

# FOCUS

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## January AAAS Meeting in San Francisco to Offer Strong Mathematics Program

Warren Page

The 1989 Annual Meeting of the AAAS, January 14-19 in San Francisco, will feature many outstanding expository talks by prominent mathematicians. These include the following symposia (three-hour sessions) and invited talks sponsored by Section A (Mathematics) of the AAAS:

- Chaos and Dynamical Systems, organized by Jerrold E. Marsden. (Robert Devaney, Philip J. Holmes, James Yorke, Stephen Smale.)
- Monte Carlo Methods, Statistical Mechanics, and Combinatorial Optimization, organized by Nicholas C. Metropolis and Lawrence Goldstein. (J. D. Doll, Stewart Geman, Brosl Hasslacker, Lawrence Goldstein, G. S. Guralnik.)
- The Next Generation of Neural Nets, organized by David H. Sharp. (Dana Ballard, Eric Mjolsness, David H. Rumelhart, John S. Denker, David Haussler.)
- Logic Today, organized by Harvey Friedman. (Stephen Simpson, Kenneth McAloon, Kenneth Manders, H. J. Keisler, Dana Scott.)
- Creativity in the Mathematical Sciences: The Many Faces of Our Dilemma, organized by Arnold E. Ross. (Ronald D. Scheid, Charles Fefferman, Peter Lax, Benjamin Bloom, Julian Stanley.)
- Mathematics and Molecular Biology, organized by Michael S. Waterman. (Michael S. Waterman, Eric Lander, Samuel Karlin, James White.)
- The Scientist's Role in Developing Minority Students, organized by Leon Henkin and Uri Treisman. (Mindy Thompson Fullilove, Ray Landes, Frederick Reif, Frank Talamantes, Uri Treisman.)
- Frontiers of Physical Sciences: A mathematics lecture by Michael H. Freedman.

This year's AAAS Annual Meeting will be held with the Joint Annual Meeting of the American Association of Physics Teachers and the American Physical Society. The AAAS program will also feature various symposia honoring the sesquicentennial of the American Statistical Association. In view of this rich interplay, Section A of

### Annual Meeting Program Issue

See page 3 for highlights of MAA and AMS programs.

Minicourse program starts page 6.

Check deadlines, page 12.

For special travel fares, see page 19.

Note the San Francisco AAAS program that closely follows the MAA meeting; see page 1.

See Special Notice on back cover.

the AAAS is also co-sponsoring various symposia that will be of interest to mathematicians and mathematics educators. These include:

- Chaos in Neural Networks
- Chaos in Biological Systems: Physiology, Medicine, and Ecology
- Chaos in Physical Systems: Studies in Turbulence
- Chaos in Physical Systems: Studies of Quantum Systems
- Chaos in Physical Systems: Astronomy and Celestial Mechanics
- Chaos in Global Affairs: Economics and the Arms Race
- Spatial Statistics
- Federal Funding of the Academic Physical Sciences
- Looking into Windows: Qualitative Research in Mathematics and Science Education
- Perspectives and Emerging Approaches for Assessing Higher-Order Thinking in Mathematics

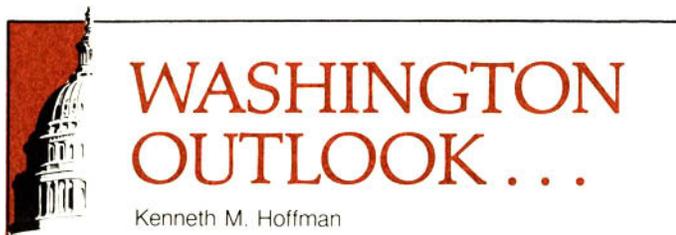
The above symposia are only a few of the 150 or so AAAS program offerings in the physical sciences, the life sciences, and the social and biological sciences that will broaden the perspectives of students and professionals alike. Indeed, AAAS Annual Meetings are showcases of American science, deserving greater participation by mathematicians. In presenting mathematics to the AAAS Program Committee, I have found the committee genuinely interested in more symposia on mathematical topics of current interest. The Section A Committee is looking for organizers and speakers who can present substantial new material in understandable ways.

This task is not easy, but the outstanding success of the mathematics symposia at last year's AAAS Annual Meeting, in Boston, proved that effort and inspiration can accomplish wonders. That meeting's mathematics program showed that first rate mathematical researchers can also effectively reach a broad scientific audience.

We in Section A of the AAAS know that the increasing representation and participation of mathematicians at AAAS Annual Meetings are important means for deepening public awareness and appreciation of the manifold ways that mathematics contributes to science and society. I need and welcome your suggestions for symposia topics and individuals who might be able to organize them.

I hope that you will have the opportunity to attend some of this year's exciting symposia in San Francisco. For details see the October 28 issue of SCIENCE. I invite you to attend our Section A Committee Meeting, 6–8 p.m., January 15, San Francisco Hilton, Walnut B Room. The committee meeting is open to all who wish to stimulate interest and activities of the mathematical sciences within the AAAS. Please send to me, and encourage your colleagues to send me, symposia proposals for future AAAS meetings.

*Warren Page is Editor of the COLLEGE MATHEMATICS JOURNAL, Second Vice President of The MAA, and Secretary of Section A of the AAAS.*



**Merci  
M. LeVeque!**

**William J. LeVeque  
Executive Director  
AMS, 1978–1988  
Shown at left.**

Each fall official Washington comes alive after a summer slowdown. The out-of-state buses that a few weeks earlier had been crammed with chil-

ren are replaced with ones holding senior citizens. The wave of tourists in shorts, armed with cameras and maps, recedes to expose people in suits and dresses scurrying to work or between government buildings. They are part of unofficial Washington, the small army of government workers and staff members who did not go away during the summer, but worked to put in place plans for the year, plans which officials will implement when they return.

The small platoon that works in Washington on behalf of the mathematics community has also been planning over the summer. The plans, which largely deal with improving communication with members of the community, will be discussed in future columns in this space, after they have been approved by the Joint Policy Board for Mathematics. This first column of the "new" year was to have been devoted to late-breaking news about events in Washington that impact us—chiefly two items about the final FY 1989 appropriation for the National Science Foundation (NSF): There may be more money for undergraduate education; and Congress has put a cap on salaries for NSF grantees. We put these matters aside in order to devote this column to an expression of gratitude to a very valuable member of our community, Bill LeVeque.

In August, shortly after the Centennial celebration, Bill LeVeque retired after almost a dozen years as Executive Director of the American Mathematical Society (AMS). One of the areas to which Bill contributed his imagination and leadership during his tenure in office was communication, specifically, the expansion and improvement of our mechanisms for communicating the messages of mathematics to one another and to the larger society around us.

People who are generally aware of Bill LeVeque's work on our behalf correctly point to his accomplishments in the heart of what we do: publication and dissemination of the results of mathematical research. Growing out of his years as Executive Editor of MATHEMATICAL REVIEWS and extending through his term as Executive Director is a string of innovations that reveals creativity together with a deep commitment to mathematics and to quality. His accomplishments cover a broad spectrum, from the use of modern printing technology to the establishment of the new JOURNAL OF THE AMS.

Bill's contributions at the interface between mathematicians and the outside world deserve wider recognition. During his time as Executive Director he worked steadily to expand our horizons, to encourage us to convey mathematics and its needs to other sciences, to government, and to the general public. The pattern of his activities is impressive, as a diverse sample will show: He was one of the first chairmen of the AMS Science Policy Committee; he pressed to have the NOTICES reformatted, to make it more accessible and readable; he built a case for having a science writer in the Providence office, which is why the aforementioned Allyn Jackson is with the AMS; he developed and put forward the idea of the new COLLEGIATE MATHEMATICS EDUCATION NEWSLETTER that will begin publication in 1989.

There is a bigger job that Bill did, one requiring years of effort. Starting with his term as Chairman of the Conference Board of the Mathematical Sciences in 1973–75, Bill was one of the small group of people who consistently argued for developing greater unity of purpose and action across the mathematical sciences community. Because of the efforts of this group the Joint Concerns Committee of AMS-MAA-SIAM was transformed into the Joint Policy Board for Mathematics (JPBM) in 1983, and in 1984 it began to create a stronger Washington presence for our community. All those who have been directly connected with the JPBM during its five years of existence would, on reflection, acknowledge that Bill has been the main pillar of this effort of the three societies—pushing the agenda forward, helping us over the bumpy spots, supplying the glue to hold the enterprise together.

Bill LeVeque is not a quiet man. But his work over the years in strengthening communication with our several publics was done quietly, steadily, and effectively. The consistency of it reveals that it was also done with vision.

Merci M. LeVeque! The good deeds, the commitment, the support, and the skill are appreciated by a good many of us.

#### **Additional Information on the MAA Program**

**Wednesday 8:30 am panel** *How to break into print* Panel participants will be: Donald J. Albers, Linda Brinn, Joan P. Hutchinson, and Doris Schattschneider

**Saturday 8:00 am** Panel on Calculus Initiatives Participants will be: James J. Callahan, Thomas P. Dick, Douglas F. Kurtz, and Sherman K. Stein

**Saturday 1:15 pm** Session on teaching mathematical modeling Participants will be: Michael Olinik, Ernest Manfred, Joseph Malkevitch, F.R. Giordano, M.V. Weir, Richard Bronson, Jeanne Agnew, and John Jobe

# 72nd Annual MAA Meeting

January 11–14, Phoenix Arizona

Phoenix n. legendary bird that lives five hundred years and is reborn from its own ashes. At right, a phoenix attacks an antelope dragon.



Highlights of the Joint Meetings include the MAA's Hedrick Lectures, which ordinarily fall in the summer, and the AMS's Gibbs and Colloquium Lectures. There will be a special address by NSF Deputy Director Bassam Z. Shakhashiri and other special sessions related to educational issues, including calculus initiatives. This program includes MAA Minicourses, an AMS Short Course, and an MAA/AMS workshop. There will be ten invited addresses sponsored by the MAA or jointly by the MAA and AMS. The topics are wide ranging: from R.P. Boas on indeterminate forms to Stephen Smale on the Poincaré conjecture in higher dimensions to Alfred W. Hales on Lewis Carroll, alternating sign matrices, and plane partitions. The menu is long and the fare is varied, with dishes to appeal to every taste, so look it over with care and join your colleagues at this feast in Phoenix.

Be sure to see the deadlines on page 12 and take note of the concert by MAA and AMS Presidents Leonard Gillman and William Browder listed on page 12.

Highlights of the American Mathematical Society's program include the Sixty-second Josiah Willard Gibbs Lecture, which this year will be given by Elliott H. Lieb of Princeton University, and the Colloquium Lectures by Nicholas Katz, also of Princeton University. A special program is being planned for Thursday evening by JPB's Office of Governmental and Public Affairs featuring a gala reception and a number of talks on *The role of mathematics in the future of American business and industry*. Also, there will be thirteen Special Sessions of selected twenty-minute papers on a variety of topics.

We have rearranged this meeting issue to put the MAA's scientific program as close to the front as possible, only preceded by this sketch of the full program.

## Tuesday, January 10

- 9:00 a.m. – 4:00 p.m. **Board of Governors' Meeting**  
6:00 p.m. – 8:00 p.m. **Minicourse #1 (Part A):** *Computer graphics in elementary statistics*, Florence S. Gordon, N. Y. Institute of Technology, and Sheldon P. Gordon, Suffolk Community College  
7:00 p.m. – 10:00 p.m. **Section Officers' Meeting**

## Wednesday, January 11

- 8:00 a.m. – 9:50 a.m. **Contributed Paper Session:** *Precalculus mathematics*, S. C. Bhatnagar, University of Nevada, Las Vegas  
8:00 a.m. – 9:50 a.m. **Contributed Paper Session:** *Graphing calculators*, Gregory D. Foley, Ohio State University  
8:00 a.m. – 9:50 a.m. **Contributed Paper Session:** *Humanistic mathematics*, Elena Anne Marchisotto, California State University, Northridge, and Alvin M. White, Harvey Mudd College  
8:00 a.m. – 9:50 a.m. **Minicourse #2 (Part A):** *Using computer graphics to enhance the teaching and learning of calculus and precalculus mathematics*, Franklin D. Demana and Bert K. Waits, Ohio State University  
8:00 a.m. – 9:50 a.m. **Minicourse #3 (Part A):** *Using history in teaching calculus*, V. Frederick Rickey, Bowling Green State University  
8:00 a.m. – 9:50 a.m. **Minicourse #4 (Part A):** *Applications of discrete mathematics*, Fred S. Roberts, Rutgers University  
8:00 a.m. – 9:50 a.m. **Minicourse #5 (Part A):** *Writing in mathematics courses*, George D. Gopen and David A. Smith, Duke University  
8:00 a.m. – 9:50 a.m. **Minicourse #6 (Part A):** *Surreal numbers*, Leon Harkleroad, Bellarmine College and Cornell University  
8:00 a.m. – 9:50 a.m. **Panel Discussion: Sponsored by Committee on Computers in Mathematics Education, EDUCOM's 1988 distinguished mathematics software**, Warren Page, New York City Technical College (organizer)  
8:30 a.m. – 9:50 a.m. **Panel Discussion: Sponsored by Committee on the Participation of Women, How to break into print in mathematics**, Marjorie L. Stein, U.S. Postal Service (moderator)  
8:30 a.m. – 9:50 a.m. **Panel Discussion: Sponsored by Task Force on Teaching Computer Science within Mathematics Departments, Teaching computer science in mathematics departments**, Zaven A. Karian, Denison University (moderator)  
10:05 a.m. – 10:55 a.m. **Hedrick Lecture I:** *Zeta functions in number theory*, Don Bernard Zagier, Max Planck Institute and University of Maryland  
11:10 a.m. – noon **AMS-MAA Invited Address:** *Story of the higher dimensional Poincaré conjecture (What actually happened on the beaches of Rio de Janeiro)*, Stephen Smale, University of California, Berkeley  
2:15 p.m. – 3:05 p.m. **Invited Address:** *Multidimensional diffusion processes*, Ruth J. Williams, University of California, San Diego  
3:20 p.m. – 4:10 p.m. **Invited Address:** *Inverse problems in mechanics and biology*, H. Thomas Banks, Brown University  
4:30 p.m. – 6:00 p.m. **Reception:** Committee on Two-Year Colleges  
6:00 p.m. – 8:00 p.m. **Minicourse #1 (Part B):** *Computer graphics in elementary statistics*, Florence S. Gordon, N. Y. Institute of Technology, and Sheldon P. Gordon, Suffolk Community College

## Thursday, January 12

- 9:00 a.m. – 9:50 a.m. **Invited Address:** *Lewis Carroll, alternating sign matrices and plane partitions*, Alfred W. Hales, University of California, Los Angeles
- 10:05 a.m. – 10:55 a.m. **Hedrick Lecture II:** *Zeta functions in number theory*, Don Bernard Zagier, Max Planck Institute and University of Maryland
- 11:10 a.m. – noon **AMS-MAA Invited Address:** *The mathematics of transonic flow*, Cathleen S. Morawetz, Courant Institute of Mathematical Sciences, New York University
- 2:15 p.m. – 4:10 p.m. **Contributed Paper Session:** *Precalculus mathematics*, S. C. Bhatnagar, University of Nevada, Las Vegas
- 2:15 p.m. – 4:10 p.m. **Contributed Paper Session:** *Graphing calculators*, Gregory D. Foley, Ohio State University
- 2:15 p.m. – 4:10 p.m. **Contributed Paper Session:** *Humanistic mathematics*, Elena Anne Marchisotto, California State University, Northridge, and Alvin M. White, Harvey Mudd College
- 2:15 p.m. – 4:10 p.m. **Minicourse #2 (Part B):** *Using computer graphics to enhance the teaching and learning of calculus and precalculus mathematics*, Franklin D. Demana and Bert K. Waits, Ohio State University
- 2:15 p.m. – 4:10 p.m. **Minicourse #3 (Part B):** *Using history in teaching calculus*, V. Frederick Rickey, Bowling Green State University
- 2:15 p.m. – 4:10 p.m. **Minicourse #4 (Part B):** *Applications of discrete mathematics*, Fred S. Roberts, Rutgers University
- 2:15 p.m. – 4:10 p.m. **Minicourse #5 (Part B):** *Writing in mathematics courses*, George D. Gopen and David A. Smith, Duke University
- 2:15 p.m. – 4:10 p.m. **Minicourse #6 (Part B):** *Surreal numbers*, Leon Harkleroad, Bellarmine College and Cornell University
- 2:15 p.m. – 4:10 p.m. **MAA/NCTM Panel Discussion on Mathematics Education:** *Mathematics teacher education – responses to the Holmes/Carnegie recommendations*, F. Joe Crosswhite, Northern Arizona University (moderator)
- 2:15 p.m. – 4:10 p.m. **Panel Discussion sponsored by Committee on Computers in Mathematics Education:** *Computers in geometry*, James R. King, University of Washington, Seattle (organizer)
- 2:15 p.m. – 4:05 p.m. **Informal Workshop sponsored by the Task Force on Minorities:** *Exploring funding possibilities for mathematics education projects for minorities*, Louise A. Raphael, Howard University (organizer)
- 2:15 p.m. – 3:20 p.m. **Panel Discussion sponsored by Committee on the Participation of Women:** *Meet the editors*, opportunities to talk in small groups with editors of journals and Wednesday's panelists on *How to break into print in mathematics*
- 6:30 p.m. – 8:30 p.m. **Minicourse #5 (Part C):** *Writing in mathematics courses*, George D. Gopen and David A. Smith, Duke University
- 6:30 p.m. – 8:30 p.m. **Minicourse #7 (Part A):** *Computer based discrete mathematics*, Nancy Hood Baxter, Dickinson College, and Ed Dubinsky, Purdue University
- 6:30 p.m. – 8:30 p.m. **Minicourse #8 (Part A):** *Teaching mathematical modeling*, Frank R. Giordano, U.S. Military Academy, and Maurice D. Weir, Naval Postgraduate School
- 6:30 p.m. – 8:30 p.m. **Minicourse #9 (Part A):** *Learning math through discrete dynamical systems*, James T. Sandefur, Georgetown University
- 6:30 p.m. – 8:30 p.m. **Minicourse #10 (Part A):** *Applied mathematics via classroom experiments*, Herbert R. Bailey, Rose-Hulman Institute of Technology
- 6:30 p.m. – 8:30 p.m. **Minicourse #11 (Part A):** *Modeling with the Poisson process*, Linn I. Sennott, Illinois State University, Normal

## Friday, January 13

- 8:00 a.m. – 9:50 a.m. **Contributed Paper Session:** *Writing across the curriculum*, Gerald M. Bryce, Hampden-Sydney College
- 8:00 a.m. – 9:50 a.m. **Contributed Paper Session:** *History of mathematics*, Charles V. Jones, Ball State University
- 8:00 a.m. – 9:50 a.m. **Contributed Paper Session:** *What is happening with calculus revision?* John W. Kenelly, National Science Foundation, and Thomas W. Tucker, Colgate University
- 8:00 a.m. – 9:50 a.m. **Minicourse #8 (Part B):** *Teaching mathematical modeling*, Frank R. Giordano, U.S. Military Academy, and Maurice D. Weir, Naval Postgraduate School
- 8:00 a.m. – 9:50 a.m. **Minicourse #9 (Part B):** *Learning math through discrete dynamical systems*, James T. Sandefur, Georgetown University
- 8:00 a.m. – 9:50 a.m. **Minicourse #10 (Part B):** *Applied mathematics via classroom experiments*, Herbert R. Bailey, Rose-Hulman Institute of Technology
- 8:00 a.m. – 9:50 a.m. **Minicourse #11 (Part B):** *Modeling with the Poisson process*, Linn I. Sennott, Illinois State University, Normal
- 8:00 a.m. – 9:50 a.m. **Minicourse #12 (Part A):** *MuMATH workshop*, Wade Ellis, Jr., West Valley College
- 8:00 a.m. – 9:50 a.m. **Panel Discussion sponsored by Task Force on Minorities:** *MAA sections and minorities – How can they work together?* Louise A. Raphael, Howard University (organizer)
- 8:15 a.m. – 9:50 a.m. **Panel Discussion:** *Aftermath of ICME-6*, Eileen L. Poiani, Saint Peter's College (organizer and moderator)
- 9:00 a.m. – 9:50 a.m. **Orientation for Arizona High School Students**, Matthew J. Hassett (organizer)

- 10:05 a.m. – 10:55 a.m. **Hedrick Lecture III: Zeta functions in number theory**, Don Bernard Zagier, Max Planck Institute and University of Maryland
- 11:10 a.m. – noon **AMS-MAA Invited Address: Arithmetic progressions: from Hilbert to Shelah**, Ronald L. Graham, AT&T Bell Laboratories
- 1:10 p.m. – 2:00 p.m. **Invited Address: Inertial manifolds**, George R. Sell, University of Minnesota, Minneapolis
- 1:30 p.m. – 3:00 p.m. **Lecture and Awards for Arizona High School Students**, Matthew J. Hassett (organizer)
- 2:15 p.m. – 3:05 p.m. **Invited Address: Computable data, noncomputable solutions**, Marian B. Pour-El, University of Minnesota, Minneapolis
- 3:15 p.m. – 4:05 p.m. **Special Invited Address: Developing a national will to enhance the quality of science and mathematics education in America**, Bassam Z. Shkhashiri, Directorate for Science and Engineering Education, National Science Foundation
- 4:15 p.m. – 5:30 p.m. **Prize Session and Business Meeting: Chauvenet Prize, Award for Distinguished Service, Certificates of Meritorious Service**
- 6:30 p.m. – 8:30 p.m. **Minicourse #8 (Part C): Teaching mathematical modeling**, Frank R. Giordano, U.S. Military Academy, and Maurice D. Weir, Naval Postgraduate School
- 6:30 p.m. – 8:30 p.m. **Minicourse #13 (Part A): Applications of the HP28S supercalculator for more experienced users**, Thomas W. Tucker, Colgate University
- 6:30 p.m. – 8:30 p.m. **Minicourse #14 (Part A): Creating order out of chaos in freshman mathematics: instituting a mathematics placement program**, Billy E. Rhoades, Indiana University at Bloomington, Committee on Placement Examinations
- 6:30 p.m. – 8:30 p.m. **Minicourse #15 (Part A): Ada for mathematicians**, Joseph Straight, SUNY College at Fredonia
- 7:30 p.m. – 9:00 p.m. **Film Program on Ramanujan**: This will feature the Nova film, *The man who loved numbers*, followed by a report by George E. Andrews, Pennsylvania State University

### Saturday, January 14

- 8:00 a.m. – 9:50 a.m. **Minicourse #7 (Part B): Computer based discrete mathematics**, Nancy Hood Baxter, Dickinson College, and Ed Dubinsky, Purdue University
- 8:00 a.m. – 9:50 a.m. **Panel Discussion on Calculus Initiatives – an update. Sponsored by CUPM/NRC-MS2000 Task Force:** Ronald G. Douglas, SUNY at Stony Brook, and Thomas W. Tucker, Colgate University (co-organizers)
- 8:30 a.m. – 9:50 a.m. **Workshop about Teaching Assistants and Part-Time Instructors (TA/PTI) (plenary session):** Bettye Anne Case, Florida State University (organizer)
- 10:05 a.m. – 10:55 a.m. **Invited Address: Can you hear the shape of a drum?** Peter B. Gilkey, University of Oregon, Eugene
- 11:10 a.m. – noon **AMS-MAA Invited Address: Indeterminate forms revisited**, Ralph P. Boas, Northwestern University
- 12:05 p.m. – 1:00 p.m. **TA/PTI Luncheon Meeting**
- 1:00 p.m. – 4:00 p.m. **Workshop about Teaching Assistants and Part-Time Instructors (small discussion sessions followed by plenary session):** Bettye Anne Case, Florida State University (organizer)
- 1:15 p.m. – 5:00 p.m. **Contributed Paper Session: What is happening with calculus revision?** John W. Kenelly, National Science Foundation, and Thomas W. Tucker, Colgate University
- 1:15 p.m. – 4:00 p.m. **Contributed Paper Session: Writing across the curriculum**, Gerald M. Bryce, Hampden-Sydney College
- 1:15 p.m. – 4:00 p.m. **Contributed Paper Session: History of mathematics**, Charles V. Jones, Ball State University
- 1:15 p.m. – 3:15 p.m. **Minicourse #12 (Part B): MuMATH workshop**, Wade Ellis, Jr., West Valley College
- 1:15 p.m. – 3:15 p.m. **Minicourse #13 (Part B): Applications of the HP28S supercalculator for more experienced users**, Thomas W. Tucker, Colgate University
- 1:15 p.m. – 3:15 p.m. **Minicourse #14 (Part B): Creating order out of chaos in freshman mathematics: instituting a mathematics placement program**, Billy E. Rhoades, Indiana University at Bloomington, Committee on Placement Examinations
- 1:15 p.m. – 3:15 p.m. **Minicourse #15 (Part B): Ada for mathematicians**, Joseph Straight, SUNY College at Fredonia
- 1:15 p.m. – 3:15 p.m. **Session on Teaching Mathematical Modeling:** B. A. Fusaro, Salisbury State University, and E. J. Manfred, United States Coast Guard Academy (co-organizers)
- 3:30 p.m. – 5:30 p.m. **Minicourse #7 (Part C): Computer based discrete mathematics**, Nancy Hood Baxter, Dickinson College, and Ed Dubinsky, Purdue University
- 4:30 p.m. – 5:45 p.m. **AMS-MAA Committee on Employment and Educational Policy Panel Discussion: Recruiting for graduate programs in mathematics**, Edward A. Connors (moderator)
- 5:30 p.m. – 7:00 p.m. **Concert:** William Browder and Leonard Gillman, Presidents of the AMS and MAA

**MAA Program Committee:** William A. Harris, John W. Kenelly, Keith L. Phillips, Richard S. Pierce, Jerry Reed, John M. Smith (ex-officio), Audrey A. Terras (chair), and Shirley R. Tembley

**AMS-MAA Joint Program Committee:** Sheldon Axler, Linda Keen (chair), Carl Pomerance, Nolan Wallah

**Local Arrangements Committee:** Andrew Bremner, Joaquin Bustoz, Matthew J. Hassett, William H. Jaco (ex-officio), Joan McCarter, John N. McDonald (Chairman), Kenneth A. Ross (ex-officio), Lance W. Small (ex-officio), William T. Trotter, Jr.

The January 1989 Joint Mathematics Meetings, including the 95th Annual Meeting of the AMS, the 72nd Annual Meeting of the Mathematical Association of America, and the 1989 annual meetings of the Association for Women in Mathematics and the National Association for Mathematicians will be held January 11–14 (Wednesday–Saturday), 1989, in Phoenix, Arizona. MAA will cosponsor a session on Thursday, January 12, with the National Council for Teachers of Mathematics (NCTM). Sessions will take place in the Hyatt Regency Phoenix and the Phoenix Civic Plaza.

### Hedrick Lectures

The 36th Earle Raymond Hedrick Lectures will be given by Don Bernard Zagier of Max Planck Institute and the University of Maryland, College Park. The title of this series is *Zeta functions in number theory*. These lectures will be given at 10:05 a.m. on Wednesday, Thursday and Friday, January 11–13.

### Special Address

A special address by Bassam Z. Shakhshiri, Directorate for Science and Engineering Education, National Science Foundation, is scheduled for 3:15 p.m. on Friday, January 13. The title of his talk is *Developing a national will to enhance the quality of science and mathematics education in America*.

### Invited Addresses

There will be six invited fifty-minute addresses. The names of the speakers, their affiliations, the dates and times of their talks, and some of the titles follow:

H. Thomas Banks, Brown University, *Inverse problems in mechanics and biology*, 3:20 p.m. Wednesday;

Peter B. Gilkey, University of Oregon, Eugene, *Can you hear the shape of a drum?*, 10:05 a.m. Saturday;

Alfred W. Hales, University of California, Los Angeles, *Lewis Carroll, alternating sign matrices and plane partitions*, 9:00 a.m. Thursday;

Marian B. Pour-El, University of Minnesota, Minneapolis, *Computable data, noncomputable solutions*, 2:15 p.m. Friday;

George R. Sell, University of Minnesota, Minneapolis, *Inertial manifolds*, 1:10 p.m. Friday;

Ruth J. Williams, University of California, San Diego, *Multidimensional diffusion processes*, 2:15 p.m. Wednesday.

There will also be four AMS-MAA Joint Invited Addresses, listed later in this announcement.

### Minicourses

Fifteen 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:

**Minicourse #1:** *Computer graphics in elementary statistics* is being organized by Florence S. Gordon, New York Institute of Technology, and Sheldon P. Gordon, Suffolk Community College. Part A is scheduled from 6:00 p.m. to 8:00 p.m. on Tuesday, January 10, and Part

B from 6:00 p.m. to 8:00 p.m. on Wednesday, January 11. Enrollment is limited to 30.

This Minicourse is intended to provide a hands-on introduction to the use of microcomputer graphics for an elementary, non-calculus-based, statistics course. All participants will have the opportunity to work with a graphics software package developed by the organizers which covers virtually all of the topics normally encountered in elementary statistics and probability including: data analysis and descriptive statistics; probability simulations of random processes; the normal and t-distributions; the Central Limit Theorem; simulations of a wide variety of other sampling distributions; estimation; hypothesis testing; linear regression and correlation analysis; etc.

The Minicourse is designed for individuals who have taught such an introductory statistics course. However, the presentation will be geared to individuals who have had very little or no previous academic computing experience.

**Minicourse #2:** *Using computer graphics to enhance the teaching and learning of calculus and precalculus mathematics* is being organized by Franklin D. Demana and Bert K. Waits, Ohio State University. Part A is scheduled from 8:00 a.m. to 9:50 a.m. on Wednesday, January 11, and Part B from 2:15 p.m. to 4:10 p.m. on Thursday, January 12. Enrollment is limited to 30.

Technology can dramatically change the way we teach mathematics and the way students learn mathematics. Participants will learn how to use "state of the art" computer graphing software with features such as zoom out and zoom in to enhance the understanding of important topics from calculus and precalculus mathematics. Computer graphing is a powerful tool that permits the user to make and test generalizations by looking at a large number of examples in a short period of time, to easily solve difficult problems, and to deal with problems and applications that are not contrived. Mathematical topics will include inequalities, theory of equations, two dimensional and three dimensional analytic geometry, polar and parametric equations, general conics, maximum and minimum problems, systems of equations (limits of integration for area between two curves), and numerical analysis. Software will be available to participants for the Macintosh, IBM, and Apple II (e, c, or GS) computers.

**Minicourse #3:** *Using history in teaching calculus* is being organized by V. Frederick Rickey, Bowling Green State University. Part A is scheduled from 8:00 a.m. to 9:50 a.m. on Wednesday, January 11, and Part B from 2:15 p.m. to 4:10 p.m. on Thursday, January 12. Enrollment is limited to 50.

Students of the calculus instinctively ask many penetrating questions: What is the calculus? What good is it? Why are the concepts presented the way they are? When the calculus reform movement eliminates the 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 a 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. Some samples: The geographical origins of the integral of the secant, an idea of Fermat for integrating  $x^n$ , a trick of Euler's for

max-min problems, and how an analysis of a wrong proof of Cauchy leads to the definition of uniform convergence. Bibliographies and historical notes will be provided.

**Minicourse #4:** *Applications of discrete mathematics* is being organized by Fred S. Roberts, Rutgers University. Part A is scheduled from 8:00 a.m. to 9:50 a.m. on Wednesday, January 11 and Part B from 2:15 p.m. to 4:10 p.m. on Thursday, January 12. Enrollment is limited to 80.

One of the reasons that discrete mathematics has become so important is the enormous variety of applications of the subject. This Minicourse will explore these applications. The emphasis will be on several simple and traditional discrete techniques: basic counting rules of combinatorics, the principle of inclusion and exclusion, the notion of graph coloring, and the concept of eulerian path. These techniques will be quickly reviewed (though prior knowledge of combinatorics or graph theory will not be necessary). Applications will include switching functions in computer science, DNA chains in genetics, power in simple games in economics and political science, scheduling and operations research, engineering problems involving telecommunications and mobile radio transmission, urban sciences, computer graph plotting of electrical networks, and keypunching errors in computing.

**Minicourse #5:** *Writing in mathematics courses* is being organized by George D. Gopen and David A. Smith, Duke University. Part A is scheduled from 8:00 a.m. to 9:50 a.m. on Wednesday, January 11; Part B from 2:15 p.m. to 4:10 p.m. on Thursday, January 12; and Part C from 6:30 p.m. to 8:30 p.m. on Thursday, January 12. Enrollment is limited to 50.

The organizers will present an effective strategy for incorporating writing assignments into mathematics courses, for helping students improve their writing, and for keeping the grading burden within reasonable bounds. This strategy is based on Reader Expectation Theory, a new way of viewing the composition and revision process. We will present the elements of the theory and explore (not just assume) the connections between writing and thinking that it implies. Where possible, examples will be based on tests written by students in calculus courses. The theory and its practical applications are not limited to calculus, of course, not even to mathematics; it is the basis for an efficient and effective Writing Across the Curriculum program that has already been implemented at the University of Chicago, Harvard Law School, and Duke University.

**Minicourse #6:** *Surreal numbers* is being organized by Leon Harkleroad, Bellarmine College and Cornell University. Part A is scheduled from 8:00 a.m. to 9:50 a.m. on Wednesday, January 11, and Part B from 2:15 p.m. to 4:10 p.m. on Thursday, January 12. Enrollment is limited to 80.

The surreal numbers combine such objects as the real numbers, infinitesimals, and the ordinal numbers all into a single system (a field, in fact). Surprisingly, this rich system can be built from scratch by a very simple construction demanding no specialized prerequisites. This Minicourse will include an examination of the surreal numbers, some of their properties, how they relate to other systems of numbers, and how they may be used in undergraduate classes.

**Minicourse #7:** *Computer based discrete mathematics* is being organized by Nancy Hood Baxter, Dickinson College and Ed Dubinsky, Purdue University. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Thursday, January 12; Part B from 8:00 a.m. to 9:50 a.m. on Saturday, January 14; and Part C from 3:30 p.m. to 5:30 p.m. on Saturday, January 14. Enrollment is limited to 30.

This Minicourse is about a new way of teaching discrete mathematics. The content agrees with what is generally recommended. The method is based on contemporary research in learning abstract mathematics and makes use of a very high level programming language ISETL. ISETL is interactive and its syntax is close to mathematical notation. Participants will learn to understand several mathematical programs that express complicated mathematical ideas and will write their own. The point for teaching is that students learn to use important mathematical constructs (such as set formers, quantifiers, function definitions) in the context of getting their programs to do the right thing. The syntax is sufficiently simple that most of their mental energy is devoted to understanding mathematical processes that become realities for them.

The course includes "hands-on" experience with ISETL and discrete mathematics, as well as discussion of what topics can be handled and how. Software and detailed lecture notes will be sent to participants after the course on request (for a nominal handling fee).

**Minicourse #8:** *Teaching mathematical modeling* is being organized by Frank R. Giordano, U.S. Military Academy and Maurice D. Weir, Naval Postgraduate School. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Thursday, January 12, and Part B from 8:00 a.m. to 9:50 a.m. on Friday, January 13. An optional third session, Part C, will use the microcomputer facility and is scheduled from 6:30 p.m. to 8:30 p.m. on Friday, January 13. Enrollment is limited to 40.

The MAA Committee on the Undergraduate Program in Mathematics recommended in 1981 that "Students should have an opportunity to undertake 'real world' mathematical modeling projects..." as part of the common core curriculum for all mathematical science majors. This is because many applications of problems in science, industry, and government are best approached using mathematical modeling techniques.

This Minicourse provides an introduction to the modeling process, to several topics underlying the construction of mathematical models, and addresses issues related to the design of an undergraduate course in modeling. The optional third session will consist of demonstrations and "hands-on" running of models on microcomputers.

**Minicourse #9:** *Learning math through discrete dynamical systems* is being organized by James T. Sandefur, Georgetown University. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Thursday, January 12, and Part B from 8:00 a.m. to 9:50 a.m. on Friday, January 13. Enrollment is limited to 60.

This course will consider difference equations as a dynamical process. Difference equations, which only require an algebra background to study, give students an appreciation of the beauty and applicability of mathematics. There is also a unifying effect in that they can

be combined with linear algebra and probability to study interesting models including the Markov processes and predator-prey relationships. Linearization of nonlinear difference equations, which arise in population models and Newton's method, uses differentiation, the product rule, the chain rule, and graphing techniques. This shows students one connection between discrete and continuous mathematics. Other applications include annuities, amortization of loans, selection and mutation in genetics, the gambler's ruin, harvesting strategies, and population models with age structure. Connections between difference equations and differential equations will be covered, as well as a discussion on the similarities and differences between continuous and discrete models.

**Minicourse #10:** *Applied mathematics via classroom experiments* is being organized by Herbert R. Bailey, Rose-Hulman Institute of Technology. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Thursday, January 12, and Part B from 8:00 a.m. to 9:50 a.m. on Friday, January 13. Enrollment is limited to 80.

This Minicourse is based on a junior level applied mathematics course which has been developed to encourage students to combine their knowledge of physics, calculus, and differential equations. Students are asked to derive and solve the equations that model simple classroom experiments. For example, the first experiment is to let a ball bounce until it stops. The problems is to relate "percent rebound" and "time to stop bouncing". The student must combine the concepts of time of fall and summation of geometric series. The full course includes five units: I-The Chain, II-Rotation, III-Fluid Flow, IV-Heat Flow, and V-Calculus of Variations. The Minicourse will begin with a brief description of each unit including demonstrations of most of the experiments. Participants will then be asked to work through some of the units either individually or in small groups. Each participant will be given a writeup and a solution manual for each of the units. The writeups include review sections covering the necessary mathematics and physics.

**Minicourse #11:** *Modeling with the Poisson process* is being organized by Linn I. Sennott, Illinois State University, Normal. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Thursday, January 12, and Part B from 8:00 a.m. to 9:50 a.m. on Friday, January 13. Enrollment is limited to 80.

The Poisson process is one of the most important and flexible stochastic processes for the modeling of diverse situations. It has applications in engineering, computer science, manufacturing, telephony, management science, and other fields. For example, the Poisson process and its relative, the Poisson distribution, may be used to model the number of bacteria growing in a Petri dish, the number of customers arriving at a bank, the number of calls coming into a switchboard, the number of jobs arriving to a mainframe computer, etc.

Participants should have an elementary knowledge of probability, including the common discrete and continuous distributions. The binomial, exponential, uniform, and Poisson distributions will be reviewed prior to the development of the Poisson process and its important properties. Numerous applications will be included, as well as a discussion of parameter estimation and goodness-of-fit tests. Real data, collected by students in the organizer's math

modeling class, will be discussed. The nonhomogeneous and compound Poisson processes will be developed. Bring scientific calculators.

**Minicourse #12:** *muMath workshop* is being organized by Wade Ellis, Jr., West Valley College. Part A is scheduled from 8:00 a.m. to 9:50 a.m. on Friday, January 13, and Part B from 1:15 p.m. to 3:15 p.m. on Saturday, January 14. Enrollment is limited to 30.

muMATH, a computer algebra system developed by David Stoutemyer and Albert Rich, is based on a LISP-like programming language. The system contains many specialized mathematically-oriented functions and operators. In the Minicourse, each participant will use muMATH on an IBM Personal Computer. No prior knowledge of computer programming will be assumed. The first session will begin with a demonstration of the muMATH formula entry conventions and computing environment. Participants will then work through hands-on guided exercises to become familiar with muMATH's built-in operations and the muSIMP computer language. The second session will be devoted to muMATH modules on calculus, linear algebra, and differential equations. A discussion period including a brief comparison of muMATH with other mathematical computer environments will conclude the workshop.

**Minicourse #13:** *Applications of the HP28S super-calculator for more experienced users* is being organized by Thomas W. Tucker, Colgate University. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Friday, January 13, and Part B from 1:15 p.m. to 3:15 p.m. on Saturday, January 14. Enrollment is limited to 40.

This Minicourse will illustrate uses of the HP28S in the various courses of the first two years of undergraduate mathematics: calculus, linear algebra, statistics, discrete mathematics. Participants will be given programs that create customized environments for particular applications. For example, the graphing environment allows automatic range finding, zooming, superimposing an unlimited number of graphs, storing and recalling graphs, computation of zeros, extrema, and inflection points, definite integrals, polar, and parametric curves; each of these is obtained by a single button push with no need for more technical HP28S syntax. Other bells and whistles include pivoting for use in matrix computations and linear programming, curve fitting for exploratory data analysis, and "rationalizing" decimal numbers into fractions via the Euclidean algorithm.

Most of these programs are very short. Participants will be given assignments to write their own programs and develop their own environments. All participants will be expected to have their own HP28S calculators, to have used their HP28S more than once or twice, and to be willing to think in reverse Polish.

**Minicourse #14:** *Creating order out of chaos in freshman mathematics: instituting a mathematics placement program* is being organized by Billy E. Rhoades, Indiana University at Bloomington and is sponsored by the Committee on Placement Examinations. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Friday, January 13, and Part B from 1:15 p.m. to 3:15 p.m. on Saturday, January 14. Enrollment is limited to 40.

Members of the MAA Committee on Placement Examinations will present, through lectures, worksheets,

and questions and answer sessions, an overview of the task of establishing a mathematics placement program. Topics covered will include: reasonable expectations of a placement program, the tests available through the MAA Placement Test Program (PTP), the selection or creation of a placement test or series of tests, statistical analyses of test items and tests, and the administration of a placement program.

**Minicourse #15:** *Ada for mathematicians* is being organized by Joseph Straight, SUNY College at Fredonia. Part A is scheduled from 6:30 p.m. to 8:30 p.m. on Friday, January 13, and Part B from 1:15 p.m. to 3:15 p.m. on Saturday, January 14. Enrollment is limited to 40.

Ada is a relatively new programming language that was designed for and under the auspices of the U.S. Department of Defense. It is intended to support the development and maintenance of large programs by teams of programmers, particularly embedded-systems applications. As such, Ada is expected to gain widespread use, not only for defense-related projects, but for other commercial software, also. Moreover, the design of Ada represents, in several important respects, a culmination in the evolution of high-level imperative programming languages. Its support for modularity, abstraction, generic units, concurrency, real-time control, and error-handling, as well as its high degree of portability, make Ada an excellent language for mathematical programming. Prospective participants are referred to the article, "Why Ada is Not Just Another Programming Language," by Jean Sammet, in the August, 1986 issue of *Communications of the ACM*.

This Minicourse presents a survey of some of Ada's more important features. Participants should be fluent in a high-level programming language, such as Pascal or FORTRAN.

Participants interested in attending any of the MAA Minicourses should complete the MAA Minicourse and Workshop Preregistration form and **send it directly to the MAA office at the address given on the form.** To assure the MAA's fullest ability to accommodate you, your application must arrive by the November 10 deadline. Larger rooms or extra sections can sometimes be arranged if the MAA has proper advance notice. Those wishing to check the availability of Minicourses can call Susan Wilderson at the MAA (1-800-331-1622). This is especially desirable after the deadline has passed. **DO NOT SEND THIS FORM TO PROVIDENCE.** Please note that these MAA Minicourses are NOT the AMS Short Course.

**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 MAA Minicourses are open only to persons who register for the Joint Mathematics 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 and Workshop 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**

**percent 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. PREREGISTRATION FORMS FOR THE JOINT MEETINGS SHOULD BE MAILED TO PROVIDENCE PRIOR TO THE DEADLINE OF NOVEMBER 10.**

The registration fee for MAA Minicourses #1, #2, #7, #12 is \$50 each. The registration fee for all other MAA Minicourses is \$30 each.

#### AMS-MAA TA/PTI Workshop

A *Workshop about teaching assistants and part-time instructors* is being organized by Bettye Anne Case, Florida State University, for Saturday, January 14. The *Workshop* will begin with a plenary session from 8:30 a.m. to 9:50 a.m. The next *Workshop* activity will be lunch at 12:05 p.m. (cost included in the registration fee). Small discussion sessions follow from 1:00 p.m. to 1:50 p.m. and 2:00 p.m. to 2:50 p.m. The groups will reconvene at 3:20 p.m. to hear the discussion group reports and discuss strategy for the future. The preregistration form provides an opportunity for participants to choose their discussion sessions. Registration fee is \$15. The procedures and deadlines are the same as for the Minicourses.

The now joint AMS-MAA Committee on TA/PTI (Teaching Assistants and Part-Time Instructors) is chaired by Bettye Anne Case and has been collecting information for the past three years. This committee wants to share survey information and models of programs which are responses to the challenge of mathematical instruction by other than regular faculty. The morning plenary session will be devoted to the general issues of selection, orientation and training, supervision and evaluation, as well as the general support of graduate teaching assistants and part-time instructors. Each participant will then take part in small group discussions with colleagues in similar situations of unique and specific problems, concerns and answers. The final session will present session reports and discuss strategies for the future.

Each participant is asked to list three or more discussion groups of interest on the Minicourse and Workshop Preregistration Form. The choices include: Administrative support for programs; Lecture/recitation and multi-section formats; Part-time instructors at two- and four-year colleges; Academic concerns of TAs; International TA concerns; TAs in master's-only departments; University-wide TA training programs; Departmental TA training; Summer TA programs.

The committee members are Thomas F. Banchoff, Brown University; Phil Huneke, Ohio State University; David Kraines, Duke University, and Bettye Anne Case, chair. They will be joined in presenting the workshop by colleagues and topic experts including Lida K. Barrett, Mississippi State University; Annette Blackwelder, Florida State University; Stephen A. Doblin, Southern Mississippi University; Jack E. Graver, Syracuse University; David McMichael, University of Wisconsin; Richard S. Millman, Wright State University; Shelba J. Morman, North Lake College, Texas; Roger Ponder, Florida State University (Spoken English); Thomas T. Read, Western Washington University.

## Contributed Papers

Contributed papers were accepted on six topics in collegiate mathematics. The topics, organizers, their affiliations, and days they will meet are:

- *Precalculus mathematics*, S. C. Bhatnagar, University of Nevada, Las Vegas, 8:00 a.m. Wednesday and/or 2:15 p.m. Thursday
- *Graphing calculators*, Gregory D. Foley, Ohio State University, 8:00 a.m. Wednesday and/or 2:15 p.m. Thursday
- *Humanistic mathematics*, Elena Anne Marchisotto, California State University, Northridge, and Alvin M. White, Harvey Mudd College, 8:00 a.m. Wednesday and/or 2:15 p.m. Thursday
- *Writing across the curriculum*, Gerald M. Bryce, Hampden-Sydney College, 8:00 a.m. Friday and/or 1:15 p.m. Saturday
- *History of mathematics*, Charles V. Jones, Ball State University, 8:00 a.m. Friday and/or 1:15 p.m. Saturday
- *What is happening with calculus revision?*, John W. Kenelly, National Science Foundation, and Thomas W. Tucker Colgate University, 1:15 p.m. Saturday and, if needed, 8:00 a.m. Friday

The deadline for submitting papers for these sessions was **September 30. Late papers will not be accepted.**

## Other MAA Sessions

### Software Session Panel Discussion

A panel discussion on *EDUCOM's 1988 distinguished mathematics software* sponsored by the Committee on Computers in Mathematics Education (CCIME) is scheduled at 8:00 a.m. on Wednesday, January 11. The organizer is Warren Page, New York City Technical College. The other participants and the software they will discuss are: Eugene A. Herman, Grinnell College, *MAX-the MAtRiX Algebra Calculator*; Herman E. Gollwitzer, Drexel University, *Phase portraits*; and David S. Griffeth, University of Wisconsin, Madison/Robert Fisch, University of North Carolina, Charlotte, *GASP-Graphical Aids for Stochastic Processes*.

### Panel Discussion and Program sponsored by Committee on Participation of Women

The Committee on Participation of Women is sponsoring two related programs. The first will be a panel discussion on *How to break into print in mathematics*. This session is scheduled at 8:30 a.m. on Wednesday, January 11, and will be moderated by Marjorie L. Stein, U.S. Postal Service.

The second program is titled *Meet the editors* and will provide opportunities to talk in small groups with several editors of journals and Wednesday's panelists. There will be two half-hour sessions on Thursday afternoon, one from 2:15 p.m. to 2:45 p.m. and one from 2:50 p.m. to 3:20 p.m.

### Teaching Computer Science in Mathematics Departments Panel Discussion

This panel discussion is sponsored by the Task Force of the MAA-ACM-IEEE Computer Society on Teaching Computer Science within Mathematics Departments and

is scheduled from 8:30 a.m. to 9:50 a.m. on Wednesday, January 11. The moderator will be the chair of the task force, Zaven A. Karian, Denison University. The other participants will be David W. Ballew, Western Illinois University, and Cris T. Roosenraad, Carleton College.

### Two-Year College Reception

The Committee on Two-Year Colleges is sponsoring an informal reception for two-year college faculty from 4:30 p.m. to 6:00 p.m. on Wednesday, January 11.

### MAA/NCTM Panel Discussion

The MAA and the National Council of Teachers of Mathematics are jointly sponsoring a panel discussion on *Mathematics teacher education—responses to the Holmes/Carnegie recommendations*. The panel is scheduled from 2:15 p.m. to 4:10 p.m. on Thursday, January 12, and will be moderated by F. Joe Crosswhite, Northern Arizona University. The other panelists are Shirley A. Hill, University of Missouri at Kansas City, Thomas J. Cooney, University of Georgia, Alan Osborne, Ohio State University, and Steve Willoughby, University of Arizona.

### Computers in Geometry Panel Discussion

A panel discussion on *Computers in geometry* is scheduled from 2:15 p.m. to 4:10 p.m. on Thursday, January 12. It is sponsored by the Committee on Computers in Mathematics Education (CCIME) and is being organized by James R. King, University of Washington, Seattle. The speakers and their titles include the organizer, *Teaching geometry with Logo*, and Doris W. Schattschneider, Moravian College, *Visual geometry project: Tools for teaching*.

### Task Force on Minorities Panel Discussion and Workshop

Beginning at 2:15 p.m. on Thursday, January 12, the Task Force on Minorities, chaired by Louise A. Raphael, Howard University, will sponsor a two-hour informal workshop on *Exploring funding possibilities for mathematics education projects for minorities*. Richard Witter, MAA Development Officer, will present an overview of foundations and funded projects, whose purpose is to increase the number of minorities in mathematics. Also, successful principal investigators and NSF program officers will discuss strategies for preparing proposals for projects such as: Undergraduate students; Undergraduate faculty workshops; Computers for curriculum development; Summer workshops for pre-college teachers; Pre-college young scholars' program; Research experience for undergraduates. In order to structure the workshop, participants are asked to send in advance a brief outline of the kind of project(s) for which they are seeking funds to Louise A. Raphael, Department of Mathematics, Howard University, Washington, DC 20059.

Also, the Task Force is sponsoring a panel discussion on *MAA sections and minorities—How can they work together?* This panel is scheduled from 8:00 a.m. to 9:50 a.m. on Friday, January 13. The panel will discuss that part of the Task Force's Report which focuses on how existing resources of the MAA sections can help to improve mathematics education for minorities, and ways to strengthen the MAA sections through increased minority membership and participation.

### Aftermath of ICME-6 Panel Discussion

A panel presentation on the *Aftermath of ICME-6* is scheduled from 8:15 a.m. to 9:50 a.m. on Friday, January 13. The organizer and moderator is Eileen L. Poiani, Saint Peter's College. The panelists will include Shirley M. Frye, Scottsdale School District and President of NCTM, James F. Hurley, University of Connecticut, R. O. Wells, Jr., Rice University, and Thomas J. Cooney, University of Georgia, Athens.

### Special Program for Arizona High School Students

A special program for selected high school students from Maricopa County is planned for Friday, January 13. An orientation is scheduled from 9:00 a.m. to 9:50 a.m. A lecture and awards ceremony is scheduled from 1:30 p.m. to 3:00 p.m. The organizer is Matthew J. Hassett, Arizona State University.

### Calculus Initiatives Panel Discussion

Several activities are concerned with calculus initiatives. There will be a panel discussion on *Calculus initiatives - an update* scheduled from 8:00 a.m. to 9:50 a.m. on Saturday, January 14. This panel is jointly sponsored by the MAA CUPM Subcommittee on the First Two Years of College Mathematics and the NRC-MS2000 Task Force on Calculus. The organizers are Ronald G. Douglas, SUNY at Stony Brook, and Thomas W. Tucker, Colgate University. This panel will provide an update on activities related to the calculus reform begun by the "Lean and Lively Calculus" of the 1986 Tulane Conference and the "Calculus for a New Century" of the 1987 Washington symposium. There will be reports on projects planned or underway both with National Science Foundation support and without. The present NSF initiative in calculus will be described and its possible future directions will be discussed. Finally, the question of whether there really is a need for calculus reform will be addressed.

There are several related sessions of interest. On Saturday afternoon there will be a session of contributed papers on *What is happening with calculus revision?* At 3:15 p.m. on Friday there will be a special invited address by Bassam Z. Shakhshiri titled *Developing a national will to enhance the quality of science and mathematics education in America*.

### Session on Teaching Mathematical Modeling

B. A. Fusaro, Salisbury State University and E. J. Manfred, United States Coast Guard Academy, are organizing a session of reports on *Teaching mathematical modeling*. This session will begin at 1:15 p.m. on Saturday, January 14.

### Ramanujan Film

The film program at 7:30 p.m. on Friday, January 13, will feature the Nova program *The man who loved numbers*. This will be accompanied by a report by George E. Andrews, Pennsylvania State University, who will bring people up-to-date on how things stand on some of the problems mentioned in the film.

### Audio-Visual Equipment

Rooms where MAA sessions will be held are equipped with one overhead projector and screen. (Invited 50-minute speakers are automatically provided with two overhead projectors.) **Blackboards are not available.**

Upon written request, the following projection equipment will be made available: one additional overhead projector/screen, 35 mm carousel slide projector, 16 mm film projector, or VHS video cassette recorder with one color monitor. Speakers requiring any of the equipment listed in this paragraph are required to submit their needs **in writing prior to November 4.**

No other equipment can be made available for these sessions without approval of the MAA Secretary. Requests for equipment not listed above should also be addressed to the Audio-Visual Coordinator in Providence (again, prior to November 4), who will forward them to the Secretary for possible approval.

### Prize Session and Business Meeting

The MAA Prize Session and Business Meeting is scheduled from 4:15 p.m. to 5:15 p.m. on Friday, January 13. The Chauvenet Prize, the Award for Distinguished Service to Mathematics, and six 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 at 9:00 a.m. on Tuesday, January 10. This meeting is open to all members of the Association.

### Section Officers

There will be a Section Officers' meeting at 7:00 p.m. on Tuesday, January 10.

### AMS-MAA Invited Addresses

By invitation of the AMS-MAA Joint Program Committee (Sheldon Axler, Linda Keen (chairman), Carl Pomerance, and Nolan Wallach), four speakers will address the AMS and MAA on the history and development of mathematics. The names of the speakers, their affiliations, the titles, dates, and times of their talks follow:

Ralph P. Boas, Northwestern University, *Indeterminate forms revisited*, 11:10 Saturday;

Ronald L. Graham, AT&T Bell Laboratories, *Arithmetic progressions: from Hilbert to Shelah*, 11:10 a.m. Friday;

Cathleen S. Morawetz, Courant Institute of Mathematical Sciences, New York University, *The mathematics of transonic flow*, 11:10 a.m. Thursday;

Stephen Smale, University of California, Berkeley, *Story of the higher dimensional Poincaré conjecture (What really happened on the beaches of Rio de Janeiro)*, 11:10 a.m. Wednesday.

### 95th Annual Meeting of the AMS January 11 - 14, 1989

The 1989 Gibbs lecture will be presented at 8:30 p.m. on Wednesday, January 11, by Elliott H. Lieb of Princeton University. There will be a series of four Colloquium Lectures presented by Nicholas Katz of Princeton University.

The lectures will be given at 1:00 p.m. daily, Wednesday through Saturday, January 11–14.

There will be seven fifty-minute invited addresses as follows: Lenore Blum, Mills College, *Computing over the reals or any arbitrary rings*, 3:20 p.m. Thursday; John H. Conway, Princeton University, *Old and new facts about surreal numbers*, 9:00 a.m. Friday; Percy Alec Deift, Courant Institute of Mathematical Sciences, New York University, title to be announced, 9:00 a.m. Wednesday; David Fried, Boston University, *Periodic orbits and determinants*, 4:25 p.m. Saturday; Peter Landweber, Rutgers University, title to be announced, 2:15 p.m. Thursday; Diana Frost Shelstad, University of Utah, Salt Lake City, title to be announced, 2:15 p.m. Saturday; Luc Tartar, Carnegie Mellon University, title to be announced, 3:20 p.m. Saturday.

A special presentation sponsored by the AMS Committee on Science Policy will take place on Friday, January 13, at 9:00 p.m. Speakers include James M. Hyman, Los Alamos National Laboratory, *Using mathematical models to understand the AIDS epidemic*, and Beverly Berger, Office of Science & Technology Policy, *Mathematical models and public policy development: A view from the White House*.

The AMS will hold a banquet to honor individuals who have been members of the Society for twenty-five years or more.

#### AMS Short Course

The AMS Short Course on *Matrix theory and applications* will be held on Tuesday and Wednesday, January 10 and 11. Speakers include Charles R. Johnson, Richard A. Brualdi, Persi Diaconis, Arunava Mukherjea, Roger A. Horn, I. Gohberg, and Ingram Olkin.

#### Other Joint AMS–MAA Sessions

##### AMS-MAA Committee on Employment and Educational Policy

A panel discussion on *Recruiting for graduate programs in mathematics* will be sponsored by the AMS-MAA Committee on Employment and Educational Policy (CEEP)

#### IMPORTANT DEADLINES

<b>AMS Abstracts</b>	
For consideration for special sessions	Expired
Of contributed papers	October 12
<b>MAA Abstracts</b>	
Of contributed papers	September 30
<b>Employment Register</b>	
(Applicants & Employers)	November 10
<b>EARLY Preregistration and Housing</b>	October 31
Preregistration and Housing	November 10
<b>MAA Minicourse and Workshop</b>	
Preregistration	November 10
<b>Motions for AMS Business Meeting</b>	December 12
<b>Preregistration cancellations (50% refund)</b>	December 30
<b>Housing Changes with Housing</b>	
Bureau/Cancellations	December 14
<b>AMS Banquet (50% refund)</b>	until December 30
<b>Desert Hike (50% refund)</b>	until December 30

on Saturday, January 14 at 4:30 p.m. Moderated by Edward A. Connors (University of Massachusetts, Amherst), the panelists include John M. Jobe (Oklahoma State University), Rhonda J. Hughes (Bryn Mawr College), Paul D. Humke (St. Olaf College), and Ralph N. McKenzie (University of California, Berkeley).

#### Presidents' Concert

A special concert will be given by William Browder (flute) and Leonard Gillman (piano), Presidents of the AMS and MAA, at 5:30 p.m. on Saturday, January 14. The tentative program is: *Sonata in G Minor* by J. S. Bach, *Sonata* by Francis Poulenc, and *Introduction and Variations* by Franz Schubert.

#### Activities of Other Organizations

The **Association for Women in Mathematics** (AWM) will sponsor the tenth annual Emmy Noether Lecture at 9:00 a.m. on Thursday, January 12.

The AWM will also sponsor a panel discussion on *Gender differences in mathematical ability—Performance vs. perceptions*, on Wednesday, January 11 at 3:20 p.m.

The AWM Business Meeting will be held at 4:20 p.m. on Wednesday, January 11.

An open reception is being planned by AWM at 9:30 p.m. on Wednesday, January 11.

The **Interagency Commission for Extramural Mathematics Programs** (ICEMAP) will present a session at 7:15 p.m. on Wednesday, January 11.

The **Joint Policy Board for Mathematics** (JPBM) Committee for Mathematics Department Heads has organized a National Meeting of Department Heads on *Outside funding for the undergraduate curriculum* at 7:00 p.m. on Friday, January 13. At 8:00 p.m. there will be three Birds-of-a-Feather sessions.

Plans are being made by The Office of Governmental and Public Affairs of JPBM for a gala reception on Thursday, January 12, followed by talks by leaders from the research, education, and corporate communities on *The role of mathematics in the future of American business and industry*.

The **National Association of Mathematicians** (NAM) will receive the William W. S. Claytor Lecture at 1:00 p.m. on Saturday, January 14.

NAM will also sponsor a panel discussion on Saturday, January 14, at 9:00 a.m.

The NAM Business Meeting will take place at 10:00 a.m. on Saturday, January 14.

NAM will also sponsor *Presentations by Recent Ph.D. Recipients* at 2:15 p.m. on Saturday, January 14. This session is being organized by Donald M. Hill, Florida Agricultural and Mechanical University.

The **National Science Foundation** (NSF) will sponsor a session at 5:45 p.m. on Wednesday, January 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.

The **Mathematicians and Education Reform Network** will sponsor a presentation on Saturday, January 14 at

2:15 p.m. Presenters include Philip D. Wagriech, University of Illinois at Chicago, and Harvey B. Keynes, University of Minnesota, Minneapolis. The recently organized Mathematicians and Education Reform Network is a three year project funded by the National Science Foundation to promote discussions within the mathematics community about issues in precollege mathematics education, and to attract a pool of mathematicians who are committed to doing sustained work in this area. The Network is organizing support services to advise mathematicians in planning and implementing precollege mathematics education projects. Wagriech and Keynes, Co-principal Investigators/Directors of the Network, will discuss the background and rationale of the Network, and will give details of current and future activities, including national workshops for interested mathematicians. For further information, contact Naomi Fisher, Associate Director of the Mathematicians and Education Reform Network, Office of Mathematics and Computer Education (M/C 249), Department of Mathematics, Statistics, and Computer Science, University of Illinois at Chicago, 208 Science and Engineering Offices, Box 4348, Chicago, IL 60680 or call 312-996-2439 or 312-413-3749.

The **Rocky Mountain Mathematics Consortium** (RMMC) Board of Directors will meet on Thursday, January 12, from 2:15 p.m. to 4:15 p.m.

## Other Events of Interest

### 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 meeting 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 and educational media exhibits will be open Wednesday through Saturday, January 11–14. The hours they will be open are 1:00 p.m. to 5:00 p.m. on Wednesday, 9:00 a.m. to 5:00 p.m. 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 acknowledgment of preregistration from the Mathematics Meetings Housing Bureau in order to enter the exhibit area.**

## Mathematical Sciences Employment Register

Those wishing to participate in the Employment Register at the Phoenix meetings should read carefully the important article about the Register which follows this meeting announcement.

### How to Preregister

The importance of early preregistration cannot be overemphasized. Some of the benefits of early preregistration are

assignment to hotels with the lowest rates, inclusion in the alphabetical list of preregistrants displayed in the registration area, reduced waiting time at the Joint Meetings Registration Desk, and registration at fees considerably lower than the fees that will be charged for registration at the meeting.

**Preregistration for these meetings must be completed by November 10, 1988.**

However, **those who preregister by the EARLY deadline of October 31 will be eligible for a drawing to select the winners of complimentary hotel rooms in Phoenix** (multiple occupancy of these rooms is permissible). Winners will be randomly selected from the names of all participants who preregister by **October 31**. The winners will be notified by mail prior to December 31. **So preregister early!** (A list of the winners in Atlanta appears in the section titled **How to Obtain Hotel Accommodations**.)

It is essential that the Preregistration/Housing Form (found at the back of this issue) be completed fully and clearly. In the case of several preregistrations from the same family, **each** family member who is preregistering should complete a separate copy of the Preregistration/Housing Form, but all preregistrations from one family may be covered by one payment. Please print or type the information requested, and be sure to complete all sections. Absence of information (missing credit card numbers, incomplete addresses, etc.) causes a delay in the processing of preregistration for that person.

Please provide your nickname if you wish this information to be printed on your badge. Also, it is planned to make available at the meeting a list of preregistrants by area of interest. If you wish to be included in this list, please provide the *Mathematical Reviews* classification number of your major area of interest on the Preregistration/Housing Form. The master copy of this list will be available for review by participants at the Message Center section of the registration desk.

Modes of payment which are acceptable, provided they are payable in U.S. dollars to the order of the American Mathematical Society, are U.S. Postal Money Orders, certified U.S. bank checks, U.S. bank money orders, personal checks drawn on a U.S. bank, or credit card (Visa or MasterCard only).

Receipt of the Preregistration/Housing Form and payment will be acknowledged by the Mathematics Meetings Housing Bureau. Participants are advised to bring a copy of this acknowledgement with them to Phoenix.

The Joint Meetings registration fees at the meeting will be 30% higher than the preregistration fees listed below.

### Joint Mathematics Meetings

Member of AMS, Canadian Mathematical Society, MAA, NCTM, Sociedad Matematica Mexicana	\$63
Emeritus Member of AMS, MAA	\$18
Nonmember	\$98
Student/Unemployed	\$18

**Employment Register**

Employer	\$75
Additional interviewer (each)	\$35
Applicant	\$15
Employer posting fee	\$10

**AMS Short Course**

Student/Unemployed	\$15
All Other Participants	\$40

**MAA Minicourses**

(if openings available)

Minicourses # 1, 2, 7, 12	\$50
Minicourses # 3, 4, 5, 6, 8, 9, 10, 11, 13, 14, 15	\$30

A \$5 charge will be imposed for all invoices prepared when preregistration forms are submitted without accompanying check(s) for the preregistration fee or are accompanied by an amount insufficient to cover the total payments due. We are sorry, but it is not possible for the Mathematics Meetings Housing Bureau to refund amounts less than \$2. Preregistration forms received well before the deadline of November 10 which are not accompanied by correct payment will be returned to the participant with a request for resubmission with full payment. This will, of course, delay the processing of any housing request.

An income tax deduction is allowed for education expenses, including registration fees, cost of travel, meals and lodging incurred to (i) maintain or improve skills in one's employment or trade or business or (ii) meet express requirements of an employer or a law imposed as a condition to retention of employment, job status, or rate of compensation. This is true even for education that leads to a degree. However, the Tax Reform Act of 1986 has introduced significant changes to this area. In general, the deduction for meals is limited to 80% of the cost. Unreimbursed employee educational expenses are subject to a 2% of adjusted gross income floor. There are exceptions to these rules; therefore, one should contact one's tax advisor to determine the applicability of these provisions.

There is no extra charge for members of the families of registered participants, except that all professional mathematicians who wish to attend sessions must register independently.

All **full-time** students currently working toward a degree or diploma qualify for the student registration fees, regardless of income.

The unemployed status refers to any person currently unemployed, actively seeking employment, and who is not a student. It is not intended to include any person who has voluntarily resigned or retired from his or her latest position.

Persons who qualify for emeritus membership in either the Society or the Association or SIAM may register at the emeritus member rate. The emeritus status refers to any person who has been a member of the AMS, MAA, or SIAM for twenty years or more, and is retired on account of age or on account of long term disability from his or her latest position.

Nonmembers who preregister or register at the meeting and pay the nonmember fee will receive mailings from

AMS and MAA, after the meeting is over, containing information about a special membership offer.

### How to Obtain Hotel Accommodations

The rates listed below are subject to a 9.1 percent sales/occupancy tax. The estimated mileage from the hotel to the Civic Plaza is given in parenthesis following the telephone number. Checkout time for all hotels is 12:00 noon. Checkin time for all hotels is 3:00 p.m.

In all cases "single" refers to one person in one bed; "double" refers to two persons in one bed; "twin" refers to two persons in two twin beds; and "twin double" refers to two persons in two double beds. A rollaway cot for an extra person can be added to a room; however, not all hotels are able to do so and for those that do, the number of cots available is limited and given on a first-come, first-served basis. Any special requests or needs should be indicated on the back of the preregistration form.

Participants should be aware that it is general hotel practice in most cities to hold a nonguaranteed reservation until 6:00 p.m. only. When one guarantees a reservation by paying a deposit or submitting a credit card number as guarantee in advance, however, the hotel usually will honor this reservation up until checkout time the following day. If the individual holding the reservation has not checked in by that time, the room is then released for sale, and the hotel retains the deposit or applies one night's room charge to the credit card number submitted.

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.

Please make all changes to or cancellations of hotel reservations with the Mathematics Meetings Housing Bureau in Providence **before December 14, 1988**. The telephone number in Providence is 401-272-9500 (extension 290). Please allow the Housing Bureau from December 15 to December 21 to get all final housing lists and changes sent to the hotels. After that date, changes should be made directly with the hotel. **Cancellations must be made directly with the hotel 48 hours prior to date of arrival in order to receive refunds of deposits. A deposit of \$50 by check OR a guarantee made by Visa, MasterCard, or American Express credit cards is required for each room reservation.** Canadian checks should be marked "In U.S. funds". **American Express cards may be used for housing guarantees only and not for preregistration.**

Participants desiring confirmed reservations for the following hotels must make the reservations through the Mathematics Meetings Housing Bureau **prior to the November 10, 1988 deadline. Reservations at these hotels cannot be made by calling the hotel directly until after December 21, 1988. Ample time is needed for the Housing Bureau to process all reservations received inhouse by the November 10 deadline. After December 21, 1988, the rates below may not apply. 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 following hotels have nonsmoking rooms available and are also equipped for the handicapped.

#### **Hyatt Regency Phoenix (Headquarters)**

122 North Second Street  
Phoenix, Arizona 85004  
Telephone: 602-252-1234 (at Civic Plaza)

Single	\$73
Double	\$73
Triple	\$83
Triple w/cot*	\$93
Quadruple	\$93
Quadruple w/cot	\$103
One Bedroom Suite	\$200
Two Bedroom Suite	\$300

\* Number of cots is limited.

Full service hotel. Restaurants, lounge, outdoor pool and jacuzzi. Self parking is \$4.50 for overnight parking in the garage. This does not include in/out privileges during the day. Self parking in and out during the day is subject to hourly rates at the garage (approximately \$1 first hour and \$.50 thereafter for each additional hour). Valet parking is \$6.50 per day with in/out privileges. (See **Parking** section.)

Children 18 years and younger are free in same room as parents. Credit cards accepted are MasterCard, Visa, American Express, Diners Club, Carte Blanche, and Discover. Personal and company checks are accepted with personal ID (address matching that of check) or a major credit card. All checks must have name and address embossed on them.

#### **Sheraton Phoenix**

Central & Adams  
Phoenix, Arizona 85001  
Telephone: 602-257-1525 (.5 miles)

Single	\$75
Double	\$75
Triple	\$85
Triple w/cot*	\$95
Quadruple	\$95
Quadruple w/cot	\$105
One Bedroom Suite	\$225
Two Bedroom Suite	\$300

\* Number of cots is limited.

Full service hotel. Restaurant, lounge, outdoor pool, whirlpool spa. Parking is \$6.00 per day with in/out privileges. (See **Parking** section.)

Children 18 years and younger are free in same room as parents. Credit cards accepted are MasterCard, Visa, American Express, Diners Club, Carte Blanche, and Discover. Personal checks are accepted with personal ID

or a major credit card along with TeleCredit. Company checks are accepted with proof of employment.

#### **Days Inn San Carlos**

202 North Central Avenue  
Phoenix, Arizona 85004  
Telephone: 602-253-4121 (1 mile)

Single	\$45
Double	\$45
Triple	\$51
Triple w/cot*	\$60
Quadruple	\$57
Quadruple w/cot	\$66

\* Number of cots is limited.

Full service hotel. Restaurant, lounge, outdoor pool. Parking is \$3.50 per day with in/out privileges. Parking lot is located on the Northeast corner of Central and Van Buren (1 block from the front door). (See **Parking** section.)

Children 18 years and younger are free in same room as parents. Credit cards accepted are MasterCard, Visa, American Express, Diners Club, and Carte Blanche. Personal and company checks are accepted with personal ID, a major credit card, or bank guarantee card.

#### **Holiday Inn-Financial Center**

3600 N. 2nd Avenue  
Phoenix, Arizona 85013  
Telephone: 602-248-0222 (3 miles)

Single	\$59
Double	\$59
Triple	\$69
Quadruple	\$79

Full service hotel. Restaurant, lounge, outdoor pool, free parking. The hotel will run regular shuttles to and from the Civic Plaza. A time schedule will be posted in the lobby of the hotel and in the registration area during the meeting.

Children 18 years and younger are free in same room as parents. Credit cards accepted are MasterCard, Visa, American Express, Diners Club, Carte Blanche, Discover, and Holiday Inn Card. Personal and company checks are accepted with personal ID.

#### **Holiday Inn-Airport East**

4300 East Washington  
Phoenix, Arizona 85034  
Telephone: 602-273-7778 (3.5 miles)

Single	\$59
Double	\$59
Triple	\$69
Quadruple	\$69

Full service hotel. Restaurant, lounge, outdoor pool, free parking. The hotel will run regular shuttles to and from the Civic Plaza. A time schedule will be posted in the lobby of the hotel and in the registration area during the meeting.

Children 18 years and younger are free in same room as parents. Credit cards accepted are MasterCard, Visa, American Express, Diners Club, Carte Blanche, Discover, Holiday Inn Card, and En Route. Personal and company checks are accepted with Diners Club or American Express.

**Participants should be aware that when major conventions occur in any large city, additional safety problems**

are created, especially at night. Those who are attending the meetings alone, or who are concerned about walking to and from the meetings after dark, are encouraged to choose a hotel in close proximity to the Civic Plaza. Participants are also urged to read the "Words to the Wise" in the local information insert in the program they receive at the meetings.

#### Atlanta Room Lottery Winners

The following participants received a complimentary hotel room during the Atlanta meetings. They qualified for these rooms by submitting their Preregistration/Housing Form by the **early** preregistration deadline. Since these rooms can be occupied by as many as four persons, this represented a considerable savings.

All participants wishing to preregister for the Phoenix meetings are urged to consider the **early deadline of October 31** in order to qualify for the Phoenix Room Lottery. (See the section titled **How To Preregister**)

#### Days Inn

Henry Alder	Heinz Schaettler
Robert Dobbins	

#### Radisson

Philip Carlson	Harry Sedinger
William Golightly	Charles Shaw
Paul Irwin	Dale Varberg
Richard Jarvinen	

#### American

Roger Hering	James Strayer
Nigel Kalton	Richard Trudeau

### Registration at the Meetings

Meeting 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 meeting badge, if so requested. **Badges are required to enter the exhibit area, to obtain discounts at the AMS and MAA Book Sales, to cash a check with the meeting cashier, and to attend all sessions scheduled in the Ballroom in the Phoenix Civic Plaza.** 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 Housing Bureau as proof of registration.

The AMS-MAA Joint Meetings Committee has, in response to a request by the AMS Council, initiated some new procedures, effective with the January 1989 meeting in Phoenix.

I. Individuals who state that they have not yet registered, or who have failed to bring the badge to the event, will be asked to give name and address at the door, admitted, and asked to obtain the regular badge as soon as is feasible. Any who in fact have not registered by the end of the meeting will be sent a bill after the meeting.

II. A person who has not preregistered or registered will be sent to the registration desk to obtain a badge. This could be a regular registration badge, or a special one if the person prefers not to register. The latter badge will be of a distinctive color, and will be valid only for a single event in question. It will be preprinted with the

words Not Registered, and will have the person's name on it.

The fees for Joint Meetings registration at the meeting listed below are 30 percent more than the preregistration fees.

#### Joint Mathematics Meetings

Member of AMS, Canadian Mathematical Society, MAA, NCTM, Sociedad Matematica Mexicana	\$ 82
Emeritus Member of AMS, MAA	\$ 23
Nonmember	\$127
Student/Unemployed	\$ 23

#### Employment Register

Employer	\$100
Additional interviewers (each)	\$ 50
Applicant	\$ 20
Employer Posting fee	\$ 15

#### AMS Short Course

Student/Unemployed	\$ 20
All Other Participants	\$ 50

#### MAA Minicourses

(if openings available)

Minicourses # 1, 2, 7, 12	\$ 50
Minicourses # 3, 4, 5, 6, 8, 9, 10, 11, 13, 14, 15	\$ 30

Registration fees may be paid at the meetings in cash, by personal or travelers' check, or by VISA or MASTERCARD credit card. Canadian checks must be marked for payment in U.S. funds. Although American Express and other cards are being accepted by hotels for housing payments, unfortunately only VISA or MASTERCARD can be accepted for registration.

There is no extra charge for members of the families of registered participants, except that all professional mathematicians who wish to attend sessions must register independently.

All **full-time** students currently working toward a degree or diploma qualify for the student registration fees, regardless of income.

The unemployed status refers to any person currently unemployed, actively seeking employment, and who is not a student. It is not intended to include any person who has voluntarily resigned or retired from his or her latest position.

Persons who qualify for emeritus membership in either the Society or the Association may register at the emeritus member rate. The emeritus status refers to any person who has been a member of the AMS or MAA for twenty years or more, and is retired on account of age or on account of long term disability from his or her latest position.

Nonmembers who preregister or register at the meeting and pay the nonmember fee will receive mailings from AMS and MAA, after the meeting is over, containing information about a special membership offer.

## Registration Dates and Times

### AMS Short Course

Tuesday, January 10 8:00 a.m. to 2:30 p.m.

### Joint Mathematics Meetings

[and MAA Minicourses (until filled)]

Tuesday, January 10 3:00 p.m. to 7:00 p.m.

Wednesday, January 11  
through 7:30 a.m. to 4:00 p.m.

Friday, January 13

Saturday, January 14 7:30 a.m. to 3:00 p.m.

## Registration Desk Services

### Assistance, Comments, and Complaints

A log for registering participants' comments or complaints about the meeting is kept at the Transparencies section of the registration desk. All participants are encouraged to use this method of helping to improve future meetings. Comments on all phases of the meeting are welcome. If a written reply is desired, participants should furnish their name and address.

Participants with problems of an immediate nature requiring action at the meeting should see the Director of Meetings, who will try to assist them.

### Audio-Visual Assistance

A member of the AMS/MAA staff will be available to advise or consult with speakers on audio-visual usage.

Rooms where special sessions and contributed paper sessions will be held are equipped with an overhead projector and screen. **Blackboards will not be available.**

### Baggage and Coat Check

Baggage and coats may be left in the Joint Meetings registration area **only** during the hours that registration is open. The staff cannot, however, take responsibility for lost or stolen articles.

### Check Cashing

The Joint Meetings cashier will cash personal or travelers' checks up to \$50, upon presentation of the official meeting registration badge, provided there is enough cash on hand. Canadian checks must be marked for payment in U.S. funds. It is advisable that participants bring travelers' checks with them. When funds are low the cashier will not be able to cash checks, and travelers' checks can be easily cashed at local banks, restaurants, or hotels.

### Information and Petition Table

There will be an Information Table and Petition Table set up in the registration area.

### Local Information

This section of the desk will be staffed by members of the Local Arrangements Committee and other volunteers from the Phoenix mathematical community.

### Lost and Found

See the Joint Meetings cashier. At the Phoenix Civic Plaza, lost and found is located in the Security Office (go to Lobby I and follow the signs).

## Mail

All mail and telegrams for persons attending the meetings should be addressed as follows: Name of Participant, Joint Mathematics Meetings, c/o Phoenix Civic Plaza, 225 East Adams, Phoenix, AZ 85004. Mail and telegrams so addressed may be picked up at the mailbox in the registration area during the hours the registration desk is open. U.S. mail not picked up will be forwarded after the meeting to the mailing address given on the participant's registration record.

### Personal and Telephone Messages

Participants wishing to exchange messages during the meeting should use the mailbox mentioned above. Message pads and pencils are provided. It is regretted that such messages left in the box cannot be forwarded to participants after the meeting is over.

A telephone message center is located in the registration area to receive incoming calls for participants. **The center is open from January 10 through 14, during the hours that the Joint Mathematics 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 602-239-7902.

### Transparencies

Speakers wishing to prepare transparencies in advance of their talk will find the necessary materials and copying machines at this section of the registration desk. A member of the staff will assist and advise speakers on the best procedures and methods for preparation of their material. There is a modest charge for these materials.

### Visual Index

An alphabetical list of registered participants, including local addresses and arrival and departure dates, is maintained in the registration area.

## Miscellaneous Information

### Child Care

There are many day care facilities in the Phoenix area which are available on a short term basis. One which is fairly close to the downtown area is Mary Moppet's preschool (part of a state-licensed chain of day care facilities), 6807 S. Central, 602-268-8341. Rates are \$2.50 per hour for 3 years and older, \$2.65 for 2 to 3 years, \$2.80 for 1 to 2 years, two hour minimum (daily rates \$12.25 for 3 years and older, \$12.50 for 2 to 3 years, \$13 for 1 to 2 years).

Other day care facilities include Kinder-care, 4123 Nth 15th, 602-265-6800 and Palo Alto, 3546 E. Thomas.

For child care in your hotel room there is Grandmother's Childcare Network Company (certified and bonded, 602-264-5454). Rates/child \$5.50 per hour, 2 children \$6 per hour, 3 children \$7 per hour, 4 children \$8 per hour (4 hour minimum plus parking costs).

In addition, a Parent-Child Lounge will be located near the Joint Meetings registration area. It will be

furnished with casual furniture, a crib, a changing area, some assorted toys and a television set. 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.

### Local Information

Phoenix, the state capitol, is located in central Arizona in an area known locally as the Valley of the Sun. The Phoenix area has been expanding rapidly in population and economic activity throughout the 60s, 70s and 80s. Its major industries include electronics, banking and tourism. The area is popular with winter visitors from all over the U.S. and Canada. Adjacent to Phoenix are the cities of Scottsdale and Tempe. Tempe is the home of Arizona State University, one of the largest state universities in the U.S. with an enrollment of over 40,000.

Local points of interest include:

Heard Museum, 22 E. Monte Vista Road, just east of Central Avenue about 2.5 miles east of north of the Convention Center. This renowned museum deals mainly with the art and culture of native peoples of the southwest. (Accessible via Central Avenue buses.) Open Monday through Saturday 10:00 a.m. to 4:45 p.m., Sunday 1:00 p.m. to 4:45 p.m.

Phoenix Zoo, 5810 East Van Buren, about 4 miles east of the Convention Center. This zoo features a fine collection of animals from all over the world, as well as local species like the desert big horn sheep. There is a children's zoo with areas for direct contact with some of the animals. (Accessible via city buses.) Open daily 9:00 a.m. to 5:00 p.m.

Desert Botanical Garden, 1201 N. Galvin Parkway adjacent to Phoenix Zoo. Contains 130 acres of plants from the deserts of the world including 1800 different kinds of cacti. (Accessible via city buses.) Open daily 9:00 a.m. until sunset.

Pueblo Grande, 4619 East Washington, about 4 miles east of the Convention Center. The excavated ruins of the Hohokam culture which flourished in the Phoenix area from 300 B.C. to 1400 A.D. Adjacent to the ruins there is an associated museum. (Accessible via city buses.) Open Monday through Saturday 9:00 a.m. to 4:30 p.m., Sunday 1:00 p.m. to 4:30 p.m.

South Mountain Park. This 16,000 acre park contains unusual rock formations, many varieties of native desert plants, picnic areas and many miles of hiking trails. The main entrance to South Mountain Park is at the southern terminus of Central Avenue.

Phoenix Art Museum, 1625 North Central Avenue. Features various art works including a nice collection of Oriental Porcelain and art from Mexico. (Accessible via city buses.) Open Thursday through Saturday 10:00 a.m. to 5:00 p.m., Wednesday 10:00 a.m. to 9:00 p.m., Sunday 1:00 p.m. to 5:00 p.m.

There are four city of Phoenix tennis courts located across the street from the Phoenix Sheraton on top of the Regency garage. There are 8 city tennis courts in Encanto Park at 15th Avenue and Encanto Drive (open

until 10:00 p.m.) There are also two city golf courses located adjacent to Encanto Park. The Phoenix area also has numerous privately owned golf and tennis facilities. Inquire at hotels for more information.

There will be performances of the Opera *Lakmé* in Phoenix on January 12 and 14 at 7:30 p.m. in the Phoenix Symphony Hall in the Phoenix Civic Plaza. This is a revival of a great French romantic classic (1883) tailored for brilliant coloratura singing, set in mid-19th century India during British colonial rule. The cast includes Beverly Hoch as Lakmé, an Indian priest's daughter; Carroll Freeman as her lover, Gerald; Dan Sullivan as her father, the Brahman priest. The role of Lakmé was last sung by Lily Pons in the Metropolitan Opera production in the 1930's, where she sang the entrancing "Bell Song". Call the Phoenix Symphony Hall box office at 602-262-7272 for tickets. Single ticket prices range from \$9 to \$36.

Tours of various scenic areas of Arizona such as the Grand Canyon, Monument Valley, etc. are available.

Phoenix residents depend more heavily on private vehicles for transport than do the inhabitants of other U.S. cities. Nevertheless, there is a city bus system which provides adequate service along the central corridor of the city as well as to points of interest like the zoo and botanical gardens. Inquire at your hotel for details concerning bus service. Note: **There is no bus service on Sundays.**

### Parking

Parking is available in the various hotel parking garages. Parking is also available in the Civic Plaza Parking Garage for \$3 per day. (If you plan to leave your car overnight at the Civic Plaza garage you should notify the attendant.) See the information on the individual hotels in the section on **How to Obtain Hotel Accommodations** for more on parking.

### Smoking

Please note that smoking is not allowed in any of the session rooms in the Hyatt Regency Phoenix or the Phoenix Civic Plaza.

### Social Events

There will be a no-host cocktail party on Friday evening, January 13, from 8:00 p.m. to 10:00 p.m. Participants are encouraged to use this occasion to spend some time with old and new friends.

The Local Arrangements Committee has organized a hike to South Mountain Park in the Sonoran Desert on Friday, January 13. Tickets are \$10. Interested participants should complete the appropriate section of the Preregistration/Housing Form. In the event of cancellations, a 50% refund of the amount paid for the ticket will be made if notification is received in Providence prior to December 30. After that date, no refund can be made. If a sufficient number of participants have not signed up for the hike, it will be cancelled; please be sure to check at the Local Information section of the Registration Desk by Thursday, January 12. The Sonoran Desert is a distinct biological entity, filled with an unusual diversity of flora and fauna; in fact, it contains species found nowhere else. Throughout the year, the desert is dense with saguaro, mixed cacti and palo verde trees.

With the rise in elevation of the mountain foothills, a lush greenland—first grass, then chapparal—emerges, and then a pine/oak woodland. Finally, near the summit of the mountains, a forest of fir covers the terrain. Basically, it's a dry desert climate with minimal cloud cover. The season for extreme change is the late spring, after early wildflowers bloom and before summer rainstorms begin. Following two months or so of drought, a single one- to two-inch storm brings an amazing overnight change. A description from a recently published book describing the state's history, people and geography, says it best: "Toads come croaking up out of the ground; gourds send out several feet of vine; and skeleton-like trees sprout leaves."

### Travel

In January, Phoenix is on Rocky Mountain Standard Time. The city airport is Sky Harbor which is about four miles from downtown. The airport is served by most of the major airlines. Shuttle service to and from the airport is provided by:

Courier Cab, 602-244-1818, \$5 for one person, \$3 for two or more

Supershuttle, 602-244-9000, \$5 per person

Shuttle service to and from the hotels to the airport is as follows (courtesy telephones are located in the airport for all hotels and the Air Courier Super Shuttle):

Participants can take the Air Courier Super Shuttle to the Hyatt Regency Phoenix. This shuttle runs from 6:00 a.m. to 2:00 p.m., every half hour. The cost is \$5 for one person or \$3 per person if more than one. The Holiday Inn—Airport East, the Holiday Inn—Financial Center, and Phoenix Sheraton provide complimentary shuttle service from the airport to their hotel. The AA Cab Company will transport participants to the Days Inn San Carlos for \$5 one way regardless of the number of occupants in the cab.

Directions for those arriving via automobile. (NOTE: It is sometimes a source of confusion to visitors that north-south numbered thoroughfares in Phoenix are designated "Avenue" on the west of Central Avenue and "Street" on the east.)

**From the west:** follow I10. After I10 merges with I17 take Jefferson Street exit. Left onto Jefferson Street. Proceed to 2nd Street and take left onto 2nd Street. Hyatt is one-and-one-half blocks on left.

**From the north:** from I17 take the Jefferson Street exit and follow above directions.

**From the south:** from I10, take 7th Street exit. Turn right onto 7th to Van Buren Street. Take left onto Van Buren to 2nd Street. Left onto 2nd Street. Hotel is about one-and-one-half blocks on right.

For some years now, the AMS-MAA Joint Meetings Committee has engaged a travel agent for the January and August Joint Meetings in an effort to ensure that everyone attending these meetings is able to obtain the best possible airfare. This service is presently being performed by Meetings, Incentives, Conventions of America, Inc. (MICA); their advertisement can be found elsewhere in this meeting announcement. Although any travel agent can obtain Supersaver or other such published promotional fares, only MICA can obtain the special additional 5 percent discount over and above these fares, and the 35 percent off regular coach fare. The latter,

of course, is financially beneficial only when one does not qualify for one of the promotional fares. Participants should pay particular attention to the cancellation policies stated in the ad.

### Weather

During January the days in Phoenix are typically sunny with high temperatures in the 60s (average maximum temperature is 64.8 degrees F) and the evenings are clear and chilly with temperatures dropping into the 30s (average minimum temperature is 37.6 degrees F). Average total rainfall accumulation for January is .71 inches. On the average there are 6.82 rainy days during January. The last snowstorm to hit the city of Phoenix occurred before 1920!

## AA American Airlines

### SPECIAL AIRFARES

1-800-888-6422

MICA, Inc., the official travel management firm for the Joint Mathematics Meetings to be held in Phoenix, January 11-14, 1989, has arranged for special discounts aboard American Airlines.

Save 5% off published promotional fares, meeting all restrictions, or 40% off regular roundtrip coach fares, with a seven day advance purchase. Only through MICA can you receive these substantial discounts on American Airlines. It may be possible to receive an even lower airfare depending upon your individual flight itinerary.

The lowest promotional fares require a Saturday night stay, are subject to an airline change/cancellation penalty and must usually be purchased at least 30 days prior to departure.

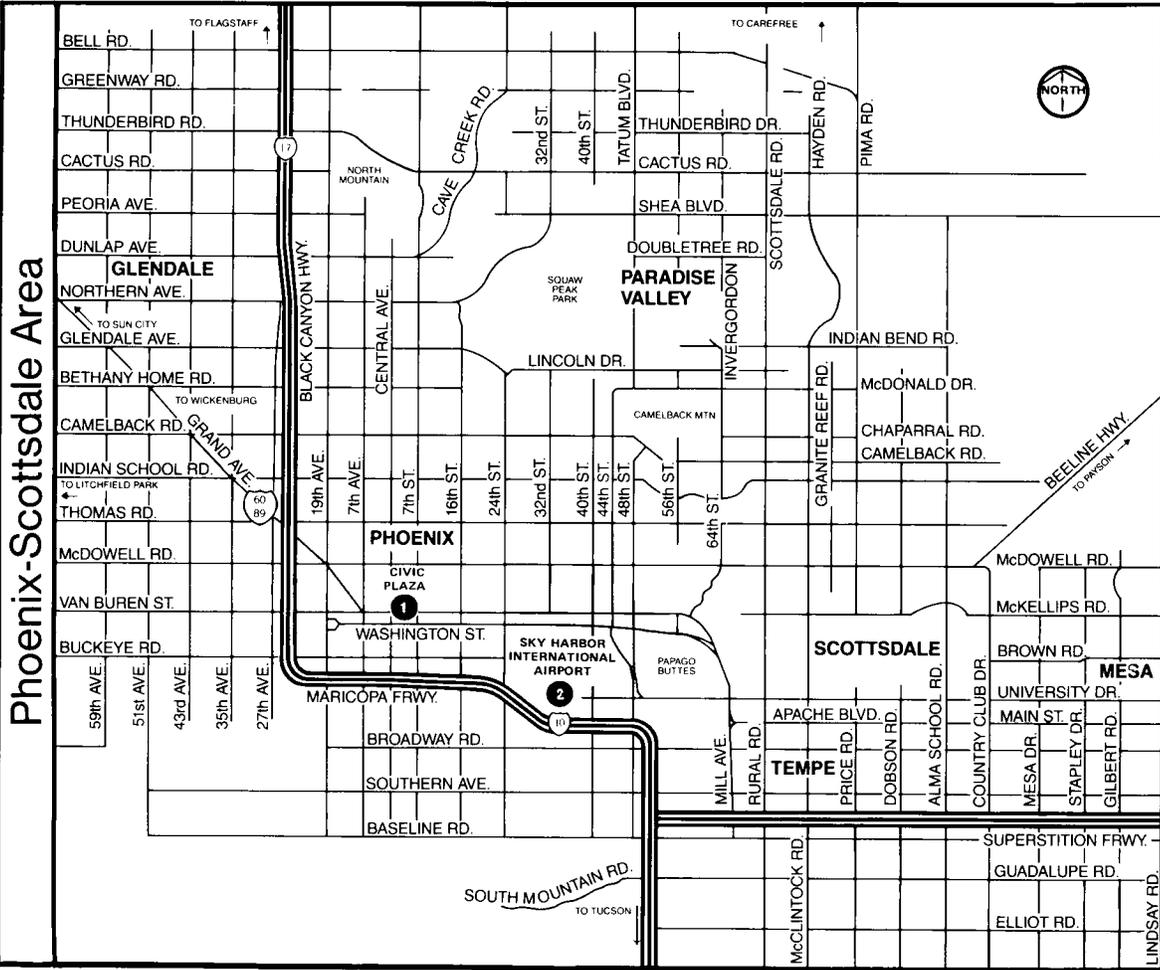
Make your reservations today! For reservations on all airlines, call MICA directly on their nationwide toll-free number, 1-800-888-6422. MICA reservationists will advise you of the most convenient flights and lowest airfares available. You may pay by credit card or ask to be invoiced. Your airfare is guaranteed when your ticket is written!

Free Flight Insurance! In addition to the discounted airfares aboard American Airlines, MICA will also provide complimentary flight insurance for each ticket purchased for the Joint Mathematics Meetings in Phoenix. Each attendee will receive \$100,000 flight accident insurance. A notice outlining the coverage will be included with your tickets.

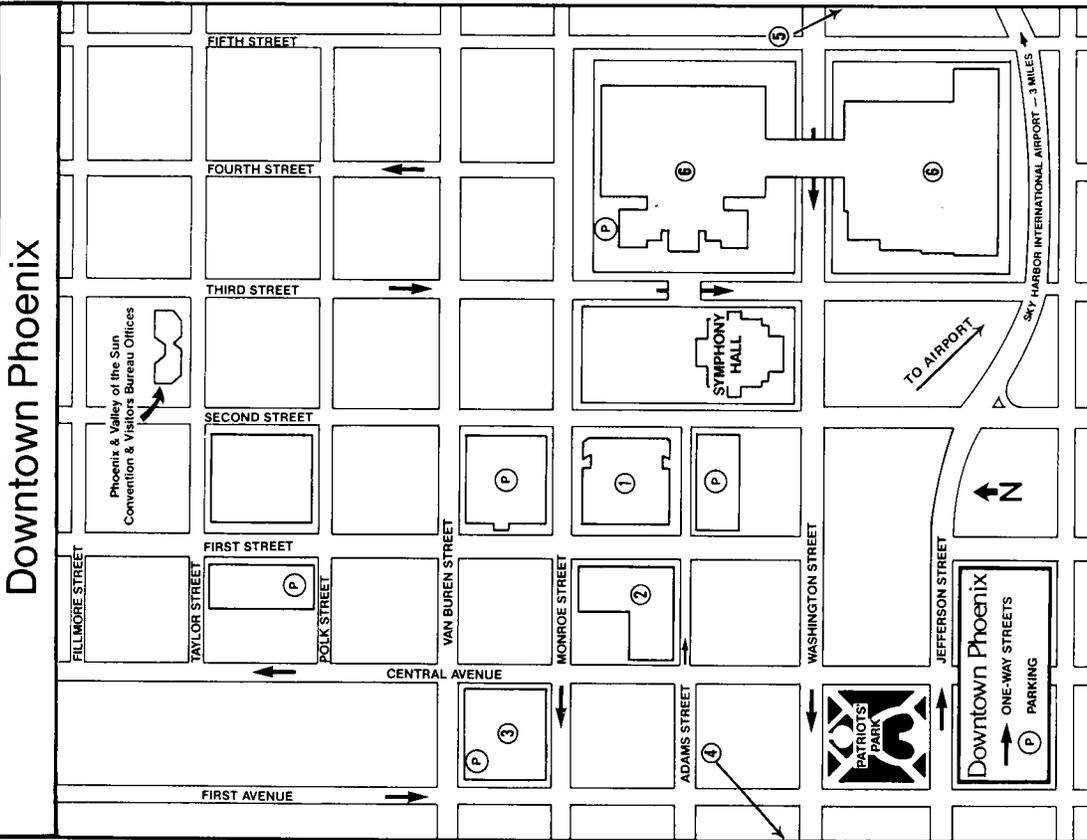
**Call today and Save!**

**Monday-Friday, 9:00 a.m.-6:00 p.m. EST**  
**Meetings, Incentives, Conventions of America,**  
**Inc. (MICA, Inc.) Suite 303,**  
**195 Farmington Avenue, Farmington, CT 06032**  
**(203) 678-1040**

PHOENIX MAPS



SCALE OF MILES 0 1 2 3 3/4  
 3/16th inch = 1 mile  
 ① CIVIC PLAZA  
 ② SKY HARBOR INTERNATIONAL AIRPORT



SCALE OF MILES 0 1/4 1/2 3.75 inch. = 1/2 mile  
 ① HYATT REGENCY PHOENIX HOTEL  
 ② PHOENIX SHERATON HOTEL  
 ③ DAYS INN SAN CARLOS HOTEL  
 ④ HOLIDAY INN FINANCIAL CENTER  
 ⑤ HOLIDAY INN AIRPORT EAST  
 ⑥ PHOENIX CIVIC PLAZA

# Mathematical Sciences Employment Register

## *January 1989 Meeting in Phoenix*

The Mathematical Sciences Employment Register (MSER), 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 displayed at the meeting for the participants so that members of each group may determine which members of the other group they would like to have an opportunity to interview. A computer program assigns the appointments, matching requests to the extent possible, using an algorithm which 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 report below outlines the operation of the register, indicating some of the procedures involved for the benefit of those not familiar with its operation.

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.

### 1989 Employment Register in Phoenix

The Employment Register will be held on Wednesday, Thursday, and Friday, January 11, 12, and 13, 1989. A short (optional) orientation session will be conducted by the AMS-MAA-SIAM Committee on Employment Opportunities at 9:00 a.m. on Wednesday, January 11. The purpose of the orientation session is to familiarize participants with the operation of the Register and with the various forms involved. Following orientation, participants should pick up their material for participating in the Employment Register. Computer-scheduled interviews will be held on Thursday and Friday, January 12 and 13. **No interviews will be held on Wednesday.**

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 (9:30–11:45 a.m.) in which interviews can be scheduled in the morning and fourteen time periods (1:15–5:00 p.m.) in the afternoon. It is possible that an applicant or employer may be scheduled for the maximum number of interviews in a session. 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). Such requests cannot be accommodated.

**Requests for interviews taking place during the two sessions on Thursday MUST BE SUBMITTED on**

**Wednesday between 9:30 a.m. and 4:00 p.m. Requests for interviews to take place during the Friday sessions must be submitted on Thursday before 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 both preregistered and 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. The interview request forms handed out at the Employment Register must be turned in before the 4:00 p.m. deadline in order to receive a computer printed schedule the next day.**

On Thursday and Friday mornings at 9 a.m. all schedules for applicants and employers for the day (both morning and afternoon sessions) will be available for distribution.

The Friday afternoon session is the annual "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 for Friday, indicating that they will attend the afternoon session that day.

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.**

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.

Anyone with questions about the Employment Register should contact Carole Kohanski at the American Mathematical Society at 401-272-9500, extension 286.

#### Background of Applicants

Statistics from previous Employment Registers have shown employers sought to fill approximately 180 positions, 10 of which were nonacademic jobs. For 98% of the positions, holders of doctoral degrees were preferred, for 65% of the positions only applicants with doctorates were acceptable, for 30% of the positions, holders of masters degrees were considered eligible. Few of the nonacademic employers indicated an interest in holders of bachelors degrees in mathematics.

The telephone number to be used after the Register begins will be announced in a later issue. Participants should note that this number will be 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 Phoenix meeting announcement.

### Preregistered Employers/Applicants

Preregistration for the Mathematical Sciences Employment Register **must be completed by November 10, 1988**. 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. Preregistration for the Employment Register, in addition to permitting inclusion in the printed winter lists of Applicants and Employers, has the advantage of reduced fees and the services of the Mathematics Meetings Housing Bureau, and has the further advantage of helping to reduce waiting times at the meeting in Phoenix.

Employer or Applicant forms received after the November 10 deadline **cannot** be included in the printed lists. For details on registration and preregistration for the Phoenix Joint Mathematics Meetings, please refer to the information on these subjects which may be found elsewhere in this issue.

Employers and applicants who have preregistered for the Employment Register may pick up their MSER material after 9:30 a.m. on Wednesday, January 11, (**This material includes the interview request forms which are handed out at the meeting only.**) These are not the forms that are submitted with preregistration.

Employers' job listings and applicants' résumés will be posted at the meeting, so that applicants and employers may review them.

Material for the Employment Register will not be mailed in advance.

### Preregistered Applicants

In addition to the Joint Meetings preregistration fee, there is an applicant fee of \$15 payable prior to the November 10 deadline. These fees must be accompanied by the Preregistration/Housing Form.

Applicants' résumés will be made available to employers at the Employment Register in printed form, so that they may be studied carefully at leisure. The December issue of *Employment Information in the Mathematical Sciences (EIMS)* will contain photographic reproductions of the résumés of applicants who have preregistered **by November 10**. Forms not received in time cannot be included in this issue. **See the section on preparation of résumés elsewhere in this announcement.**

Employers' job listings and applicants' résumés will be posted at the meeting, so that applicants and employers may review them.

### 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. There is no

additional charge for posting more than one position, provided they are in the same department.

Please refer to the Preregistration/Housing Form for the Joint Mathematics Meetings and the Employment Register fees. These fees must be accompanied by the Preregistration/Housing Form. The registration fee for employers covers the cost of a copy of the December Issue of *Employment Information in the Mathematical Sciences (EIMS)*. This publication (distributed at the meeting) contains printed copies of the résumés of applicants who preregistered prior to the deadline; it also contains a copy of the Winter List of Applicants. **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 cointerviewers 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.** (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.

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 a computer-printed list of preregistered employers for distribution to the applicants at the meeting.

### Nonpreregistered Applicants and Employers

Employers and applicants who wish to participate in the Register who have neither preregistered nor paid the Employment Register fee must first go to the Joint Mathematics Meetings registration desk, in order to complete their registration. **No provision will be made to handle cash transactions at the site of the Employment Register.** Registration for the Joint Meetings is required for participation in the Employment Register. It is also required that all participating employer interviewers register for the Joint Mathematics Meetings.

Please refer to the Preregistration/Housing Form for onsite registration fees.

Onsite registration for the Employment Register is \$100 for employers and an additional \$50 for each additional interviewer and \$20 for applicants. The registration

fee for employers covers the cost of a copy of the December Issue of *Employment Information in the Mathematical Sciences (EIMS)*. This publication contains printed copies of the résumés of applicants who preregistered prior to the deadline and a copy of the Winter List of Applicants.

After registration has been completed, applicants and employers should come to fill out the forms necessary to participate in the Employment Register. Employers' job listings and applicants' résumés will be posted at the meeting, so that applicants and employers may review them.

#### Nonparticipating Employers

Employers who do not plan to participate in the Employment Register, but wish to display job descriptions, may obtain special forms from Carole Kohanski, MSER, P. O. Box 6248, Providence, RI 02940. These job descriptions, subject to approval, must be received in the Providence office by **November 10** in order to qualify for the reduced fee of \$10. There is a \$15 fee for listings received after the November 10 deadline.

Employers who attend the Joint Mathematics Meetings, but do not want to interview, can post job descriptions, subject to approval, at the Employment Register. Postings will not be allowed in the Joint Meetings registration area. A fee of \$15 will be charged payable to the cashier at the Joint Mathematics Meetings registration desk. Participants should be sure to inform the cashier that they would like to post a job description but are not planning to interview and obtain the proper receipt in order to receive the form necessary for posting at the Employment Register desk.

#### Applicants Not Planning to Attend

Applicants for professional positions in the mathematical sciences, who do not plan to attend the meeting in Phoenix and participate in the Employment Register, may also submit résumés for publication in the December issue if they use the MSER Form for Applicants at the back of this issue and observe the deadline of November 10. **(It is, of course, not necessary to preregister for the meeting or pay the Employment Register registration fee if one is not attending the meeting. Résumés will not be posted at the Employment Register if the participant is not attending the meeting.)**

#### Winter Lists of Applicants and Employers

The Winter List of Applicants, which is a summary of the résumés of preregistered applicants, will be available for sale at the AMS Exhibits and Book Sale at the meeting. The price at the meeting is \$5 each. Any copies remaining after the meeting will be available from the Providence office of the Society for \$7 each.

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 Exhibits and Book Sale at the meeting or from the Providence office after the meeting. The prices are the same as stated in the previous paragraph.

Please note that these lists will not be updated with onsite employers or applicants after the Employment Register has concluded.

## December Issue of Employment Information in the Mathematical Sciences

For several years the periodical *Employment Information in the Mathematical Sciences (EIMS)* has published six issues per year listing open positions in academic, governmental and industrial organizations, primarily in North America, along with a few listings from countries in other parts of the world. *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 1988 issue provided they are received before the November 10 deadline and are in satisfactory condition. Other mathematical scientists who wish to be included may have their résumés printed if the same deadline is observed and if the copy supplied meets the same technical requirements described in the following section.

Copies of the December issue of *EIMS* will be distributed in Phoenix to the employers who participate in the Employment Register.

Job applicants planning to participate in the Employment Register in Phoenix are therefore strongly urged to preregister so that their résumés can appear in the December issue.

Please note that the December issue of *EIMS* contains the Winter List of Applicants, but does not contain the Winter List of Employers.

Additional copies of the December Issue of *EIMS* will be available for sale at the AMS Exhibits and Book Sale at the meeting. Prices at the meeting are \$8 each for the December issue. Any copies remaining after the meeting will be available from the Providence office of the Society for \$13.

#### Preparation of Applicants' Résumés for the December issue of *EIMS*

The December issue of *EIMS* will be printed using photographic reproductions of forms completed and submitted by applicants. For this reason, special care must be exercised by those who prepare the forms in order to assure that the results are of good quality, and will be clear and legible after they have been photographed, reduced in size, and printed.

Because an employer's first impressions of an applicant are likely to be based on the appearance of the printed form, applicants are strongly advised to study the suggestions given below before the forms are filled out, so that the original copy will be neither marred nor damaged.

The forms **must be** carefully typed using a new black ribbon. The best results are obtained by using a modern typewriter with a carbon-coated polyethylene film ribbon, but satisfactory results may be obtained with 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, which must be a uniform dark black. Gray, blue, or other colors will not reproduce and should, therefore, not be used. Do not use an eraser, as it will cause smudges which reproduce when photographed. Use a correcting typewriter, or correction tape or fluid, if necessary.

**Only an original copy of the form should be submitted, a photocopy or xerographic reproduction will not reproduce as**

well and may not be accepted for publication. It is therefore important to exercise care in order to assure that the results are satisfactory.

Submission of copy of good quality is entirely the responsibility of the applicant. The Society (which will print this material) must be the final judge of what copy is capable of being reproduced adequately, and therefore of what is acceptable for inclusion in the printed booklet. The Society will not correct or replace inadequate copy, and cannot prepare original copy. In the event the quality of a résumé, submitted by an applicant participating in the Employment Register, does not meet the necessary conditions for inclusion in the December issue, the résumé will be returned if time allows; otherwise the résumé will be posted at the Employment Register in Phoenix, along with those of the other participants. **Forms received past the deadline of November 10 will be returned.**

### List of Retired Mathematicians Available for Employment

The annual *List of Retired Mathematicians* will be included in the December and January issues of the publication *Employment Information in the Mathematical Sciences*. Retired mathematicians who are interested in being included in the list may send the following information to the Mathematical Sciences Employment Register, American Mathematical Society, P. O. Box 6248, 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 10**. Offprints of the list will be available from the Mathematical Sciences Employment Register, American Mathematical Society, P.O. Box 6887, Providence, Rhode Island 02940.

### Instructions for Applicant's Form on facing page

**The form.** Applicants' forms submitted for the Employment Register will be photographically reproduced in the December 1988 issue of *Employment Information in the Mathematical Sciences*. Résumés of 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.**

**Applicants' forms must be received by the Society by November 10, 1988 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. Forms received past the deadline or not completed will be returned.**

**The summary strip.** Information provided here will be used to prepare a printed list of applicants for distribution to employers. Please supply all information requested, and confine your characters to the boxes provided. Use the codes below. Circled letters identify corresponding items on the form and the strip.

#### Ⓐ 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

#### Ⓑ Career Objectives

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

#### ⒣ Ⓓ 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	O = Outside U.S.
	I = Indifferent

#### Ⓕ U.S. Citizenship Status

C = U.S. Citizen	P = Permanent Resident
T = Temporarily in U.S.	N = Non-U.S. Citizen



EMPLOYMENT FORMS

JANUARY 11-13, 1989

PHOENIX, ARIZONA

MATHEMATICAL SCIENCES EMPLOYMENT REGISTER

EMPLOYER FORM

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 sessions. 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 Phoenix meeting announcement.)

EMPLOYER FORM Institution \_\_\_\_\_ Dept. \_\_\_\_\_

Name of Interviewer(s) 1. \_\_\_\_\_ 2. \_\_\_\_\_

3. \_\_\_\_\_ 4. \_\_\_\_\_

City, State, Zip \_\_\_\_\_

(A) Title(s) of Position(s) \_\_\_\_\_ (B) Number of Positions \_\_\_\_\_ Number of People Supervised \_\_\_\_\_

(C) Starting Date \_\_\_\_\_ Salary \_\_\_\_\_ (D) Term of Appointment \_\_\_\_\_ yrs. (E) Renewal ( ) Possible ( ) Impossible Yes ( ) No ( ) Unknown ( )

Teaching hrs./week \_\_\_\_\_ (F) Specialties Sought \_\_\_\_\_

(G) Degree Preferred \_\_\_\_\_ (H) Degree Accepted \_\_\_\_\_ (I) Duties \_\_\_\_\_ (J) Experience \_\_\_\_\_ (K) Citizenship Restriction \_\_\_\_\_

(L) Available for Interviews Session 1 ( ) Thurs. AM, 9:30-11:45 Session 2 ( ) Thurs. PM, 1:15-5:00 Session 3 ( ) Fri. AM, 9:30-11:45 Session 4 ( )\* Fri. PM, 1:15-5:00

(M) Number of Interviewers: \_\_\_\_\_ Interviewers \_\_\_\_\_ Interviewers \_\_\_\_\_ Interviewers \_\_\_\_\_ Interviewers \_\_\_\_\_

(N) Start mo. / yr. \_\_\_\_\_

Institution \_\_\_\_\_ City \_\_\_\_\_ State (A) Title of position (B) No. \_\_\_\_\_ (C) Start mo. / yr. \_\_\_\_\_

(D) Specialties sought (E) Duties (F) Experience (G) Sessions

NOTES: (A) Inst, Lect, Asst Prof, Prof, Dean, Open, MTS (Member Technical Staff), OPAN (Operations Analyst), PREN (Project Engineer), RESC (Research Scientist); (B) Date 01/89, e.g.; (C) Possible=P, Impossible=I; (D) 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=FI, Fluid Mechanics=FL, 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; (E) Bachelor=B, Master=M, Doctor=D; (F) 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; (G) U.S. Citizen=C, U.S. Citizen or permanent resident=CP, No restriction=NR; (H) Periods available for interviews: List 1, 2, 3, and/or 4, see the FORM above.

\* Interviews are scheduled in this session on the basis of employers request only.

**Preregistration/Housing Form, Phoenix, Arizona**  
January 11-14, 1989

**Must Be Received in Providence No Later Than November 10, 1988**

Please complete this form and return it with your payment to  
Mathematics Meetings Housing Bureau  
P.O. Box 6887, Providence, Rhode Island 02940 - Telephone: (401) 272-9500, Ext. 290-Telex: 797192

<b>DEADLINES:</b>	Room Lottery Qualification	October 31, 1988
	Preregistration/Hotel Reservations	November 10, 1988
	Housing Changes/Cancellations	December 14, 1988
	Preregistration Changes/Cancellations	December 30, 1988
	50% Refund on Preregistration/Banquet/Hike	December 30, 1988 (no refunds after this date)

	REGISTRATION FEES	
	Preregistration by mail by November 10, 1988	At Meeting
	\$	\$
<b>JOINT MATHEMATICS MEETINGS</b>		
Member of AMS, CMS, MAA, NCTM, SMM	63	82
Nonmember	98	127
* Student, Unemployed, or Emeritus	18	23
<b>AMS SHORT COURSE</b>		
Member/Nonmember	40	50
* Student or Unemployed	15	20
<b>EMPLOYMENT REGISTER</b>		
- Employer fee (1st Interviewer)	75	100
- Employer fee (2nd / 3rd Interviewer)	35	50
- Applicant fee	15	20
- Posting fee for job descriptions for noninterviewing employers	10	15

\* All full-time students currently working toward a degree or diploma qualify for the student registration fees, regardless of income. The unemployed status refers to any person currently unemployed, actively seeking employment, and who is not a student; it is not intended to include persons who have voluntarily resigned from their latest position. The emeritus status refers to any person who has been a member of the AMS or MAA for twenty years or more and is retired on account of age or on account of long term disability from his or her latest position.

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

Joint Meetings  AMS Short Course (January 10-11, 1989)  Employer  Applicant  Posting

- 1) \_\_\_\_\_ Telephone: \_\_\_\_\_  
(Please print) Surname First Middle
  - 2) \_\_\_\_\_  
(Mailing address)
  - 3) Badge information: a) Nickname (optional): \_\_\_\_\_ b) Affiliation: \_\_\_\_\_
  - 4) I am a student at \_\_\_\_\_ 5) Emeritus member  Unemployed
  - 6) Accompanied by spouse \_\_\_\_\_ Number of children \_\_\_\_\_ (Enumerate only if accompanying to meeting)  
(name)
  - 7) Member of AMS  CMS  MAA  NCTM  SMM  Nonmember  (Member discount applies only to members of AMS, CMS, MAA, NCTM, and SMM) Member of other organizations: AWM  NAM  **MR Classification #** \_\_\_\_\_
  - 8) Joint Meetings fee \$ \_\_\_\_\_ 9) AMS Short course fee \$ \_\_\_\_\_ 10) Employer fee(s) \$ \_\_\_\_\_ 11) Co-Interviewer fee(s) \$ \_\_\_\_\_
  - 12) Applicant fee \$ \_\_\_\_\_ 13) Posting fee \$ \_\_\_\_\_ 14) Hotel deposit \$ \_\_\_\_\_ (necessary ONLY if paying deposit by check)
  - 15) \_\_\_\_\_ AMS 25-Year Banquet ticket(s) @ \$25 each = \$ \_\_\_\_\_ 16) \_\_\_\_\_ Desert Hike ticket(s) @ \$10 each = \$ \_\_\_\_\_
  - 17) **TOTAL AMOUNT ENCLOSED FOR 8 through 16 \$ \_\_\_\_\_** NOTE: May be paid by check payable to AMS (Canadian checks must be marked "U.S. Funds") or VISA or MasterCard credit cards.
- 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 CHECK HERE IF YOU WILL NOT REQUIRE A ROOM

PLEASE CHECK HERE IF YOU WILL BE STAYING AT A HOTEL/MOTEL NOT LISTED ON THE REVERSE

**Please complete the appropriate sections on the reverse if you will require hotel accommodations.**

For office use only:

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

**PREREGISTRATION AND HOUSING FORMS**

January 11-14, 1989

PREREGISTRATION/HOUSING FORM, Phoenix, Arizona

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 9.1% 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. **PLEASE SUPPLY THIS INFORMATION ON THE REVERSE**, together with mailing address for confirmation of room reservation.

Order of choice	Single	Double	Twin double	Triple 2 beds	Triple 2 beds w/cot	Quad 2 beds	Quad 2 beds w/cot	Suite
	73	73	73	83	93	93	103	200-300
Hyatt Regency Phoenix (Headquarters Hotel)								
	75	75	75	85	95	95	105	225-300
Sheraton Phoenix								
	59	59	59	69	N/A	79	N/A	Upon Request
Holiday Inn-Financial Center								
	59	59	59	69	N/A	69	N/A	Upon Request
Holiday Inn-Airport East								
	45	45	45	51	60	57	66	Upon Request
Days Inn San Carlos								

Special housing requests: \_\_\_\_\_

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.**

FULL NAME

ARRIVAL DATE

DEPARTURE DATE

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## FOCUS EMPLOYMENT ADVERTISEMENTS

FOCUS advertisements reach the MAA's 28,000 members, most of whom are college and university mathematicians. FOCUS now offers a new line of advertisement formats; for these new formats we have adjusted our rates per inch accordingly. A FOCUS ad now costs approximately 60 cents per word for solid text; such text will yield roughly sixty-six words for each eight lines and slightly more than eight lines per inch.

Rates for FOCUS Employment Ads are:

- 50 words or less: \$37.50
- More than 50 words: \$40.00 per column inch

There is a 15% discount for the same ad in more than two consecutive issues (with contract in advance). An insertion order on institutional letterhead will be considered a contract. Charges will be billed after the first occurrence specified in the contract.

Anyone wishing to place an employment advertisement in FOCUS should write to: Siobhán B. Chamberlin, FOCUS Employment Advertisements, The Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036. For more information, call the MAA Washington office at (202) 387-5200.

The deadline for submission in the November-December 1988 issue is September 16, 1988.

### DEPARTMENT OF MATHEMATICS University of Alberta

Applications are invited for tenure-track positions, subject to budgetary approval, in Approximation Theory (File AP-1), Numerical Optimization or Partial Differential Equations (File NP-1), in Number Theory (File NT-1), or closely related areas and Algebraic or Differential Topology (File AT-1) at the Assistant Professor level, beginning July 1, 1989. Requirements are a Ph.D. and proven ability or demonstrated potential for research and teaching. Current salary range is from \$33,144 (Canadian) per annum depending upon qualifications. Send vitae and arrange for three letters of reference to be sent to: Professor L. H. Erbe, Chairman, Department of Mathematics, University of Alberta, Edmonton, Canada T6G 2G1. In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. Closing date for applications is October 31, 1988. Please quote file numbers when responding to this advertisement. The University of Alberta is committed to the principal of equity in employment.

### TRINITY UNIVERSITY San Antonio, Texas Assistant/Associate Professor of Mathematics

Trinity University invites applications and nominations for a tenure-track position in mathematics, appointment beginning August 1989. The appointment will be made at the rank of Assistant Professor or Associate Professor, depending on qualifications. Responsibilities include teaching nine credit hours per semester, continuing scholarly activity, assisting in curriculum development as appropriate to the needs of the department and the university, advising, and committee service.

Minimum qualifications are the Ph.D. in Mathematics or Applied Mathematics with excellence in and strong commitment to teaching. Preference given

to candidates with teaching and research interests in one or more of the following areas: applied mathematics, numerical analysis, classical analysis, differential equations.

Founded in 1869, Trinity University occupies a modern campus overlooking the San Antonio skyline. Purposely small and selective, with about 2700 students, Trinity stresses a high quality, undergraduate liberal arts and sciences program. San Antonio is a city of approximately 850,000 people situated in a metropolitan area of 1.2 million.

Closing date for application is January 27, 1989. Send vita, transcripts, and three letters of reference to:

Dr. Donald F. Bailey, Chairman  
Department of Mathematics  
Trinity University  
715 Stadium Drive  
San Antonio, Texas 78284

*Trinity University is an equal opportunity affirmative action employer.*

### CANISIUS COLLEGE Department of Mathematics

A tenure-track position as Assistant Professor in mathematics is available beginning in late August 1989. Applicants must have a Ph.D. in mathematics and a strong commitment to quality teaching. The teaching load is twelve hours per semester. Salary and fringe benefits are competitive, commensurate with credentials and experience.

Applicants should send resume, transcripts, and three letters of recommendation to Dr. Richard H. Escobales, Chairman, Department of Mathematics, Canisius College, Buffalo, New York 14208. AA/EOE.

### MATHEMATICS INSTRUCTOR

Lee College is accepting applications for instructors in mathematics for the spring or fall semester 1989. (These are full-time, nine-month positions.) The positions require a Master's degree with 18 graduate hours in mathematics. The successful candidate will possess the ability to teach a wide range of courses from remedial through differential equations. Qualified candidates may apply by submitting a letter of application, resume, college transcripts, and three professional references to: Personnel Office, Lee College, 511 South Whiting Street, Baytown, Texas 77520-4703. EOE/AA MF.

### ENDOWED POSITION IN APPLIED MATHEMATICS

Nominations and applications are sought for an endowed position in applied mathematics. The position (yet unnamed) is permanently funded by an endowment and is expected to lead to tenure. Other attractive features of the position include a reduced course load and the possibility of budget supplements for travel and secretarial support. A specific responsibility of the holder of this position will be the establishment and supervision of a **Center for Applied Mathematics** within the Department of Mathematics, focused on the preparation of undergraduates for work in applied mathematics, including opportunities for undergraduate research and for collaboration with the region's profit and non-profit institutions on specific problems.

The successful applicant for this position will hold a Ph.D. in mathematics or applied mathematics, have a recognized program of research in one or more areas of applied mathematics, demonstrate good organizational and interpersonal skills, and share a

commitment to quality teaching in a liberal arts environment. The salary and rank of appointment will be appropriate for the candidate selected.

**The College of St. Thomas**, the largest private college in Minnesota, is located one block from the Mississippi River in the heart of the attractive and dynamic Twin Cities metropolitan area. For over a century the college has provided a strong program of liberal arts education in the Catholic tradition of service to the greater community. The Department of Mathematics has a current faculty of 12, representing a variety of mathematical interests.

Application materials, including a letter of interest, curriculum vita, and three letters of recommendation (including comments on the applicant's experience and promise in the areas of teaching, research, and leadership) will be accepted until December 31, 1988 and, thereafter, until the position is filled. Applications, nominations, and inquiries should be sent to John T. Kemper, Chair, Department of Mathematics, College of St. Thomas, St. Paul, MN 55105. Individuals from both academic and industrial backgrounds whose interests and credentials are compatible with the requirements of the position are encouraged to apply. The College of St. Thomas is an equal opportunity/affirmative action employer.

### TENNESSEE TECHNOLOGICAL UNIVERSITY Department of Mathematics Cookeville, Tennessee 38505

Applications are invited for a tenure-track position in Statistics at the rank of Assistant Professor, available 1 January 1989. Ph.D. in Statistics, or equivalent, experience in both Applied and Mathematical Statistics, evidence of excellent teaching ability at all levels, and strong interest in research are required. Duties include teaching undergraduate and graduate courses, and directing graduate students, consulting and research activities, and helping develop Statistics courses for science and engineering students. Position is open until filled. Send transcript and curriculum vitae, and have three letters of recommendation sent, as soon as possible, to: Chairman, Search Committee, Department of Mathematics, Box 5054, TTU, Cookeville, TN 38505.

### SOUTHWESTERN UNIVERSITY Georgetown, Texas 78626

Applications are being invited for a tenure-track position in Mathematics at the Assistant Professor level beginning Fall semester 1989. Ph.D. required. Southwestern is a selective liberal arts undergraduate college with 1100 students. Faculty are expected to have a strong commitment to excellence in undergraduate teaching, to maintain an active interest in scholarly pursuits, and to possess an appreciation of liberal arts education. Please send a letter of application, vita, and three current letters of reference to Theodore D. Lucas, Associate Provost. Southwestern University in an EOE/AA employer.

### VACANCY

Tenure-track or Full-time Visiting Lecturer position in the Department of Mathematics beginning September, 1989.

Earned doctorate and excellence in teaching required. Research potential/experience is expected. The selected candidate will join an established program with traditional and computer-oriented degrees and will have the opportunity to participate in the development of mathematics courses for growing undergraduate and graduate programs in the

Department of Mathematics and in the Department of Computer and Information Sciences.

Application deadline: **January 15, 1989**. Applications, including resume, transcript, and *three letters of reference* should be sent to:

Rufus A. Winsor, Chairperson  
Department of Mathematics  
Southeastern Massachusetts University  
North Dartmouth, MA 02747

SMU IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER. APPLICATIONS FROM MEMBERS OF MINORITY GROUPS AND WOMEN ARE PARTICULARLY ENCOURAGED.

### FINANCIAL EDITOR

Editor needed to originate materials dealing with comprehensive analysis of real estate investments. Teaching experience, strong academic background in economics, statistics, or math and excellent writing skills required. Experience developing college-level textbooks, instructor manuals or corporate training programs preferred. Competitive salary, downtown Chicago location, good benefits. Respond, with salary history, to:

Mary E. Herrmann  
Human Resources Coordinator  
Institute of Real Estate Management  
430 N. Michigan Avenue  
Chicago, Illinois 60611

### MATHEMATICS

Assistant Professor, tenure-track position, beginning September 1, 1989. Candidate should hold a Doctorate in Mathematics, specialty in Real Analysis, Complex Analysis, or Differential Equations preferred. Some college teaching preferred. Send vita to Tarleton State University, Dr. Joe Cude, Box T-519, Tarleton Station, Stephenville, Tx 76402. Deadline: February 1, 1989. AA/EEO.

### MATHEMATICS DEPARTMENT

California State University  
Northridge, California 91330

One tenure-track position is available. Requirements are a Ph.D. in Mathematics, evidence of teaching excellence, and research activity in applied mathematics. Applications will be considered for appointment at the assistant professor rank. Salary range: \$30,252 to \$36,408.

Starting date for this position is August 29, 1989. Send a cover letter and resume by December 19, 1988 to Dr. D. H. Potts, Chair, Department of Mathematics, California State University, Northridge, California 91330.

California State University is an Equal Opportunity, Affirmative-Action, Handicapped Title IX Employer.

### UNIVERSITY OF WYOMING

Department of Mathematics

Invites applications for the following positions:

One of more tenure-track positions at the assistant/associate professor level in the areas of applied mathematics, algebraic/computational combinatorics, functional analysis, numerical linear algebra.

One or more visiting positions at levels appropriate for the applicant.

Send resume and direct three letters of recommendation to:

Professor W. Bridges, Chairman

Mathematics Department  
P.O. Box 3036 University Station  
University of Wyoming  
Laramie, WY 82071-3036  
(307) 766-4222

Applications completed by January 31, 1989 will be given first consideration. The University of Wyoming is an Equal Opportunity/Affirmative Action Employer.

### UNIVERSITY OF WYOMING

Department of Mathematics

Invites applications for the following positions:

A senior-level position in the area of computational mathematics. Candidates should have an outstanding record of accomplishment in an area of computational applied mathematics that makes significant use of high speed computers. The appointee will be expected to interact with our Center for Computational Mathematics and Mechanics and to provide leadership in the developing field of scientific computation.

Send resume and direct three letters of recommendation to:

Professor W. Bridges, Chairman  
Mathematics Department  
P.O. Box 3036 University Station  
University of Wyoming  
Laramie, WY 82071-3036  
(307) 766-4222

Applications completed by January 31, 1989 will be given first consideration. The University of Wyoming is an Equal Opportunity/Affirmative Action Employer.

### MATHEMATICS

(Search Reopened)

Onondaga Community College is accepting applications for the following position. Master's Degree in Mathematics, Mathematics Education or a Mathematics related field. Two (2) years teaching experience at the community college level. Should be able to teach a full range of mathematics courses. Salary/Rank: \$25,048 minimum—Assistant Professor.

Deadline for applications: October 31, 1988.

To apply: Interested candidates should submit a cover letter, resume, and three (3) letters of reference to:

Office of Human Resources  
Onondaga Community College  
Service & Maintenance Bldg., Rm. #114  
Syracuse, New York 13215

OCC is an EEO/AA employer. Women and minorities are encouraged to apply.

### WASHINGTON AND LEE UNIVERSITY

Department of Mathematics  
Lexington, Virginia 24450

At least one tenure-track position at Asst./Assoc. Prof. level to begin Sept., 1989. Ph.D. in mathematics required. Any field, but some training in Num. Anal. desirable. W & L is a privately endowed, undergraduate college with a strong liberal arts tradition. Classes are small and excellence in teaching is emphasized. Good fringe benefit package and competitive salary. To apply, send resume, graduate transcript (which may be unofficial), and three letters of reference (at least one of which should address teaching experience and potential) to Search Committee at the address above. Consideration of

applications will begin Jan. 2 and will continue until position(s) is (are) filled.  
EQUAL OPPORTUNITY EMPLOYER.



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Editor: Peter Renz, Associate Director, MAA

Associate Editors: Donald J. Albers, Menlo College; David Ballew, Western Illinois University

Managing Editor: Harry Waldman

Advertising Manager: S. B. Chamberlin  
Chairman of the MAA Newsletter Editorial Committee: Paul Zorn, St. Olaf College

Readers are invited to submit articles, announcements, or letters to the Editor for possible publication in FOCUS. All materials should be sent to the Editor at the MAA Headquarters in Washington, DC.

The subscription price for FOCUS to individual members of the Association is \$3, included as part of the annual dues. Annual dues for regular members (exclusive of subscription prices for MAA journals) are \$29. Student, unemployed, emeritus, and family members receive a 50% discount; new members receive a 30% discount for the first two years of membership.

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## Calendar

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### National MAA Meetings

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**January 11–14, 1989** 72nd Annual Meeting, Phoenix, Arizona (Board of Governors, January 10, 1989)  
**January 24–27, 1990** 73rd Annual Meeting, Louisville, Kentucky

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### Sectional MAA Meetings

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**Eastern Pennsylvania and Delaware** Pennsylvania State at its Ogontz Campus, Abington, Pennsylvania, November 19, 1989  
**Illinois** Western Illinois University, Macomb, April 28–29, 1989  
**Iowa** Coe College, Cedar Rapids, April 7–8, 1989  
**Kansas** Hutchinson Community College, Hutchinson, Kansas, April 21–22, 1989  
**Kentucky** Pennyriple Forest State Park, Dawson Springs, Kentucky, April 7–8, 1989  
**Louisiana–Mississippi** Mississippi State University, Biloxi, Mississippi, February 24–25, 1989  
**Maryland–DC–Virginia** American University, Washington, DC, November 11–12, 1988  
**Michigan** Hope College, Holland, Michigan, May 12–13, 1989  
**Missouri** University of Missouri–Columbia, April 7–8, 1989  
**Nebraska** Doane College, Crete, Nebraska, April 14–15, 1989  
**New Jersey** William Paterson College, Wayne, New Jersey, November 5, 1988  
**North Central** Concordia College, Moorhead, Minnesota, November 4–5, 1988  
**Northeastern** Rhode Island College, Providence, Rhode Island, November 18–19, 1988  
**Oklahoma–Arkansas** Central State University, Edmond, Oklahoma, March 31–April 1, 1989  
**Pacific Northwest** Gonzaga University, Spokane, Washington,

June 15–17, 1989

**Rocky Mountain** Fort Lewis College, Durango, Colorado, April 21–22, 1989

**Seaway** Syracuse University, Syracuse, New York, November 11–12, 1988

**Southeastern** University of Tennessee, Knoxville, Tennessee, April 7–8, 1989

**Southern California** Claremont McKenna College, Claremont, California, November 12–13, 1988 (joint meeting with AMS)

**Texas** Texas Lutheran College, Seguin, Texas, April 6–8, 1989

**Wisconsin** University of Wisconsin–Parkside, Kenosha, Wisconsin, April 21–22, 1989

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### Other Meetings

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**October 27–29** Conference on Technology in Collegiate Mathematics, Ohio State University. Areas include: computer graphing/graphics, computer simulation, educational research issues, instructional materials, testing and evaluation, the role of computation and algebraic techniques, and symbolic and computer algebra systems. For information, contact: Department on Conferences and Institutes, P.O. Box 21878, Columbus, OH 43221.

**October 27–30** AMATYC Annual Convention, Palliser Hotel, Calgary, Alberta, Canada. For further information, contact either Convention Co-Chair: Steven Terry, Ricks College, Rexburg, Indiana, 83440, (208) 356–1406; or Shao Mah, Red Deer College, Red Deer, Alberta, Canada T4N 5H5, (403) 342–3300.

**November 4–5, 1988** Third Annual Pi Mu Epsilon Regional Conference, St. Norbert College, DePere, Wisconsin 54115-2099. The invited speaker, Phil Straffin of Beloit College, will speak on voting power and comparison of voting methods. For information, contact Rick Poss at St. Norbert College, (414) 337-3198.

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### SPECIAL NOTICE MAA SEEKS EXECUTIVE DIRECTOR

The Mathematical Association of America seeks an Executive Director to succeed Alfred B. Willcox on his retirement in September 1990 after twenty-two years of service. (An interim plan will be considered for someone prepared to begin earlier.) The Association, with 26,000 members, is dedicated to the advancement of mathematics, particularly at the collegiate level. Its activities include national and regional meetings, publication of journals and books, visiting lecturer programs, and mathematical competitions for high school and college students. In addition, the Association (in cooperation with other mathematical organizations) is active in publicizing and explaining to the public and the government the importance of mathematics in meeting the needs of the country.

The Executive Director is the Chief Executive Officer of the Association, working under the immediate direction of the Executive and Finance Committees of the board of Governors, and assisted by associate directors. The Executive Director attends meetings of these committees and of the Board.

The Executive Director has ultimate responsibility for all programmatic and administrative activities of the Association, including supervision of the headquarters staff of twenty-five; serves as the staff officer in charge of development; and, along with the elected officers, represents the Association in professional, governmental, and public affairs as an advocate in behalf of collegiate mathematics, as a fund raiser, and as a liaison with other organizations.

Candidates who hold a Ph.D. in the mathematical sciences and have substantial experience as professional mathematicians and educators are encouraged to apply, particularly if they also have administrative and managerial experience equivalent to that of department chair or higher, experience in fund raising and dealing with foundations, and a history of activity in the Association. Helpful attributes would be some familiarity with publishing and with the use of computers in publishing as well as data processing.

The Executive Director is based at the headquarters of the Association, a historic townhouse complex in downtown Washington. The appointment is for an indefinitely renewable five-year term. Candidates should have in mind a (nonbinding) commitment of at least two terms. The salary will be competitive, and fringe benefits are liberal.

Send applications (with vitae and names of three references) and nominations to: Professor Deborah Tepper Haimo, Chair; Executive Director Search Committee; Department of Mathematics and Computer Science; University of Missouri—St. Louis; St. Louis, MO 63121

The Committee will begin to review applications on December 15, 1988. *The Mathematical Association of America is an Affirmative Action, Equal-Opportunity Employer.*

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FOCUS

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OCTOBER 1988

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