depends, to an ever greater extent, on science and technology, and as Francis Bacon wrote, 'Mathematics is the door and the key to the sciences.' Without a strong basis in mathematics, our international standing in many areas of science and industry will be threatened."
(Olympiads continues on page six.)



Winners of the Twentieth United States of America Mathematical Olympiad (USAMO). From left to right: Michail G. Sunitky, Joel E. Rosenberg, Rudy Y. Breydo, J. P. Grossman, Lenhard L. Ng, Robert D. Kleinberg, and Kiran S. Kedlaya.

The Interactive Mathematics Text Project

With the aid of grants from IBM and the National Science Foundation (NSF), the MAA has established the Interactive Mathematics Text Project (IMTP). Its aim is to increase the use of interactive texts in undergraduate mathematics instruction, both by the circulation of information about interactive texts within the mathematical community and by giving support to authors of such texts.

IBM will provide the project with a \$2.4 million grant of equipment and cash over the next four years. Equipment includes 135 PS/2 computers. The NSF has awarded the MAA a grant of \$62,883 to support the initial activities of the IMTP.

Interactive texts are computer documents that are linked to numeric, symbolic, and graphical tools. In such texts, examples can be changed at will, student comments and notes can be incorporated into the text, and graphs and plots are easily drawn and can be manipulated at will. Beginning with simple examples, students can progress at their own speed—investigating, reviewing, and, most importantly, thinking and learning. Interactive texts are designed to transform undergraduate mathematics learning from a passive teacher-centered activity to an interactive one controlled by the student. According to Brown, Porta, and Uhl, interactive texts will "change forever the way undergraduate mathematics is taught." (Brown, D., Porta, H., and Uhl, J. J., "University of *(Interactive Texts continues on page two.)*")

Inside This Issue . . .

MAA Election Results	3
Committee on Preparation of Teachers Seeks New Proposals	3
Calculus, Computers, Concepts, and Cooperative Learning	3
East-West Scientific Exchanges	4
NSF Calculus Program	4
AMS Strategic Planning Report	5
Quantitative Literacy Courses Sought	5
Summer Geometry Institute	7
Cunningham Bequest to the MAA	8
Contributed Paper Sessions Seek Organizers and Topics	8
Gift Planning	8
ICME-7 Miniconference	8
From the Orono Mathfest Scrapbook	9
NSF Awards Grant to AACJC	10
Washington Outlook	10 and 11
1992 Annual Meetings Program	12-36

IBM Awards \$2.4 Million to Interactive Mathematics Text Project

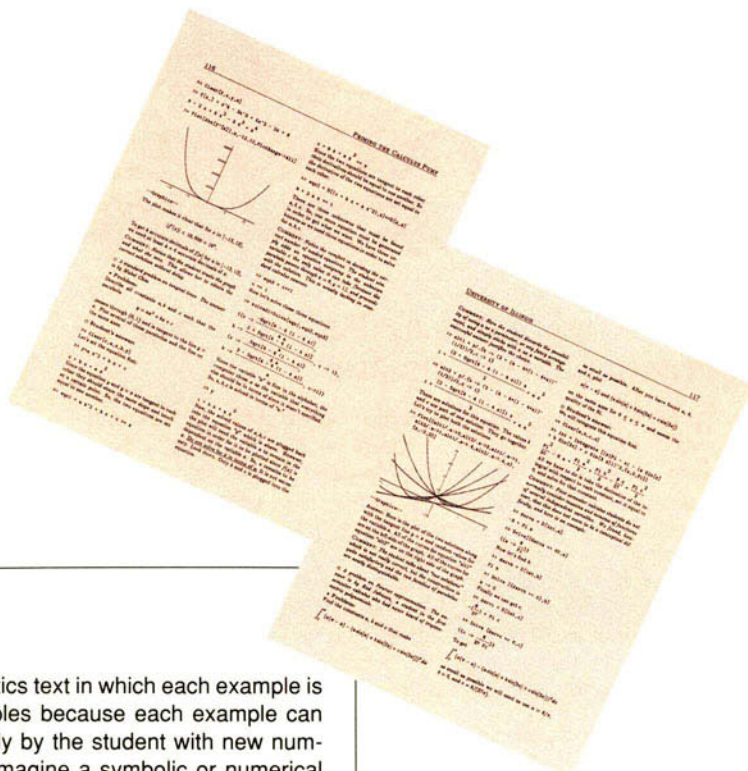
(*Interactive Texts* continued from front page.)

Illinois: Calculus and Mathematica," in *Priming the Calculus Pump: Innovations and Resources*, edited by Thomas W. Tucker, 101–120. MAA Notes Volume 17. Washington, DC: The Mathematical Association of America, 1990.)

The project will establish six laboratories, equipped with IBM PS/2 computers, at designated colleges. The laboratories will be used both for mathematics instruction at the host school and for workshops and minicourses with an emphasis on the use and creation of interactive texts. Current plans call for twelve workshops to be held during the summer of 1992 and another twelve during the summer of 1993.

Up to twenty-four faculty members will be selected from workshop attendees for additional support. These faculty members will each receive a loan of an IBM PS/2 computer and appropriate software so that they can continue their development of an interactive text. The project codirectors will work with these developers during the year on their texts, and conferences will be held during the summers of 1993 and 1994 to bring the developers together to discuss their work. The IMTP will work with these authors to disseminate their texts either through commercial publishers or through IMTP workshops.

The IMTP sites will be distributed geographically and will be easily accessible by public transportation. Two workshops will be held at each site during the summer of 1992 and again in 1993. Each workshop will run for six days and accommodate up to thirty participants. The cost for each participant will be approximately \$500 for room and board. Proposals are being prepared to seek funding for workshop participants' expenses, including travel and room



Imagine a mathematics text in which each example is infinitely many examples because each example can be redone immediately by the student with new numbers and functions. Imagine a symbolic or numerical computer routine into which fully word-processed descriptions can be inserted at will between lines of active code. Imagine a text whose paragraphs can be modified and added to as the teacher sees fit. Imagine a text that has better graphics and plots than any available in any standard mathematics book and imagine that the amount of graphics is limited only by the computer memory instead of the cost and weight of printed pages. Imagine that all graphics can be in color and that the three dimensional graphics are all perfectly shaded and can easily be viewed from any desired viewpoint. Imagine a text in which a student can launch his or her own graphic and calculational explorations with graphics and calculations appearing as the student desires. Imagine a text in which the student can find as much space as he or she needs to solve the assigned exercises. Imagine that a student, in a matter of seconds, can copy his or her own homework and can turn it in while retaining the original.

Brown, D., Porta, H., and Uhl, J.J.
"Calculus and Mathematica"
*Priming the Calculus Pump:
Innovations and Resources*

and board. Faculty members interested in attending a workshop should contact: **Interactive Mathematics Text Project**, c/o G. J. Porter, Department of Mathematics, University of Pennsylvania, 209 South Thirty-third Street, Philadelphia, Pennsylvania 19104-6395. Additional details will be sent to those indicating interest as they become available.

Project codirectors are Gerald J. Porter of the University of Pennsylvania and James E. White of the University of North Carolina at Chapel Hill and the Institute for Academic Technology. Eugene A. Herman of Grinnell College chairs the Interactive Mathematics Text Project Advisory Board. ■

. . . interactive texts will "change forever the way undergraduate mathematics is taught."

Calculus, Computers, Concepts, and Cooperative Learning

Purdue University will host a summer workshop, partially funded by the National Science Foundation (NSF) and West Educational Publishing Company, in late May and early June 1992. This two-week, intensive, total-immersion program will focus on the use of computers, research into learning theory, and a cooperative learning environment to help students learn calculus concepts. A three-day, preworkshop tutorial on the basic use of the necessary computer systems will be offered as an option. Participants are expected to return the following summer for two days to discuss their teaching experiences based on the workshop. This is the second year in which the workshop has been held and participants will have an opportunity to hear about the teaching experiences of those who attended last year.

The workshop provides hands-on experiences with computer software (both MS DOS and Macintosh); class materials; and seminars on learning theory that include viewing and discussing videos of Purdue classroom laboratory experiences in cooperative learning. The program will feature the use of the mathematical programming language ISETL and its graphics package, in addition to the symbolic computer systems Maple and Derive. Participants will be encouraged to consider piloting the calculus course presented during the workshop during academic year 1992–1993. Partial support for attending the workshop will be available.

For additional information on the program and application materials, contact: Ed Dubinsky or Keith E. Schwingendorf, Department of Mathematics, Purdue University, West Lafayette, Indiana 47907; bbf@j.cc.purdue.edu or (317) 494-1982. ■

Committee on Preparation of College Teachers—New Proposals Sought

Six university mathematics departments are cooperating in a project to help their advanced graduate students prepare for future needs as college professors. Materials, travel, and faculty-mentor summer salary supplements were paid during the planning stages at Cincinnati, Clemson, Delaware, and Oregon State; Dartmouth and Washington University are also involved in the project and have similar programs. The AMS-MAA-SIAM Committee on Preparation for College Teaching was able to provide this funding through a three-year grant from the Fund for the Improvement of Postsecondary Education (FIPSE), administered by the MAA. Continuation is anticipated so that two or three new sites can receive 1992 spring-summer assistance.

To further disseminate the ideas which have been developed on the project, and to bring useful information to departments interested in such programs, the committee will sponsor at the 1992 Annual Meetings in Baltimore, Maryland, a special session of invited and contributed twenty-minute papers, *Preparing the College Mathematics Teachers of the Future*.

Proposals for projects beginning planning in the summer of 1992 should be submitted by **30 November 1991**. Some detail about the current projects and ideas which the committee feels should be implemented are available from the committee chair, Bettye Anne Case. Proposals should be sent to her at Mathematics B-154, Florida State University, Tallahassee, Florida 32306; case@math.fsu.edu. FAX: (904) 644-4053. ■

People in the News

MAA President **Deborah Tepper Haimo** was awarded an honorary degree of Doctor of Science by Franklin and Marshall College on 12 February 1991.

Patrick T. Harker, Director of the Fishman-Davidson Center for the Study of the Service Sector, has been promoted to Professor of Decision Sciences at the Wharton School of the University of Pennsylvania. Dr. Harker was also named a White House Fellow by President Bush and will serve in the Executive Branch of the US government for the period September 1991–August 1992.

John E. Lavery, Scientific Officer for the Applied Analysis Program at the Office of Naval Research, has been appointed Staff Director of the Board on Mathematical Sciences (BOMS) of the National Research Council (NRC).

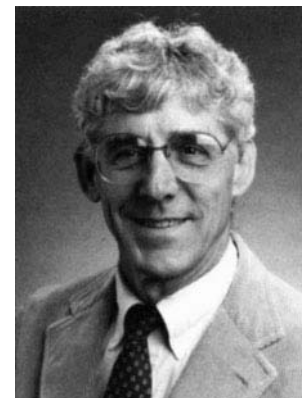
Max A. Sobel of Montclair State College has been designated Distinguished Professor of Mathematics. In the fall of 1990, the Association of Mathematics Teachers of New Jersey named him "Outstanding Mathematics Educator, 1990." ■

MAA Election Results

Donald L. Kreider of Dartmouth College is to be the next President of the MAA. Following his election by the MAA membership in the ballot conducted last spring, the results of which have just been announced, Kreider will serve for one year as President-Elect, starting in January 1992, and one year later will begin his two-year term as President.

The same ballot resulted in the election of Susan L. Forman of the Bronx Community College of the City University of New York as the First Vice-President and Sharon Cutler Ross of DeKalb College as Second Vice-President, both positions to run for the two-year period starting in January 1992.

Kreider has been an MAA member for thirty-one years, during which time he has served on a large number of committees at both the Sectional and national level. In addition to being the MAA's current Treasurer, he is presently a member of the Association's Development Committee, the Publications Management Committee, and the Building Subcommittee. He was chair of the Northeastern Section from 1971–1973.



Forman, the present Second Vice-President, has been an MAA member for eighteen years, and among her many MAA activities she is currently Chair of both the Committee on Membership and the Newsletter Editorial Committee.

Ross has been in the MAA for twenty-one years and is presently a member of the Committee on the Undergraduate Program in Mathematics (CUPM) and the CUPM Subcommittee on Calculus Reform and the First Two Years (CRAFTY). She was Chair of the Southeastern Section from 1987 to 1989. ■

East-West Scientific Exchanges

The National Academy of Sciences (NAS) invites applications from American scientists who wish to visit the USSR or Eastern Europe. Applicants must be US citizens and must possess doctoral degrees or their equivalent six months prior to the requested beginning date of their visits. The program has a special emphasis for young investigators. Applicants for the project development visits need to demonstrate that joint proposals for collaborative research will be prepared during their visits for submission to the National Science Foundation (NSF) for funding.

PROJECT DEVELOPMENT VISITS IN 1992 The program of two-week project development visits will support two rounds of visits: April through August 1992 and August through December 1992. Applications must be postmarked no later than **30 November 1991** for the first round and **29 February 1992** for the second round.

NEW APPROACH IN 1992 American scientists interested in visiting the USSR or Eastern Europe in 1993 may apply to the NAS for travel grants to help defray the visits' costs. Also, American scientists interested in receiving scientific colleagues from the USSR or Eastern Europe may apply for travel grants to help support the visitors. Applicants are expected to make all logistical and administrative arrangements for the visits. Application deadlines are **29 February 1992** for long-term research (one to six months) visits in 1993; **30 September 1992** for project development visits to take place between January and June 1993; and **28 February 1993** for project development visits to take place between July and December 1993. Address application requests to: Soviet and East European Affairs, National Academy of Sciences, 2101 Constitution Avenue Northwest (FO 2014), Washington, DC 20418; (202) 334-3680. ■



ISSN: 0731-2040

FOCUS is published by The Mathematical Association of America, 1529 Eighteenth Street Northwest, Washington, DC 20036-1385, six times a year: February, April, June, September, October, and December.

Editor: Keith J. Devlin, Colby College

Associate Editors: Donald J. Albers, MAA Associate Director for Publications and Programs
Barbara Trader Faires, Westminster College

Advertising Manager: Siobhán B. Chamberlin

Chair of the MAA Newsletter Editorial Committee: Susan L. Forman, Bronx Community College of the City University of New York

The annual FOCUS subscription price to individual members of the Association is \$6, included in the annual dues. (Annual dues for regular members, exclusive of annual subscription prices for MAA journals, are \$64. Student and unemployed members receive a 66% discount; emeritus members receive a 50% discount; new members receive a 40% discount for the first two membership years.)

© by The Mathematical Association of America (Incorporated), 1991. Educational institutions may reproduce articles for their own use, but not for sale, provided that the following citation is used: "Reprinted with permission from FOCUS, the Newsletter of the Mathematical Association of America (Incorporated), 1991."

Second-class postage paid at Washington, DC and additional mailing offices.

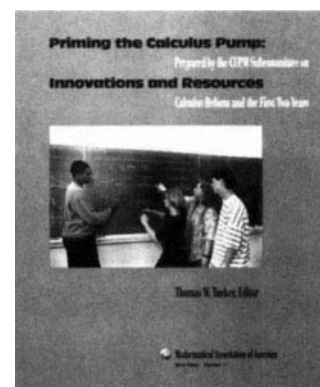
Postmaster: Address changes to FOCUS, Membership-Subscriptions Department, The Mathematical Association of America, 1529 Eighteenth Street Northwest, Washington, DC 20036-1385. Printed in the United States of America.

Revitalizing Calculus Instruction: the NSF Calculus Program

As part of an overall plan to strengthen science, engineering, and mathematics education, the National Science Foundation (NSF) has sponsored the Curriculum Development in Mathematics: Calculus Program. Initiated five years ago, the Calculus Program was designed to stimulate the development of projects in response to the need for revision and renewal in the calculus curriculum. The program has provided support for projects that deal with all the topics of one and two-year calculus sequences, including linear algebra and differential equations.

To meet the challenge of increasing the percentage of students studying calculus under renewed approaches, several changes in the Calculus Program are being considered. The emphasis of the program is expected to be more significantly shifted from the development of pilot projects to the revitalization of calculus instruction on a large scale, involving students at the collegiate or secondary levels. In addition, it is anticipated that conferences and workshops to consider student preparation for the renewed calculus will be supported. The program will continue to support particularly promising new pilot projects, including major comprehensive curriculum development projects and highly focused entrepreneurial efforts. Assessment and evaluation activities should form an important component of all projects.

In the nearly six years since the 1986 Tulane Conference, organized to develop curriculum and teaching methods for calculus at the college level, faculty nationwide have implemented major changes in calculus instruction. While approaches have varied greatly, the emphasis has been on raising students' conceptual understanding, problem solving skills, analytical and transference skills, and on implementing new methods that reduce



tedious calculations and place the student more in the role of an active learner. Approaches have included, for example, student projects, cooperative learning, writing, and an increased emphasis on numerical and graphical viewpoints. Some of the projects have had NSF support, some have received other external support, and others have been developed with only local institutional support. Information concerning more than seventy projects is included in MAA Notes Volume 17, *Priming The Calculus Pump: Innovations and Resources*. Additional reports are included in issues of *UME Trends* and have been presented at conferences and at sessions of meetings of professional societies. The challenge is now viewed to include large numbers of students in the renewed calculus courses.

The closing date for proposals is anticipated to be early February 1992. The program announcement is expected to be available in late October 1991. The program will be managed by the Division of Undergraduate Science, Engineering, and Mathematics Education with cooperation of the Division of Mathematical Sciences and the Division of Materials Development Research and Informal Science Education. For additional information, contact the program director, James Lightbourne, at: USEME, Room 639, the National Science Foundation, 1800 G Street, Washington, DC 20550; (202) 357-7051; jlightbo@nsf.gov (internet) or jlightbo@nsf (bitnet). ■

AMS Unveils Its Strategic Planning Report

In recent years, the mathematical sciences community has produced many reports calling for the revitalization of two mutually dependent activities: teaching and research. Studies produced by the National Research Council (NRC) in the past decade have produced a thoughtful and detailed agenda for the collaboration of the professional societies, colleges and universities, faculty, departments, corporations, foundations, and the government to strengthen all components of the mathematics enterprise in the United States.

Last year, the leadership of the American Mathematical Society (AMS) decided to conduct a strategic planning review to determine, of the many issues facing the mathematical sciences community and the Society's membership, which ones the AMS could address effectively and with sustained results. This review culminated in the report of the AMS Strategic Planning Task Force, which was published in the July–August 1991 issue of the *Notices of the AMS*.

In organizing the planning process, the Society was committed to making the process as inclusive as possible and to utilizing the opportunity to meld the opinions of the broad mathematical community with those of the AMS membership and leadership. For example, the task force included many who actively participate in such organizations as the Mathematical Association of America, the Society for Industrial and Applied Mathematics (SIAM), and the Association for Women in Mathematics (AWM). From the outset, the AMS intended to develop a plan that complements the efforts of other professional organizations and creates synergism within the community to promote research and connections to applications and education.

The task force carefully considered the relationship between the practice and teaching of mathematics and the acquisition of mathematical knowledge through research. This process led to a reinterpretation of the original AMS mission—which centers on furthering the interests of research and scholarship—to include explicitly such activities as promoting the communication and use of mathematics research, supporting mathematics education, advancing the status of the profession, and fostering public awareness of mathematics.

“This transition involves the recognition of the interactions between research and education, as well as the complex interaction of mathematics and other disciplines.”

Hugo Rossi, Task Force Chair

“The AMS has had to make the transition from a sort of club devoted to the research and scholarly interests of the American mathematics community, to a professional organization which not only serves those interests, but represents them,” notes task force chair Hugo Rossi of the University of Utah. “This transition involves the recognition of the interactions between research and education, as well as the complex interaction of mathematics and other disciplines.”

MAA Treasurer Donald L. Kreider of Dartmouth College also served on the task force. “Throughout the history of the AMS, its mission has held implicit the important mutual relationship between research activities and teaching responsibilities of its membership,” he says. “This has contributed to the emergence within our profession of reward structures that undervalue teaching and other educational work not only of AMS members but of all mathematics faculty at universities, colleges, and even two-year colleges. The new interpretation of the AMS mission can be a first step toward redressing this imbalance, but it will require significant and sustained leadership from the AMS, in cooperation with the MAA and other mathematical organizations, to effect such change.”

In addition to the reinterpretation of the AMS mission, the task force also formulated the following six goals for the AMS over the next three to five years.

1. Articulate and advocate an agenda for the coming decade to provide the resources for the mathematical research enterprise, in terms of funds, time, and communication.
2. Position the AMS publications program for growth and response to change.
3. Make mathematicians more aware of the importance of activities which contribute to mathematics education, and those contributions which can be made by the research community. Increase the involvement of mathematicians in these activities and facilitate the transfer of mathematical knowledge to other disciplines and industry.
4. Enhance the participation of underrepresented groups in disciplines with a strong mathematical component. Promote the involvement of the diverse membership in the development and delivery of AMS programs and services.
5. Promote public awareness and advocate the advancement of mathematics through an understanding of the benefits of the study and application of mathematics.
6. Renew AMS organization, management, and governance to optimize use of its resources and its ability to identify and respond to current and emerging needs.

The planning process will be ongoing, enabling the AMS to continue to meet emerging needs to its membership and of the broad mathematical sciences community. The AMS has begun developing annual operating plans that will permit implementation of the report's recommendation.

In working toward these goals, the AMS looks forward to working with the community to develop a thoughtful and integrated approach to applying its energy and resources to reform in mathematics education and to the renewal of mathematical sciences research.

To obtain a copy of the AMS Strategic Planning Task Force Report, contact: Timothy Goggins, Strategic Planning Project Manager, American Mathematical Society, PO Box 6248, Providence, Rhode Island 02940-6248; (401) 455-4110; tjg@math.ams.com. ■

Quantitative Literacy Courses

The Subcommittee on Quantitative Literacy of the Committee on the Undergraduate Program in Mathematics (CUPM) seeks information on innovative quantitative literacy courses. If your institution has developed such a course, or if you know someone who has, could you please forward details to: Linda R. Sons, Chair, CUPM Subcommittee on Quantitative Literacy, Department of Mathematical Sciences, Northern Illinois University, DeKalb, Illinois 60115; sons@math.niu.edu. ■



MAA President Deborah Tepper Haimo and Dr. D. Allan Bromley, Assistant to President Bush for Science and Technology, marvel at the Department of State's elegantly appointed Jefferson Room.



Keith Devlin, Carter Professor of Mathematics at Colby College, delivered the 1992 USAMO Invited Address on *Alan Turing and the Childlike Simplicity of Mathematical Genius*.



Inside the National Academy of Sciences, MAA President Deborah Tepper Haimo welcomes Michail G. Sunitsky and his mother, Raisa Sunitsky, to the USAMO ceremonies.

(Olympiads continued from front page.)

Also at the dinner were University of Nebraska President Martin A. Massengale and Interim Chancellor John E. Goebel, who each received a special presentation for the extensive support given by the University to the American Mathematics Competitions (AMC), whose Executive Director, Walter E. Mientka, is a faculty member at Nebraska.

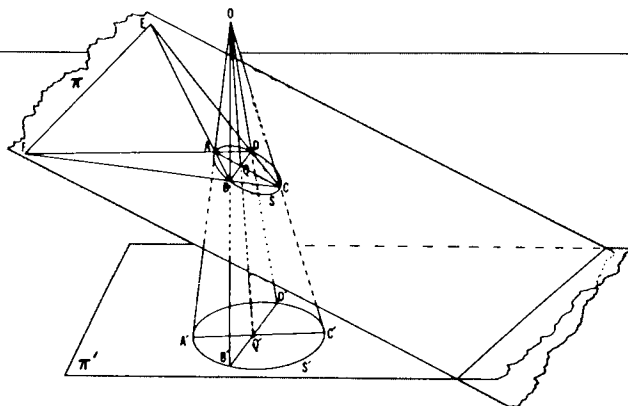
One notable feature of this year's USAMO was that two of the eight winners, Ruby Y. Breydo (second place) and Michail G. Sunitsky (seventh place), together with twelfth placed Sergey Levin, are all students at Stuyvesant High School in New York City, are all immigrants from the Soviet Union, and all attended the same school in Leningrad, where they were tutored by Sergey Rushkin of the Leningrad Gertsen Pedagogical Institute.

The banquet marked the end of two days of events for the USAMO winners that began with a reception at the MAA headquarters on Sunday, 9 June, where MAA President Deborah Tepper Haimo welcomed the students and their parents to Washington, after which the seven (of eight) winners able to attend were each presented with gifts from the various donors and sponsoring organizations.

The morning of Monday, 10 June saw the students attend a special lecture session at the National Science Foundation headquarters, prior to the actual awards ceremony, held at the National Academy of Sciences in the late afternoon. Awards presentations were made by Deborah Tepper Haimo, Walter E. Mientka, the Executive Director of the American Mathematics Competitions, and Marc Brodsky of IBM. The Twentieth USAMO Address was given by Keith Devlin, Carter Professor of Mathematics at Colby College in Maine, who spoke on *Alan Turing and the Childlike Simplicity of Mathematical Genius*.

The first place winner of this year's competition was J. P. Grossman, a senior at Northern Secondary School in Toronto, who was awarded with the Samuel I. Greitzer-Murray S. Klamkin Award for Excellence in Mathematics at the banquet later that evening. The other winners were, in order of placement, Ruby Y. Breydo from Stuyvesant High School in New York City; Kiran S. Kedlaya from Georgetown Day School in Washington, DC, last year's USAMO first place winner and a Gold Medal winner in the 1990 International Mathematical Olympiad held in Beijing, China; Joel E. Rosenberg, a senior at Hall High School in West Hartford, Connecticut and last year's third place winner in the USAMO and a Silver medal winner in the 1990 IMO; Robert D. Kleinberg, from Iroquois Central High School in Elma, New York; Lenhard L. Ng, a tenth grader at Chapel Hill High School in North Carolina, who in addition to scoring a perfect 800 on the math SAT at age ten, is also a prizewinning pianist and violinist; Michail G. Sunitsky, a colleague of Ruby Breydo at Stuyvesant High School; and Dean R. Chung from Mountain Lakes High School in New Jersey.

(Olympiads continues on opposite page, bottom.)



Summer Geometry Institute

PROGRAM The Summer Geometry Institute will be held from 21 June–10 July 1992, at Prospector Square Hotel and Conference Center, Park City, Utah. The Institute's sponsors include Rice University, the University of Illinois at Chicago, the University of Texas at Austin, the University of Utah, and the University of Washington.

The Summer Geometry Institute, sponsored by the National Science Foundation (NSF), is a multiuniversity endeavor to integrate the subject of geometry, from high school education to advanced research. To this end, the three-week institute will bring together geometers from all sectors of geometry education and research in a unique and congenial setting. The program is designed to foster communication and deeper insight into geometry at all levels.

The conference will consist of four programs operating concurrently: high school teachers of geometry, undergraduate students, graduate students and postdoctorates, and researchers in geometry. (**NOTE:** The high school teachers division is a two-year program begun in 1991 and not open to applications in 1992. Applications for the session beginning in 1993 may be requested in the fall of 1992.)

Undergraduate students will attend regular class and problem sessions, including a computer lab. Graduate students and postdoctorates will participate in the Summer School, centered on lectures by prominent geometers and problem sessions. Researchers will participate in workshops and informal lectures—the participants will determine the program, based on the Aspen Physics Center model.

Evening programs of general interest will be optional, and movement between courses and lectures in different programs is encouraged. Opportunities for informal and social interaction abound, both among and between groups.

TOPICS The graduate-post-doctorate topic for the 1992 Summer School will be *Non-linear Partial Differential Equations in Differential Geometry*. Topics for the research program will be related and designated on the sessions' first

day (22 June 1992). Undergraduate topics will continue to cover classical geometry and the use of computers in mathematics.

LECTURERS Graduate Summer School lecturers include Luis A. Caffarelli of the Institute for Advanced Study; Sun-Yung Alice Chang of the University of California at Los Angeles; Richard M. Schoen of Stanford University; Leon M. Simon of Stanford University; and Michael Struwe of Eidgen Tech Hochschule, Math Zentrum Zurich.

APPLICATION INFORMATION A limited number of fully funded slots will be available in the three programs open to applicants in 1992. **Apply early!** Recommendation letters will be required for undergraduate and graduate students and postdoctorates. The Institute must receive your completed application by **15 February 1992**. For additional information and application materials, contact: Charles Herbert Clemens, Institute Director, or Lorena Hitchens, Institute Coordinator, Summer Geometry Institute, Department of Mathematics, 210 JWB, University of Utah, Salt Lake City, Utah 84112; (801) 585-3488; RGI@math.utah.edu. FAX: (801) 581-4148.

(Olympiads continued from opposite page.)

For the winners, the USAMO awards were followed by an intensive, four-week mathematical training camp at West Point, after which the team of six was selected to take part in the Thirty-Second International Mathematical Olympiad in Sigtuna, Sweden. There the US team as a whole placed fifth, scoring 212 points out of a possible 252, following the USSR (241), China (231), Romania (225), and Germany (222), with Hungary (209) in sixth place. For their individual performances, US team member Joel E. Rosenberg won a gold medal, Kiran S. Kedlaya, Robert D. Kleinberg, Lenhard L. Ng, and Michail G. Sunitzky won silver medals, and Ruby Y. Breydo was awarded a bronze medal.

The format of the IMO consists of six challenging mathematics problems in two four-and-one-half hour sessions. One of this year's IMO problems was this. Let $S = \{1, 2, 3, \dots, 280\}$. Find the smallest integer n such that each n -element subset of S contains five numbers which are pairwise relatively prime.

The USA has taken part in the IMO since 1974. It has never ranked lower than sixth, and on seven occasions has placed first or second. During the last ten years, every US team member has earned at least an individual bronze medal. For team members, their participation in the IMO marks the end of a selection process that begins with the American High School Mathematics Examination (AHSME), taken by nearly 400,000 students. From this some 4,000 go on to take the America Invitational Mathematics Examination (AIME). About 140 students take the USAMO exam itself.

Sponsors of the USAMO are the MAA, the American Mathematical Association of Two-Year Colleges, the American Mathematical Society, the American Statistical Society, the Casualty Actuarial Society, the National Council of Teachers of Mathematics, Mu Alpha Theta, and the Society of Actuaries.

Next year, the USAMO Awards Ceremonies will be held on 7 and 8 June 1992. The Thirty-Third IMO will be held in Moscow. ■

Fifty-Year Member Leaves \$53,000 Bequest to the MAA

The MAA was recently notified of a \$53,397 bequest from the estate of Allen Byron Cunningham. The MAA Board of Governors is deeply appreciative of the high value which Dr. Cunningham placed on the work of the Association as indicated by this gift. Dr. Cunningham passed away on 3 May 1991 at the age of 79.

A fifty-year member of the Association, Cunningham distinguished himself in 1940 as the third person in the history of West Virginia to receive a PhD in mathematics. Cunningham was a devoted teacher and will long be remembered by his former students for his knowledge and superb teaching of classical geometry. Cunningham served as a full professor since 1960 at West Virginia University. ■

Contributed Paper Sessions Seek Organizers and Topics

The MAA's Committee on Sessions of Contributed Papers selects topics and organizers for contributed paper sessions conducted during national meetings. The committee would be delighted to hear from MAA members interested in organizing such a session or who wish to suggest topics.

The committee has initiated planning for the Seventy-Sixth Annual Meeting in San Antonio, Texas, 13–16 January 1993. The deadline for receipt of proposals for contributed paper sessions is **6 January 1992**. You should submit information to: Duane Blumberg, Chair, MAA Committee on Sessions of Contributed Papers, Department of Mathematics, The University of Southwestern Louisiana, Lafayette, Louisiana 70504; (318) 231-5279; blumbergdd@ea.usl.edu. ■

Gift Planning

Participating in the future growth of the MAA can be very fulfilling for you and beneficial to the MAA. You can do that by planning a gift to the MAA through your estate. Several brochures are available which will assist you in planning a gift that will take into consideration your personal and family needs, your tax situation, and how you can help the MAA. Write for any or all of the following brochures.

- Gifts That Meet Women's Goals
- Gifts Made Outright Now
- Gifts with Income Retained
- Gifts You Can Revoke
- Gift Annuity Arrangements
- Gifts of Appreciated Property
- Gifts of Life Insurance
- Gifts of Real Estate

Send your request to: Dr. Marcia P. Sward, Executive Director, The Mathematical Association of America, 1529 Eighteenth Street Northwest, Washington, DC 20036-1385.

Mr. Richard M. Witter, MAA Development Consultant, will be available at the 1992 Annual Meetings in Baltimore, Maryland for individual personal consultation with MAA members who are interested in estate and gift planning. His location and time frame will be available in the meetings registration area. This is provided as a service to members and there is no obligation intended. ■

ICME-7 Miniconference on Computers and Calculators in the Curriculum

As reported in the September 1991 issue of FOCUS (pages ten and eleven), the Seventh International Congress on Mathematical Education (ICME-7) will be held at Université Laval in Québec, Canada, 17–23 August 1992. The program on the first working afternoon, Monday, 17 August 1992, includes a miniconference on *Computers and Calculators in the Curriculum*. It is designed to give participants the opportunity to gather information, share experiences, and discuss strategies, with the aim of advancing the practical applications of the new technology in classrooms around the world.

The program for this miniconference will consist of parallel strands by age group (ages 5–11, 11–16, 15–18, and undergraduate), and there will be a strand on teacher education. Each strand will comprise a plenary session; simulated classrooms with various settings, such as rooms with a single computer, rooms where several people share a computer, and rooms where each participant is provided with a calculator; and also sessions of short presentations.

- The 15–18 age group sessions will deal with uses of scientific, graphing, and programmable calculators as well as with personal computers, in applications to topics of upper secondary school teaching. These applications will include, but not be limited to: numerical, graphic, and symbol manipulation tools for concept development and problem solving; computer-based tutors; and uses of programming to develop mathematical understanding.
- The undergraduate sessions will stress innovative and interesting uses of computers and calculators in the classroom setting in any undergraduate course. There will also be some place in the program for work on the uses of computers and calculators in laboratory or other out-of-class settings.
- The teacher education sessions will emphasize technology uses appropriate for preparing preservice and/or inservice teachers of students ages 6–18. Presentations will focus on how a specific technology has been used to facilitate the mathematical preparation of teachers.

Copies of the *Second Announcement* which provides more details about the program and activities of the Congress, describes the venue, and explains the procedures for registration and applying for accommodation, are available by writing: Congrès ICME-7 Congress, Université Laval, Québec, QC, Canada G1K 7P4; ICME-7@VM1.ULVAL.CA. FAX: (418) 656-2000. Individuals interested in contributing specifically to the miniconference program should communicate directly with the organizer of the age group of their choice. They should, however, note that the miniconference is only one of the many activities of the Congress and therefore participation in it will require registration for the Congress.

15–18 AGE GROUP James T. Fey, Chief Organizer, Center for Mathematics Education, H. R. W. Benjamin Building, University of Maryland, College Park, Maryland 20742; 203196@UMMD.BITNET. FAX: (301) 314-9278.

UNDERGRADUATE Anthony Ralston, Chief Organizer, Department of Computer Science, 226 Bell Hall, State University of New York at Buffalo, Buffalo, New York 14260; RALSTON@CS.BUFFALO.EDU. FAX: (716) 636-3464.

TEACHER EDUCATION Connie Carroll Widmer, Chief Organizer, Department of Education, Northern Kentucky University, Highland Heights, Kentucky 41099; WIDMER@NKUVAX.BITNET. FAX: (513) 572-5566. ■



A typical University of Maine structure



Barry A. Cipra, Allyn Jackson, William H. Jaco, Eileen L. Polani, Henrik Lenstra, Fan R. K. Chung, Ronald L. Graham, Gerald L. Alexanderson, and Deborah Tepper Haimo.



An afternoon art project for children

Nearly 1,100 mathematicians attended the Orono Mathfest in August 1991. Many of them brought their families, taking advantage of the excellent recreational opportunities provided by the venue for this year's joint AMS-MAA Summer Meetings—the University of Maine campus, in the heart of what the Maine car license plate proclaims to be “Vacationland.”

From the very start there was a definite family orientation to the whole meeting. While the grown-ups attended the opening banquet, where AMS and MAA prizes and awards were presented, the children were entertained by a clown, a magic show, singing, and cartoons. Friendships established during these introductory children's events continued throughout the meetings. Other children's activities on offer during the meeting included an afternoon of art projects, while for entire families there were a moose watch, a whale watch, whitewater rafting, and (an obligatory Maine event) a lobster cookout.

And then there were the meetings themselves: a splendid set of morning lectures, deliberately not scheduled opposite other events (a striking departure from many of our other meetings), together with the usual special sessions, minicourses, and contributed paper sessions in the afternoon. If there was a problem with the meeting it was that the Mathfest was so successful that seating at the major talks was at a premium and a larger auditorium was really required! Attendance was roughly twice that of a number of recent summer meetings.

The new format, having unopposed major talks in the morning with afternoons reserved for special sessions, contributed papers, and committee meetings, was experimental. From all reports, the new structure for the meetings was well received by the participants.

There will be no AMS-MAA Summer Meetings in 1992 due to the ICME-7 meeting in Québec, and there are very special joint meetings with the Canadian Mathematical Society scheduled for Vancouver in 1993, but if the success of the Orono Mathfest is anything to go by, we can probably look forward to more meetings of this type in the following years. ■

Family Emphasis Helps Makes Orono Mathfest a Great Success

NSF Grant to AACJC Launches Two-Year Faculty Institute

A \$593,500 grant from the National Science Foundation (NSF) has been awarded to the American Association of Community and Junior Colleges (AACJC) to develop a Faculty Enrichment Institute exclusively for two-year colleges.

The eighteen-month grant will be used to bring key two-year college mathematics, science, and engineering faculty to Washington, DC to spend at least nine months as AACJC/NSF Fellows working at the NSF offices.

At least six top instructors will be chosen for the program. The grant will cover the faculty member's salary, plus a limited amount for living expenses.

"This is a marvelous opportunity for faculty to learn more about the work and success of the National Science Foundation," AACJC President David Pierce said. "The program will benefit the individual faculty members, the community college movement, and NSF itself, which has had a long history of partnerships with four-year colleges and universities but until recently has had less contact with faculty from community, technical, and junior colleges."

"The program will benefit the individual faculty members, the community college movement, and NSF itself, which has had a long history of partnerships with four-year colleges and universities but until recently has had less contact with faculty from community, technical, and junior colleges."

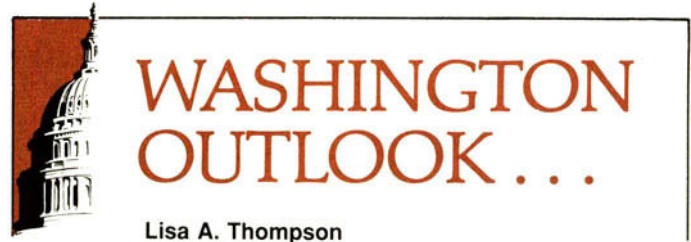
In addition to their work at the NSF, the faculty chosen for the program will spend some time at AACJC headquarters in Washington, DC, and with the professional organizations within their discipline.

Each participant in the project will be involved in a variety of experiences: seminars, advisory committee meetings, and other NSF activities; evaluation of NSF grant opportunities; and site visits on NSF projects.

The AACJC/NSF Fellows will participate in a special presentation during the 1992 AACJC Convention in Phoenix, Arizona. The first three Fellows appointed are from mathematics. They are:

- **Denny K. Burzynski** of West Valley College in Saratoga, California, to the Division for Materials Development, Research, and Informal Science Education;
- **Ray E. Collings** of Tri-County Technical College in Pendleton, South Carolina, to the Division of Teacher Preparation and Enhancement; and
- **Elizabeth J. Teles** of Montgomery College in Takoma Park, Maryland, to the Division of Undergraduate Science Engineering and Mathematics Education.

Potential applicants must be full-time, two-year college faculty with at least five years' experience in the classroom. Preference will be given to those individuals who possess evidence of scholarly activity beyond the classroom, such as course development, publications, activities with professional associations, and contributions to the improvement of instruction. The NSF and AACJC encourage participation by women, minorities, and the disabled. For additional information and an application, contact: James McKenney, Project Director, NSF/AACJC Two-Year College Faculty Enrichment Institute, One Dupont Circle Northwest, Suite 410, Washington, DC 20036; (202) 728-0200. ■

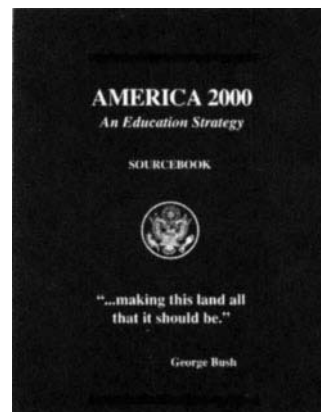


America 2000: The Education President's Education Strategy

With the words, "dollar bills don't educate students; education depends on committed communities determined to be places where learning will flourish," President Bush introduced in April a grand plan to reform precollege education in the United States and transform the country into a nation of learners. *America 2000* is a strategy for achieving goals adopted at the education summit undertaken by the Bush administration and the nation's governors in the fall of 1989. Secretary of Education Lamar Alexander calls *America 2000* not just another federal program, but a nine-year crusade to transform American education state by state, community by community, school by school, and family by family.

The National Educational Goals state that by the year 2000:

1. All children in America will start school ready to learn;
2. The high school graduation rate will increase to at least ninety percent;
3. American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography, and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy;
4. US students will be first in the world in science and mathematics achievement;
5. Every adult American will be literate and possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship; and
6. Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.



A legislative package authorizing many of *America 2000's* proposals was introduced in May 1991 amid a spirit of bipartisanship and an expectation that at least portions of the package would be expedited. Both Houses of Congress have held a number of hearings on various aspects of the bill, but no action had been taken on the most sweeping proposals prior to the August congressional recess. (*Washington Outlook* continues on opposite page, bottom.)

FOCUS EDITORIAL

Two out of the six that made up this year's US team to the International Mathematical Olympiad (IMO) in Sweden were recent immigrants from the Soviet Union, having placed second and seventh in the United States Mathematical Olympiad (USAMO) competition. A third Soviet immigrant came twelfth. The winner of the USAMO was a Canadian. (See the related article on page one of this issue of FOCUS). Does this tell us anything about the current state of mathematics education in the United States?

To the headline writers in the popular press it might—teacher-bashing is all the rage these days, and math teachers seem to come in for the greater part of the assault. But we ought to be cautious before rushing to conclusions based on a single mathematics competition. Solving ingeniously devised problems in limited time is a highly specialized ability whose connection to general mathematical ability is very hard to evaluate. I know professors of mathematics who admit to finding Olympiad problems extremely challenging, even without the pressure of a time limit, and many often fail to get far at all within the time allowed in the actual competition. This is hardly surprising; for the professional mathematician, speed is rarely, if ever, a factor; far more important are tenacity and involvement. Some Olympiad winners go on to successful careers in mathematics—Harvard's Noam Elkies is an obvious example; others never seem to make any obvious use of their mathematical talent.

Talking to some of the winners of this year's USAMO, I was struck by how much they approached the Olympiad just like any other competition: chess, crossword-puzzles, gymnastics, track, swimming, or whatever. Just as important as mathematical ability are the desire to compete and the sense of camaraderie that develops between those involved. Certainly the USAMO winners I met would hardly fit anyone's conception of a "math nerd." They are regular young people who simply enjoy taking part in a competition for which they have a strong aptitude.

In fact, the comparison with other forms of competition goes further than that. Solving Olympiad-type problems is a skill that can be vastly improved with training. This is why the team sent to the IMO undergoes an intensive, four-week training session immediately prior to the competition.

The three young Russian immigrants who scored so well on this year's USAMO are all friends, they all attended the same school in Leningrad, where they were coached by the same instructor, and all attend Stuyvesant High School in New York. That they all scored so well is no doubt due to the fact that, in addition to their obvious talent, they are part of a small community of friends that enjoys taking part in the competition. They have themselves to work with, to spur each other on, and to measure their progress against. And when you think about it, that does not sound too different from the message we hear from Uri Treisman about calculus instruction for minority college students.

So I do not think this year's Olympiad results signify the end of American mathematics as most MAA members know it. But that is not to say that there aren't significant problems with school mathematics education in this country, and maybe there are lessons to be learned from the success of Ruby, Michail, and Sergey.

In the meantime, all of the USAMO winners have demonstrated both a great deal of mathematical talent and a deep love for the subject. For the recent success brought by the former they deserve our warmest congratulations; for the latter our continuing encouragement and support.

Keith Devlin ■

The above is the opinion of the FOCUS editor, and does not necessarily represent the official view of the MAA.

(Washington Outlook continued from opposite page.)

Despite the Administration's emphasis on the strategy, *America 2000* has company on Congress' education agenda. Shortly before the President's plan was unveiled, the Senate passed a bill that would establish literacy programs, model schools, a pilot program to test school-based management, and increased funding for science and mathematics education. Congress is also involved this year in reauthorizing the Higher Education Act, generating much debate on the appropriate structure of federal student aid.

Congress is still working on the fiscal year 1992 budget, which includes a proposal from the Committee on Education and Human Resources of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) to increase support for federal programs in mathematics, sciences, and engineering education thirteen percent, to a level of nearly two billion dollars; much of that increase would be spent at the precollege level. The National Science Foundation's Education and Human Resources programs and the Department of Education have been singled out for generous treatment in the congressional budget process, though not in ways conforming to the President's priorities.

While *America 2000* is still evolving and it remains to be seen how it is implemented by the schools, there is clearly a role for the mathematical sciences community. Recent activities in support of improved mathematics education—the efforts in preparing standards for curriculum and teaching of the National Council of Teachers of Mathematics (NCTM), the work in assessment of the Mathematical Sciences Education Board (MSEB), and the curriculum action and teacher preparation projects of the MAA to name a few—give mathematics a head start among the five school subject areas emphasized by the strategy. *America 2000* is another opportunity to contribute to the improvement of mathematics education and to encourage a continuing supply of teachers, researchers, and workers who are mathematically literate. ■

Lisa A. Thompson is the Assistant for Governmental Affairs at the Office of Governmental and Public Affairs (OGPA) of the Joint Policy Board for Mathematics (JPBM) in Washington, DC. She did graduate work in the field of science and technology policy and has served on the staffs of the Council of Scientific Society Presidents (CSSP) and on the Office of Science and Technology Policy.

Meetings Program Guide

1991 MAA Meetings Program	14-16
Mathematics and the Environment	17
AMS-MAA Joint Sessions	18
Annual Meeting of the MAA	18-22
Minicourse Descriptions	18-20
Details on Contributed Papers	20
Other MAA Sessions	20 and 21
Student Activities	21 and 22
Activities of Other Organizations	22 and 23
Other Events of Interest	23
How to Preregister	23 and 24
How to Reserve a Hotel Room	24 and 25
Miscellaneous Information	25
Hotel Descriptions and Rates	26 and 27
Map of Downtown Baltimore	28
Preregistration and Housing Forms	29 and 30
MAA Minicourse Preregistration Form	31
Employment Register	32-36
Applicant Form	35
Employer Form	36
Travel Information	34

Important Meeting Deadlines

MAA Contributed Paper Abstracts	EXPIRED
Early Preregistration and Housing	29 October
Submissions for <i>Poetry Reading Session</i>	31 October
Ordinary Preregistration and Housing	18 November
MAA Minicourse Preregistration	18 November
Employment Register	
(Both Applicants and Employers)	18 November
Housing Changes	10 December
Cancellations with Housing Bureau	10 December
Final Preregistration (no housing or tickets)	10 December
Banquet Cancellations (50% refund)	
AWM Workshop Dinner	30 December
MER Banquet	30 December
NAM Luncheon	30 December
Preregistration Cancellations (50% refund)	3 January
Employment Register Cancellations (50% refund) ..	3 January

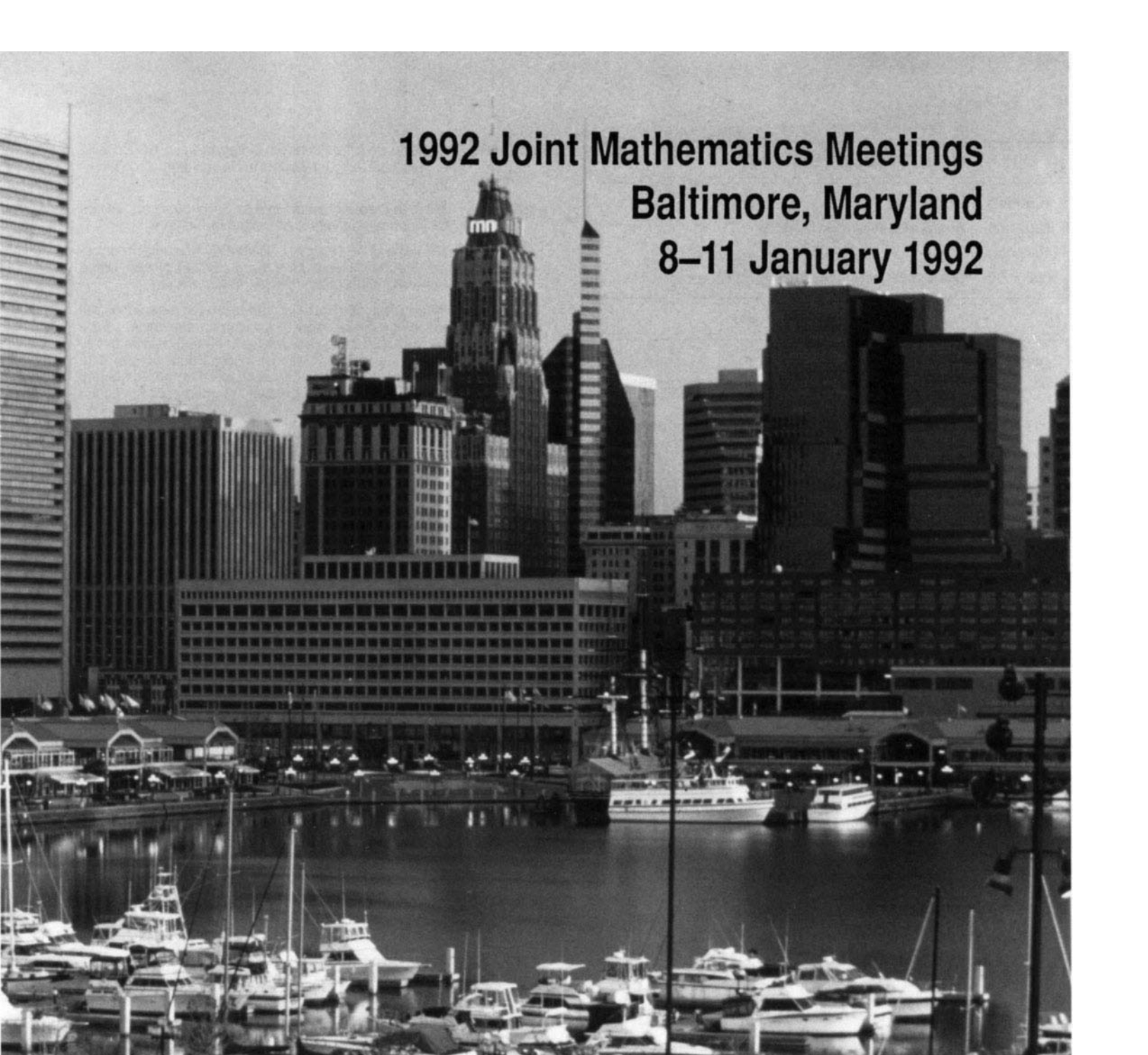
It is often said that today's calculator-reared students can't do simple arithmetic, so what will the younger generation of mathematicians make of the presentation by Arthur T. Benjamin on *The Art of Mental Calculation*, one of the special student events at the forthcoming Joint AMS-MAA Annual Mathematics Meetings to be held at Baltimore from Wednesday, 8 January through Saturday, 11 January 1992. Benjamin, from Harvey Mudd College, has demonstrated his remarkable facility at mental arithmetic the world over.

Two sessions on mathematical poetry and *An Encore Musical Performance* by Past Presidents William Browder of the AMS and Leonard Gillman of the MAA form three further events that are likely to attract considerable recreational interest. So too is the *Skits* evening, though the purpose here is to highlight continuing gender issues in the mathematics profession.

These events will provide islands of contrast for participants in what should prove to be as exciting and stimulating a meeting as others in recent years. No less than seventeen minicourses deal with different aspects of the mathematics teaching profession, ranging from alternatives to the lecture method to the use of history and the many different ways to make use of computer technology. Attendants interested in these issues are likely to be among many interested in the National Science Foundation (NSF) sponsored session on *The Changing Environment for NSF Funding for Research and Education*.

BALTIMORE





1992 Joint Mathematics Meetings Baltimore, Maryland 8-11 January 1992

The four joint AMS-MAA invited speakers are Joan S. Birman of Columbia University; Simon A. Levin, Charles A. Alexander Professor of Biological Sciences at Cornell University; Isadore M. Singer of the Massachusetts Institute of Technology; and J. Ernest Wilkins of Clark Atlanta University. David H. Carlson of San Diego State University; Ingrid Daubechies of Rutgers University and AT&T Bell Laboratories; James W. Demmel of the University of California at Berkeley; Jeffrey Shallit of the University of Waterloo; and Harold Stevenson of the Department of Psychology at the University of Michigan are the five Invited Speakers in the MAA program. In addition, Lida K. Barrett, the forty-third President of the MAA, will deliver her *Retiring Presidential Address*.

The AMS program includes Michael E. Fisher of the Institute for Physical Sciences and Technology at the University of Maryland, who will give the Gibbs Lecture, and Robert P. Langlands of the Institute for Advanced Study at Princeton University, who will deliver the Colloquium Lectures.

A particular highlight of the 1992 meeting will be a number of sessions related to the theme of mathematics and the environment (see the special insert on page seventeen of this issue of FOCUS).

Other events that are bound to appeal are a *First Time Attendees Social*, a SUMMA Workshop on how to strengthen minority mathematics achievement and a special presentation on *The Philosophical Legacy of John Von Neumann*, to be given by the late mathematician's brother, Nicholas Vonneuman.

Of special interest to students will be the first ever *Career Fair* at a national meeting, where thirty companies and agencies will describe the kind of mathematical expertise they seek, plus a panel discussion on mathematical life outside academia.

Sound interesting?

Then we'll see you in Baltimore. ■

Tuesday, January 7

morning8:30–4:00 **Board of Governors' Meeting****afternoon**7:00–9:00 **Section Officers' Meeting**

Wednesday, January 8

morning8:00–10:55 **AMS Special Sessions and Sessions for Contributed Papers**8:00–9:20 **Panel Discussion: Mathematical life outside academia: Input from the real world**, sponsored by the Committee on Mathematicians Outside Academia,—(Patrick D. McCray, chair)8:00–9:20 **Panel Discussion: ICME- 7 (August 17-23, 1992)**, sponsored by the United States Commission on Mathematical Instruction (Eileen Poiani, chair)8:00–10:55 **Contributed Paper Session: Mathematics placement testing programs: Their organization, administration and problems**, Rose Hamm, College of Charleston, and John Harvey, University of Wisconsin, Madison8:00–10:55 **Contributed Paper Session: Innovations in mathematics courses for business**, Wade Ellis, Jr., West Valley College, and Barbara A. Jur, Macomb Community College8:00–10:55 **Contributed Paper Session: Using spreadsheets to teach mathematics**, Robert S. Smith, Miami University8:00–10:00 **Minicourse #1 (Part A): Alternatives to the lecture method in collegiate mathematics**, Julian Weissglass, University of California, Santa Barbara8:00–10:00 **Minicourse #2 (Part A): The Harvard calculus reform project: Hands-on experience with the project materials**, Sheldon P. Gordon, Suffolk Community College, Deborah Hughes Hallett, Harvard University, William McCallum, University of Arizona, and Thomas W. Tucker, Colgate University8:00–10:00 **Minicourse #3 (Part A): Using history in teaching calculus**, V. Frederick Rickey, Bowling Green State University9:15–9:30 **Welcoming Address**9:30–10:55 **Panel Discussion: Values and rewards in the mathematics profession**, sponsored by the AMS Committee on Science Policy (Michael C. Reed, chair), and the MAA Science Policy Committee (John P. Thorpe, chair)11:10–noon **AMS-MAA Invited Address: A new look at knot polynomials**, Joan S. Birman, Columbia University**afternoon**2:15–6:00 **AMS Special Sessions and Sessions for Contributed Papers**2:15–3:05 **MAA Special Presentation: The philosophical legacy of John von Neumann**, Nicholas A. Vonneuman2:15–6:00 **AMS-MAA Special Session: Mathematics and education reform**, Naomi D. Fisher, Harvey B. Keynes and Philip D. Wagreich, Mathematicians and Education Reform Network (MER)2:15–6:00 **Contributed Paper Session: Mathematics placement testing programs: Their organization, administration and problems**, Rose Hamm, College of Charleston, and John Harvey, University of Wisconsin, Madison2:15–6:00 **Contributed Paper Session: The "seven-into-four" problem**, David Carlson, San Diego State University, and Ann Watkins, California State University, Northridge2:15–4:15 **Minicourse #4 (Part A): Environmental modeling**, Robert McKelvey, Environmental Research Lab-EPA, Corvallis, OR2:15–4:15 **Minicourse #17: Advance workshop on DERIVE**, David R. Stoutemyer, University of Hawaii and Soft Warehouse, Inc.3:20–4:10 **MAA Invited Address: title to be announced**, James W. Demmel, University of California, Berkeley4:30–6:30 **Minicourse #5 (Part A): Using group projects in calculus**, Stephen Hilbert, John Macelli, Eric Robinson, Diane Schwartz and Stanley Seltzer, Ithaca College4:30–6:30 **Minicourse #6 (Part A): Introduction to research in the teaching and learning of undergraduate mathematics: Examples in calculus**, Joan Ferrini-Mundy, University of New Hampshire, and Kathleen Heid, Pennsylvania State University, University Park, sponsored by the Committee on Research in Undergraduate Mathematics Education (Ed Dubinsky, chair)6:00–7:00 **First Time Attendees Social**: sponsored by the MAA Committee on Membership (Susan Forman, chair) and the AMS

Thursday, January 9

morning8:00–10:55 **AMS Special Sessions and Sessions for Contributed Papers**8:00–10:55 **AMS-MAA Special Session: Mathematics and education reform**, Naomi Fisher, Harvey B. Keynes and Philip D. Wagreich, Mathematicians and Education Reform Network (MER)8:00–10:55 **Contributed Paper Session: Research in undergraduate mathematics education**, sponsored by the Committee on Research in Undergraduate Mathematics Education (Ed Dubinsky, chair)8:00–10:00 **Minicourse #1 (Part B): Alternatives to the lecture method in collegiate mathematics**, Julian Weissglass, University of California, Santa Barbara, and the Mathematical Sciences Education Board8:00–10:00 **Minicourse #7 (Part A): Using NETPAD software to teach and learn about graphs**, Nathaniel Dean, Bellcore, and Joseph G. Rosenstein, Rutgers University8:00–10:00 **Minicourse #8 (Part A): CAS laboratory projects for first year calculus using DERIVE**, Carl Leinbach, Gettysburg College, and Marvin L. Brubaker, Messiah College8:30–9:50 **Panel Discussion: How to start and maintain a departmental colloquium**, sponsored by the Visiting Lectures Committee (James G. Ware, chair)8:30–9:50 **Panel Discussion: Curriculum initiatives: Statistics, geometry, environment, assessment, and quantitative literacy**, organized by James R. C. Leitzel, MAA and Ohio State University, and Lynn A. Steen, St. Olaf College9:00–10:55 **Contributed Paper Session: Environmental mathematics**, Ben A. Fusaro, Salisbury State University, and Margaret Barry Cozzens, Northeastern University10:05–10:55 **MAA Invited Address: Wavelets making waves in mathematics and engineering**, Ingrid Daubechies, Rutgers University and AT & T Bell Labs11:10–noon **AMS-MAA Environmental Address: The problems of scale in ecology**, Simon A. Levin, Charles A. Alexander Professor of Biological Sciences, Cornell University**afternoon**2:15–4:10 **AMS Special Sessions and Sessions for Contributed Papers**2:15–3:15 **Special Presentation: The art of mental calculation**, Arthur Benjamin, Harvey Mudd College2:15–4:10 **Panel Discussion: Preparing teachers of mathematics**, sponsored jointly by COMET, the Committee on the Mathematical Education of Teachers (James R. C. Leitzel, chair), and CTUM, the Committee on the Teaching of Undergraduate Mathematics (Donald Lick, chair)

- 2:15–4:10 **Panel Discussion:** *Guidelines for undergraduate mathematics programs*, sponsored by the ad hoc Committee on Guidelines (John D. Fulton, chair)
- 2:15–4:10: **Contributed Paper Session:** *Innovations in mathematics courses for business*, Wade Ellis, Jr., West Valley College, and Barbara A. Jur, Macomb Community College
- 2:15–4:10: **Contributed Paper Session:** *A toolbox for liberal arts mathematics courses*, John Emert and Kay Meeks, Ball State University
- 2:15–4:10: **Contributed Paper Session:** *Using spreadsheets to teach mathematics*, Robert S. Smith, Miami University
- 2:15–4:15 **Minicourse #2 (Part B):** *The Harvard calculus reform project: Hands-on experience with the project materials*, Sheldon P. Gordon, Suffolk Community College, Deborah Hughes Hallett, Harvard University, William McCallum, University of Arizona, and Thomas W. Tucker, Colgate University
- 2:15–4:15 **Minicourse #3 (Part B):** *Using history in teaching calculus*, V. Frederick Rickey, Bowling Green State University
- 2:15–4:15 **Minicourse #4 (Part B):** *Environmental modeling*, Robert McKelvey, Environmental Research Lab-EPA, Corvallis, OR
- 2:15–4:15 **Minicourse #9 (Part A):** *Learning abstract algebra by programming in ISETL*, Ed Dubinsky, Purdue University, and Uri Leron, Technion-IIT
- 4:00–7:00 **Career Fair**
- 6:15–7:30 **Two-Year College Reception**
- 7:00–9:00 **Minicourse #5 (Part B):** *Using group projects in calculus*, Stephen Hilbert, John Maceli, Eric Robinson, Diane Schwartz and Stanley Seltzer, Ithaca College
- 7:00–9:00 **Minicourse #10 (Part A):** *How to make effective use of inexpensive pocket computers to develop the concepts and techniques of calculus*, Franklin Demana and Bert K. Waits, Ohio State University
- 7:00–10:00 **AMS-MAA Panel Discussion:** *The undergraduate linear algebra curriculum*, organized by the Linear Algebra Curriculum Study Group, A. Duane Porter (Chair)
- 8:00–10:55 **AMS Special Session:** *History of mathematics*, Florence Fasanelli, MAA, Victor J. Katz, University of the District of Columbia, and David E. Rowe, Pace University
- 8:00–10:00 **Minicourse #11 (Part A):** *Instituting a mathematics placement program: Creating order out of chaos in freshman mathematics*, Philip C. Curtis, Jr., University of California, Los Angeles
- 8:00–10:00 **Minicourse #12 (Part A):** *Mathematical modeling with a spreadsheet*, Stephen D. Comer and Hughes B. Hoyle III, The Citadel
- 8:00–10:00 **Minicourse #13 (Part A):** *Integrating calculus and physics for freshmen*, Joan R. Hundhausen and F. Richard Yeatts, Colorado School of Mines
- 8:00–10:00 **Minicourse #14 (Part A):** *The Fibonacci and Catalan numbers*, Ralph P. Grimaldi, Rose-Hulman Institute of Technology
- 9:00–10:55 **Strengthening Underrepresented Minority Mathematics Achievement Workshop:** Winson Coleman, University of District of Columbia, and Carol Malloy, Mathematics and Science Education Network, University of North Carolina
- 9:30–10:55 **Panel Discussion:** *Site testing of new calculus projects*, sponsored by CRAFTY, CUPM Subcommittee on Calculus Reform and the First Two Years (Thomas W. Tucker, chair)
- 9:30–10:55 **Panel Discussion:** *Getting started*, sponsored by the ad hoc Committee on Mathematics and the Environment (Bernard A. Fusaro, chair)
- 11:10–noon **AMS-MAA Invited Address:** *Optimization for extended services for heat transfer*, J. Ernest Wilkins, Clark University

afternoon

- 1:00–4:10 **AMS Special Sessions and Sessions for Contributed Papers**
- 1:00–4:10 **Contributed Paper Session:** *The "seven-into-four" problem*, David Carlson, San Diego State University, and Ann Watkins, California State University, Northridge
- 1:00–4:10 **Contributed Paper Session:** *Mathematics for the health sciences*, Henry C. Foehl, Philadelphia College of Pharmacy and Science
- 1:00–4:10 **AMS Special Session:** *Preparing for future college teaching*, Bettye Anne Case, Florida State University
- 2:00–4:00 **Student Workshop (Part A):** sponsored by the ad hoc Committee on Mathematics and the Environment (Bernard A. Fusaro, chair), and the Committee on Student Chapters (Howard Anton, chair)
- 2:00–4:00 **Minicourse #9 (Part B):** *Learning abstract algebra by programming in ISETL*, Ed Dubinsky, Purdue University, and Uri Leron, Technion-IIT
- 2:00–4:00 **Minicourse #11 (Part A):** *Instituting a mathematics placement program: Creating order out of chaos in freshman mathematics*, Philip C. Curtis, Jr., University of California, Los Angeles
- 2:15–3:05 **MAA Invited Address:** *Real numbers with bounded partial quotients*, Jeffrey Shallit, University of Waterloo
- 3:20–4:10 **MAA Retiring Presidential Address:** *Mathematics goes public*, Lida K. Barrett, Mississippi State University
- 4:25–5:30 **MAA Prize Session and Business Meeting**
- 7:00–10:00 **Poetry Reading:** sponsored by the Humanistic Mathematics Network (Alvin White), organized by JoAnne Growney, Dan Kalman, and Elena Marchisotto
- 7:00–9:00 **Minicourse #15 (Part A):** *Why, when and how to use CAS calculators in calculus and linear algebra instruction*, John Kennelly and Donald R. LaTorre, Clemson University

Friday, January 10

morning

- 8:00–10:55 **AMS Special Sessions and Sessions for Contributed Papers**
- 7:00–8:00 **Breakfast for Student Chapter Advisors and Section Coordinators:** sponsored by the Committee on Student Chapters
- 8:00–9:20 **Panel Discussion:** *The source book for college mathematics teaching*, sponsored by CTUM, the Committee on the Teaching of Undergraduate Mathematics (Donald R. Lick, chair)
- 8:00–9:20 **Panel Discussion:** *Statistics for the twenty-first century*, Florence S. Gordon, New York Institute of Technology, and Sheldon P. Gordon, Suffolk Community College
- 8:00–10:55 **AMS-MAA Special Session:** *Mathematics and education reform*, Naomi Fisher, Harvey B. Keynes, and Philip D. Wagreich, Mathematicians and Education Reform Network (MER)
- 8:00–10:55 **Contributed Paper Session:** *A toolbox for liberal arts mathematics courses*, John Emert and Kay Meeks, Ball State University
- 8:00–10:55 **Contributed Paper Session:** *Research in undergraduate mathematics education*, sponsored by the Committee on Research in Undergraduate Mathematics Education (Ed Dubinsky, chair)
- 8:00–10:55 **Contributed Paper Session:** *Mathematics for the health sciences*, Henry C. Foehl, Philadelphia College of Pharmacy and Science

- 7:00–9:00 **Minicourse #16 (Part A):** *Challenging students with research projects in calculus*, Douglas Kurtz and David Pengelley, New Mexico State University
- 7:30–8:20 **Special Student Lecture:** *Contemporary problems in graph theory*, Carolyn R. Mahoney, California State University at San Marcos, sponsored by the Committee on Student Chapters (Howard Anton, chair) and the Committee on Minority Participation in Mathematics (Manuel P. Berriozábal and Sylvia T. Bozeman, co-chairs)
- 7:30–9:30 **New 1991 Skits:** sponsored by the Committee on the Participation of Women (Patricia C. Kenschaft, chair)
- 7:30–9:00 **CAS Workshop Participants Reunion:** organized by Donald B. Small, West Point

Saturday, January 11

morning

- 8:00–10:55 **AMS Special Sessions and Sessions for Contributed Papers**
- 8:00–8:50 **Special Presentation:** *Process and symbols in the mind*, David Tall, Warwick, co-sponsored by CUPM Subcommittee on Symbolic Computer Systems (Zaven A. Karian, chair), and CCIME, the Committee on Computers in Mathematics Education (Eugene A. Herman, chair)
- 8:00–10:55 **Contributed Paper Session:** *Environmental mathematics*, Ben A. Fusaro, Salisbury State University, and Margaret Barry Cozzens, Northeastern University
- 8:00–10:55 **Contributed Paper Session:** *Actuarial mathematics education and research*, sponsored by the Actuarial Faculty Forum, James Daniel, University of Texas
- 8:00–10:55 **AMS Special Session:** *Preparing for future college teaching*, Bettye Anne Case, Florida State University
- 8:00–10:55 **AMS Special Session:** *History of mathematics*, Florence Fasanelli, MAA, Victor J. Katz, University of the District of Columbia, and David E. Rowe, Pace University
- 8:00–10:00 **Minicourse #7 (Part B):** *Using NETPAD software to teach and learn about graphs* Nathaniel Dean, Bellcore, and Joseph G. Rosenstein, Rutgers University
- 8:30–10:00 **AMS Panel Discussion:** *Directions for AMS action in education*, sponsored by the AMS Committee on Education, (Ramesh A. Gangolli, chair)
- 8:00–10:00 **Minicourse #8 (Part B):** *CAS laboratory projects for first year calculus using DERIVE*, Carl Leinbach, Gettysburg College, and Marvin L. Brubaker, Messiah College
- 9:00–9:50 **MAA Invited Address:** *Teaching linear algebra; Must the fog always roll in?*, David H. Carlson, San Diego State University
- 9:00–10:00 **Panel Discussion:** *The fate of minority mathematics students*, cosponsored by MAA and the National Association of Mathematicians
- 9:00–11:00 **Student Workshop (Part B):** sponsored by the ad hoc Committee on Mathematics and the Environment (Bernard A. Fusaro, chair), and the Committee on Student Chapters (Howard Anton, chair)
- 10:05–10:55 **MAA Invited Address:** *Problems in mathematics: East Asian and the United States*, Harold Stevenson, Department of Psychology, University of Michigan
- 11:10–noon **AMS-MAA Invited Address:** *The current interface of geometry and elementary particle physics*, I. M. Singer, Massachusetts Institute of Technology
- afternoon**
- 1:00–5:30 **AMS Special Sessions and Sessions for Contributed Papers**
- 1:00–3:00 **Panel Discussion:** *The AP calculus program*, sponsored by the CEEB-MAA College Board Committee on Mutual Concerns (Philip C. Curtis, Jr. and Carole E. Greenes, co-chairs)
- 1:00–3:00 **Panel Discussion:** *Future directions in symbolic computing software*, sponsored by CUPM Subcommittee on Symbolic Computer Systems (Zaven A. Karian, chair)
- 1:00–2:00 **Poetry Reading:** *The Calculus Virgin*, sponsored by the Humanistic Mathematics Network (Alvin White)
- 1:00–5:30 **Contributed Paper Session:** *Environmental mathematics*, Ben A. Fusaro, Salisbury State University, and Margaret Barry Cozzens, Northeastern University
- 1:00–5:30 **AMS Special Session:** *Preparing for future college teaching*, Bettye Anne Case, Florida State University
- 1:00–3:00 **Minicourse #6 (Part B):** *Introduction to research in the teaching and learning of undergraduate mathematics: Examples in calculus*, Joan Ferrini-Mundy, University of New Hampshire, and Kathleen Heid, Pennsylvania State University, University Park, sponsored by the Committee on Research in Undergraduate Mathematics Education (Ed Dubinsky, chair)
- 1:00–3:00 **Minicourse #10 (Part B):** *How to make effective use of inexpensive pocket computers to develop the concepts and techniques of calculus*, Franklin Demana and Bert K. Waits, Ohio State University
- 1:00–3:00 **Minicourse #12 (Part B):** *Mathematical modeling with a spreadsheet*, Stephen D. Comer and Hughes B. Hoyle III, The Citadel
- 1:00–3:00 **Minicourse #13 (Part B):** *Integrating calculus and physics for freshmen*, Joan R. Hundhausen and R. Richard Yeatts, Colorado School of Mines
- 3:30–5:30 **Minicourse #9 (Part C):** *Learning abstract algebra by programming in ISETL*, Ed Dubinsky, Purdue University, and Uri Leron, Technion-IIT
- 3:30–5:30 **Minicourse #14 (Part B):** *The Fibonacci and Catalan numbers*, Ralph P. Grimaldi, Rose-Hulman Institute of Technology
- 3:30–5:30 **Minicourse #15 (Part B):** *Why, when and how to use CAS calculators in calculus and linear algebra instruction*, John Kennelly and Donald R. LaTorre, Clemson University
- 3:30–5:30 **Minicourse #16 (Part A):** *Challenging students with research projects in calculus*, Douglas Kurtz and David Pengelley, New Mexico State University
- 5:15–6:45 **Concert:** (tentative) Past Presidents William Browder (AMS) and Leonard Gillman (MAA)

Joint Program Committee

Members of the AMS-MAA Joint Program Committee are Nancy K. Stanton (Chair), Roger A. Horn, Raymond L. Johnson, and Gerald J. Porter.

MAA Program Committee

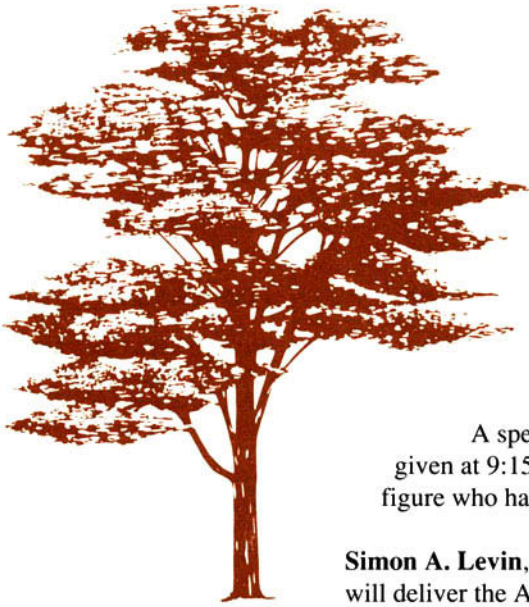
Members are David W. Ballew, Susan J. Devlin, B. A. Fusaro, Leon Henkin, Roger Horn (Chair), Raymond L. Johnson, L. Carl Leinbach, Louise A. Raphael, and Lawrence C. Washington.

AMS Program Committee for National Meetings

Members are James G. Arthur, Spencer Bloch, Robert M. Fossum (ex-officio), Dusa McDuff, Peter Sarnak, Nancy K. Stanton, and Jean E. Taylor (Chair).

Local Arrangements Committee

The members of the Local Arrangements Committee are Thomas E. Armstrong, John Chollet, Marie A. Dowling, James F. Gilroy, William H. Jaco (ex-officio), Alan F. Karr (Chair), Nathaniel Knox, Robert LeWand, George Mackiw, Kenneth A. Ross (ex-officio), Lance W. Small (ex-officio), and Marcia P. Sward (ex-officio).



Mathematics and the Environment

The AMS-MAA Joint Meetings Committee, in recognition of rising environmental concerns throughout the world wishes to draw attention to the following events in the program:

A special **Welcome Address** in keeping with this environmental "thread" will be given at 9:15 a.m. on Wednesday. Although the speaker is not yet firm, it will be a public figure who has demonstrated concern for environmental issues.

Simon A. Levin, Charles A. Alexander Professor of Biological Sciences at Cornell University, will deliver the AMS-MAA Environmental Address at 11:00 a.m. on Thursday. Levin will speak on *Problems of scale in ecology*.

The AMS program contains a Special Session on *Environmental modeling*, organized by **B. A. Fusaro**, Salisbury State University, and **Roland H. Lamberson**, Humboldt State University. This Special Session will meet at 4:15 p.m. on Wednesday and at 1:00 p.m. on Friday.

The MAA program contains a number of related events:

A contributed paper session on *Environmental mathematics* organized by **B. A. Fusaro**, Salisbury State University, and **Margaret Barry Cozzens**, Northeastern University, will meet on Thursday morning and on Saturday. Papers are invited that treat topics that are suitable for a liberal arts mathematics course or for a modeling course, preferably at the sophomore-junior level.

A **panel discussion**, sponsored by the MAA ad hoc Committee on Mathematics and the Environment (B. A. Fusaro, Chair), will take place at 9:30 a.m. on Friday, and is titled *Getting started*.

A **Student Workshop** titled *Environmental mathematics* is jointly sponsored by the same committee and the MAA Committee on Student Chapters (Howard Anton, Chair) and is scheduled from 2:00 p.m. to 4:00 p.m. on Friday. The workshop will be repeated on Saturday at 9:00 a.m.

Minicourse #4 on *Environmental modeling* is being organized by **Robert McKelvey**, Environmental Research Lab EPA, Corvallis. Part A is scheduled from 2:15 p.m. to 4:15 p.m. on Wednesday, and Part B from 2:15 p.m. to 4:15 p.m. on Thursday. Enrollment is limited to 80.

In addition, a number of nonprofit environmental groups, including the **Chesapeake Bay Foundation**, can be found in the exhibit hall. Interested participants can pick up literature and information from these organizations during the hours that the exhibits are open.

The AMS-MAA Joint Meetings Committee has been striving to make these meetings environmentally responsible. For example, the programs have been printed on recycled paper for some time now, and the use of styrofoam cups has been eliminated whenever refreshments are served at any of the meeting events. Beginning with this meeting, all participants are asked to deposit their plastic badge holders in the marked containers provided for this purpose before leaving the meetings, so that they can be reused again at future meetings. We encourage everyone to cooperate in this effort to cut waste and keep costs down.

The Scientific Program

The January 1992 Joint Mathematics Meetings, including the 75th Annual Meeting of the Mathematical Association of America, the 98th Annual Meeting of the American Mathematical Society, and the 1992 annual meetings of the Association for Women in Mathematics and the National Association for Mathematicians, will be held January 8–11 (Wednesday–Saturday), 1992, in Baltimore, Maryland. Sessions will be held in the Baltimore Convention Center and the Hyatt Regency Baltimore.

Welcome Address

There will be a Welcome Address for all participants at 9:15 a.m. on Wednesday.

AMS-MAA Invited Addresses

By invitation of the AMS-MAA Joint Program Committee three speakers will address the AMS and MAA on the history or development of mathematics. The names of the speakers, their affiliations, the titles, dates, and times of their talks follow:

Joan S. Birman, Columbia University, *A new look at knot polynomials*, 11:10 a.m. Wednesday;

I. M. Singer, Massachusetts Institute of Technology, *The current interface of geometry and elementary particle physics*, 11:10 a.m. Saturday;

J. Ernest Wilkins, Jr., Clark Atlanta University, *Optimization for extended services for heat transfer*, 11:10 a.m. Friday.

Other AMS – MAA Sessions and Events

Also please see the page on Environmental Mathematics sessions and events.

There will be a special presentation featuring **Richard J. Shaker**, National Security Administration, titled *The agency that came in from the cold*, at 7:15 p.m. on Wednesday.

Values and Rewards in the Mathematics Profession: The AMS Committee on Science Policy (Michael C. Reed, Chair) and the MAA Science Policy Committee (John A. Thorpe, Chair) are cosponsoring this panel discussion from 9:30 a.m. to 10:55 a.m. on Wednesday. This session will focus on issues raised in many recent reports dealing with infrastructure problems in science and mathematics. The MS 2000 report recommends broadening attitudes and value systems. The David II report recommends broadening the reward structure. The Joint Policy Board for Mathematics has appointed a committee on Professional Values, Recognition and Rewards. Other science organizations, including the Conference Board on the Mathematical Sciences and Sigma Xi, have also raised these issues. The principal speaker will be **Daniel E. Koshland, Jr.**, editor of *Science*, the journal of the American Association for the Advancement of Science. Respondents include **Calvin C. Moore**, University of California, Berkeley; and **David A. Sanchez**, National Science Foundation. The organizer and moderator is **John A. Thorpe**, SUNY at Buffalo.

Special Session: There will be a Special Session jointly sponsored by the AMS and MAA on *Mathematics and education reform* organized by **Naomi Fisher**, University of Chicago; **Harvey B. Keynes**, University of Illinois; and **Philip D. Wagreich**, University of Minnesota, on Wednesday at 2:15 p.m., Thursday at 8:00 a.m., and Friday at 8:00 a.m. The Wednesday and Thursday sessions will cover a variety of educational activities by mathematicians, while the Friday session will focus on NSF vertically integrated projects.

Panel Discussion: The AMS and MAA are cosponsoring a panel discussion on *The undergraduate linear algebra curriculum* from 7:00 p.m. to 10:00 p.m. on Thursday. The panel is being organized by the Linear Algebra Curriculum Study Group (A. Duane Porter, Chair). There will be a series of short talks followed by a discussion. Topics may include past work of the Linear Algebra Curriculum Study group, suggested course outlines and reports from faculty who have used them, pedagogy/teaching strategies, technology, and a microcomputer demonstration.

Other AMS-MAA Events

Social for First-time Attendees: The AMS and the MAA Committee on Membership (Susan Forman, Chair) are cosponsoring a social on Wednesday from 6:00 p.m. to 7:00 p.m. for participants who are attending their first national mathematics meeting and for others who would like to learn some of the secrets to surviving in the environment of a large meeting.

Concert: An encore musical performance by Past Presidents **William Browder** (AMS) and **Leonard Gillman** (MAA) is tentatively scheduled at 5:15 p.m. on Saturday.

75th Annual Meeting of the MAA January 8–11, 1992

Retiring Presidential Address: Past President **Lida K. Barrett**, Mississippi State University, will give her Retiring Presidential Address titled *Mathematics goes public* at 3:20 p.m. on Friday.

Invited Addresses: There will be five invited fifty-minute addresses. The names of the speakers, their affiliations, the dates, times, and titles follow:

David H. Carlson, San Diego State University, *Teaching linear algebra; Must the fog always roll in?*, Saturday, 9:00 a.m.

Ingrid Daubechies, Rutgers University and AT&T Bell Labs, *Wavelets making waves in mathematics and engineering*, Thursday, 10:05 a.m.

James W. Demmel, University of California, Berkeley, Wednesday, 3:20 p.m.

Jeffrey Shallit, University of Waterloo, *Real numbers with bounded partial quotients*, Friday, 2:15 p.m.

Harold Stevenson, Department of Psychology, University of Michigan, Ann Arbor, *Problems in mathematics: East Asian and the United States*, Saturday, 10:05 a.m.

Minicourses: Seventeen Minicourses are being offered by the MAA. The names and affiliations of the organizers, the topics, the dates and times of their meetings, and the enrollment limitations of each are as follows: (Also, be sure to see sessions on the page on Environmental Mathematics.

Minicourse #1: Alternatives to the lecture method in collegiate mathematics, Julian Weissglass, University of California, Santa Barbara. Part A is scheduled from 8:00 a.m. to 10:00 a.m. on Wednesday, and Part B from 8:00 a.m. to 10:00 a.m. on Thursday. Enrollment is limited to 40.

This course will provide participants with information about using alternatives to the lecture method – particularly small group discussion methods. The goal is to enable teachers to get their students actively involved in doing, discussing and writing about mathematics. Participants will engage in small group learning activity, see video clips, discuss the issues involved and learn about the research literature. Attention will be paid to educational and organizational issues, assessment, and student's reactions.

Minicourse #2: The Harvard calculus reform project: Hands-on experience with the project materials, Deborah Hughes Hallett, Harvard University; **Sheldon P. Gordon**, Suffolk Community College; **William McCallum**, University of Arizona; and **Thomas W. Tucker**, Colgate University. Part A is scheduled from 8:00 a.m. to 10:00 a.m. on Wednesday, and Part B from 2:15 p.m. to 4:15 p.m. on Thursday. Enrollment is limited to 40.

This minicourse will familiarize the participants with the philosophy and the materials being developed under the Harvard Calculus Reform Project. It will describe the philosophy behind the project and its implementation at a variety of institutions. The project is based on the *Rule of Three* in which most topics are presented geometrically, numerically and symbolically to enhance student understanding of the concepts of calculus. Participants will be provided sample materials to examine, try out and bring home to incorporate into their own classes.

Minicourse #3: Using history in teaching calculus, V. Frederick Rickey, Bowling Green State University. Part A is scheduled from 8:00 a.m. to 10:00 a.m. on Wednesday, and Part B from 2:15 p.m. to 4:15 p.m. on Thursday. Enrollment is limited to 80.

Students of calculus instinctively ask many penetrating questions: What is calculus? What good is it? Why are the concepts presented the way they are? When the calculus reform movement eliminates computational drudgery to concentrate on the fundamental ideas of the calculus, it will be even more imperative to respond to these questions. The answers are inherently historical, and so by interjecting an historical vein into our teaching we can respond to these questions in meaningful and inspiring ways. A wide variety of ideas for using the history of the calculus that have been successfully used to motivate students will be presented. A bibliography and historical notes will be provided.

Minicourse #5: Using group projects in calculus, Stephen Hilbert, John Macelli, Eric Robinson, Diane Schwartz and Stanley Seltzer, Ithaca College. Part A is scheduled from 4:30 p.m. to 6:30 p.m. on Wednesday, and Part B from 7:00 p.m. to 9:00 p.m. on Thursday. Enrollment is limited to 80.

Many have recommended using projects and/or cooperative learning in calculus courses. The organizers have been teaching calculus using group projects since Spring 1989. Open-ended projects challenge

students to develop problem-solving skills beyond looking for a similar problem solved in the text or class notes. This minicourse will address issues relating to the use of group projects in calculus, including an overview, examples of projects, hands-on experience working in a group on a project, and the impact on the curriculum.

Minicourse #6: *Introduction to research in the teaching and learning of undergraduate mathematics: Examples in calculus*, **Joan Ferrini-Mundy**, University of New Hampshire; and **Kathleen Heid**, Pennsylvania State University. This Minicourse is sponsored by the MAA Committee on Research in Undergraduate Mathematics Education (Ed Dubinsky, Chair). Part A is scheduled from 4:30 p.m. to 6:30 p.m. on Wednesday, and Part B from 1:00 p.m. to 3:00 p.m. on Saturday. Enrollment is limited to 30.

Can better understandings of how students learn, and of how teaching affects learning, lead to more effective undergraduate mathematics experiences? The formation of working groups interested in pursuing this question will be encouraged. By viewing data from research studies of learning and teaching calculus and other areas, and by conducting clinical interviews with undergraduate students, participants will gain first-hand introductory experience with qualitative research methods. An overview of literature and resources helpful to those interested in "getting started" in research of this nature will be provided. "Homework" between sessions is planned.

Minicourse #7: *Using NETPAD software to teach and learn about graphs*, **Nathaniel Dean**, Bellcore; and **Joseph G. Rosenstein**, Rutgers University. Part A is scheduled from 8:00 a.m. to 10:00 a.m. on Thursday, and Part B from 8:00 a.m. to 10:00 a.m. on Saturday. Enrollment is limited to 30.

The NETPAD software provides an easy way to draw and analyze graphs using computers. It can be a valuable tool for both research and hands-on teaching of graph-theoretic concepts. It can be used like an electronic pencil and notepad to draw, modify, save, and recall graphs or networks and such attributes as colors of vertices or weights of edges. It can also be used to access a library of NETPAD algorithms for manipulating and analyzing graphs. NETPAD was developed at Bell Communications Research, and it will be used in this course to introduce basic concepts involving graphs and graph algorithms and to demonstrate how it can be used for theoretical research, for industrial research, and to enhance teaching.

NETPAD is a portable system that runs on workstations under the X Windows System. The participants will gain hands-on experience, and the NETPAD software and documentation will be made available to all participants at no additional charge. There are no prerequisites for this minicourse.

Minicourse #8: *CAS laboratory projects for first year calculus using DERIVE*, **Carl L. Leinbach**, Gettysburg College; and **Marvin L. Brubaker**, Messiah College. Part A is scheduled from 8:00 a.m. to 10:00 a.m. on Thursday, and Part B from 8:00 a.m. to 10:00 a.m. on Saturday. Enrollment is limited to 30.

This course is designed to acquaint participants with a method of presenting calculus as a laboratory course. In addition to discussing the philosophy and the logistics of a laboratory calculus course, participants will have hands-on experience working in simulated laboratory sessions. Laboratories will be conducted using the DERIVE Computer Algebra System.

Minicourse #9: *Learning abstract algebra by programming in ISETL*, **Ed Dubinsky**, Purdue University; and **Uri Leron**, Technion-IIT. Part A is scheduled from 2:15 p.m. to 4:15 p.m. on Thursday, Part B from 2:00 p.m. to 4:00 p.m. on Friday, and Part C from 3:30 p.m. to 5:30 p.m. on Saturday. Enrollment is limited to 30.

The organizers believe that undergraduates' difficulty in learning abstract algebra has less to do with the complexity of the theorems than with the abstract nature of the mathematical objects involved. Programming in a mathematical language can help by getting students to construct those objects on the computer, allowing mathematical operations to be, for them, activities about meaningful objects. The minicourse is a hands-on experience in doing this with ISETL. No previous programming background is necessary.

Minicourse #10: *How to make effective use of inexpensive pocket computers to develop the concepts and techniques of calculus*, **Franklin Demana** and **Bert K. Waits**, Ohio State University. Part A is scheduled from 7:00 p.m. to 9:00 p.m. on Thursday, and Part B from 1:00 p.m. to 3:00 p.m. on Saturday. Enrollment is limited to 40.

Inexpensive (\$100 or less) pocket computers are dramatically changing the way calculus is taught (and the way students learn). Participants will use the latest "state of the art" Texas Instruments pocket computers – powerful tools that permit the user to make and test

generalizations by looking at a large number of examples quickly, make solving graphically and numerically a realistic and powerful problem solving technique, and make noncontrived examples routine for all students. Topics include limits, continuity, differentiation, integration, optimization, sequences, series, vectors, matrices, and motion simulation.

Minicourse #11: *Instituting a mathematics placement program: Creating order out of chaos in freshman mathematics*, **Phillip C. Curtis, Jr.**, University of California, Los Angeles. Part A is scheduled from 8:00 a.m. to 10:00 a.m. on Friday, and Part B from 2:00 p.m. to 4:00 p.m. on Friday. Enrollment is limited to 40.

Members of the MAA Committee on Testing will use lectures, worksheets, and question and answer sessions to present an overview of the task of establishing a mathematics placement program. Topics covered will include: reasonable expectations of a placement program, tests available through the MAA Placement Test Program (PTP), selection or creation of a placement test or series of tests, statistical analysis of test items and tests, methods of establishing a cutoff score, and administration of a placement program.

Minicourse #12: *Mathematical modeling with a spreadsheet*, **Stephen D. Comer** and **Hughes B. Hoyle III**, The Citadel. Part A is scheduled from 8:00 a.m. to 10:00 a.m. on Friday, and Part B from 1:00 p.m. to 3:00 p.m. on Saturday. Enrollment is limited to 30.

This minicourse will give participants hands-on experience building spreadsheet models which enhance the teaching of introductory mathematics. Applications and sample assignments will be drawn from the maximum and minimum problems, linear programming, and the mathematics of finance. Participants will use Lotus 1-2-3 on the new Hewlett-Packard palmtop PC. No prior experience using a spreadsheet or the palmtop PC will be assumed.

Minicourse #13: *Integrating calculus and physics for freshmen*, **Joan R. Hundhausen** and **F. Richard Yeatts**, Colorado School of Mines. Part A is scheduled from 8:00 a.m. to 10:00 a.m., Friday, and Part B from 1:00 p.m. to 3:00 p.m., Saturday. Enrollment is limited to 35.

This minicourse is based upon the organizers' experiences in developing and teaching an integrated course in calculus and physics, but also will be addressed to those who are particularly interested in emphasizing applications in a traditional calculus course. Sessions will feature discussion of physical applications in motivating and illustrating calculus concepts, modeling, use of parameters, and problem-solving. Participants will be offered guidance on the design and implementation of Laboratory/Workshop exercises. Some practical considerations such as student preparation and motivation, textbooks, sequencing and reinforcement of topics, and testing will be discussed.

Minicourse #14: *The Fibonacci and Catalan numbers*, **Ralph P. Grimaldi**, Rose-Hulman Institute of Technology. Part A is scheduled from 8:00 a.m. to 10:00 a.m., Friday, and Part B from 3:30 p.m. to 5:30 p.m., Saturday. Enrollment is limited to 80.

In introductory courses in discrete or combinatorial mathematics one encounters the Fibonacci numbers – and sometimes the Catalan numbers. This minicourse will review and then extend this first encounter as it examines some of the properties these numbers exhibit as well as applications where these sequences arise. A survey of applications dealing with chemistry, physics, computer science, linear algebra, set theory, graph theory, and number theory will show why these sequences are of interest and importance.

Minicourse #15: *Why, when and how to use CAS calculators in calculus and linear algebra instruction*, **John Kenelly** and **Donald R. LaTorre**, Clemson University. Part A is scheduled from 7:00 p.m. to 9:00 p.m., Friday, and Part B from 3:30 p.m. to 5:30 p.m. on Saturday. Enrollment is limited to 30.

This minicourse will be a hands-on consideration of why the power of CAS calculators is needed in undergraduate mathematics and how their portability gives special advantages in both day-to-day classes and testing. The participants will work through specific examples showing when and how to use the unit effectively to enhance instruction in calculus and linear algebra. Part A will concentrate on calculus with an emphasis on differentiation and integration concepts, arc length, power series and selected multidimensional topics. Part B will focus on linear algebra with an emphasis on elimination methods, factorization techniques, orthogonality concepts, and eigenvalues and eigenvectors.

Minicourse #16: *Challenging students with research projects in calculus*, **Douglas Kurtz** and **David Pengelley**, New Mexico State University. Part A is scheduled for 7:00 p.m. to 9:00 p.m. on Friday, and Part B from 3:30 p.m. to 5:30 p.m. on Saturday. Enrollment is limited to 80.

Intellectually demanding and interesting two-week projects improve student attitudes and engender independent learning.

Students gain pride in their work by "making a problem their own". Instructors find teaching calculus rewarding and are impressed by their students' accomplishments. An introduction to an established departmental projects program will be provided. Participants will grapple with interacting with students about particular projects, creating projects, and with using group projects and a help laboratory. Materials will be provided.

Minicourse #17: Advanced workshop on DERIVE, David R. Stoutemyer, University of Hawaii and Soft Warehouse, Inc., 2:15 p.m. to 4:15 p.m. on Wednesday. This minicourse is intended for persons who have had at least six months of experience in using DERIVE, preferably in classroom or workshop situations. Enrollment is limited to 30.

The lenient menu-driven interface of the DERIVE computer algebra program enables it to be used in support of mathematical education with very little investment in learning its elementary features. However, guidance is helpful for using the programming feature of DERIVE to extend the built-in features for educational or research applications. This two-hour hands-on workshop course is designed to provide that guidance for experienced DERIVE users.

Participants interested in attending any of the MAA Minicourses should complete the MAA Minicourse Preregistration Form found at the back of this issue and send it directly to the MAA office at the address given on the form so as to arrive prior to the November 18 deadline. DO NOT SEND THIS FORM TO PROVIDENCE. Please note that these MAA Minicourses are NOT the AMS Short Course. After the deadline, potential participants are encouraged to call the MAA headquarters at 800-331-1622.

Please note that prepayment is required. Payment can be made by check payable to MAA (Canadian checks must be marked "in U.S. funds") or Visa or MasterCard credit cards.

The registration fee for MAA Minicourses # 7, 8, 9 is \$60 each and the registration fee for MAA Minicourse # 17 is \$30. All other MAA Minicourses are \$36 each.

The MAA Minicourses are open only to persons who register for the Joint Meetings and pay the Joint Meetings registration fee. **If the only reason for registering for the Joint Meetings is to gain admission to a MAA Minicourse, this should be indicated by checking the appropriate box on the MAA Minicourse Preregistration Form. Then, if the Minicourse is fully subscribed, full refund can be made of the Joint Meetings preregistration fee. Otherwise, the Joint Meetings preregistration will be processed, and then be subject to the 50% refund rule. Participants should take care when cancelling Minicourse preregistration to make clear their intention as to their Joint Meetings preregistration, since if no instruction is given, the Joint Meetings registration will also be cancelled. PRE-REGISTRATION FORMS FOR THE JOINT MEETINGS SHOULD BE MAILED TO PROVIDENCE PRIOR TO THE DEADLINE OF NOVEMBER 18.**

Contributed Papers: Contributed papers are being accepted on nine topics. The topics, organizers, their affiliations, and the probable days they will meet are (also see the section on Environmental Mathematics at the Baltimore meetings):

- **Research in undergraduate education, Ed Dubinsky**, Purdue University, Thursday and Friday mornings. Presentations are invited that describe research on the learning and teaching of any aspect of undergraduate mathematics. Descriptions of courses taught must be in the context of investigations into such questions as to how mathematics is learned, methods of teaching, effectiveness of the approach, and similar issues.
- **Mathematics placement testing programs: Their organization, administration and problems, Rose Hamm**, College of Charleston; and **John G. Harvey**, University of Wisconsin, Madison, Wednesday. Papers on various aspects of placement testing programs are welcome. Of special interest are the test(s) used and the other data used (e.g., aptitude scores, high school GPA's), as well as the problems that arise and the ways of solving them.
- **The "seven-into-four" problem, David H. Carlson**, San Diego State University; and **Ann Watkins**, California State University, Northridge, Wednesday and Friday afternoons. This session was organized by the Committee on Calculus Reform and the First Two Years (CRAFTY). Papers are invited which present innovative ways of solving the seven-into-four problem. Seven courses (Calculus I, II, and III, Differential Equations, Discrete Mathematics, Linear Algebra, and Probability/Statistics) have been recommended for the first four semesters of college mathematics. Is it possible to squeeze them all in? What are some good partial solutions to the problem?

- **Innovations in mathematics courses for business, Wade Ellis, Jr.**, West Valley College; and **Barbara A. Jur**, Macomb Community College, Wednesday morning and Thursday afternoon. This session is organized by the CUPM Subcommittee on Service Courses, which focuses on service courses for business students. Contributed papers may address issues of specialized business subject matter, innovative instructional techniques, the relationship of business-oriented courses to the mathematics curriculum, or other related topics.
- **Actuarial mathematics education and research, James W. Daniel**, University of Texas, Austin, Saturday. Sponsored by the Actuarial Faculty Forum. Contributions should address educational (or research) issues in actuarial mathematics, including such topics as curricula, teaching methods, program organization, textbooks, software, professional exams, and research.
- **A toolbox for liberal arts mathematics courses, John Emert and Kay Meeks**, Ball State University, Thursday afternoon and Friday morning. Liberal arts mathematics courses generally include as goals the changing of students' perception of mathematics and the illumination of relationships between mathematics and other disciplines. The purpose of this session is to share innovative, yet practical and transferable, ideas and techniques which can aid in the development and realization of these common goals. Topics for discussion may include: creative classroom techniques and assignments; fresh, unusual topics for inclusion in courses; and specific ways to encourage students' discovery of the usefulness of mathematics in their own fields of study.
- **Mathematics for the health sciences, Henry C. Foehl**, Philadelphia College of Pharmacy and Science, Friday. Papers contributed for this session should describe the content of courses or sequences of courses that constitute part or all of the mathematics requirements for degree programs in the health or health-related sciences. Of particular interest are criteria for selecting the appropriate content for such courses and methods for integrating the content into the curricula of various degree programs, especially where the courses also serve as the mathematics component of a core curriculum.
- **Using spreadsheets to teach mathematics, Robert S. Smith**, Miami University, Wednesday morning and Thursday afternoon. The spreadsheet is a powerful and versatile—yet easy to use—software tool that has become increasingly popular in the teaching of the mathematical sciences. It is ideal for implementing algorithms which rely upon iterative procedures or recurrence relations, and is a natural tool for solving many types of applied problems. This session invites papers which illustrate the spreadsheet as a problem solving, data analysis, or graphing tool. Papers are also invited which demonstrate how the spreadsheet can be used to prove theorems, discover patterns and results, or illustrate mathematical concepts. Papers which describe courseware that is developed around the spreadsheet are strongly encouraged.

Presentations are normally limited to ten minutes, although selected contributors may be given up to twenty minutes. The deadline for submitting papers was **September 11**.

Rooms where sessions of contributed papers will be held are equipped with an overhead projector and screen. Blackboards are **not** available. Persons having other equipment needs should contact the MAA Associate Secretary (Kenneth A. Ross, Department of Mathematics, University of Oregon, Eugene, OR 97403-1222; electronic mail: ross@math.uoregon.edu) as soon as possible, but in any case **prior to November 1**. Upon request, the following will be made available: one additional overhead projector/screen, 35mm carousel slide projector, or $1/2'$ or $3/4'$ VHS video cassette recorder with one color monitor.

Organizers are cautioned that requests for equipment made at the meeting may not be able to be satisfied because of budgetary restrictions.

Other MAA Sessions

John von Neumann Presentation: On the first day of the meeting there will be a special presentation by John von Neumann's brother, Nicholas A. Vonneuman, by now practically the only surviving witness of von Neumann's early years. The presentation, titled *The philosophical legacy of John von Neumann*, will report on the evolution of his formative years and will include John's attitude concerning manifestations of nature, pragmatism, positivism, pure versus applied science, responsibility of scientists, geopolitics, etc. Although the material to be presented is primarily from Nicholas' perspective, it is part of an overall scenario that should be of interest to future historians.

An exhibit of memorabilia and photographs from the Von Neumann family will be on display in the exhibit area.

Helaman Ferguson Sculpture Exhibit: Works by this mathematician/artist will be on display in the exhibit area.

Mathematical Life Outside Academia: Input from the Real World: This panel discussion is sponsored by the Committee on Mathematicians Outside Academia (Patrick D. McCray, Chair) and is scheduled on Wednesday, from 8:00 a.m. to 9:20 a.m. The moderator is **S. Brent Morris**, National Security Agency.

ICME - 7 (August 17-23, 1992): This panel discussion, scheduled from 8:00 a.m. to 9:20 a.m. on Wednesday, is sponsored by the United States Commission on Mathematical Instruction and is chaired by **Eileen L. Polani**, Saint Peter's College. The panelists are **Florence D. Fasanelli**, consultant to MAA/SUMMA; **Bernard R. Hodgson**, Université Laval and Chair of the National Committee for ICME - 7; **Martin Johnson**, University of Maryland; **Eric R. Miller**, Brock University and member of the International Program Committee for ICME - 7; and **Paul Zorn**, St. Olaf College.

How to Start and Maintain a Departmental Colloquium: This panel discussion is sponsored by the Visiting Lectures Committee (**James G. Ware**, University of Tennessee at Chattanooga, Chair) and is scheduled from 8:30 a.m. to 9:50 a.m. on Thursday. Panel members are the committee Chair; **Jean B. Chan**, Sonoma State University; **Sandy Grabiner**, Pomona College; and **Deane Arganbright**, Whitworth College.

Curriculum Initiatives: Statistics, Geometry, Environment, Assessment, and Quantitative Literacy: This panel discussion organized by **James R. C. Leitzel**, MAA and Ohio State University; and **Lynn A. Steen**, St. Olaf College, is scheduled from 8:30 a.m. to 9:50 a.m. on Thursday.

Preparing Teachers of Mathematics: The panel discussion is jointly sponsored by COMET, the Committee on the Mathematical Education of Teachers (**James R. C. Leitzel**, Chair) and CTUM, the Committee on the Teaching of Undergraduate Mathematics (**Don R. Lick**, Chair). It will take place 2:15 p.m. to 4:10 p.m. on Thursday. The panel will address issues in preparing and providing continuing professional development for teachers of mathematics at all levels. The panelists are **Bettye Anne Case**, Florida State University; **Ed Dubinsky**, Purdue University; **Patricia L. Jones**, University of Southwestern Louisiana; and **Glenda Lappan**, Michigan State University. The moderators are **James R. C. Leitzel** and **Don R. Lick**.

Guidelines for Undergraduate Mathematics Programs: The ad hoc Committee on Guidelines (**John D. Fulton**, Chair), which is sponsoring this panel discussion scheduled from 2:15 p.m. to 4:10 p.m. on Thursday, is preparing a set of Guidelines for Undergraduate Mathematics Programs for consideration by the MAA Board of Governors. The committee is nearing completion of its task and seeks advice from mathematicians. The Guidelines are intended to be used by departments of mathematics for self-assessment or assessment by other reviewers. The current draft version incorporates current policy statements of our professional organizations as well as data from the recent CBMS survey of departments. The panelists are **John D. Fulton**, The University of West Florida; **David J. Lutzer**, College of William & Mary; and **John A. Thorpe**, SUNY at Buffalo. They will address the draft document, its rationale and seek input from the audience.

The Source Book for College Mathematics Teaching: This panel discussion is scheduled from 8:00 a.m. to 9:20 a.m. on Friday. This panel discussion is sponsored by CTUM, the Committee on the Teaching of Undergraduate Mathematics. The moderator is the Chair of the committee, **Don R. Lick**, Eastern Michigan University, and the panel members are **Carole Ann Bauer**, Triton College; **Ed Dubinsky**, Purdue University; **Peter Ross**, Santa Clara University; and **Alan H. Schoenfeld**, University of California, Berkeley.

Statistics for the Twenty-First Century: This panel discussion is scheduled from 8:00 a.m. to 9:20 a.m. on Friday. The organizers are **Florence S. Gordon**, New York Institute of Technology, and **Sheldon P. Gordon**, Suffolk Community College. Participants are **Robert V. Hogg**, University of Iowa; **J. Laurie Snell**, Dartmouth College; and **Ann Watkins**, California State University, Northridge.

SUMMA Workshop: SUMMA, Strengthening Underrepresented Minority Mathematics Achievement, is sponsoring a workshop led by **Winson Coleman**, University of the District of Columbia; and **Carol Malloy**, Mathematics and Science Education Network, University of North Carolina, scheduled from 9:00 a.m. to 10:55 a.m. on Friday.

Site Testing of New Calculus Projects: This panel discussion is sponsored by CRAFTY, CUPM Subcommittee on Calculus Reform and the First Two Years (Thomas W. Tucker, Chair) and is scheduled from 9:30 a.m. to 10:55 a.m. on Friday. The participants are **Tom Dick**, Oregon State University; **Ed Dubinsky**, Purdue University; **Deborah Hughes Hallett**, Harvard University; **David A. Smith**, Duke University; and **Wayne Roberts** (moderator), CRAFTY. As calculus reform moves into the beta test stage, one of the better ways for an institution to become involved in the effort to strengthen calculus instruction is to be a test site for an established calculus project. This panel will discuss the experiences of four such projects engaged in ambitious programs to implement their ideas and methods at a variety of institutions.

Poetry Readings: A general poetry reading is scheduled from 7:00 p.m. to 10:00 p.m. on Friday. This reading has been organized by **JoAnne Growney**, **Dan Kalman**, and **Elena Marchisotto**. From 1:00 p.m. to 2:00 p.m. on Saturday there will be a special reading entitled *The calculus virgin*. **Louis Leithold**, mathematician, and artist-poet **d'Arcy Hayman** will read poetry and show drawings which are d'Arcy Hayman's passionate and thrilling response to Louis Leithold's seminar on calculus for teachers of Advanced Placement calculus. These readings are sponsored by the Humanistic Mathematics Network (Alvin White).

CAS Workshop Reunion: This has been organized by **Donald B. Small**, West Point, and is scheduled at 7:30 p.m. on Friday.

New 1991 Skits: New skits and discussions of micro-inequities are dramatizations of incidents that actually happened in 1991 to women in mathematics, including students. Micro-inequities are events that may seem funny later but chip away at women like drops of water on a rock. After laughing, those who like may join discussions about how we can diminish the number of micro-inequities experienced by women in mathematics. These skits are sponsored by the Committee on the Participation of Women (**Patricia C. Kenschaft**, Chair) and are scheduled from 7:30 p.m. to 9:30 p.m. on Friday.

Symbolic Computer Systems: **David Tall**, Warwick, will make a special presentation titled *Processes and symbols in the mind* from 8:00 a.m. to 8:50 a.m. on Saturday. This presentation is cosponsored by CUPM Subcommittee on Symbolic Computer Systems (**Zaven A. Karian**, Chair) and CCIME, the Committee on Computers in Mathematics Education (**Eugene A. Herman**, Chair).

This committee is sponsoring a panel discussion titled *Future directions in symbolic computing software* from 1:00 p.m. to 3:00 p.m. on Saturday. The moderator is **Zaven A. Karian**, Denison University, and the panelists are **Ben Friedman**, Wolfram Research; **Brenton Leong**, University of Waterloo; and **David Stoutemyer**, Soft Warehouse, Inc.

The Fate of Minority Mathematics Students: This panel discussion, jointly sponsored by the MAA and the National Association of Mathematicians, is moderated by **William A. Hawkins**, SUMMA, and will be held on Saturday from 9:00 a.m. to 10:00 a.m.

The Advanced Placement Calculus Program: a Pump or a Filter?: This panel discussion is scheduled from 1:00 p.m. to 3:00 p.m. on Saturday and is sponsored by the CEEB-MAA College Board Committee on Mutual Concerns (**Philip C. Curtis, Jr.** and **Carole E. Greenes**, Co-Chairs). Among the participants are **Judith Broadwin**, Jericho High School; **John W. Kenelly**, Clemson University; **Daniel Kennedy**, The Baylor School; and **David J. Lutzer**, College of William and Mary. The panel will focus on mathematics education reform issues for AP calculus. The moderator is **Philip C. Curtis, Jr.**, University of California, Los Angeles.

Two-Year College Reception: The Committee on Two-Year Colleges is sponsoring an informal reception for two-year college faculty from 6:15 p.m. to 7:30 p.m. on Thursday.

Prize Session and Business Meeting: The MAA Prize Session and Business Meeting is scheduled from 4:25 p.m. to 5:30 p.m. on Friday. The Chauvenet Prize, the Yueh-Gin Gung & Dr. Charles Y. Hu Award for Distinguished Service to Mathematics and several Certificates of Meritorious Service will be presented. This meeting is open to all members of the Association.

Board of Governors: The MAA Board of Governors will meet from 8:00 a.m. to 4:00 p.m. on Tuesday, January 7. This meeting is open to all members of the Association.

Section Officers: There will be a Section Officers' meeting from 7:00 p.m. to 9:00 p.m. on Tuesday, January 7.

Student Activities

Also be sure to see the page on Environmental Mathematics sessions.

There will be a special presentation titled *The art of mental calculation*, **Arthur T. Benjamin**, Harvey Mudd College, from 2:15 p.m. to 3:15 p.m. on Thursday. Benjamin has demonstrated his rapid mental calculation skills all over the world.

The Committee on Student Chapters and Pi Mu Epsilon are co-sponsoring a **Student Hospitality Center** which will be open from the opening of registration until noon on Saturday.

There will be a **Career Fair** on Thursday from 4:00 p.m. to 7:00 p.m. sponsored by the Committee on Student Chapters. This special event is intended to provide an opportunity for prospective employers of mathematically trained people to make the academic mathematics community more aware of the needs of such employers, and of the variety of career opportunities available to people with a strong mathematics background. The Career Fair is open to all who register for the Joint Meetings. However, if you are an undergraduate student or high school teacher interested in attending **only** the Career Fair, please contact the MAA office in Washington for the appropriate registration form.

A **Breakfast for Student Chapter Advisors and Coordinators** is scheduled from 7:00 a.m. to 8:00 a.m. on Friday in the Student Hospitality Center.

Contemporary Problems in Graph Theory is the title of a **Special Student Lecture** by **Carolyn Mahoney**, California State University at San Marcos, that is especially targeted for students. This lecture will begin at 7:30 p.m. on Friday and is cosponsored by the Committee on Student Chapters (Howard Anton, Chair) and the Committee on Minority Participation in Mathematics (Manuel P. Berriozábal and Sylvia T. Bozeman, Co-Chairs).

98th Annual Meeting of the AMS January 8–11, 1992

Sixty-Fifth Josiah Willard Gibbs Lecture: The 1992 Gibbs Lecture will be presented at 8:30 p.m. on Wednesday, by **Michael E. Fisher**, University of Maryland, College Park.

Prizes: The 1992 Frank Nelson Cole Prize in Number Theory, the 1992 Prize for Distinguished Public Service, and Citations for Public Service will be awarded at 4:25 p.m. on Thursday.

Colloquium Lectures: A series of three Colloquium Lectures will be given by **Robert P. Langlands**, Institute for Advanced Study. The lectures will be given at 1:00 p.m. daily, Wednesday through Friday.

Retiring Presidential Address: William Browder will deliver his Retiring Presidential Address, at 10:05 a.m. Wednesday. Browder was President of the Society 1989–1990.

Invited Addresses: By invitation of the AMS Program Committee for National Meetings, there will be at least four fifty-minute invited addresses. The names and affiliations of the speakers, their titles, and the days and times they will talk are as follows:

Yakov M. Eliashberg, Stanford University, *On the border of symplectic geometry and complex analysis*, Wednesday, 4:25 p.m.;

Marina Ratner, University of California, Berkeley, *Lie groups in ergodic theory*, 9:00 a.m. Friday;

Walter Rudin, University of Wisconsin, Madison, *Holomorphic mappings from C^n to C^n* , 2:15 p.m. Thursday;

Michael Shearer, North Carolina State University, *Waves in elastic-plastic materials*, 3:20 p.m. Thursday;

Other AMS Sessions

Session for Reviewers for Mathematical Reviews: There will be an informal session for reviewers for Mathematical Reviews (MR), and those interested in becoming reviewers, on Friday at 6:00 p.m. Members of the MR Editorial Committee and the MR staff will make a short presentation and there will be an opportunity for reviewers to ask questions and make comments and suggestions. Refreshments will be provided.

Committee on Science Policy: The Committee on Science Policy (Michael C. Reed, Chair) will sponsor an address by a prominent public figure on Friday at 10:05 a.m.

The same committee will also sponsor a panel discussion on *PhD Employment: Is there a crisis?* at 8:30 p.m. on Friday. The panel will feature an update from the AMS Task Force on PhD Employment.

Committee on Education: The Committee on Education, **Ramesh A. Gangolli** (Chair), University of Washington, will sponsor this panel discussion on *Directions for AMS Action in Education* on Saturday at

8:30 a.m. The panel will be moderated by the committee Chair and focus on the AMS role in mathematics education.

In addition, there will be fourteen special sessions of selected twenty-minute papers and sessions for contributed papers.

AMS Short Course on New Scientific Applications of Geometry and Topology

The American Mathematical Society will present a two day Short Course titled *New Scientific Applications of Geometry and Topology* on Monday and Tuesday, January 6-7, 1992. The program is under the direction of De Witt L. Sumners, Florida State University. The speakers and topics are Nicholas R. Cozzarelli, Department of Molecular and Cell Biology, University of California, Berkeley, *Mathematical approaches to DNA structure*; James H. White, University of California, Los Angeles, *Geometry and topology of DNA and DNA-protein interactions*; De Witt L. Sumners, *Knot theory and DNA*; Stuart G. Whittington, Department of Chemistry, University of Toronto, *The topology of polymers*; Jonathan K. Simon, University of Iowa, *Knots and chemistry*; and Louis H. Kauffman, University of Illinois at Chicago, *Knots and physics*.

Please note that this is **NOT** and MAA Minicourse. See the section on **How to Preregister** for more information.

Activities of Other Organizations

The **Association of Research Libraries** is sponsoring a session on *Electronic delivery of scientific and technical information to scientists* on Friday from 2:00 p.m. to 4:00 p.m. This session is being organized by **Ann Okerson**, ARL Office of Scientific & Academic Publishing, and will feature **Keith Dennis**, Cornell University, where the Commission on Preservation and Access is scanning mathematical monographs; **Lorin Garson**, American Chemical Society, where a group is doing retrospective scanning of their journal literature for online delivery and is becoming a leader in indexing and abstracting services; and **David Rodgers**, AMS e-MATH, who will discuss the advances of the e-MATH system.

The **Association for Women in Mathematics (AWM)** will conduct a Workshop on Tuesday, January 7, from 9:00 a.m. to 6:30 p.m., in order to provide opportunities for women to discuss their research and to participate in a number of other events during the day. There will be talks by ten postdocs; a graduate student poster session; a panel to discuss research funding, the graduate school environment, and pipeline issues; a luncheon; and a special program and dinner where participants will have the opportunity to meet established women mathematicians. All mathematicians (female and male) are invited to attend the entire program.

AWM has obtained grant funds for this Workshop. Female mathematicians are urged to contact AWM, Box 178, Wellesley College, Wellesley, MA 02181, for application procedures, keeping in mind that completed applications must be received at the AWM office by October 15, 1991.

Registration for this Workshop will be held from 7:00 p.m. to 9:00 p.m. on Monday, and 8:00 a.m. to 9:00 a.m. on Tuesday in the Hyatt Regency Baltimore.

Information on the AWM Workshop Dinner can be found in the **Social Events** section of this announcement.

The AWM is sponsoring a panel discussion on graduate education at 3:20 p.m. Wednesday.

The thirteenth annual AWM Emmy Noether Lecture will be given by **Nancy J. Kopell**, Boston University, at 9:00 a.m. on Thursday.

The AWM Membership Meeting and Prize Session is scheduled from 4:20 p.m. to 4:50 p.m. on Wednesday. The Louise Hay Award for Contributions to Mathematics Education will be given.

An open reception is planned for 9:30 p.m. on Wednesday.

The **Board on Mathematical Sciences (BMS)** is sponsoring a panel discussion titled *Educating mathematicians* at 8:00 a.m. Wednesday. Near the end of 1991 the National Research Council will publish a report on doctoral and postdoctoral education in the mathematical sciences. This report will describe the findings of an eighteen-month study, conducted by a committee of BMS, to identify characteristics of doctoral and postdoctoral programs that are particularly effective in educating mathematicians. The panel presentation will be an opportunity to discuss the results of this study and to sample the reactions of the mathematical community. The organizer is **Ronald G. Douglas**, SUNY at Stony Brook.

The **Joint Policy Board for Mathematics** and the **Office of Governmental and Public Affairs (JPBM/OGPA)** will sponsor a session on public policy on Thursday evening.

The **National Association of Mathematicians (NAM)** invites all participants to a luncheon on Friday from noon to 1 p.m. (please see more detailed information in the **Social Events** section of this announcement) where **Gloria Gilmer**, Math-Tech, Inc., will give the Cox-Talbot Address.

NAM will have a session on *Presentations by recent doctoral recipients*, organized by **Gerald R. Chacere**, Howard University, and scheduled at 9:00 a.m. on Friday.

The NAM Business Meeting will take place from 10:00 a.m. to 10:55 a.m. on Saturday, January 11. **Rogers J. Newman**, Southern University, will preside.

The **National Science Foundation (NSF)** will sponsor a session on *The changing environment for NSF funding of research and education* from 5:45 p.m. to 6:45 p.m. on Wednesday. Members of the NSF Advisory Committees for Mathematical Sciences and Education and Human Resources will join NSF staff in a discussion of how programs at NSF have been changing in recent years and the implications of this for members of the community seeking funding. There will be an opportunity for discussion with the audience.

NSF invites participants at the Joint Mathematics Meetings to meet informally with staff members over the lunch hour (noon to 1:00 p.m.) daily, Wednesday to Saturday, January 8-11.

The NSF will also be represented at a booth in the exhibit area. NSF staff members will be available to provide counsel and information on NSF programs of interest to mathematicians. The booth will be open the same days and hours as the exhibits. Times that staff will be available will be posted at the booth.

The **Rocky Mountain Mathematics Consortium (RMMC)** Board of Directors will meet on Friday from 2:15 p.m. to 4:10 p.m.

Other Events of Interest

AMS Information Booth: All meeting participants are invited to visit the AMS Information Booth during the meetings. Complimentary coffee and tea will be served. A special gift will be available for participants, compliments of the AMS. The Membership Manager of the Society will be at the booth to answer questions about membership in the Society.

Book Sales: Books published by the AMS and MAA will be sold at discounted prices somewhat below the cost for the same books purchased by mail. **These discounts will be available only to registered participants wearing the official meetings badge.** Visa and MasterCard credit cards will be accepted for book sale purchases at the meeting. The book sales will be open the same days and hours as the exhibits.

Exhibits: The book, educational media and software exhibits will be open 1:00 p.m. to 5:00 p.m. on Wednesday, 9:00 a.m. to 5:00 p.m. on Thursday and Friday, and 9:00 a.m. to noon on Saturday. All participants are encouraged to visit the exhibits during the meeting. **Participants visiting the exhibits will be asked to display their meeting badge or acknowledgement of preregistration from the Mathematics Meetings Service Bureau in order to enter the exhibit area.**

Joint Books, Journals and Promotional Materials Exhibit: This exhibit will be open the same hours as the other exhibits, and affords participants the opportunity to order publications from various commercial publishers not represented at the meeting.

Mathematical Sciences Employment Register: Those wishing to participate in the Baltimore Employment Register should read carefully the important article about the Register which follows this meeting announcement.

Social Events

It is strongly recommended that tickets for these events be purchased through preregistration, since only a very limited number of tickets will be available for sale on-site. Tickets purchased through preregistration will be mailed with the badge and program unless the participant instructs otherwise on the Preregistration/Housing Form. In that case, participants can pick up their ticket(s) at the meeting at the same time as their badge and program. To get a 50 percent refund, **returned tickets must be received by the Mathematics Meetings Service Bureau by December 30.** After that date no refunds can be made. Special meals are available at all banquets, upon request, including vegetarian, but this must be indicated on the Preregistration/Housing Form in advance.

AMS 25-Year Member Banquet: All meeting participants are invited to attend the annual banquet to honor individuals who have been members of the Society for twenty-five years or more. This banquet provides an excellent opportunity to socialize with fellow participants in

a relaxed atmosphere. The banquet will be held on Saturday, January 11, with a cash bar reception at 6:30 p.m. and dinner at 7:30 p.m. The attendee who has been a member of the Society for the greatest number of years will receive a special tribute. Each attendee will receive a memento of the occasion and there will be a drawing for door prizes.

The menu includes baby bibb salad, mixed grill of chicken and sirloin, seasonal vegetables, apple streudel with vanilla sauce, and nonalcoholic beverages. Vegetarian meals are available on request. Tickets are \$25 each; the price includes tax and gratuity.

AWM Workshop Dinner: The Association for Women in Mathematics will host a dinner after the conclusion of their Workshop on Tuesday at 6:30 p.m. The menu includes rainbow salad, chicken marsala, fresh vegetables, chocolate eclair, and coffee/tea. All participants are invited to attend the banquet, whether or not they attended the Workshop. Vegetarian meals are available upon request. Tickets are \$26 each, including tax and gratuity.

MER Banquet: The Mathematicians and Education Reform (MER) Network welcomes all mathematicians who are interested in issues in precollege mathematics education to attend the MER Banquet on Wednesday at 6:00 p.m. This is an opportunity to make or renew ties with other mathematicians who are involved in educational projects. There will be a brief presentation of the current activities and future plans of the MER Network, but the evening's main feature promises to be lively conversation among the participants.

There will be a cash bar beginning at 6:30 p.m. Dinner will be served at 7:30 p.m. and includes crab bisque, chicken piccata, seasonal vegetables, chocolate torte, and nonalcoholic beverages. Vegetarian meals are available on request. Tickets are \$26 each, including tax and gratuity.

NAM Luncheon: The National Association of Mathematicians will host a luncheon at noon on Friday. Tickets are \$22 each, including tax and gratuity. The menu will be announced at a later date.

How to Preregister and Get a Room

How to Preregister

The importance of preregistration cannot be overemphasized. Those who preregister pay fees considerably lower than the fees that will be charged for registration at the meeting and will receive typeset badges instead of typewritten ones. Participants who preregister by the **ORDINARY** deadline of November 18 may utilize the housing services offered by the Mathematics Meetings Service Bureau.

Joint Mathematics Meetings

Member of AMS, Canadian Mathematical Society, MAA	\$105
Emeritus Member of AMS, MAA	\$ 25
Nonmember	\$163
Student/Unemployed	\$ 25

Employment Register

Employer	\$125
Additional interviewer (each)	\$ 60
Applicant	\$ 30
Employer posting fee	\$ 30

AMS Short Course

Student/Unemployed	\$ 25
All Other Participants	\$ 60
Emeritus Member of AMS, MAA	\$ 25

MAA Minicourses

(if openings available)

Minicourses # 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16	\$ 36
Minicourses # 7, 8, 9	\$ 60
Minicourse # 17	\$ 30

Preregistration and registration fees only partially cover expenses of holding meetings. All mathematicians who wish to attend sessions are expected to register and should be prepared to show their badge, if so requested. Badges are required to obtain discounts at the AMS and MAA Book Sales and to cash a check with the Joint Meetings cashier. If a preregistrant should arrive too late in the day to pick up his/her badge, he/she may show the acknowledgment of preregistration received from the Mathematics Meetings Service Bureau as proof of registration.

If you hold a guaranteed reservation at a hotel, but are informed upon arrival that there is no room for you, there are certain things you can request the hotel do. First, they should provide for a room at another hotel in town for that evening, at no charge. (You have already paid for the first night when you made your deposit.) They should pay for taxi fares to the other hotel that evening, and back to the meetings the following morning. They should also pay for one telephone toll call so that you can let people know you are not at the hotel you expected. They should make every effort to find a room for you in their hotel the following day and, if successful, pay your taxi fares to and from the second hotel so that you can pick up your baggage and bring it to the first hotel. Not all hotels in all cities follow this practice, so your request for these services may bring mixed results, or none at all.

Miscellaneous Information

Audio-Visual Equipment: Standard equipment in all session rooms is one overhead projector and screen. (Invited 50-minute speakers are automatically provided with two overhead projectors.) **Blackboards are not available.**

MAA speakers requiring additional equipment may make written request for one additional overhead projector/screen, 35mm carousel slide projector, or VHS video cassette recorder with color monitor. Such requests should be addressed to the MAA Associate Secretary (Kenneth A. Ross, Department of Mathematics, University of Oregon, Eugene, OR 97403). These requests should be received **by November 1**.

All other speakers requiring additional equipment should contact the Audio-Visual Coordinator for the meetings at the AMS office in Providence at 401-455-4140, or electronic mail WSD@MATH.AMS.COM **by November 1**.

Speakers are cautioned that requests for equipment made at the meeting may not be able to be satisfied because of budgetary restrictions.

Child Care: Information on child care will be available in future updates to this announcement. Participants are reminded they should contact these agencies directly.

In addition, a Parent-Child Lounge will be located in the Baltimore Convention Center. This room will be furnished with casual furniture, a crib, a changing area, and a VCR and monitor for viewing videotapes. The tapes, appropriate for children, can be checked out at the Telephone Message section of the registration desk. Any child using this lounge must be accompanied by a parent (not simply an adult) who must be responsible for supervision of the child. This lounge will be unattended and parents assume all responsibility for their children. This lounge will only be open during the hours of registration and all persons must leave the lounge at the close of registration each day.

Information Distribution: A table is set up in the registration area for dissemination of general information of possible interest to the members.

A second table is set up in the book sale area for the dissemination of information of a **mathematical** nature **not** promoting a product or program for sale.

If a person or group wishes to display information of a mathematical nature promoting a product or program for sale, they may do so in the book sale area at the Joint Books, Journals and Promotional Materials exhibit for a fee of £30 per item.

If a person or group would like to display material in the book sale area separate from the Joint Books table, the proponent must reimburse the AMS and MAA for any extra furnishings requested (tables, chairs, easels, etc.) in addition to payment of the \$30 per item fee. (This latter display is also subject to space availability.)

The administration of these tables is in the hands of the AMS-MAA Joint Meetings Committee, as are all arrangements for Joint Mathematics Meetings. The following rules and procedures apply.

1. Announcements submitted by participants should ordinarily be limited to a single sheet no more than $8\frac{1}{2} \times 14$ ".
2. A copy of any announcement proposed for either table is to be sent to the Director of Meetings, American Mathematical Society, Post Office Box 6887, Providence, Rhode Island 02940 to arrive at least one week before the first day of the scientific sessions.
3. The judgment on the suitability of an announcement for display rests with the Joint Meetings Committee. It will make its judgments on a case-by-case basis to establish precedents.
4. Announcements of events competing in time or place with the scheduled scientific program will not be accepted.
5. Copies of an accepted announcement for either table are to be provided by the proponent. Announcements are not to be

distributed in any other way at the meetings (for example, not by posting or personal distribution of handbills).

6. It may be necessary to limit the number of events or the quantity of announcements distributed at a meetings.
7. At the close of registration, both tables will be swept clean. Therefore, a proponent who wishes the return of extra copies should remove them before the close of registration.

Mail: All mail and telegrams for persons attending the Joint Meetings should be addressed as follows: Name of Participant, Joint Mathematics Meetings, Baltimore Convention Center, One West Pratt Street, Baltimore, MD 21201. Mail and telegrams so addressed may be picked up at the mailbox outside the meetings registration area. U.S. mail not picked up will be forwarded after the meetings to the mailing address given on the participant's registration record.

Petition Table: At the request of the AMS Committee on Human Rights of Mathematicians, a table will be made available in the meetings registration area at which petitions on behalf of named individual mathematicians suffering from human rights violations may be displayed and signed by meetings participants acting in their individual capacities.

Signs of moderate size may be displayed at the table, but must not represent that the case of the individual in question is backed by the Committee on Human Rights unless it has, in fact, so voted. Volunteers may be present at the table to provide information on individual cases, but notice must be sent at least seven (7) days in advance of the meetings to the Director of Meetings in Providence (telephone 401-455-4137). Since space is limited, it may also be necessary to limit the number of volunteers present at the table at any one time. The Committee on Human Rights may delegate a person to be present at the table at any or all times, taking precedence over other volunteers.

Any material which is not a petition (e.g., advertisements, résumés) will be removed by the staff. **When registration closes, any material on the table will be discarded, so individuals placing petitions on the table should remove them prior to the close of registration.**

Telephone Messages: A telephone message center is located in the registration area to receive incoming calls for participants. **The center is open from January 7 through 11 during the hours that the meetings registration desk is open.** Messages will be taken and the name of any individual for whom a message has been received will be posted until the message has been picked up at the message center. Once the registration desk has closed for the day there is no mechanism for contacting participants other than calling them directly at their hotel. The telephone number of the message center is 410-234-1501.

Travel: Baltimore-Washington International Airport, located 14 miles south of Baltimore, is served by all major airlines. Shuttle vans depart the airport every 30 minutes from 5:30 a.m. to 11:00 p.m., and stop at major downtown hotels. The fare is \$6.50 one way and \$12 round trip. For information or reservations, telephone 301-859-0800.

Taxi fare from the airport to downtown hotels is metered, and costs approximately \$17 for up to four people.

Some Amtrak trains and some MARC commuter trains traveling north stop at the BWI station, then at Penn Station in Baltimore. The approximate frequency is two trains per hour. For information, call Amtrak at 1-800-872-7245 or MARC at 1-800-325-7245.

Driving directions: From the northeast, travel south on I-95, continue through the Ft. McHenry tunnel. Exit shortly past the tunnel at I-395 (Exit 53, marked "Downtown"), and take it until it ends. Then follow signs to the Inner Harbor. From the north, travel south on I-83, remain on I-83 until it ends. Proceed south to Lombard Street, then west to St. Paul, then south to the Inner Harbor. From the west, travel east on I-70 and exit at the Baltimore beltway (I-695). Proceed south (counterclockwise) to I-95. Take I-95 north to downtown, as from the south. From the south, travel north on I-95, exit at I-395 (Exit 53, marked "Downtown"), and take it until it ends. Then follow signs to the Inner Harbor.

For some years now, the AMS-MAA Joint Meetings Committee has engaged a travel agent for the January and August meetings in an effort to ensure that everyone attending these meetings is able to obtain the best possible airfare. This service is being performed by TRAVCON; their advertisement can be found elsewhere in this meeting announcement.

Weather: January weather in Baltimore is generally cool and cloudy. Normal daily maximum and minimum temperatures are 41.0° F (5.0° C) and 24.3° F (-4.2° C), with extremes of 75° F (24° C) and -7° F (-22° C). On the average, 23 days of the month are cloudy or partly cloudy, and precipitation — totaling 3 inches and usually rain — occurs on 10 days.

How to Obtain Hotel Accommodations

The rates listed below are subject to a 12 percent sales/occupancy tax. Checkin time for all hotels is 3:00 p.m. except for the Marriott which is 4:00 p.m.. Checkout time for all hotels is noon. Participants desiring confirmed reservations for the following hotels must make the reservations through the Mathematics Meetings Service Bureau prior to the November 18, 1991 deadline. Reservations, cancellations, and/or changes at these hotels CANNOT be made by calling the hotel directly until after December 20, 1991. Please make all changes to or cancellations of hotel reservations with the Service Bureau in Providence through December 10, 1991. The telephone number in Providence is 401-455-4143. The Service Bureau cannot accept changes after December 10, 1991; however, changes and cancellations can be called in directly to the hotels after December 20, 1991. Please allow the Service Bureau from December 11 to December 20 to get all final housing lists and changes sent to the hotels. In addition, the hotels need this time to input all final housing lists and changes into their systems. It is imperative that all hotels listed on the back of the preregistration form be numbered in order of preference to insure accurate hotel assignments.

The hotels listed below are full service hotels. They offer a LIMITED number of nonsmoking rooms and are equipped for the handicapped. Special attention will be given to participants with special needs if they are noted on the prereg form. Rooms in the Omni and Stouffers have windows that open. Please note that the distance from the hotels to the Convention Center can be found in the "Location" column.

GUARANTEE REQUIREMENTS: \$50 by check OR a credit card guarantee with VISA, MasterCard, or American Express (for housing only). No other credit cards will be accepted. American Express cards may be used for housing guarantees only and not for preregistration. For room payments, the hotels accept all major credit cards. Personal checks are accepted at all hotels except the Days Inn with personal identification with photo and a credit card backup. The Days Inn accepts personal checks only in advance of arrival.

Location	Description	Single	Double 2 beds	Triple 2 beds	Triple 2 beds w/cot	Quad 2 beds	Quad 2 beds w/cot	Suites* (starting rates)
Hyatt Regency (Headquarters) 300 Light Street Baltimore, MD 21202 301-528-1234 Distance: .10 miles	Restaurants, Lounge, Outdoor Pool, Health Club, Tennis Courts. Parking \$7 per day (In/Out)**. Children 18 yrs. and younger free.	\$ 85	\$ 95	\$ 115	\$ N/A***	\$ 135	\$ N/A***	\$ 225+
REGULAR		76	76	96	N/A***	116	N/A***	225+
STUDENT****								
Stouffer Harborplace 202 East Pratt Street Baltimore, MD 21202 301-547-1200 Distance: .15 miles	Restaurant, Lounge, Indoor Pool, Sauna. Parking \$8 per day (In/Out)**. Children 18 yrs. and younger free.	85	95	105	N/A	115	N/A	185+
STANDARD-REGULAR		75	75	75	N/A	75	N/A	185+
STANDARD-STUDENT****								
HARBORVIEW		105	115	125	N/A	135	N/A	275+
CLUB		110	120	130	N/A	140	N/A	275+

* All reservations for suites must be made directly with the Service Bureau. The hotel can supply general information only.
 ** All parking rates listed pertain to overnight guests only. Parking tickets must be validated at the front desk.
 *** The Hyatt offers a flat fee of \$20 per hotel stay for the use of a rollaway.
 **** Participant must be a certified student or unemployed to qualify for these rates (see section on "How to Preregister" in Notices or Focus for definitions).
 In addition, the Service Bureau lists as an alternative to hotel housing Amanda's Bed and Breakfast Service. Amanda's offers several homes in the Inner Harbor area. Rates range from \$60 to over \$100 and include either a continental or full breakfast. For reservations and more information, please call 301-225-0001.

(CONTINUED ON NEXT PAGE)

How to Obtain Hotel Accommodations (continued)

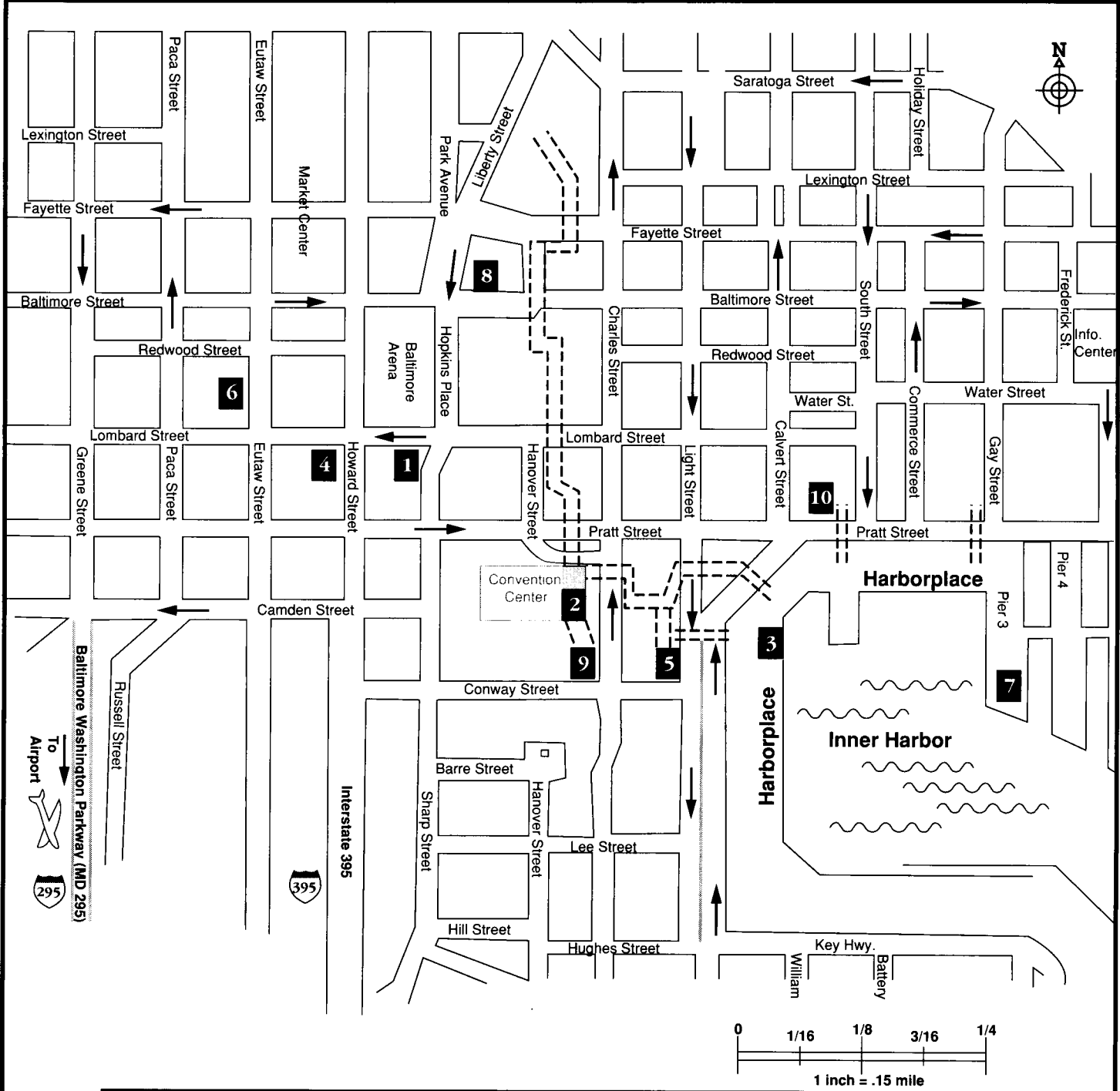
	Location	Description	Single	Double	Double 2 beds	Triple 2 beds	Triple 2 beds w/cot	Quad 2 beds	Quad 2 beds w/cot	Suites* (starting rates)
Sheraton Inner Harbor	300 South Charles Street Baltimore, MD 21202 301-962-8300 Distance: .10 miles	Restaurant, Lounge, Health Club, Indoor Pool, Sauna. Parking \$9 per day (In/Out)**. Children 17 yrs. and younger free.	\$83	\$93	\$93	\$108	\$108	\$123	\$123	\$325+
			REGULAR	73	73	88	103	103	325+	
Marriott Inner Harbor	110 South Eutaw Street Baltimore, MD 21201 301-962-0202 Distance: .25 miles	Restaurant, Lounge, Indoor Pool, Sauna, Exercise Room. Parking \$7 per day (In/Out)**. Children 17 yrs. and younger free.	78	88	88	103	118	118	133	205+
			REGULAR	78	78	78	93	108	123	205+
Omni Inner Harbor	101 West Fayette Street Baltimore, MD 301-752-1100 Distance: .35 miles	Restaurants, Lounge, Outdoor Pool, Exercise Facility. Parking \$9 per day (In/Out)**. Children 18 yrs. and younger free.	75	75	75	95	110	115	130	200+
			STUDENT***	69	79	79	89	99	109	200+
Holiday Inn Inner Harbor	301 West Lombard Street Baltimore, MD 21201 301-685-3500 1-800-HOLIDAY Distance: .20 miles	Restaurant, Lounge, Indoor Pool, Sauna. Parking \$4 per day (In/Out)**. Children 18 yrs. and younger free.	55	65	65	75	N/A	85	N/A	125
			REGULAR	55	65	65	75	N/A	85	N/A
Days Inn Inner Harbor	100 Hopkins Place Baltimore, MD 21201 301-576-1000 Distance: .15 miles	Restaurant, Lounge, Outdoor Pool. Parking \$4.50 per day (In/Out)**. Children 12 yrs. and younger free.	78	78	78	93	108	108	123	205+
			STUDENT***	75	75	75	95	110	115	130

* All reservations for suites must be made directly with the Service Bureau. The hotel can supply general information only.

** All parking rates listed pertain to overnight guests only. Parking tickets must be validated at the front desk.

In addition, the Service Bureau lists as an alternative to hotel housing Amanda's Bed and Breakfast Service. Amanda's offers several homes in the Inner Harbor area. Rates range from \$60 to over \$100 and include either a continental or full breakfast. For reservations and more information, please call 301-225-0001.

Downtown Baltimore



- | | |
|-----------------------|-----------------------|
| 1 - Days Inn Hotel | 6 - Marriott |
| 2 - Convention Center | 7 - National Aquarium |
| 3 - Harborplace | 8 - Omni |
| 4 - Holiday Inn | 9 - Sheraton |
| 5 - Hyatt | 10 - Stouffers |

→ Indicate directions on one-way streets
 - - - Indicates skywalk

Preregistration/Housing Form, Baltimore, Maryland

January 8-11, 1992

Please complete this form and return it with your payment to
Mathematics Meetings Service Bureau

P.O. Box 6887, Providence, Rhode Island 02940 - Telephone: (401) 455-4143-Telex: 797192

DEADLINES: Room Lottery Qualification Joint Meetings & AMS Short Course Preregistration/Employment Register/Hotel Reservations/Tickets Final Preregistration ONLY (No housing, Employment Register, and/or tickets) Housing Changes/Cancellations 50% Refund Preregistration/Employment Register/AMS Short Course Other Changes to Preregistration 50% Refund on Tickets	October 29, 1991 November 18, 1991 December 10, 1991 December 10, 1991 January 3, 1992 (no refunds after this date) December 30, 1991 December 30, 1991 (no refunds after this date)
---	--

REGISTRATION FEES

JOINT MATHEMATICS MEETINGS		Preregistration by December 10, 1991
Member of AMS, CMS, MAA		\$ 105
Nonmember		163
* Student, Unemployed, or Emeritus		25
AMS SHORT COURSE		
Member/Nonmember		60
* Student, Unemployed, or Emeritus		25
EMPLOYMENT REGISTER		Preregistration by November 18, 1991
- Employer fee (1st Interviewer)		125
- Employer fee (2nd / 3rd Interviewer)		60
- Applicant fee		30
- Posting fee for job descriptions for noninterviewing employers		30

(N.B.: A separate form appears in this issue for preregistration for MAA Minicourses)

* See section on "How to Preregister" in the *Notices* or *Focus* for definition of "student", "unemployed", or "emeritus" status.

PREREGISTRATION SECTION: Please check the function(s) for which you are preregistering:

Joint Meetings AMS Short Course (January 6-7, 1992) Employer Co-Interviewer Applicant Posting

- 1) _____ Telephone: _____
 (Please print) Surname First Middle
- 2) _____ (Mailing address) _____ (E-mail address)
I do not wish my badge, program, and/or Employment Register material to be mailed; however, the mailing address for my acknowledgement is given above.
- 3) Badge information: Affiliation _____
- 4) I am a student at _____ 5) Emeritus member Unemployed MR Classification # _____
- 6) Member of AMS CMS MAA Nonmember Member of other organizations: AWM NAM
- 7) Joint Meetings fee \$ _____ 8) AMS Short Course fee \$ _____ 9) Employer fee(s) \$ _____ 10) Co-Interviewer fee(s) \$ _____
- 11) Applicant fee \$ _____ 12) Posting fee \$ _____ 13) Hotel deposit \$ _____ (**necessary ONLY if paying deposit by check**)
- 14) _____ AMS 25-Year Banquet tkt(s) @ \$25 each = \$ _____ Veg. meal 15) _____ NAM Luncheon tkt(s) @ \$22 each = \$ _____ Veg. meal
- 16) _____ MER Banquet tkt(s) @ \$26 each = \$ _____ Veg. meal 17) _____ AWM Banquet tkt(s) @ \$26 each = \$ _____ Veg. meal
- 18) **TOTAL AMOUNT ENCLOSED FOR 7 through 17 \$ _____** NOTE: May be paid by check payable to AMS (Canadian checks must be marked "U.S. Funds") or VISA or MasterCard credit cards.

original institutional purchase order attached

Credit card type: _____ Card number: _____ Expiration date: _____

If this is your credit card, please print your name as it appears on the credit card on the line below as well as sign your name.
 If this is not your credit card, please print card holder's name as it appears on the credit card on the line below, and have the card holder sign:

 (Printed name)

 (Signature)

Please complete the appropriate sections on the reverse.

For office use only:

Codes:	Options:	Hotel:	Room type:
Dates:	Hotel Deposit	Total Amt. Paid:	
Special Remarks:			

January 8-11, 1992

PREREGISTRATION/HOUSING FORM, Baltimore, Maryland

HOUSING SECTION:

PLEASE CHECK HERE IF YOU WILL NOT REQUIRE A ROOM PLEASE CHECK HERE IF YOU WILL BE STAYING AT A HOTEL/MOTEL NOT LISTED BELOW

Please rank hotels in order of preference by writing 1, 2, 3, etc. in the spaces at the left on form, and by circling the requested room type and rate. If the rate requested is no longer available, you will be assigned a room at another hotel at the next available rate. **If not all hotels are ranked, and all rooms have been filled at the ranked hotels, the assignment will be made at an unranked hotel with the next available rate.** Rates listed below are subject to 12% sales/occupancy tax.

GUARANTEE REQUIREMENTS: \$50 by check OR a credit card guarantee with VISA, MasterCard, or American Express (for housing only). No other credit cards will be accepted for room guarantees. **PLEASE SUPPLY THIS INFORMATION ON THE REVERSE,** together with mailing address for confirmation of room reservation.

Order of choice	Single	Double 1 bed	Double 2 beds	Triple 2 beds	Triple 2 beds w/cot	Quad 2 beds	Quad 2 beds w/cot	Suites* (starting rates)
Hyatt (Headquarters Hotel)								
	85	95	95	115	N/A**	135	N/A**	225 +
	76	76	76	96	N/A**	116	N/A**	225 +
Stouffer Harborplace								
	85	95	95	105	N/A	115	N/A	185 +
	75	75	75	75	N/A	75	N/A	185 +
	105	115	115	125	N/A	135	N/A	275 +
	110	120	120	130	N/A	140	N/A	275 +
Sheraton Inner Harbor								
	83	93	93	108	108	123	123	325 +
	73	73	73	88	88	103	103	325 +
Marriott								
	78	88	88	103	118	118	133	205 +
	78	78	78	93	108	108	123	205 +
	75	75	75	95	110	115	130	200 +
	69	79	79	89	99	99	109	200 +
	55	65	65	75	N/A	85	N/A	125 +

* Reservations for suites must be made directly with the Service Bureau. The hotel can supply general information only.
 ** The Hyatt offers a flat fee of \$20 per hotel stay for the use of a rollaway cot.
 *** Participant must be a certified student or unemployed (as described in the "How to Preregister" section of the Notices or Focus) to qualify for these rates.

Special housing requests, handicapped needs, etc.:

I will arrive on (date) _____ at _____ a.m./p.m., and depart on (date) _____ at _____ a.m./p.m.

Please list other room occupants, indicating ages of children. Please check here if one of the occupants is your spouse

FULL NAME _____ ARRIVAL DATE _____ DEPARTURE DATE _____

Mathematical Sciences Employment Register January 8, 9, & 10 Baltimore Convention Center

The Mathematical Sciences Employment Register, held annually at the Joint Mathematics Meetings in January, provides opportunities for mathematical scientists seeking professional employment to meet employers who have positions to be filled. Job listings (or descriptions) and résumés prepared by employers and applicants are assigned code numbers and displayed at the meeting so that members of each group may determine which members of the other group they would like to have an opportunity to interview. Requests for interviews are submitted at the meeting on the interview request form indicating the code number of the applicant or employer you wish to have an opportunity to interview. The algorithm under which the computer program works does **not** assign or match participants according to their qualifications. Therefore, employers and applicants should be aware that interviews with unqualified parties may occur. This algorithm maximizes the number of interviews which can be scheduled subject to constraints determined by the number of time periods available, the numbers of applicants and employers, and the pattern of requests.

The Mathematical Sciences Employment Register is apparently unique among employment services offered by professional organizations in the sciences, engineering and the humanities. The computer programs used are constructed around a matching program, devised by Donald R. Morrison, and based on an algorithm described in his paper "Matching Algorithms" in *Journal of Combinatorial Theory*, volume 6 (1969), pages 20 to 32; see also "Matching Algorithms" (abstract) *Notices*, August 1967, page 630. The number of interviews arranged by the program is significantly greater than the number possible at the employment registers of other organizations, in many cases greater by an order of magnitude.

The Mathematical Sciences Employment Register is sponsored by the American Mathematical Society, the Mathematical Association of America, and the Society for Industrial and Applied Mathematics; it is operated by members of the AMS staff under the general supervision of the joint AMS-MAA-SIAM Committee on Employment Opportunities.

Questions about the Employment Register should be addressed to the Employment Register Coordinator at the American Mathematical Society at 401-455-4142, or by e-mail: CAK@MATH.AMS.COM. The telephone number to be used after the Register begins in Baltimore is 410-234-1500. Participants should note that this number is for those who will be participating in the Employment Register and is not for contacting participants or taking messages. Those who wish to leave messages should call the message center telephone number found in the Baltimore meeting announcement.

1992 Employment Register Schedule

Wednesday, January 8

7:30 a.m. Distribution of Employment Register material for nonpreregistered and preregistered participants who did not receive material by mail.

9:00 a.m. Short (optional) orientation session.

9:30 a.m. – 4:00 p.m. Submission of all interview request forms in order to receive a schedule of appointments for Thursday interviews. This applies to both preregistered and nonpreregistered participants.

N.B. No interviews are held on Wednesday.

Thursday, January 9

8:00 a.m. Distribution of interview schedules.

9:00 a.m. – 4:00 p.m. Submission of all interview request forms in order to receive a schedule of appointments for Friday interviews.

9:00 a.m. – 5:00 p.m. Interviews.

Friday, January 10

8:00 a.m. Distribution of interview schedules.

9:00 a.m. – 5:00 p.m. Interviews.

Requests for Thursday interviews MUST BE SUBMITTED ON WEDNESDAY BETWEEN 9:30 a.m. and 4:00 p.m. Requests for Friday interviews MUST BE SUBMITTED ON THURSDAY BETWEEN

9:00 a.m. and 4:00 p.m. Those who fail to do so cannot be included in the pool of available participants when the matching program which schedules the interviews is run on the computer that night. This applies to all employers and applicants, whether preregistered or on-site registrants. Forms submitted with preregistration achieve registration for the Employment Register only. These forms do not automatically include the participant in the interviewing process.

Fifteen-minute intervals are allowed for interviews, including two or three minutes between successive interviews. The interviews are scheduled in half-day sessions: Thursday morning and afternoon, and Friday morning and afternoon, amounting to four half-day sessions for interviews. There are ten time periods (9:00–11:15 a.m.) in which interviews can be scheduled in the morning and fourteen time periods (12:45–4:30 p.m.) in the afternoon.

Requests for interviews will be accommodated depending on the availability of participants. The scheduling program does NOT have a provision allowing participants to specify particular times for interviews beyond the choice of session (day, and morning or afternoon).

The Friday afternoon session is the "employers' choice" session. For this session interviews will be scheduled on the basis of requests made by employers. Applicants do not submit specific interview requests for this session, but in order to participate they must indicate their availability for the session by returning the Interview Request Form appropriately marked for Friday afternoon.

Applicants should be aware of the fact that interviews arranged by the Employment Register represent only an initial contact with employers and that hiring decisions are not ordinarily made during or immediately following such interviews. **Applicants are advised to bring a number of copies of their vitae or résumés so that they may leave them with prospective employers.**

ALERT TO APPLICANTS:

Applicants should be aware that the current job market for mathematicians seeking academic employment is tight. We anticipate that the Baltimore Employment Register will experience a similar imbalance between applicants and employers as occurred at the 1991 San Francisco Employment Register – almost five applicants per employer. In San Francisco the average number of interviews per applicant was seven, and applicants in Baltimore should expect a similar number of interviews. As in the past, applicants whose highest degree is a master's or bachelor's should be aware that most jobs listed will require a doctorate. Most jobs listed will be academic.

Preregistration Procedures

Preregistration for the Mathematical Sciences Employment Register **must be completed by November 18, 1991**. Applicants and employers (including all interviewers) who wish to preregister for the Employment Register must also register for the Joint Mathematics Meetings. **Forms for preregistration, housing, the applicant résumé form, and the employer form are located in the back of this issue.**

Employer and applicant forms received after the **November 18 deadline cannot** be included in the printed lists.

Those who preregister by the deadline of **November 18** will receive their badge, program and Employment Register material in the mail two to three weeks prior to the meeting, unless they indicate otherwise.

Those who preregister for the Joint Meetings by the **FINAL** deadline of December 10, must register for the Employment Register on-site. The Mathematics Meetings Service Bureau regrets it is unable to accommodate Employment Register registration for the **FINAL** deadline. Therefore, it is important that one submit these forms by **November 18**, if one wishes to appear in the lists. However, all employers' job listings and applicants' résumés will be posted at the meeting, so that applicants and employers may review them.

Preregistered Applicants

In addition to the Joint Meetings preregistration fee, there is an applicant fee of \$40 payable **prior to the November 18 deadline**. These fees must accompany the Preregistration/Housing Form.

The December issue of *Employment Information in the Mathematical Sciences (EIMS)* will contain of the résumés of applicants who have preregistered by **November 18**. Forms not received in time cannot be

included in this issue. See the instructions on preparation of applicant forms elsewhere in the back of this issue.

Applicants Not Planning to Attend

Applicants seeking professional positions in the mathematical sciences who do not plan to attend the meeting in Baltimore may submit résumés for publication in the December issue of *EIMS* if they use the Mathematical Sciences Employment Register Form for Applicants at the back of this issue and observe the deadline of November 18. There is no charge for this service. Nonregistered applicants' résumés will not be posted at the Employment Register if the participant is not attending the meeting.)

Preregistered Employers

In addition to the Joint Meetings preregistration fee, there is a separate charge for each employer who will be interviewing applicants at the register.

Please refer to the Preregistration/Housing Form for a list of the Joint Mathematics Meetings and Employment Register fees. These fees must accompany the Preregistration/Housing Form. The registration fee for employers covers the cost of a copy of the December Issue of *EIMS*. This publication contains printed copies of the résumés of applicants who preregistered prior to the deadline.

It is requested that employers submit both employer and Preregistration/Housing Forms with appropriate fees in the same envelope. It would also be helpful if the names of co-interviewers are listed on the employer form. If possible, these individuals should also preregister at the same time.

It is the policy of some institutions to pay for employer fees. These payments do not always accompany the preregistration forms but are sent in after the deadline has passed, or when the meeting is over. It is important that the institution's fiscal department indicate the name of the participating employer with their remittance advice or payment order so that proper credit can be made in Providence.

Employers are encouraged to provide more than one interviewer, when they are able to do so, in order to increase the number of interviews which may be scheduled.

Please take care to indicate on the form the number and names of interviewers for whom simultaneous interviews may be scheduled. Every interviewer who wishes to interview applicants for a position(s) and receive a separate schedule and table must pay the applicable employer registration fee in addition to the Joint Meetings registration fee. In the case of multiple job listings submitted on one or more employer forms, only one code number will be assigned. At the meeting each interviewer must submit an interview request form using the same code number in order to receive a schedule and be seated at a separate table. Interviewers for the same positions will be seated next to each other. However, if specific interviewers want to interview applicants separately for a position within the same department then each job description must be submitted on a separate form and the applicable fees remitted for each position. Each position will be assigned a separate code number.

A coded strip at the bottom of the form summarizes the information on each form. All employers are required to complete the summary strip. This is used to prepare the Winter List of Employers for distribution to the applicants at the meeting.

Winter Lists of Employers

The Winter List of Employers consists of summaries of the position listings submitted by the employers who preregistered for the meeting. It will be distributed to the applicants participating in the Register. Others may purchase the Winter List of Employers at the AMS Exhibit and Book

Sale at the meeting or from the Providence office after the meeting. The price at the meeting is \$8 each. Any copies remaining after the meeting will be available from the Providence office of the Society for \$10 each. The list will not be updated with employers who register at the meeting.

Employers Not Planning to Interview

Employers who do not plan to participate in the Employment Register, but wish to display job descriptions, may obtain special forms from Carole Kohanski, Mathematical Sciences Employment Register, P. O. Box 6887, Providence, RI 02940. These job descriptions must be received in the Providence office by **November 18** along with the fee of \$30 for this service.

Employers who attend the Joint Mathematics Meetings, but do not want to interview, can post job descriptions at the Employment Register. **Postings will not be allowed in the Joint Meetings registration area.** A fee of \$30 will be charged and must be paid at the Joint Mathematics Meetings registration desk prior to posting the form. Participants should be sure to inform the cashier that they would like to post a job description but are not planning to interview and should obtain the proper receipt in order to receive the form necessary for posting at the Employment Register desk. The form may then be obtained at the Employment Register area.

December Issue of Employment

Information in the Mathematical Sciences

The periodical *EIMS* publishes six issues per year listing open positions in academic, governmental and industrial organizations, primarily in North America. *EIMS* is a joint project of the American Mathematical Society (publisher), the Mathematical Association of America, and the Society for Industrial and Applied Mathematics.

The December issue of *EIMS* contains résumés of persons seeking professional positions in the mathematical sciences. Résumés of applicants taking part in the Employment Register and those not attending will be included in the December 1991 issue provided they are received before the November 18 deadline. Other mathematical scientists who wish to be included may have their résumés printed if the same deadline is observed.

Additional copies of the December Issue of *EIMS* will be available for sale at the AMS Exhibit and Book Sale at the meeting. Prices at the meeting are \$9 each for the December issue. Any copies remaining after the meeting will be available from the Providence office of the Society for \$16 each.

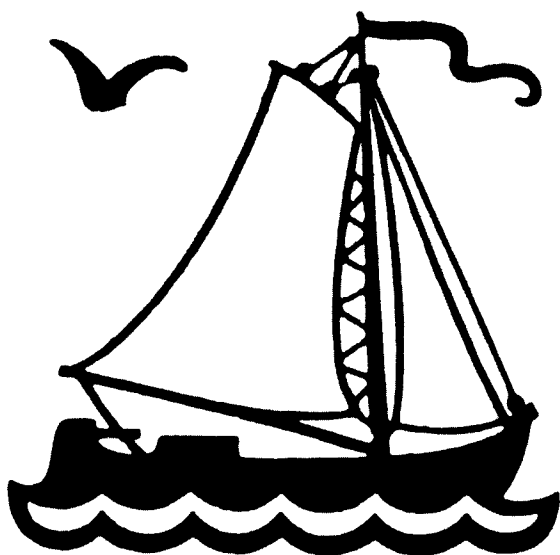
List of Retired Mathematicians

Available for Employment

The *List of Retired Mathematicians* will be included in the December and January issues of the publication *EIMS*. Retired mathematicians who are interested in being included in the list may send the following information to the Mathematical Sciences Employment Register, P. O. Box 6887, Providence, Rhode Island 02940.

1. Full name
2. Mailing address
3. Highest degree, year, university
4. Most recent employment, institution
5. Type of position desired
6. Academic or industrial employment preferred
7. Date available for employment (month/year)
8. Geographic location preferred

The deadline for receipt of this information is **November 18**. Offprints of the list will be available from the Mathematical Sciences Employment Register at the above address.



Special Airfares

1-800-999-9780

TRAVCON, INC., the official travel management firm for the Joint Mathematics Meetings to be held in Baltimore, Maryland, 8–11 January 1992 has arranged for special discounts aboard US Air.

Save 5% off the lowest published promotional fares, meeting all restrictions, or 45% off regular round trip coach fares, with a seven day advance purchase. The lowest fares require a Saturday night stay, are subject to airline change/cancellation penalties, and must be purchased at least 14 days prior to departure. *These discounted fares can only be obtained through TRAVCON, INC.*

Each Joint Mathematics Meetings participant will also receive \$100,000 flight insurance with each ticket purchased through TRAVCON, INC. aboard any airline.

US Air has been designated as the official airline carrier for the Baltimore Meeting because it provides the most convenient service for the majority of participants from across the country. However, if US Air does not provide convenient service from your area, TRAVCON will be happy to inform you of the most convenient flights and lowest available airfare on other airlines.

Your airfare is not guaranteed until ticketed.

**Call Today Toll-Free and Save
1-800-999-9780**

Monday–Friday, 9:00 am – 5:00 pm EST

TRAVCON, INC.
65 LaSalle Road, Suite 300
West Hartford, Connecticut 06107
(203) 232-9939

Instructions for Applicant's Form on facing page

The form. Applicants' forms submitted for the Employment Register by the November 18 deadline will be photographically reproduced in the December 1991 issue of *Employment Information in the Mathematical Sciences (EIMS)*. Résumés of only those attending will be posted at the meeting.

The forms **must be carefully typed** using a fresh black ribbon. The best results are obtained with a carbon-coated polyethylene film ribbon, but satisfactory results may be obtained using a ribbon made of nylon or other woven fabric if suitable care is exercised. It is important that the keys be clean and make a sharp, clear impression. Do not erase—it causes smudges which reproduce when photographed. Use a correcting typewriter or correction tape or fluid if necessary. Submit the original typed version only. Copies will not reproduce properly and are not acceptable. **Hand lettered forms will be returned. Do not type outside the box.**

Applicants' forms must be received by the Society by **November 18, 1991 in order to appear in the special issue of EIMS and must be accompanied by the Preregistration/Housing Form printed in this issue, if attending the meeting.**

(A) Specialties

AL = Algebra	AN = Analysis
BI = Biomathematics	BS = Biostatistics
CB = Combinatorics	CM = Communication
CN = Control	CS = Computer Science
CT = Circuits	DE = Differential Equations
EC = Economics	ED = Mathematical Education
FA = Functional Analysis	FI = Financial Mathematics
FL = Fluid Mechanics	GE = Geometry
HM = History of Math	LO = Logic
MB = Mathematical Biology	ME = Mechanics
MO = Modelling	MP = Mathematical Physics
MS = Management Science	NA = Numerical Analysis
NT = Number Theory	OR = Operations Research
PR = Probability	SA = Systems Analysis
ST = Statistics	TO = Topology

(B) Career Objectives

AR = Academic Research	AT = Academic Teaching
NR = Nonacademic R&D	NC = Nonacad. Consulting
NS = Nonacademic Supervision	

(H) (I) Duties

T = Teaching	U = Undergraduate
G = Graduate	R = Research
C = Consulting	A = Administration
S = Supervision	IND = Industry
GOV = Government	DP = Data Processing

Location

E = East	S = South
C = Central	M = Mountain
W = West	I = Indifferent
O = Outside U.S.	

MATHEMATICAL SCIENCES EMPLOYMENT REGISTER

APPLICANT FORM

JANUARY 8-10, 1992

BALTIMORE, MARYLAND

1. Form must be typed. (Please see instructions on facing page. No other format will be accepted.)
2. This form CANNOT be submitted by electronic mail.
3. Hand lettered forms will be returned. Do not type beyond the box
4. Please check if Preregistration/Housing Form previously sent
5. Return form with payment with your Preregistration/Housing Form by November 18 to AMS, P.O. Box 6887, Providence, RI 02940, to be included in the December issue of EIMS.

APPLICANT: Name _____

CODE: Mailing address (include zip code) _____

(A) Specialties _____

(B) Career objectives and accomplishments

ACADEMIC: Research, Teaching

NON-ACADEMIC: Research and Development, Consulting, Supervision

Near-term career goals _____

Significant achievements or projects, including role _____

Honors and offices _____

Other (e.g., paper to be presented at THIS meeting) _____

Selected titles of papers, reports, books, patents _____

(C) Degree	Year	Institution	(D) No. of abstracts, internal reports
_____	_____	_____	_____
_____	_____	_____	(E) No. of papers accepted
_____	_____	_____	_____
_____	_____	_____	(F) No. of books and patents
_____	_____	_____	_____

EMPLOYMENT HISTORY:

	Present	Previous	Previous
(G) Employer	_____	_____	_____
Position	_____	_____	_____
(H) Duties	_____	_____	_____
Years	_____ to _____	_____ to _____	_____ to _____

DESIRED POSITION: _____

(I) Duties _____

(J) Available mo. _____ /yr. _____ Location _____

(K) References (Name and Institution) _____

(L) Citizenship: (check one) U.S. Citizen Non-U.S. Citizen, Permanent Resident
 Non-U.S. Citizen, Temporary Resident

(M) AVAILABLE FOR INTERVIEWS:
 (Interviews for Session 4 scheduled on the basis of employer's request only.)

Session 1 Session 2 Session 3 Session 4
 Thurs. AM 9:00-11:15 Thurs. PM 12:45-4:30 Fri. AM 9:00-11:15 Fri. PM 12:45-4:30

I do not plan to attend the Baltimore meetings

JANUARY 8-10, 1992

BALTIMORE, MARYLAND

MATHEMATICAL SCIENCES EMPLOYMENT REGISTER

EMPLOYER FORM

This form CANNOT be submitted by electronic mail.

INSTRUCTIONS: Please read carefully before completing form below. **Circled** letters identify corresponding items in the FORM and the SUMMARY STRIP; abbreviations to be used are provided in the notes below. Please **print or type** in black ink. Block capitals are suggested. The FORM itself will be placed on display at the Register exactly as submitted. The SUMMARY STRIP (be sure to complete) will be used to prepare a computer printed list of summaries for distribution at the Register. Employers are encouraged to provide more than one interviewer when they are able to do so, in order to increase the number of interviews which may be scheduled. Please take care to indicate on the Form the number of interviewers for whom simultaneous interviews may be scheduled. (If all interviewers will be interviewing for the same position, or for the same set of positions, only one form should be submitted and only one employer code number will be assigned; therefore, each interviewer would then receive a separate computer schedule and separate table number.) More than one employer code will be required if some interviewers will not interview for all positions. Thus, if there are two disjoint sets of positions, two forms are required and two employer codes will be assigned. (Please refer to the section on the Employment Register following the Baltimore meeting announcement.) **Return form with payment with your preregistration/Housing form by November 18.**

EMPLOYER CODE	Institution	Dept.			
	Name of Interviewer(s)	1.	2.		
		3.	4.		
	City, State, Zip				
(A)	Title(s) of Position(s)	(B)	Number of Positions	(C)	Number of People Supervised
(C)	Starting Date	(D)	Term of Appointment	(E)	Renewal () Possible () Impossible
	mo. / yr.		yrs.		Yes () No ()
	Teaching hrs./wk	(F)	Specialties Sought	(G)	Degree Preferred
(G)	Degree Preferred	(H)	Degree Accepted	(I)	Duties
(L)	Available for Interviews	(J)	Experience	(K)	Citizenship Restriction
	Session 1 () Thurs. AM, 9:00-11:15		Session 2 () Thurs. PM, 12:45-4:30		Session 3 () Fri. AM, 9:00-11:15
	Session 4 () * Fri. PM, 12:45-4:30				
(M)	Number of Interviewers	(N)	Interviewers	(O)	Interviewers

Institution	City	State	Title of position	No.	yr.
(D)	(E)	(F)	(G)	(H)	(I)
Specialties sought	(J)	(K)	(L)	(M)	(N)
Experience	(O)	(P)	(Q)	(R)	(S)

NOTES: A. Inst, Lect, Asst Prof, Asso Prof, Dean, Open, MTS (Member Technical Staff), OPAN (Operations Analyst), PREN (Project Engineer), RESC (Research Scientist); C. Date e.g. 01/92; E. Possible=P, Impossible=I; F. Algebra=AL, Analysis=AN, Biomathematics=BI, Biostatistics=BS, Combinatorics=CB, Communication=CM, Control=CN, Computer Science=CS, Circuits=CT, Differential Equations=DE, Economics=EC, Mathematical Education=ED, Functional Analysis=FA, Financial Mathematics=FL, Fluid Mechanics=FM, Geometry=GE, History of Mathematics=HM, Logic=LO, Mathematical Biology=MB, Mechanics=ME, Modeling=MO, Mathematical Physics=MP, Management Science=MS, Numerical Analysis=NA, Number Theory=NT, Operations Research=OR, Probability=PR, Systems Analysis=SA, Statistics=ST, Topology=TO; G. H. Bachelor=B, Master=M, Doctor=D; I. J. Teaching=T, Undergraduates=U, Graduates=G, Research=R, Consulting=C, Administration=A, Supervision=S, Industry=IND, Government=GOV, Data Processing=DP, no experience required=N; K. U.S. Citizen=C, U.S. Citizen or permanent resident=CP, No restriction=NR; L. Periods available for interviews: Check 1, 2, 3, and/or 4, see the FORM above. * Interviews are scheduled in this session on the basis of employers request only.

FOCUS Employment Advertisements

The Mathematical Association of America's more than 31,500 members all receive FOCUS and its "Employment Advertisements" as a standard membership benefit. FOCUS readers describe themselves as mathematicians teaching in secondary schools, colleges and universities, or working in business, industry, and government.

Rates for both classified and display FOCUS Employment Advertisements:

- Fifty (50) words or less: \$50.00
- More than fifty (50) words: \$55.00 per column inch

Each advertising column measures 14.33 picas or $2\frac{7}{16}$ inches wide. Advertisements spanning two columns measure 29.66 picas or $4\frac{15}{16}$ inches wide. Advertisements spanning three columns measure 45 picas or $7\frac{1}{2}$ inches wide.

FOCUS offers a 15% discount for the same advertisement in three or more consecutive issues.

The MAA will invoice advertisers after the *first* occurrence specified in insertion orders. All invoices include a tear sheet.

ADVERTISING COPY DEADLINES

The Association publishes FOCUS six times per year. Advertisement copy deadlines include:

- December 1991 issue
Monday, 21 October 1991

- February 1992 issue
Monday, 16 December 1991

After these deadlines, we advise potential advertisers to telephone MAA headquarters to inquire about advertising space availability in these issues. *The Association will accept postdeadline advertisements on a discretionary basis only.*

Anyone wishing to place an employment advertisement in FOCUS should contact:

Siobhán B. Chamberlin
FOCUS Employment Advertisements
The Mathematical Association of America
1529 Eighteenth Street Northwest
Washington, DC 20036-1385
Telephone: (202) 387-5200
FAX: (202) 265-2384
e-mail: maa@athena.umd.edu

THE UNIVERSITY OF AKRON

Head-Department of Mathematical Sciences

The Department of Mathematical Sciences invites applications and nominations for the position of department head. A PhD in the mathematical sciences (mathematics, applied mathematics, statistics, or computer science) and a strong commitment to teaching and research are required. Some administrative and/or professional experience in a mathematical sciences PhD program is desirable. The department consists of thirty-seven full-time faculty members and offers BS degrees in mathematics, applied mathematics, statistics, and computer science, and MS degrees in mathematics, applied mathematics, and statistics. The department has proposed graduate programs for the MS in computer science and the PhD in applied mathematics.

The University of Akron is the third largest state university in Ohio (30,000 day and evening students) and offers a multitude of associate, bachelor's, master's and doctorate degree programs in the physical and social sciences, engineering, and education.

Review of applications will begin **November 18, 1991** and continue until the position is filled. Tentative inquiries are desirable and will be treated confidentially. Please send a curriculum vitae and the names of at least three references to: Dr. Chand Midha, Chair, Search Committee, Department of Mathematical Sciences, The University of Akron, Akron, OH 44325-4002. The University of Akron is an equal opportunity/affirmative action employer. Women and minorities are encouraged to apply.

CHAIRPERSON

Department of Mathematics and Computer Science GETTYSBURG COLLEGE

The Department of Mathematics and Computer Science invites nominations and applications for the position of Chairperson of Mathematics. This is a tenure-track faculty appointment; the term as chairperson is a five-year renewable appointment.

The Department seeks a dynamic individual who has demonstrated considerable contributions to the field of mathematics in both instruction and research, who is an experienced teacher and leader, and who has proved administrative skills in higher education.

More specifically, the chairperson will be responsible for continuing to develop an innovative program of mathematics instruction; provide leadership for a staff of six mathematicians and two computer scientists, work with the computer science faculty on the administration of a computer science program of high quality; and design the annual departmental budget.

Gettysburg College is a highly selective, liberal arts college located within an hour and a half of the Washington/Baltimore area; it is an Equal Opportunity, Affirmative Action employer. Women and minorities are encouraged to apply. Consideration for this position will begin on **October 15, 1991** and continue until the position is filled. Please send nominations or letters of application along with current vita and names, addresses, and telephone numbers of three references to: Chair, Search Committee, Department of Mathematics and Computer Science, Gettysburg College, Gettysburg, PA 17325.

NORTHERN ARIZONA UNIVERSITY DEPARTMENT CHAIR

The Department of Mathematics seeks a dynamic individual to lead a progressive department with a balanced teaching-research-service mission in a growing, comprehensive university. Qualifications include an earned doctorate in mathematics, or mathematics through the doctoral qualifying level and a doctorate in mathematics education or statistics; a record of high quality university teaching and research; extensive professional service including leadership roles; excellent administrative skills; excellent communication and interpersonal skills; recent, extensive experience in a mathematics department; and broad knowledge of academic mathematics, mathematics education, and statistics. The starting date is July 1, 1992.

The department of 32 permanent faculty offers degree programs through the master's level with emphases in mathematics, mathematics education, statistics, and actuarial science. Our programs have experienced consistent, strong growth during the last several years. Faculty have active research interests in algebra, analysis, combinatorics, geometry, mathematics education, statistics, and topology. Special research concentrations have recently been established in combinatorics and dynamical systems. In addition, the department is actively involved in initiatives of regional and national interests including calculus reform, use of technology, and participation of minorities.

NAU has a current, on-campus enrollment of about 14,000 students. It lies on the southern edge of Flagstaff, a city of about 45,000, at an altitude of 7,000 feet. The setting is mountainous, pine-forested and cool, with four distinct seasons, a relatively dry climate, abundant blue skies, and generous winter snows. Nearby attractions include spectacular canyons, national forests, high mountains, large recreation areas, numerous national parks and monuments, and Indian ruins.

To apply, send letter of application, vita, and statement of academic philosophy, and direct four letters of reference to: Mathematics Chair Screening Committee, College of Arts and Sciences, PO Box 5621, Northern Arizona University, Flagstaff, AZ 86011-5621. The search will remain open until the position is filled; however, the screening committee will begin reviewing applications on **December 13, 1991**.

NAU IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION INSTITUTION.

WOMEN AND MINORITIES ARE ENCOURAGED TO APPLY.

WILLIAMS COLLEGE DEPARTMENT OF MATHEMATICS WILLIAMSTOWN, MA 01267

Anticipated part-time position, for fall 1992 and/or spring 1993, teaching one or two courses in quantitative studies or possibly other topics, probably at the rank of lecturer.

Proven success in teaching a general college course such as algebra, trigonometry, or precalculus is essential. Other possible qualifications might include a background in statistics, a PhD, a commitment to scholarship.

Please send a vita and three letters of recommendation to Frank Morgan, Chair. Evaluation of applications may begin as early as **November 15, 1991**, and continue until the position is filled. AA/EOE.

MATHEMATICS

The Mathematics Department of the Southern College of Technology seeks applicants for one or more tenure-track positions at the rank of assistant professor. The department desires faculty who can contribute to the newly created BS program in mathematics. PhD in mathematics required. Research is desirable but is neither required nor heavily weighed.

The ideal candidate will show a strong mastery of the discipline, a commitment to professional growth and development, an ability for and commitment to excellence in teaching, and the potential and desire to enhance the college's intellectual community.

The Mathematics Department has sixteen tenure-track positions. There is a new BS in mathematics, dual major programs with other departments, and several minor programs. The bulk of the teaching is in service courses.

Southern Tech is a state-supported senior college in the University System of Georgia. Situated on a 230 acre site 15 miles northwest of Atlanta, the college enrolls about 4,000 students in technically oriented programs through the master's level.

A complete application consists of a letter of application, a curriculum vitae, transcripts of all college work, and a minimum of two letters of reference. The deadline for applications is **February 1, 1992**; applications not *completed* by that date will not be considered. Applicants who are not US citizens should state visa type and authorization for permanent employment in the US; an application will not be considered complete without such a statement.

Applications and inquiries should be addressed to:

Dr. James C. Kropa
Mathematics Department
Southern College of Technology
Marietta, Georgia 30060-2896

Southern College of Technology is an equal opportunity/affirmative action employer.

FURMAN UNIVERSITY

Greenville, South Carolina 29613

The Department of Mathematics at Furman University, an undergraduate, liberal arts college, invites applications for a tenure-track assistant professorship beginning September 1, 1992. A PhD in a mathematical science is required. All areas of specialization are acceptable. Excellence in teaching and continued scholarly activity are expected of all faculty. The application should address the candidate's interest in a position at a liberal arts college and plans for an ongoing program of scholarly activity. A vita, graduate and undergraduate transcripts, and three letters of recommendation should be sent to Robert Fray, Department of Mathematics. At least one of the letters should discuss the applicant's teaching ability. Application deadline: **January 24, 1992**. EO/AAE.



The MAA now prints FOCUS on recycled paper

STETSON UNIVERSITY

Department of Mathematics
and Computer Science

Applications are invited for a tenure-track position in mathematics at the assistant professor level beginning fall 1992. A PhD in mathematics is required. Applicants should have a strong commitment to undergraduate teaching in a liberal arts environment. Teaching load: 9–10 hrs/wk. Responsibilities include teaching mathematics courses at all levels of the undergraduate curriculum, and continuing scholarly activity. The department currently has 10 full-time faculty members. Stetson University, located in central Florida, is a small, private, comprehensive university of 2,500 students. Its three schools—the College of Arts and Sciences, the School of Business, and the School of Music—are dedicated to excellence in teaching and are united by a commitment to the liberal arts. Send vita and three letters of recommendation to: Professor Dennis Kletzing, Department of Mathematics and Computer Science, Stetson University, DeLand, Florida 32720. Deadline for applications is **December 31, 1991**, or until position is filled. Stetson University is an Equal Opportunity Employer and enthusiastically solicits applications from women and minority candidates.

UNIVERSITY OF PUERTO RICO AT MAYAGUEZ

Department of Mathematics

The Department of Mathematics has a tenure-track opening at the assistant professor level in the area of functional analysis (with special interest in operator theory). The salary is \$23,820 per year. A PhD degree and at least one year of academic or industrial/research experience are required, as is fluency in both English and Spanish. The appointee will be required to teach graduate and undergraduate courses and to do research. Send resumé and three letters of recommendation to:

Dr. Darrell W. Hajek
Acting Chairperson
Department of Mathematics-UPR
PO Box 500
Mayaguez, Puerto Rico 00681-5000

The University of Puerto Rico is an equal opportunity employer.

MATHEMATICIAN

Mount Saint Mary's College, an independent, Catholic college, has an opening in academic year 1992-1993 for an entry level assistant professor of mathematics, tenure-track. A PhD in mathematics is required by September of 1992 (preferably in hand). Candidates should possess a dedication to quality teaching at a small liberal arts college. Computer experience is desirable as is an interest in mathematical modeling and applications. Knowledge of current reforms in mathematics education a plus. Duties include teaching mathematics courses at all levels and involvement in departmental and college-wide activities and committees. Salary is competitive. Letter of application, vita, and three letters of recommendation should be sent to: Search Committee, Department of Mathematics & Computer Science, Mount Saint Mary's College, Emmitsburg, MD 21727. Application review begins **October 1991** and continues until the position is filled.

Mount Saint Mary's College does not discriminate on the basis of sex, age, race, or national origin. Women and minorities are actively encouraged to apply.

OBERLIN COLLEGE

Department of Mathematics

A full-time, tenure-track position beginning 1992–93. Responsibilities include teaching undergraduate courses (5/year) including abstract algebra, academic advising, work with honors students, service on committees, and sustained scholarly production. All specialities considered but preference given to algebraists. Qualifications required include the PhD degree (in hand or expected by September 1992). Candidates must demonstrate potential excellence in teaching. Oberlin is a selective college playing a historic role in the education of minorities and women, and with a strong record producing students earning a PhD degree in science and mathematics. Applications from female and minority candidates welcomed. Please send letter of application, curriculum vitae, academic transcripts, and 3 letters of reference to: Michael Henle, Department of Mathematics, Oberlin College, Oberlin, OH 44074 by **November 4 1991**. Applications received afterwards may be considered until the position is filled.

FROSTBURG STATE UNIVERSITY

Mathematics

Three full-time, tenure-track, instructor/assistant professor positions, available fall 1992, SUBJECT TO FINAL FUNDING APPROVAL. Teach 12 credits introductory level mathematics per semester and share departmental responsibilities. REQUIRED: Master's degree in mathematics, strong commitment to undergraduate teaching, and continuing interest in mathematical development. PREFERRED: Doctorate in mathematics or mathematics education, teaching experience, experience with applications of mathematics and interest in applications of technology to classroom teaching. Salary range \$25,000–\$30,000 plus benefits package afforded University of Maryland system employees. Direct questions to Dr. Richard C. Weimer, Department Chair, (301) 689-4377. Send letter of interest, resumé, transcripts, and three letters of recommendation, not later than **January 15, 1992**, to: Mr. C. Douglas Schmidt, Director of Personnel Services, Frostburg State University, Frostburg, MD 21532. Women and minorities are encouraged to apply. AA/EOE.

MACALESTER COLLEGE

MATHEMATICS/COMPUTER SCIENCE
1600 Grand Avenue
St. Paul, MN 55105

Applications are invited for a tenure-track position in mathematics to begin in the fall of 1992. Candidates must have the PhD and a strong commitment to teaching and research in an undergraduate liberal arts college.

Located in a pleasant residential neighborhood of the culturally rich twin cities of St. Paul and Minneapolis, Macalester has a student body of 1,750, 11% of whom are international and 10% of whom are American minorities, reflecting a long-standing desire to maintain a multinational, multiethnic community. Part of a strong science program, the Math and CS Department has the largest total course enrollments on campus.

Applicants should send a resumé and a statement giving reasons for interest in a liberal arts college having no graduate program; also arrange for three letters of reference to be sent to Wayne Roberts at the address above. Evaluation of applications will begin on **December 1** and will continue until the position is filled. Macalester is an Affirmative Action/Equal Opportunity employer and encourages applications from women and minority groups.

NORTH LAKE COLLEGE
 member of the
DALLAS COUNTY
COMMUNITY COLLEGE DISTRICT

North Lake College, a comprehensive community college, is accepting applications for an instructor to teach developmental and academic transfer mathematics courses. This is a full-time position starting in the fall of 1992 with the option of summer employment. Applicants must have a master's degree including 18 graduate hours of mathematics. Duties include designing and implementing quality mathematics programs to improve student participation and success, along with participating in college, division, department, and professional activities. North Lake College is committed to affirmative action and strongly encourages applications from minorities and women. Send resumé, all transcripts, and three professional letters of reference to: Dr. Grady Grizzle, Chairman of Humanities, Mathematics, and Technology, 5001 N. MacArthur Blvd., Irving, Texas 75038-3899; (214) 659-5320. Applications should be received by **December 31, 1991**.

UNIVERSITY OF SOUTH ALABAMA

Applications are invited for a full-time, continuing, nontenure-track position beginning Sept. 1, 1992. Applicants must have at least a master's degree in mathematics. A record of successful teaching at the college level required. Duties include teaching undergraduate courses in mathematics, advising students, department committee work, and other professional activities as appropriate. Salary is competitive and commensurate with experience and qualifications. Qualified candidates should submit letter of interest, resumé, undergraduate and graduate transcripts (student copies will suffice initially) and arrange to have three letters of recommendation sent directly to:

Dr. John Cruthirds, Committee Chair
 Dept. of Mathematics/Statistics
 Univ. of South Alabama
 Mobile, AL 36688

Applications will be accepted until position is filled but should be completed by **Dec. 16, 1991** to ensure consideration. The Univ. of South Alabama is an equal opportunity, affirmative action employer.

DEPARTMENT OF
MATHEMATICAL SCIENCES
THE JOHNS HOPKINS UNIVERSITY

Applications are invited for a faculty position in **OPERATIONS RESEARCH** or **OPTIMIZATION**

to begin in fall 1992. Within these areas, either a stochastic or a deterministic emphasis is of interest. Applications at all levels will be considered.

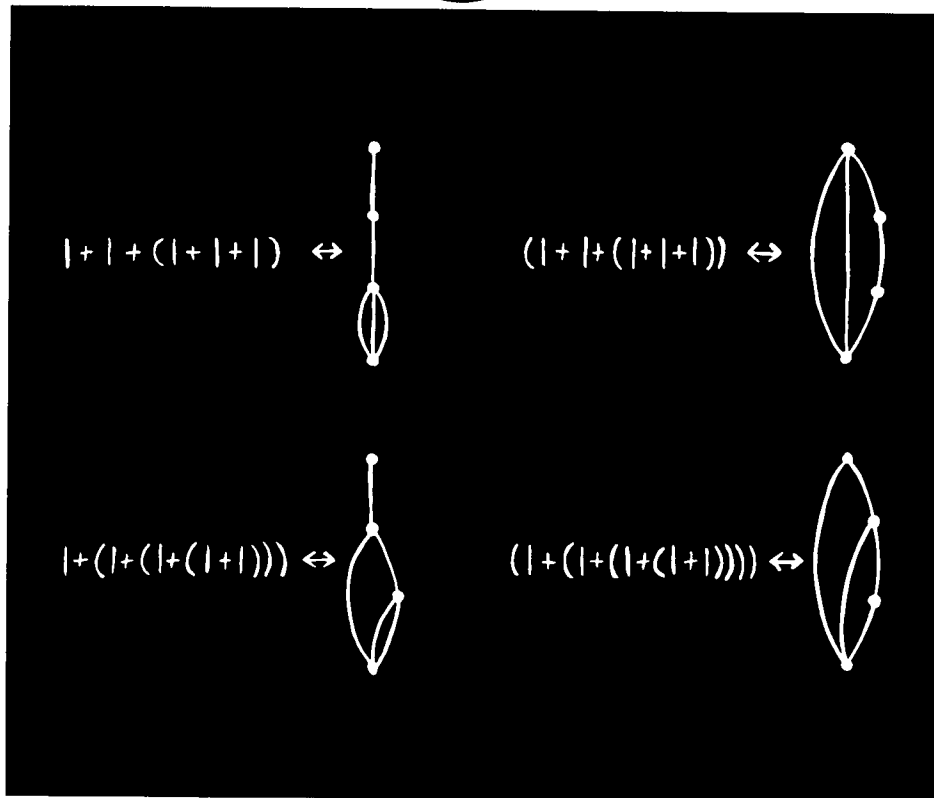
Selection is based on demonstration and promise of excellence in research, teaching, and innovative applications. AA/EOE.

Applicants are asked to furnish a curriculum vitae, transcripts (junior applicants only), reprints (if available), a letter describing professional interests and aspirations, and to arrange for three letters of recommendation to be sent to:

John C. Wierman, Chair
 Department of Mathematical Sciences
 220 Maryland Hall
 The Johns Hopkins University
 Baltimore, MD 21218-2689

(Calendar continued from back cover.)
7-10 November 1991 *The Seventeenth Annual Convention of the American Mathematical Association of Two-Year Colleges*, (AMATYC), Westin Hotel, Seattle, Washington. For additional information, contact: Vicky Ringen, 1991 General Chair, Department of Mathematics, North Seattle Community College, 9600 College Way North, Seattle, Washington 98103; (206) 527-3746.
29 December 1991-2 January 1992 *First International Conference on Post High School Technical Education*, Jerusalem-Tel Aviv, Israel. An opportunity to discuss new programs and solutions to problems common to technical education throughout the world. Conference cochair Jakov Hecht of the Israel Ministry of Labour and Social Affairs invites topic suggestions and invited speaker nominations. For additional information, contact: ISAS, PO Box 574, Jerusalem 91004, Israel.
29-31 March 1992 *Fifteenth Annual Symposium on Developmental Education*, The Nevele Country Club, Ellenville, New York. The conference sponsor, New York College Learning Skills Association, seeks presentation proposals on all aspects of developmental education and learning support services at the college level. Submission deadline for proposals: **25 October 1991**. For additional information, contact: Barbara Risser, Department of English, Onondaga Community College, Route 173, Syracuse, New York 13215; (315) 469-7741, ext. 2424.

Intrigued?



Then consider joining a highly talented group of mathematicians whose job it is to deduce structure where structure is not apparent, to find patterns in seemingly random sets, to create order out of chaos.

These are the mathematicians of the National Security Agency. They contribute to the solution of cryptologic problems using Number Theory, Group Theory, Finite Field Theory, Linear Algebra, Probability Theory, Mathematical

Statistics, Combinatorics and more. And they function as a true community, exchanging ideas and working with some of the finest minds—and most powerful computers—in the country.

If you love problem-solving and like the idea that those solutions will be applied to real world problems, look into a career with NSA. Send your resume to the address below or contact your campus placement office.



The Opportunities of a Lifetime

Attn: M322 (AEF), Ft. Meade, Maryland 20755-6000

An equal opportunity employer. U.S. citizenship required for applicant and immediate family members.

Calendar

National MAA Meetings

8–11 January 1992 Seventy-Fifth Annual Meeting, Baltimore, Maryland (Board of Governors, 7 January 1992)
13–16 January 1993 Seventy-Sixth Annual Meeting, San Antonio, Texas (Board of Governors, 12 January 1993)
15–19 August 1993 Sixty-Eighth Summer Meeting, Vancouver, British Columbia (Board of Governors, 14 August 1993)

Sectional MAA Meetings

Allegheny Mountain Slippery Rock University, Slippery Rock, Pennsylvania: 10 and 11 April 1992
Eastern Pennsylvania and Delaware Drexel University, Philadelphia, Pennsylvania: 9 November 1991
Florida University of North Florida, Jacksonville, Florida: 6 and 7 March 1992
Illinois North Central College, Naperville, Illinois: 24 and 25 April 1992
Indiana Indiana University-Purdue University, Fort Wayne, Indiana: 18 and 19 October 1991
Intermountain Weber State University, Ogden, Utah: 10 and 11 April 1992
Iowa Graceland College, Lamoni, Iowa: 24 and 25 April 1992
Kansas Hesston College, Hesston, Kansas: 20 and 21 March 1992
Kentucky Bellarmine College, Louisville, Kentucky: 27 and 28 March 1992
Louisiana and Mississippi Louisiana State University, Baton Rouge, Louisiana: 6 and 7 March 1992
Maryland-District of Columbia-Virginia Marymount University, Arlington, Virginia: 15 and 16 November 1991
Michigan Saginaw Valley State University, University Center, Michigan: 8 and 9 May 1992
Missouri Northwest Missouri State University, Maryville, Missouri: 10 and 11 April 1992
Nebraska Hastings College, Hastings, Nebraska: 10 and 11 April 1992
New Jersey County College of Morris, Randolph, New Jersey: 16 November 1991
North Central Bemidji State University, Bemidji, Minnesota: 18 and 19 October 1991
Northeastern Providence College, Providence, Rhode Island: 22 and 23 November 1991
Northern California University of the Pacific, Stockton, California: 29 February 1992
Ohio John Carroll University, University Heights, Ohio: 25 and 26 October 1991; University of Dayton, Dayton, Ohio: 27 and 28 March 1992

Oklahoma and Arkansas Henderson State University, Arkadelphia, Arkansas: 3 and 4 April 1992
Pacific Northwest University of Montana, Missoula, Montana: 18–20 June 1992
Rocky Mountain Colorado College, Colorado Springs, Colorado: 10 and 11 April 1992
Seaway State University of New York, College at Fredonia, Fredonia, New York: 1 and 2 November 1991; Queen's College, Kingston, Ontario, Canada: 1 and 2 May 1992
Southeastern Kennesaw College, Marietta, Georgia: 10 and 11 April 1992
Southern California University of California at Santa Barbara, Santa Barbara, California: 9 November 1991
Southwestern University of Arizona, Tucson, Arizona: Spring 1992
Texas University of Houston-Downtown, Houston, Texas: 9–11 April 1992
Wisconsin University of Wisconsin at Whitewater, Whitewater, Wisconsin: 24 and 25 April 1992

Other Meetings

15–17 October 1991 *Fourth Annual Conference on Technology in Collegiate Mathematics*, Portland Hilton, Portland, Oregon. The conference will feature more than fifty invited presentations on the use of technology in collegiate and high school mathematics. Interested persons should submit, by **1 October 1991**, a one-page abstract for the paper sessions or a proposal for the poster sessions, along with two self-addressed, stamped envelopes to: Lewis Lum, Department of Mathematics and Computer Science, University of Portland, 5000 North Williamette Boulevard, Portland, Oregon 97203. (See page eleven of the September 1991 issue of *FOCUS* for additional information on this conference.)
1 and 2 November 1991 *The Sixth Annual Pi Mu Epsilon Regional Undergraduate Mathematics Conference*, St. Norbert College, De Pere, Wisconsin 54115-2099. The conference welcomes all students, faculty, and others interested in mathematics. Invited speaker: J. Douglas Faires of Youngstown State University. For additional information, contact: Richard L. Poss of the Department of Mathematics at St. Norbert College; (414) 337-3198.
1 and 2 November 1991 The Consortium for Computing in Small Colleges will sponsor its *Fifth Annual Southeastern Small College Computing Conference*, David Lipscomb University, Nashville, Tennessee. Theme: "In Support of Computing in Small Colleges." For additional information, contact: Frank D. Cheatham, Department of Mathematics, Campbellsville College, 200 West College Street, Campbellsville, Kentucky 42718; (502) 465-8158.
(*Calendar continues inside back cover.*)

FOCUS

The Mathematical Association of America
1529 Eighteenth Street Northwest
Washington, DC 20036-1385

OCTOBER 1991

Second class postage paid
at Washington, DC and
additional mailing offices.