

# FOCUS

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THE NEWSLETTER OF THE MATHEMATICAL ASSOCIATION OF AMERICA

October 1987

## 100 Years of American Mathematics

Kenneth Hoffman

**1988: A VERY SPECIAL YEAR** Next year the national mathematics community will celebrate *100 Years of American Mathematics*. Its underlying idea is to build on the American Mathematical Society (AMS) Centennial (officially celebrated next August) and on nine other special events scheduled throughout 1988, to create a "centennial of American mathematics." Announcements about *100 Years*, and its events can be found on pages xviii-xix of this issue of FOCUS. It is a "happening" for the benefit of our whole community and your participation is vital to its success.

Our goals in linking 10 major events in 1988 go beyond festive ones to the creation of a unique vehicle for increasing public understanding and for stimulating dialogue in the mathematics community about its future. This special year provides us with the biggest public education opportunity the mathematics community in the U.S. will have for many years to come. It also presents an unusual opportunity to promote dialogue within the community about major issues it faces in research, in education, and in its relations with its several publics. Following is the background for the year, viewed from these two perspectives.

**PUBLIC UNDERSTANDING OF MATHEMATICS** As the language in which nature speaks to us, mathematics has been a vital ingredient in physics, chemistry, and engineering for centuries. After WWII, it came to permeate the intellectual fabrics of a broad range of disciplines, increasing its impact on such diverse areas as space science, management, and the social sciences. More recently, the fundamental role of mathematics has been recognized in biology and medicine. Moreover, it has long been an essential component of the school and college curriculum, especially for the preparation of scientists and engineers. Yet, mathematics has not consistently held a place of importance in American society.

What is disturbing in America today is that few adults recognize that mathematics is the foundation of our technological society, and that it is a growing, changing discipline with new results constantly being discovered. Nor do they recognize that the computer has greatly extended the reach and power of mathematics, making it even more crucial that young people be solidly grounded in the subject. Equally disturbing are recent studies which show conclusively that American grade and high school students lag significantly behind their Chinese, Taiwanese, and

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## The Meeting You Missed

Sheldon Axler

Did you know that the properties of a polygonal billiard table are reflected in the geometry of Teichmüller geodesics? You would if you had attended the opening talk at the joint summer meeting of the AMS and MAA held in Salt Lake City in August 1987. Later in the meeting you could have learned how physicists used mathematics to discover the existence of a new phase of solid matter, called quasicrystals, that has icosahedral symmetry in three dimensions. If you weren't in Salt Lake City in early August, you missed the best AMS-MAA meeting I have ever attended.

What makes a good meeting? Beautiful scenery, such as the mountains surrounding Salt Lake City, helps, but excellent expository talks form the backbone of a successful meeting. I attended all the fifty-minute invited talks and as usual assigned each a grade on a 0 to 4 scale, with 4 the highest score. Because the selection committees were careful, all the speakers talked with expertise about interesting mathematics, but I gave scores of higher than 2 only to those speakers who followed the instructions to direct their talks to non-specialists. Of the seventeen invited fifty-minute speakers, nine received the usually rare scores of 3.5 or 4.

An uncommonly large percentage of the speakers at Salt Lake City made excellent use of the overhead projectors by illustrating their talks with graphics. For example, the talk on the topology of mirages was accompanied by spectacular pictures. The mirage pictures were better in Salt Lake City than in the speaker's article on the same subject in *SCIENTIFIC AMERICAN*, and we were not subjected to the errors introduced by the *SCIENTIFIC AMERICAN* editors in their effort to achieve a uniform writing style.

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**FOCUS ON MEETINGS** This entire issue is devoted to meetings, starting with Sheldon Axler's review of the summer meeting and Kenneth Hoffman's review of special events for 1988.

**CENTER SECTION January Meetings** See especially the MAA Program, the banquet announcement, and the full program of minicourses.

Material unrelated to meetings has been held for the November-December issue.

### The Meeting You Missed

*(continued from page 1)*

If you had come to Salt Lake City you could have heard an introduction to quantized topology, which, despite its name, is mostly analysis. You could have laughed at the anecdotes told about R.H. Bing during the talk on his mathematical accomplishments. If attending the invited talks did not fill up your time, you could have browsed through the book exhibit or listened to the panel discussion on gender and science. Or you could have participated in one of the MAA education software minicourses or attended the AMS special session of twenty-minute talks on ring theory. The organized social events in Salt Lake City included a barbecue at 8100 feet in the Wasatch Mountains, followed by the Association for Women in Mathematics party.

Only 602 mathematicians attended the Salt Lake City meeting, so most of you missed the wonderful talk on recent developments in differential geometry. You didn't learn about new research trends in matrix analysis, and you weren't entertained by viewing the paradoxical properties of large bodies with small cross-sectional areas. Will you ever again get an opportunity to hear more than a dozen top researchers give expository talks in pleasant surroundings? Sure, just come to future summer meetings.

### 100 Years of American Mathematics

*(continued from page 1)*

Japanese counterparts in mathematics (see "Smokestack Classrooms" in the March-April 1987 issue of FOCUS). Additionally, fewer and fewer Americans are studying enough mathematics to prepare them for any of the wide variety of technically-based careers, let alone for mathematics teaching and research.

All this indicates that public awareness and understanding of mathematics need to increase, both in quantity and in accuracy of perception.

This situation was recognized several years ago by the leadership of three major U.S. mathematical organizations, the American Mathematical Society located in Providence, RI; the Mathematical Association of America located in Washington, DC; and the Society of Industrial and Applied Mathematics based in Philadelphia, PA. The AMS, MAA, and SIAM joined together in order to develop a governmental and public affairs program broadly representing American mathematics. The result was the Joint Policy Board for Mathematics (JPBM), created in 1984. Interactions with federal agencies began immediately and the public information got underway in 1985.

In its first few months of operation, the JPBM public information office called reporters and editors across the U.S. to ascertain who covered mathematics, who was assigned to cover the field, and how much and what kinds of interest existed regarding mathematics. Not too surprisingly, there were then fewer than 12 reporters who regularly and knowledgeably covered the field. Moreover, reporters from many newspapers, magazines, and radio and television stations expressed chagrin over covering mathematical stories. These same media outlets were already covering space flights, education, and the computer sciences.

For the past two years the JPBM has spread the word about mathematics to the various publics on Capitol Hill and at governmental agencies, in addition to the general public via television, newspapers, and radio. Because of the efforts of this program, understanding within government has improved; the number of reporters covering mathematics has grown; and the

number of stories and quality of coverage concerning mathematics has increased.

However—mathematics is still largely unrecognized for what it is: a crucial component of our culture and a discipline essential to the well-being of American science and technology, to U.S. economic strength and industrial competitiveness, and to national defense.

A number of significant events in mathematics are taking place in 1988, among them the Centennial of the American Mathematical Society, the first U.S. professional organization of mathematicians. Because of the convergence of the Centennial with numerous other noteworthy events, the JPBM has designated this year as a celebration called 100 Years of American Mathematics.

These events during 1988 cover research, education, and application of mathematics and will involve individual mathematicians, mathematical sciences departments, educators, industrialists, public policy makers, media, and other audiences. 1988, therefore, is the first year the American mathematics community has had an opportunity to markedly increase and enrich public understanding and appreciation of mathematics.

**MATHEMATICS: PLANNING FOR THE FUTURE** The U.S. mathematics community is engaged in a multi-staged, multi-year critical examination of its roles in research, in education, and in public policy. This ambitious undertaking, which will take another major step forward in 1988, began in 1980 when leading mathematicians became alarmed over markedly decreased flows of talent and resources into their field, and into science and technology more broadly. They mobilized the professional societies in mathematics and enlisted the aid of the National Academy of Sciences (NAS) and the National Academy of Engineering (NAE) in analyzing the forces undermining the infrastructures of mathematics research and education. The initial goal was to develop national game-plans for reversing the trends of declining PhD production, erosion of federal support, deterioration within mathematics departments, increasing student and public apathy toward mathematics, and growing complacency within the field itself about some of its responsibilities. The focus for the analyses was not on the past, however, it was on the opportunities which mathematics provides for the future well-being of science and technology, the nation, and its individual citizens.

The comprehensive assessment which these actions set in motion will last throughout the 1980s and is generating, in successive steps, the plans and organizational mechanisms needed at the national level to renew and continuously maintain the vitality of the country's broader mathematics enterprise. 1988 is the first year the mathematics community will have before it for widespread discussion organizational plans for its several futures—in research, in precollege education, in college/university education, and in relations with its various publics. Following are some of the major steps which brought the dialogue to its present stage:

1981 The David Committee The National Research Council (NRC), public policy arm of the NAS and NAE, establishes prestigious committee of scientists and engineers, chaired by Dr. Edward E. David, Jr., to review health and support of research in the mathematical sciences in the U.S.

1982 The Browder Briefing Panel At the request of the White House, NRC's Committee on Science, Engineering, and Public Policy (COSEPUP) establishes panels to brief the Science Adv-

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# 71st ANNUAL MEETING OF THE MATHEMATICAL ASSOCIATION OF AMERICA



January 6–9, 1988

ATLANTA, GEORGIA

MAA and AMS to cosponsor special banquet launching

 YEARS OF AMERICAN MATHEMATICS  
YEARS OF AMERICAN MATHEMATICS

See pages xviii and xix

The January 1988 Joint Mathematics Meetings, including the 71st Annual Meeting of the Mathematical Association of America, the 94th Annual Meeting of the American Mathematical Society, and the 1988 annual meetings of the Association for Women in Mathematics and the National Association for Mathematicians will be held January 6–9 (Wednesday–Saturday), 1988, in Atlanta, Georgia. Sessions will take place in the Hyatt Regency Atlanta and the Atlanta Marriott Marquis.

## 71st Annual Meeting of the MAA January 6–9, 1988 (Program on xvi & xvii)

### Retiring Presidential Address

The Retiring Presidential Address will be given by Lynn A. Steen, St. Olaf College, at 3:50 p.m. on Friday, January 8. The title of his address is *Celebrating mathematics*.

### Invited Addresses

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

Lawrence Couvillon, Southern University, *What does it mean to understand the function concept?*, 9:00 a.m. Thursday;

Ronald G. Douglas, SUNY at Stony Brook, *Calculus: Past, present, and future*, 2:45 p.m. Friday;

Donald L. Kreider, Dartmouth College, title to be announced, 10:05 a.m. Saturday;

Jeffrey C. Lagarias, AT&T Bell Laboratories, title to be announced, 10:05 a.m. Thursday;

Charles C. Lindner, Auburn University, *Perpendicular arrays and graph decompositions*, 3:20 p.m. Wednesday;

Vera S. Pless, University of Illinois at Chicago, *Codes and designs—existence and uniqueness*, 9:00 a.m. Saturday;

Jane Cronin Scanlon, Rutgers University, *Singularly perturbed equations—theory vs. applications*, 2:15 p.m. Wednesday.

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

### Minicourses (see form on page iii)

Thirteen 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: *Using computer graphing to enhance the teaching and learning of calculus and precalculus mathematics* is being organized by Franklin D. Demana and Bert K. Waits of Ohio State University. Part A is scheduled from 7:00 p.m. to 9:00 p.m. on Tuesday, January 5, and Part B from 4:30 p.m. to 6:30 p.m. on Wednesday, January 6. 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 #2: *Computer software for differential equations* is being organized by Howard Lewis Penn and James Buchanan of the U.S. Naval Academy. Part A is scheduled from 9:00 a.m. to 10:55 a.m. on Wednesday, January 6, and Part B from 2:15 p.m. to 4:15 p.m. on Thursday, January 7. Enrollment is limited to 30.

In this Minicourse, the participants will have a chance to see demonstrations of and use several computer packages which are useful in the teaching of differential equations. The Minicourse is limited to 30 people so as to allow hands on experience with each participant. There will be available at least 10 IBM PC's for the students to use. The Minicourse will consist of two two-hour sessions with about half of each session devoted to demonstrations by the instructors and the other half devoted to use of the programs by those taking the Minicourse. The programs will cover numerical and graphical uses of the computers as well as applications of differential equations.

Minicourse #3: *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 9:00 a.m. to 10:55 a.m. on Wednesday, January 6, and Part B from 2:15 p.m. to 4:15 p.m. on Thursday, January 7. An optional third session, Part C, will use the microcomputer facility and is scheduled from 7:00 p.m. to 9:00 p.m. on Thursday, January 7. 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 #4: *Teaching calculus with an HP-28C symbol manipulating calculator* is being organized by John W. Kenelly, Clemson University. Part A is scheduled from 9:00 a.m. to 10:55 a.m. on Wednesday, January 6 and Part B from 2:15 p.m. to 4:15 p.m. on Thursday, January 7. Enrollment is limited to 30.

After briefly surveying the capabilities of currently available graphic calculators, the Minicourse will introduce participants, hands on, to the HP-28C. Graphing, symbol manipulating, differentiation, equation solving, Taylor polynomials and (time permitting) matrix operations will be viewed.

There will be a discussion of the use of the HP-28C in calculus instruction of how its use will change current topics and will make possible the introduction of new topics in calculus.

Minicourse #5: *Logo and problem solving* is being organized by Charles A. Jones, Grinnell College. Part A is scheduled from 2:15 p.m. to 4:15 p.m. on Wednesday, January 6, and Part B from 9:00 a.m. to 10:55 a.m. on Thursday, January 7. Enrollment is limited to 30.

Logo is a powerful computer language which includes commands for graphics and list processing. Logo has been an excellent language to teach to nonscience oriented undergraduates in the course "Problem Solving and Computing" at Grinnell College. The goal of this Minicourse is to provide an introduction to Logo that illustrates how Logo can be used to teach problem solving concepts and techniques.

This Minicourse will provide a hands-on introduction to a selection of Logo commands and programming techniques. The emphasis will be on the use of procedures, especially recursive procedures, to produce graphical displays and to obtain elegant solutions to list processing problems. The Logo instruction will consist of handouts which provide a wide variety of problems and which describe the particulars of Logo syntax.

Some previous programming experience (using any programming language) is assumed.

Minicourse #6: *Coloring and path following algorithms for approximating roots and fixed points* is being organized by William F. Lucas, Claremont Graduate School. Part A is scheduled from 4:30 p.m. to 6:30 p.m. on Wednesday, January 6, and Part B from 7:00 p.m. to 9:00 p.m. on Thursday, January 7. Enrollment is limited to 80.

Cayley (1879) found that Newton's method for approximating *complex* roots of a polynomial equation could lead to complications. (See *Science News*, February 28, 1987, regarding regions with chaotic boundaries.) H. W. Kuhn (1974) has provided an elementary path following algorithm in the plane for finding such roots. The roots are triple points in a simple three coloring of the plane as was already evident in a geometric view provided in Gauss' thesis (1799).

The fundamental combinatorial lemmas by E. Sperner (1928) and A. W. Tucker (1946) for labeling (or coloring) the vertices of an  $n$ -simplex or  $n$ -octahedron are the discrete analogues of the Brouwer fixed point theorem and Borsuk-Ulam antipodal points theorems, respectively. These provide the basis for the path following algorithms of Scarf (1967) and others for finding approximate fixed points. Applications include the computing of equilibrium points or prices in game theory and economics.

These topics can be included at various levels in undergraduate courses on discrete mathematics, and do not assume any specialized prerequisites.

Minicourse #7: *Computer based discrete mathematics* is being organized by Nancy Baxter, Dickinson College and Ed Dubinsky, Purdue University. Part A is scheduled from 9:00 a.m. to 10:55 a.m. on Friday, January 8, and Part B from 3:30 p.m. to 5:30 p.m. on Saturday, January 9. An optional open-ended hands-on lab is scheduled from 11:15 a.m. to 12:45 p.m. on Saturday. 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

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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: *Laboratory projects for first year calculus* is being organized by L. Carl Leinbach, Gettysburg College. Part A is scheduled from 9:00 a.m. to 10:55 a.m. on Friday, January 8, and Part B from 3:30 p.m. to 5:30 p.m. on Saturday, January 9. Enrollment is limited to 80.

The presentation of the First Year Calculus course differs from that of any other course we offer to mathematics majors. Instead of the presentation of theorems and proofs in the standard format, much of our effort is spent on motivation of results and application of technique. The course is more mathematical engineering than it is mathematics.

The format for presenting a Calculus course suggested in this Minicourse is to use the existence of inexpensive software and hardware to create a laboratory component for the standard calculus course. The laboratory is to be conducted in the same way a physics, chemistry, or biology laboratory is conducted. Students run experiments, observe results, write reports, and make conjectures. Some experiments are to motivate results to be presented in lecture. Others are to apply the material of the lecture to a specific situation. In an ideal situation, student conjectures may be used to motivate a lecture presentation.

Minicourse #9: *Constructing placement examinations* is being organized by John G. Harvey, University of Wisconsin at Madison, and sponsored by the Committee on Placement Examinations. Part A is scheduled from 9:00 a.m. to 10:55 a.m. on Friday, January 8, and Part B from 3:30 p.m. to 5:30 p.m. on Saturday, January 9. Enrollment is limited to 40.

Lectures and workshops will take participants, step-by-step, through the entire process of constructing and implementing placement exams, including: preliminary planning, writing test items, designing a test for establishing cut-off scores, and evaluating the test. Placement testing problems of participants’ own institutions will be discussed during question and answer periods.

Minicourse #10: *Computer graphics in elementary statistics* is being organized by Florence S. Gordon, New York Institute of Technology and Sheldon P. Gordon, Suffolk County Community College. Part A is scheduled from 1:30 p.m. to 3:30 p.m. on Friday, January 8, and Part B from 9:00 a.m. to 10:55 a.m. on Saturday, January 9. 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 presenters which covers virtually all of the topics normally encountered in elementary statistics including data analysis and descriptive statistics, probability simulations, the normal and t-distributions, sampling and the Central Limit Theorem, estimation, hypothesis testing, linear regression analysis, etc. The Minicourse is designed for individuals who have taught such an introductory statistics course, though no previous computer experience is assumed.

Minicourse #11: *The use of computing in teaching linear algebra* is being organized by Eugene Herman and Charles Jepsen, Grinnell College. Part A is scheduled from 7:00 p.m. to 9:00 p.m. on Friday, January 8, and Part B from 1:00 p.m. to 3:00 p.m. on Saturday, January 9. Enrollment is limited to 30.

The goal of this course is to discuss the changes that can or should occur in a linear algebra course in which students have access to a powerful matrix computation package. Participants will get hands-on experience in using such a package to better prepare them for the discussion.

A major reason that linear algebra is now taught to so many students so early in their education is that the computer has made linear algebra much more useful to scientists than it was 35 years ago. Yet computing has not had a significant effect on how undergraduate linear algebra is usually taught. This Minicourse explores the possibilities and consequences of putting powerful matrix computation packages in the hands of beginning linear algebra students. Participants will get to use one such package and will get information on others. Topics discussed will include the new kinds of problems that can be assigned to students, the changes that might be warranted in course, the background needed by instructors and students, the effects of the changed course on students, and the mathematical algorithms incorporated into the software. The packages we discuss have at least the following computational capabilities: Finding all the solutions of a consistent system of equations, finding matrix inverses, LU-factoring, QR-factoring, finding complete sets of eigenvectors and associated eigenvalues for arbitrary square matrices, and finding least-squares solutions.

Minicourse #12: *Using computer algebra systems in undergraduate mathematics* is being organized by Paul Zorn, St. Olaf College. Part A is scheduled from 7:00 p.m. to 9:00 p.m. on Friday, January 8, and Part B from 1:00 p.m. to 3:00 p.m. on Saturday, January 9. Enrollment is limited to 80.

Computer algebra system (Macsyma, Maple, SMP, etc.) which handle many standard mathematical operations, are emerging as powerful tools for teaching, learning, and doing mathematics. In freshman calculus, for example, a CAS facilitates *combining* algebraic, numerical, and graphical viewpoints on limits, derivatives, integrals, antiderivatives, Taylor series, differential equations, and other objects. Because CAS’s operate in calculator-like interactive mode, without programming, distraction from mathematical content is minimized.

The course will include a detailed demonstration (on-line or simulated) of an introduction to a particular CAS, description (with examples) of a freshman calculus project using CAS at St. Olaf College, and remarks on

use of CAS in other courses. Because CAS hardware and software are changing rapidly and teaching experience is limited, the course will raise questions, not give definitive answers. Discussion time will be reserved.

Minicourse #13: *Learning mathematics through discrete dynamical systems* is being organized by James T. Sandefur, Georgetown University. Part A is scheduled from 7:00 p.m. to 9:00 p.m. on Friday, January 8, and Part B from 1:00 p.m. to 3:00 p.m. on Saturday, January 9. 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.

Participants interested in attending any of the MAA Minicourses should complete the MAA Minicourse Pre-registration Form and send it directly to the MAA office at the address given on the form so as to arrive prior to the November 6 deadline. **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 Preregistration Form. Then, if the Minicourse is fully subscribed, full refund can be made of the Joint Mathematics Meetings preregistration fee. Otherwise, the Joint Meetings preregistration will be processed, and then be subject to the 50 percent refund rule. PREREGISTRATION FORMS FOR THE JOINT MEETINGS SHOULD BE MAILED TO PROVIDENCE PRIOR TO THE DEADLINE OF NOVEMBER 6.**

The registration fee for MAA Minicourses #1, #2, #5, #7, #10, and #11 is \$40 each. The registration fee for the other MAA Minicourses is \$30 each.

#### Contributed Papers

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

- *Teaching mathematical modeling*, Jeanne Agnew, Oklahoma State University, 1:00 p.m. Saturday.
- *History of contemporary mathematics*, Florence D. Fasanelli, Sidwell Friends School, Washington, DC,

Victor J. Katz, University of District of Columbia, and V. Frederick Rickey, Bowling Green State University, Wednesday morning.

- *Strategies for teaching geometry*, Doris Schattschneider, Moravian College, 1:00 p.m. Saturday.
- *Writing as part of the mathematics curriculum*, Andrew Sterrett, Denison College, 2:15 p.m. Thursday.

The deadline for submitting papers for these sessions was **September 15. Late papers will not be accepted.**

### Other MAA Sessions

#### Software Session

A panel discussion on *Software issues – pricing, copy protection, copyright* is being sponsored by the Committee on Computers in Mathematics Education (CCIME) and is scheduled from 8:30 a.m. to 10:55 a.m. on Wednesday, January 6. The moderator is Howard Anton, Drexel University. The participants are Michael C. Gemignani, University of Maine; William H. Graves, University of North Carolina; Kevin Howat, Wadsworth Publishing; Alan Jacobs, Addison-Wesley Publishing; and Peter Trotter, CONDUIT and University of Iowa.

#### First Two Years Panel Discussion

The CUPM subcommittee on the First Two Years of College Mathematics is sponsoring a panel discussion titled *Compressing five into four: How can we streamline the first two years of college mathematics?* The session is scheduled from 9:00 a.m. to 10:55 a.m. on Wednesday, January 6, and will be moderated by Richard D. Anderson, Louisiana State University.

#### 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 6.

#### ICME-6 Panel Discussion

A panel discussion titled *What can mathematicians contribute to mathematics education?* is scheduled from 2:15 p.m. to 4:15 p.m. on Thursday, January 7. The moderator is Eileen L. Poiani, St. Peter's College, and the lead speaker is Jeremy Kilpatrick, University of Georgia. The other participants are George Berzsenyi, Lamar University; Thomas J. Cooney, University of Georgia; Donald M. Hill, Florida A&M University; Warren Page, New York City Technical College; and Lynn A. Steen, St. Olaf College.

#### Task Force on Minorities Panel Discussion

The Task Force on Minorities in Mathematics is sponsoring a panel discussion titled *Mathematics, minorities and the MAA – How do they fit together?* It is scheduled from 2:15 p.m. to 4:15 p.m. on Thursday, January 7. The moderator is Reuben Hersh, University of New Mexico. The presenters are Manuel P. Berriozabal, University of Texas at San Antonio; Rogers J. Newman, Southern University; and Paul J. Sally, Jr., University of Chicago. The responders are Lida K. Barrett, Mississippi State University; Wade Ellis, Jr., West Valley College; and Kenneth A. Ross, University of Oregon. About an hour will be available for open discussion.

### Computer Algebra Systems Symposium

The Committee on Computers in Mathematics Education (CCIME) is sponsoring a symposium on *Applications and implications of computer algebra systems in mathematics instruction*. The symposium is being organized by Warren Page, New York City Technical College, and will run from 8:30 a.m. to 10:55 a.m. on Friday, January 8. The program follows:

8:30 a.m. – 8:55 a.m. *Technology at the high end of the low end: the HP-28C calculator*, John W. Kenelly, Clemson University

9:00 a.m. – 9:25 a.m. *Symbolic computation without a computer algebra system*, David A. Smith, Duke University.

9:30 a.m. – 9:55 a.m. *The Colby experience: two classroom examples*, Donald Small, Colby College

10:00 a.m. – 10:25 a.m. Title to be announced, Bruce W. Char, University of Tennessee at Knoxville

10:30 a.m. – 10:55 a.m. *New perspectives, current concerns, future directions*, Warren Page

### NAM-MAA Panel Discussion

The National Association of Mathematicians and the Mathematical Association of America are cosponsoring a panel discussion on the *Impact of computer science on the mathematics program*, scheduled from 9:30 a.m. to 10:55 a.m. on Friday, January 8. The moderator is David W. Ballew, Western Illinois University.

### TA/PTI Panel Discussion

The CTUM Subcommittee on Teaching Assistants and Part-Time Instructors is sponsoring a panel discussion scheduled from 10:00 a.m. to 10:55 a.m. on Friday, January 8. The organizer of the panel is Bettye Anne Case, Florida State University. The participants are the organizer; Thomas F. Banchoff, Brown University; Annette Blackwelder, Florida State University; and John Philip Huneke, Ohio State University. Most of the time will be an informal exchange between the panel and the audience.

### Presentation on Participation of Women

The Committee on the Participation of Women is sponsoring an address on *Academic structure and women faculty* by Donna Shavlik, Director of the American Council on Education, Office of Women in Higher Education. The talk is scheduled from 1:30 p.m. to 2:20 p.m. on Friday, January 8.

### Teaching experiences in Soweto

There will be a special presentation on Saturday, January 9, from 3:15 p.m. to 3:45 p.m. on *Teaching experiences in Soweto*, given by Terry Lloyd Jenkins, University of Wyoming.

### 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 1.**

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 1), 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 5:00 p.m. to 6:00 p.m. on Friday, January 8. The Chauvenet Prize and the Award for Distinguished Service to Mathematics will be presented. Some bylaw changes allowing the creation of an Associate Secretary will be submitted to the membership. 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 5. 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 5.

### Joint AMS – MAA Sessions

#### AMS-MAA Invited Addresses

By invitation of the AMS-MAA Joint Program Committee (H. W. Lenstra, Jr., Carl Pomerance, Paul H. Rabinowitz, and James W. Vick, chairman), 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:

Lipman Bers, Columbia University, *The European mathematicians' migration to America*, 11:10 Friday.

Joseph W. Dauben, Graduate School and University Center, CUNY, *Georg Cantor – the battle for transfinite set theory*, 11:10 a.m. Saturday.

John G. Kemeny, Dartmouth College, *How computers have changed the way I teach*, 11:10 a.m. Wednesday.

David Mumford, Harvard University, *Oscar Zariski and his work*, 11:10 a.m. Thursday.

#### 100 Years of American Mathematics

In Atlanta, Thursday evening, January 7, will be devoted to a Special Banquet, co-hosted by the Presidents of AMS and MAA, launching *100 Years of American Mathematics*, a year-long expansion of the Society's Centennial linking ten major events in 1988. A letter of invitation from President Gillman and further details on the banquet appear on pages xviii and xix.

On Friday evening, January 8, the AMS and MAA, in cooperation with the Society for Industrial and Applied Mathematics, the Board of Mathematical Sciences, and the Mathematical Sciences Education Board, have organized a Special Program on *Forces for Change in Mathematics Education*. This program begins at 6:15 p.m. with an exhibitor-hosted open reception and light supper, followed at 7:30 p.m. by three concurrent sessions to help launch The Mathematical Sciences in the Year



2000 (MS 2000), a joint BMS/MSEB project for the revitalization of collegiate mathematics, undertaken at the request of AMS, MAA, and SIAM. Again, further details on this Special Program appear on pages xviii and xix.

#### **Ethno-mathematics Panel Discussion**

The AAAS-AMS-MAA Committee on Opportunities in Mathematics for Disadvantaged Groups is sponsoring a panel discussion on *How does ethno-mathematics make sense at the college level?* This panel is scheduled from 1:00 p.m. to 3:00 p.m. on Saturday, January 9. The organizer is Gloria Gilmer, Math-Tech, Inc. The participants are the organizer; Ubiratan D'Ambrosio, Universidade Estadual de Campinas (Brazil); Solomon A. Garfunkel, COMAP; Marcia Ascher, Ithaca College; and Arthur B. Powell, Jr., Rutgers University.

#### **AMS-MAA-TUG Workshop**

This workshop is being cosponsored by the AMS and MAA and will be presented by the T<sub>E</sub>X Users Group.

T<sub>E</sub>X is a series of programs for preparation of scientific papers for publication. It was developed by Donald Knuth, Stanford University, Computer Science Department. This workshop is designed to familiarize the participant with T<sub>E</sub>X and also give basic instruction in how to use T<sub>E</sub>X. An opportunity for hands-on experimentation using the IBM PC will be available.

The AMS-T<sub>E</sub>X macro package, which was written by Michael Spivak to simplify using T<sub>E</sub>X for inputting mathematical material, will be discussed also.

This workshop will be presented in three two-hour sessions on Tuesday, January 5: 9:00 a.m. to 11:00 a.m., 2:00 p.m. to 4:00 p.m., and 7:00 p.m. to 9:00 p.m. A fee of \$60 will be charged through preregistration. The fee at the meeting is \$80.

### **94th Annual Meeting of the AMS January 6 – 9, 1988**

The **American Mathematical Society** (AMS) program will feature a series of four Colloquium Lectures on *Spectral properties of Riemannian manifolds* presented by Victor Guillemin. The sixty-first Josiah Willard Gibbs Lecture on *How natural is our mathematics? The example of equilibrium statistical mechanics* will be presented by David P. Ruelle. There will be eight fifty-minute invited addresses given by Constantine M. Dafermos, Brown University; R. Mark Goresky, Northeastern University; Philip J. Hanlon, University of Michigan; H. W. Lenstra, Jr., University of California, Berkeley; Dusa McDuff, SUNY at Stony Brook; Roger D. Nussbaum, Rutgers University; Peter Clive Sarnak, Stanford University; and Stephen William Semmes, Yale University.

The American Mathematical Society will also present a short course entitled *Computational complexity theory* on Tuesday and Wednesday, January 5–6.

#### **Activities of Other Organizations**

The **Association for Women in Mathematics** (AWM) will sponsor a panel discussion on *Is the climate for women in mathematics changing?* on Wednesday, January 6 at 3:20 p.m. The moderator is Judith Roitman, University of Kansas. Panelists include Louise Hay, University

of Illinois at Chicago; Mary Ellen Rudin, University of Wisconsin; Nancy K. Stanton, University of Michigan, Ann Arbor; and Karen Uhlenbeck, University of Chicago.

The AWM Business Meeting will be held at 4:20 p.m. on Wednesday, January 6.

An open reception is being planned by AWM at 9:30 p.m. on Wednesday, January 6.

The AWM will also sponsor the eighth annual Emmy Noether Lecture at 9:00 a.m. on Thursday, January 7. The speaker is Karen Uhlenbeck, University of Chicago. The title of her lecture will be announced.

The **Interagency Commission for Extramural Mathematics Programs** (ICEMAP) will present a session at 7:15 p.m. on Wednesday, January 6. ICEMAP is a coordinating group of all federal funding agencies which sponsor basic and applied research in mathematical sciences. This includes NSF, DOE and DOD agencies such as AFOSR, ARO, DARPA, NSA and ONR. This forum will provide presentations by the key members of this group about the research opportunities and program trends at their respective agencies. The panel will be chaired/moderated by Jagdish Chandra, Director, Mathematical Sciences Division, U.S. Army Research Office, who is the current chairman of ICEMAP. Members will be available for informal discussion after the panel.

The **Joint Policy Board for Mathematics** (JPBM) Committee for Mathematics Department Heads has organized a National Meeting of Department Heads at 8:45 p.m. on Friday, January 8.

Information on a number of special events being planned for the Atlanta meetings in connection with *100 Years of American Mathematics* can be found on pages xviii and xix.

The **National Association of Mathematicians** (NAM) will receive the William W. S. Claytor Session of Invited Presentations at 1:00 p.m. on Saturday, January 9.

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

The NAM Business Meeting will take place at 10:00 a.m. on Saturday, January 9.

A panel discussion sponsored by MAA and NAM will be held on Friday, January 8. Further information can be found in the MAA section of this announcement.

The **National Science Foundation** (NSF) will sponsor a session at 5:45 p.m. on Wednesday, January 6.

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 **Rocky Mountain Mathematics Consortium** (RMMC) Board of Directors will meet on Thursday, January 7, 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 and are located in Ivy Hall, Hyatt Regency Atlanta.

### Exhibits

The book and educational media exhibits will be located in Ivy Hall, Hyatt Regency Atlanta, and will be open Wednesday through Saturday, January 6-9. 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 Atlanta meetings should read carefully the important article about the Register which follows this meeting announcement.

### Accommodations (forms on page xxxii)

#### Hotels

The rates listed below are subject to an 11 percent sales/occupancy tax. The estimated walking distance from the hotel to the headquarters hotel is given in parentheses following the telephone number. Checkout time for all hotels is 12:00 noon.

**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 at or in close proximity to the Hyatt. Participants are also urged to read the "Words to the Wise" in the local information insert in the program they receive at the meetings.**

**Reservations at these hotels cannot be made by calling the hotel directly until after December 9, 1987. After December 14, 1987, 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.**

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 23, 1987**. The telephone number in Providence is 401-272-9500 (extension 290). 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 or deposits. A deposit of \$50 is required for each room reservation and may be paid by check, VISA, MASTERCARD, or American Express (for housing only) credit cards.** (Canadian checks should be marked "In U.S. funds".)

The following hotels accept American Express, MasterCard, Visa, Carte Blanche, and Diners' Club credit cards, personal checks with identification, and travelers' checks as payment for room charges.

#### Hyatt Regency Atlanta, Headquarters Hotel

265 Peachtree Street Northeast  
Atlanta, Georgia 30303  
Telephone: 404-577-1234

Singles	\$69
Doubles	\$80 (1 or 2 beds)
Triples	\$89
Quads	\$98

There is no charge for children 17 years of age and younger. The Hyatt is a full-service hotel equipped with restaurants, lounge, and outdoor pool. Parking is \$8 per day. Rates for suites vary upon request. There is also a small health club including free weights, Universal Paramount machine, sauna and steam room.

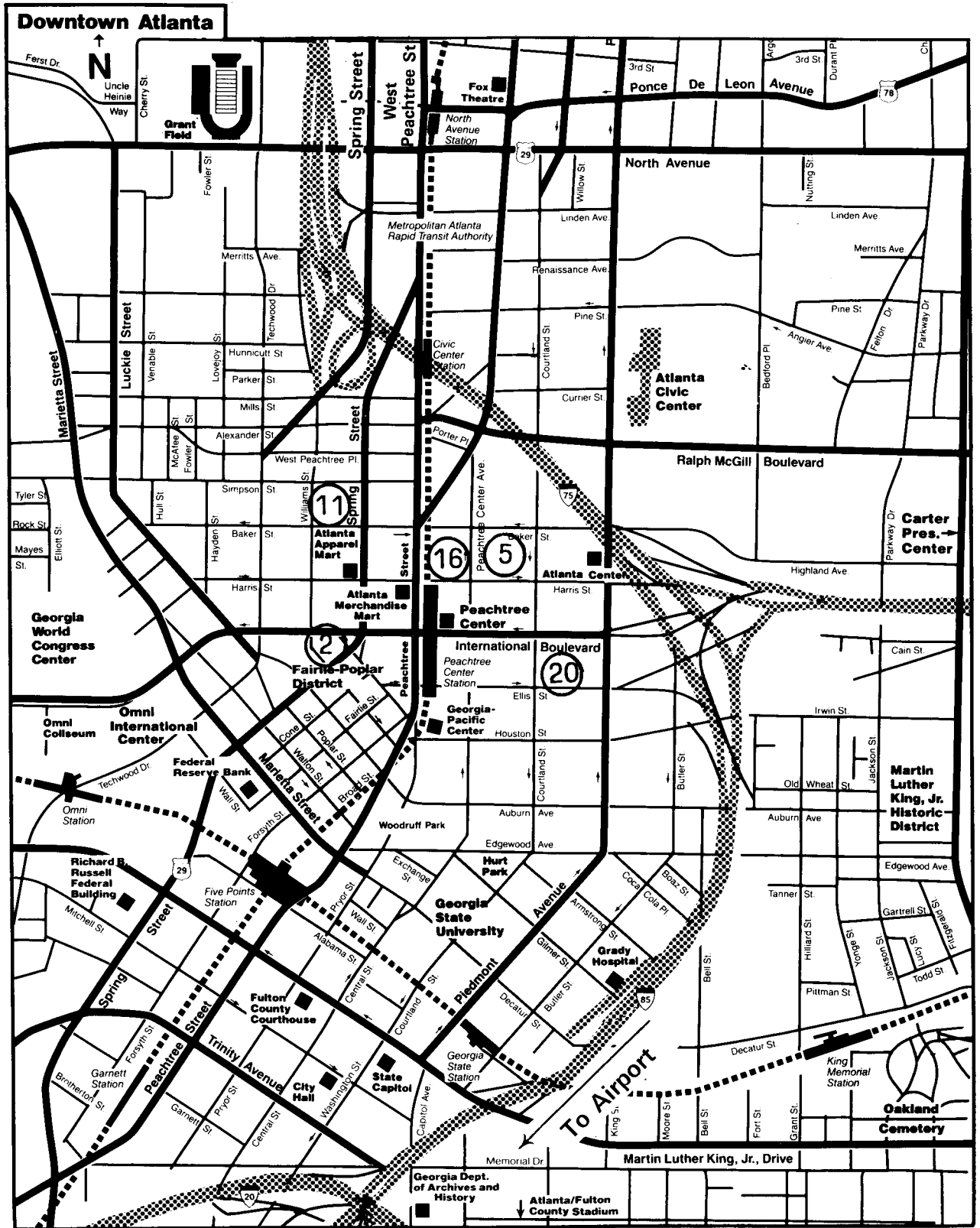
#### Marriott Marquis

265 Peachtree Center Avenue  
Atlanta, Georgia 30303  
Telephone: 404-586-6045 (1 block)

Singles	\$71
Doubles	\$81 (1 or 2 beds)
Additional person	\$20 extra

There is no charge for children 17 years of age and younger. The Marriott is a full-service hotel equipped with restaurants, lounge, and indoor pool. Parking is \$8 per day. Rates for suites vary upon request.

*(continued on page xi)*



DOWNTOWN ATLANTA



- ② American Hotel
- ①① Days Inn Downtown
- ⑤ Atlanta Marriott Marquis
- ①⑥ Hyatt Regency Atlanta (Headquarters)
- ②① Radisson Hotel Atlanta

**Radisson**

Courtland & International Blvds.  
 Atlanta, Georgia 30303  
 Telephone: 404-659-6500 (2 blocks)

Singles	\$60
Doubles	\$65 (1 or 2 beds)
Triples	\$70
Triples	\$86 (with cot)
Quads	\$75
Quads	\$91 (with cot)

There is no charge for children 12 years and younger. The Radisson is a full-service hotel equipped with restaurant, lounge, and indoor pool. Parking is \$4 per day. Rates for suites vary upon request.

**American**

Spring Street at International  
 Atlanta, Georgia 30303  
 Telephone: 800-621-7885 (2 blocks)

Singles	\$55
Doubles	\$60 (1 or 2 beds)
Triples	\$65
Triples	\$70 (with cot)
Quads	\$65
Quads	\$70 (with cot)

There is no charge for children 17 years and younger. The American is a full-service hotel equipped with restaurant, coffee shop, outdoor pool, and lounge. Parking is \$2 per day. Rates for suites vary upon request.

**Days Inn Downtown**

300 Spring Street  
 Atlanta, Georgia 30308  
 Telephone: 800-325-2525 (1 block)

Singles	\$55
Doubles	\$65 (1 or 2 beds)
Triples	\$65
Quads	\$65

The Days Inn Downtown is a full-service hotel equipped with a restaurant and outdoor pool. Parking is \$3 per day. Rates for suites vary upon request.

Most hotel facilities are accessible to the handicapped. People with special requirements should contact the Mathematics Meetings Housing Bureau. The Hyatt has two specially equipped rooms for handicapped.

**San Antonio Room Lottery Winners**

The following participants received a complimentary hotel room during the San Antonio 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 Atlanta meetings are urged to consider the **early deadline of October 26** in order to qualify for the Atlanta Room Lottery.

Hyatt Regency  
 John E. Sasser  
 Norman R. Howes  
 Robert L. Devaney  
 Ronald E. Bruck  
 Michael W. Ecker

Gerald L. Norword  
 Travelodge  
 Michael J. Evans  
 Charles R. Grissom, Jr.  
 Holiday Inn  
 Ronald D. Jamison  
 La Quinta Market Square  
 Greg A. Kirmayer  
 Mitsuhiro Okada  
 Crockett  
 Donald E. Sarason  
 George Crocker  
 Edmond Nadler  
 La Quinta Convention Center  
 Edwin E. Moise  
 David F. Dawson

**Registration at the Meetings (form on page xxxi)**

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 Regency Ballroom in the Hyatt Regency Atlanta. (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 fees for Joint Meetings registration at the meeting listed below are 30 percent more than the preregistration fees.

Participants wishing to attend sessions for one day only may take advantage of the one-day fees listed below. These special fees are effective daily January 6 through 9, and are available at the meeting to members and nonmembers only. These one-day fees are not applicable to student, unemployed, or emeritus participants, whose fees for registration at the meetings are listed below.

**Joint Mathematics Meetings**

Member of AMS, CMS, MAA	\$ 79
Emeritus Member of AMS, MAA	\$ 22
Nonmember	\$122
Student/Unemployed	\$ 22

**Joint Mathematics Meetings One-Day**

Member of AMS, CMS, MAA	\$ 41
Nonmember	\$ 63

**Employment Register**

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

**AMS Short Course**

Student/Unemployed	\$ 15
All Other Participants	\$ 45

**MAA Minicourses**

(if openings available)

Minicourses # 1, 2, 5, 7, 10, or 11	\$ 40
Minicourses # 3, 4, 6, 8, 9, 12, or 13	\$ 30

**AMS-MAA-TUG Workshop** \$ 80

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 is 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 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, Times, and Locations****AMS Short Course**

Outside Lancaster A & B, Hyatt Regency Atlanta  
 Tuesday, January 5 8:00 a.m. to 2:30 p.m.

**Joint Mathematics Meetings**

[and MAA Minicourses (until filled)]

Ivy Hall, Hyatt Regency Atlanta  
 Tuesday, January 5 4:00 p.m. to 8:00 p.m.  
 Wednesday, January 6  
 through 7:30 a.m. to 4:00 p.m.  
 Friday, January 8  
 Saturday, January 24 7:30 a.m. to 3:00 p.m.

**AMS-MAA-TUG Workshop**

Outside English Suite, Hyatt Regency Atlanta  
 Tuesday, January 5 8:00 a.m. to 9:30 a.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 in Ivy Hall **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 meetings cashier will not be able to cash checks and travelers' checks can be easily cashed at local banks, restaurants, or hotels.

*Local Information*

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

*Lost and Found*

See the Joint Meetings cashier.

*Mail*

All mail and telegrams for persons attending the meetings should be addressed as follows: Name of Participant, c/o Joint Mathematics Meetings, Atlanta Convention and Visitors Bureau, 233 Peachtree Street NE, Suite 200, Peachtree Harris Building, Atlanta, GA 30043. 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 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.

*Telephone Messages*

A telephone message center is located in the registration area to receive incoming calls for participants. The center is open from January 5 through 9, 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. The telephone number of the message center will be announced later.



### Information Table

The information table at Joint Meetings of the AMS and MAA is set up in the registration area for the dissemination of information of a nonmathematical nature of possible interest to the members. The administration of the information table is in the hands of the AMS-MAA Joint Meetings Committee, as are all arrangements for such joint meetings. The following rules and procedures apply.

1. Announcements submitted by participants should ordinarily be limited to a single sheet no more than  $8\frac{1}{2}'' \times 14''$ .
2. A copy of any announcement proposed for the table is to be sent to the Director of Meetings, American Mathematical Society, Post Office Box 6248, Providence, Rhode Island 02940 to arrive at least one week before the first day of the scientific sessions.
3. The judgment on the suitability of an announcement for display rests with the Joint Meetings Committee. It will make its judgments on a case by case basis to establish precedents.
4. Announcements of events competing in time or place with the scheduled scientific program will not be accepted.
5. Copies of an accepted announcement for the table are to be provided by the proponent. Announcements are not to be distributed in any other way at the meeting (for example, not by posting or personal distribution of handbills).
6. It may be necessary to limit the number of events or the quantity of announcements distributed at a meeting.
7. At the close of registration, the table will be swept clean. A proponent who wishes the return of extra copies should remove them.

### 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 two state-licensed child care facilities that are available. Reservations should be made directly with the facility of your choice.

ABC Atlanta Best Care, 404-451-2884-5, 3154 Shallowford Road, Atlanta 30341. Contact Wendy. All ages. In the Hyatt Regency Atlanta. Rates: \$4 per hour, 4 hour minimum, \$7.50 booking fee. Maximum \$12. Please make reservations by December 1.

The Wonderful World of Children, 404-881-6668, 1316 West Peachtree, Atlanta 30309. Located near the Arts Center MARTA Station (See Local Information). Contact Melanie. Ages 6 weeks to 11 years. Hours: 24 hours per day, 7 days a week. Rates: \$3.50 per hour under 30 months old; \$3 per hour over 30 months old. One time insurance fee \$10. Please make reservations at least one week in advance.

In addition, a Parent-Child Lounge will be located adjacent to the Joint Meetings registration area in Ivy Hall of the Hyatt. It will be furnished with casual furniture, cribs, 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.

The Hyatt Regency Atlanta has a limited number of cribs. Reservations should be made by December 1 directly through the Mathematics Meetings Housing Bureau. Metal portacribs can be rented from Aaron Rents, 1853 Piedmont Road, Atlanta 30324, 404-873-1455. Reservations should be made by December 1. The cost is approximately \$12.50 per week. Tax is 5 percent. Aaron Rents is about three miles from the Hyatt. They will deliver to the Hyatt for \$31.50. Contact the manager, Scott Boswell.

### Local Information

Atlanta, the state capital, is located in the northwest part of Georgia. Since its inception, Atlanta has been a transportation hub, first with the railways and now with the airlines. Hartsfield Airport is the busiest in the world. Atlanta is a major commercial center and the home of Coca Cola.

Bus and rapid rail service are available by MARTA, Metropolitan Atlanta Rapid Transit Authority, 404-522-4711, where 152 bus routes feed into 26 rail stations. The Peachtree Center Station is one block from the Hyatt. Passengers can ride anywhere MARTA serves for 75 cents, exact change required. Tokens are 8 for \$5 and 10 for \$6. Tokens are available at the main Five Points station and from machines (\$5 only) in all MARTA stations. The downtown Atlanta map shows rapid rail stations (see dotted line along Peachtree Street).

Downtown sights include:

Carter Presidential Center, (about three miles from Hyatt), 1 Copen Hill, 404-331-3942. President Jimmy Carter's life and administration and the office of the presidency itself are portrayed. Accessible by MARTA bus #16 from the Five Points station.

Federal Reserve Bank, (about one mile from Hyatt), Monetary Museum, 104 Marietta Street, NW, 404-521-8747. The Monetary Museum traces the evolution of currency through the ages, and is located a few blocks from the Five Points station.

Fox Theater, (about one mile from Hyatt), 660 Peachtree Street, NE, 404-881-1977. The Fox is fancy outside with its minarets, onion domes and parapets and inside with Egyptian-Art Deco trappings. Hosts a wide

range of live performance, and is adjacent to the North Avenue station.

Georgia State Capitol, (about one and one half miles from Hyatt), Capitol Hill at Washington Street, 404-656-2844. Besides the state offices included are natural science displays, A Hall of Flags and a Hall of Fame honoring outstanding Georgians; located one block south of the Georgia State station.

High Museum of Art, (about two miles from Hyatt), 1280 Peachtree Street, NE, 404-892-3600, 24-hour information line 892-HIGH. Contains collections of European and American paintings, sculpture and decorative arts, photography, prints and graphics and international traveling exhibits. Covered walk leads from adjacent Arts Center station.

High Museum at Georgia-Pacific Center, (about four blocks from Hyatt) 133 Peachtree Street, NE, 404-577-6940. Contains works from the "uptown" High Museum along with rotating traveling exhibits, adjacent to the Peachtree Center station.

Martin Luther King, Jr. Historical Site, Auburn Avenue between Jackson and Randolph Streets, two blocks associated with Martin Luther King, Jr., the Nobel Peace Prize winner and civil rights leader. The birth home: 507 Auburn Avenue, 404-331-5190. Ebenezer Baptist Church: 407 Auburn Avenue, 404-688-7263. Gravesite: 449 Auburn Avenue, 404-524-1956. MARTA bus #3 (Auburn Avenue) from Five Points and #3 (MLK) from Edgewood/Candler Park station.

Metropolitan highlights include:

Atlanta Historical Society, 3101 Andrews Drive, 404-261-1837. Rotating exhibits, archives and library. Swan House, 1928 Anglo-Palladian showstopper and 1830 middle-class Tullie Smith House, Swan House Coach House contains a restaurant, art gallery and gift shop. Take MARTA bus #40 (West Paces Ferry) from Lenox station.

Cyclorama, Grant Park, Georgia and Cherokee Avenues, SE, 404-658-7625. Immense painting in the round of the Civil War Battle of Atlanta, also a film and exhibits. Take Marta bus #31 (Grant Park), #97 (Atlanta Avenue/Georgia Avenue), #32 (Eastland) from Five Points station.

Georgia's Stone Mountain Park, (about fifteen miles from Hyatt), Highway 78, Stone Mountain, GA, 404-498-5600. The world's largest bas-relief sculpture on the world's largest mass of granite, a 3200 acre park with skating, camping, swimming, fishing, tennis and golf. Take MARTA bus #120 from Avondale station, limited return bus service on weekdays.

Lenox Square, (about seven miles from Hyatt), 3393 Peachtree Road, NE, 404-233-6767. The South's oldest and largest shopping center. Rich's, Macy's, Neiman-Marcus and over 100 shops, restaurants and boutiques; adjacent to Lenox station.

Tours are available from the following firms:

Atlanta Tours and Sightseeing, 255 Peachtree Center Avenue, Suite M42, Atlanta, 30303, 404-522-4299

Gray Line of Atlanta, 3745 Zip Industrial Boulevard, SE, Atlanta 30354, 404-767-0594

### Smoking

Please note that smoking is not allowed in any of the session rooms in the Hyatt Regency Atlanta or the Atlanta Marriott Marquis.

### Travel

In January, Atlanta is on Eastern Standard Time. The city is served by most major U.S. airlines. The airport lies about ten miles south of the Hyatt. The airport shuttle runs every half hour to the Hyatt. It costs \$7.50 one way. Cab fare to the Hyatt should cost \$14.

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 on page iv. 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.

If you drive to Atlanta, you will approach the Hyatt from the North on I-75 and I-85. Exit the interstate onto Courtland Street, proceed south about three blocks and turn right onto International Boulevard. Proceed west two blocks and turn right onto Peachtree Center Avenue. The Hyatt parking entrance is about two blocks north on Peachtree Center Avenue. See map of downtown Atlanta.

If you approach the Hyatt from the south on I-75 and I-85, exit the interstate onto International Boulevard. Now follow the directions in the preceding paragraph.

The interstate near the Courtland Street exit and the International Boulevard exit is being widened. Markers are temporary and are subject to change.

### Weather

In January the normal high is 52 degrees F and the normal low is 37 degrees F. Rain is common and sleet is not uncommon. It rarely snows. Weather conditions may be variable, mild one day and cold the next.

## Strengthen the MAA and Earn Credit

We are asking our members to help us enroll new members and offering current members a \$10 credit for each new member signed up. Our members are our strength. We need new members as a source of new ideas and energy, to help move our present program ahead, to better promote mathematics, to share the benefits and costs of membership. To earn your \$10 credits, sign up new members using a copy of the form on the facing page.

## Help Strengthen MAA. See facing page.

### OLD MEMBER'S PART OF FORM

This complete form with current member's name below must be returned to receive proper credit.

name \_\_\_\_\_

address on MAA records \_\_\_\_\_

(SEE FOCUS LABEL) \_\_\_\_\_

address \_\_\_\_\_

city \_\_\_\_\_

state \_\_\_\_\_ zip \_\_\_\_\_

MAA customer code (above name of FOCUS Label) \_\_\_\_\_

### CATEGORIES OF MEMBERSHIP

#### ALL MEMBERS

*From the bylaws of the Association:*

*Art. II, Sec. 2.* Any person interested in the field of collegiate mathematics shall be eligible for election to ordinary membership in the Association.

*Sec. 4.* Election to membership shall be by vote of the Board upon written application from the individual . . . seeking admission. In the case of individuals qualifying for student dues the application shall be endorsed by two ordinary members of the Association.

*Art. VII, Sec. I.* The Board shall establish the annual dues and privileges of membership for ordinary . . . members. The dues of ordinary members shall include a subscription to one of the official journals.

The Board has set the **annual dues** for ordinary members at the rates specified on the form.

The membership year is a calendar year. Members entering the Association between November 1 and March 31 should send one year's dues with this application; Journals will be sent beginning with the nearest January issue.

Members entering between April 1 and October 31 may, if they wish, send a payment covering dues for one and one-half years, at the appropriate rate; Journals will then be sent beginning with the nearest June issue.

#### STUDENT MEMBERSHIP

Student Membership is available to high school and undergraduate students and students regularly enrolled in graduate study at least half-time.

Applicants for Student Membership must be nominated by two members of the Association. Nomination implies affirmation that the applicant qualifies for this special membership under the definition stated above.

#### NOMINATION FOR STUDENT MEMBERSHIP

We the undersigned members of the Association  
recommend that this application for  
Student Membership be approved.

Print name: \_\_\_\_\_

Signature: \_\_\_\_\_

Print name: \_\_\_\_\_

Signature: \_\_\_\_\_

#### UNEMPLOYED MEMBERSHIP

Unemployed rates are also available on request to unemployed mathematicians for a period of up to two years. The unemployed status refers to anyone currently unemployed and actively seeking employment. It is not intended to include members who have voluntarily resigned or retired from their latest position. To request these rates as an unemployed member applicant should enclose a letter stating that he/she meets the above criteria.

### NEW MEMBER'S APPLICATION

Mail to:

The Mathematical Association of America • Tel: 202 387-5200  
1529 Eighteenth Street, Northwest, Washington, DC 20036

I hereby apply for membership in the Mathematical Association of America.

I have  have not  been a member of MAA before (maiden name \_\_\_\_\_).

**PLEASE PRINT CLEARLY**

\_\_\_\_\_  
TITLE, FIRST NAME, MIDDLE INITIAL, LAST NAME

\_\_\_\_\_  
ADDRESS FOR ALL MAIL

\_\_\_\_\_  
CITY, STATE/PROV, ZIP/POSTAL CODE

\_\_\_\_\_  
DATE OF BIRTH

\_\_\_\_\_  
HIGHEST EARNED DEGREE, YEAR AWARDED, AWARDING INSTITUTION

\_\_\_\_\_  
CURRENT POSITION (OR "STUDENT")

\_\_\_\_\_  
EMPLOYER (OR STUDENT'S INSTITUTION)

\_\_\_\_\_  
EMPLOYERS CITY, STATE

#### Membership Fees

All MAA members receive *FOCUS*, the Newsletter of the Mathematical Association of America. Subscription prices are included with dues.\*

#### Journal Options/Membership Fees

CIRCLE the appropriate number in the table below and write the amount below.

M = The AMERICAN MATHEMATICAL MONTHLY  
G = MATHEMATICS MAGAZINE  
J = COLLEGE MATHEMATICS JOURNAL

Line	M	G	J	M+G	M+J	G+J	M+G+J
Regular	\$40.00	\$28.00	\$31.00	\$52.00	\$55.00	\$43.00	\$67.00
Student	\$24.00	\$18.00	\$20.00	\$30.00	\$32.00	\$26.00	\$38.00

Student memberships require special certification and approval. See left column.

Amount paid \$ \_\_\_\_\_ (fill in)

Method of payment (U.S. funds only please)

Check.

Credit Card. Type \_\_\_\_\_

Card Number (Please show blanks)

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Expiration date \_\_\_\_/\_\_\_\_

Signature \_\_\_\_\_

\*Annual dues include annual subscription prices as follows: Reg. Memb. \$24 (M), \$15 (J), \$12 (G), \$1 (Focus), Std. Memb. \$12 (M), \$8 (J), \$6 (G), \$1 (Focus).

# MAA PROGRAM

## Tuesday, January 5

- 9:00 a.m. – 4:00 p.m. **Board of Governors' Meeting**  
 9:00 a.m. – 9:00 p.m. **AMS-MAA-TUG Workshop**  
 7:00 p.m. – 9:00 p.m. **Section Officers' Meeting**  
 7:00 p.m. – 9:00 p.m. **Minicourse #1 (Part A):** *Using computer graphing to enhance the teaching and learning of calculus and precalculus mathematics*, Franklin D. Demana and Bert K. Waits, Ohio State University

## Wednesday, January 6

- morning – **Contributed Paper Session:** *History of contemporary mathematics*, Florence D. Fasanelli, Sidwell Friends School, Washington, DC, Victor J. Katz, University of District Columbia, and V. Frederick Rickey, Bowling Green State University
- 8:30 a.m. – 10:55 a.m. **Panel Discussion:** *Software issues – pricing, copy protection, copyright*, Sponsored by Committee on Computers in Mathematics Education, Howard Anton, Drexel University (moderator)
- 9:00 a.m. – 10:55 a.m. **Panel Discussion:** *Compressing five into four: how can we streamline the first two years of college mathematics?* Sponsored by CUPM subcommittee on the First Two Years of College Mathematics, Richard D. Anderson, Louisiana State University (moderator)
- 9:00 a.m. – 10:55 a.m. **Minicourse #2 (Part A):** *Computer software for differential equations*, Howard Lewis Penn and James Buchanan, U. S. Naval Academy
- 9:00 a.m. – 10:55 a.m. **Minicourse #3 (Part A):** *Teaching mathematical modeling*, Frank R. Giordano, U. S. Military Academy, and Maurice D. Weir, Naval Postgraduate School
- 9:00 a.m. – 10:55 a.m. **Minicourse #4 (Part A):** *Teaching calculus with an HP-28C symbol manipulating calculator*, John W. Kenelly, Clemson University
- 11:10 a.m. – noon **AMS-MAA Invited Address:** *How computers have changed the way I teach*, John G. Kemeny, Dartmouth College
- 2:15 p.m. – 3:05 p.m. **Invited Address:** *Singularly perturbed equations – theory vs. applications*, Jane Cronin Scanlon, Rutgers University
- 2:15 p.m. – 4:15 p.m. **Minicourse #5 (Part A):** *Logo and problem solving*, Charles A. Jones, Grinnell College
- 3:20 p.m. – 4:10 p.m. **Invited Address:** *Perpendicular arrays and graph decompositions*, Charles C. Lindner, Auburn University
- 4:30 p.m. – 6:00 p.m. **Reception:** Committee on Two-Year Colleges
- 4:30 p.m. – 6:30 p.m. **Minicourse #1 (Part B):** *Using computer graphing to enhance the teaching and learning of calculus and precalculus mathematics*, Franklin D. Demana and Bert K. Waits, Ohio State University
- 4:30 p.m. – 6:30 p.m. **Minicourse #6 (Part A):** *Coloring and path following algorithms for approximating roots and fixed points*, William F. Lucas, Claremont Graduate School

## Thursday, January 7

- 9:00 a.m. – 9:50 a.m. **Invited Address:** *What does it mean to understand the function concept?* Lawrence Couvillon, Southern University
- 9:00 a.m. – 10:55 a.m. **Minicourse #5 (Part B):** *Logo and problem solving*, Charles A. Jones, Grinnell College
- 10:05 a.m. – 10:55 a.m. **Invited Address:** *Title to be announced*, Jeffrey C. Lagarias, AT&T Bell Laboratories
- 11:10 a.m. – noon **AMS-MAA Invited Address:** *Oscar Zariski and his work*, David Mumford, Harvard University
- 2:15 p.m. – 4:15 p.m. **Panel Discussion:** **Sponsored by the Task Force on Minorities in Mathematics, *Mathematics, minorities and the MAA – How do they fit together?*** Reuben Hersh, University of New Mexico (moderator)
- 2:15 p.m. – 4:15 p.m. **Contributed Paper Session:** *Writing as part of the mathematics curriculum*, Andrew Sterrett, Denison College
- 2:15 p.m. – 4:15 p.m. **Panel Discussion on ICME-6:** *What can mathematicians contribute to mathematics education?* Eileen L. Poiani, St. Peter's College (moderator)
- 2:15 p.m. – 4:15 p.m. **Minicourse #2 (Part B):** *Computer software for differential equations*, Howard Lewis Penn and James Buchanan, U. S. Naval Academy
- 2:15 p.m. – 4:15 p.m. **Minicourse #3 (Part B):** *Teaching mathematical modeling*, Frank R. Giordano, U. S. Military Academy and Maurice D. Weir, Naval Postgraduate School
- 2:15 p.m. – 4:15 p.m. **Minicourse #4 (Part B):** *Teaching calculus with an HP-28C symbol manipulating calculator*, John W. Kenelly, Clemson University
- 7:00 p.m. – 9:00 p.m. **Minicourse #3 (Part C):** *Teaching mathematical modeling*, Frank R. Giordano, U. S. Military Academy and Maurice D. Weir, Naval Postgraduate School
- 7:00 p.m. – 9:00 p.m. **Minicourse #6 (Part B):** *Coloring and path following algorithms for approximating roots and fixed points*, William F. Lucas, Claremont Graduate School

## Friday, January 8

- 8:30 a.m. – 10:55 a.m. **Symposium: Sponsored by Committee on Computers in Mathematics Education, *Applications and implications of computer algebra systems in mathematics instruction***, Warren Page, New York City Technical College (organizer)
- 9:00 a.m. – 10:55 a.m. **Minicourse #7 (Part A): *Computer based discrete mathematics***, Nancy Baxter, Dickinson College and Ed Dubinsky, Purdue University
- 9:00 a.m. – 10:55 a.m. **Minicourse #8 (Part A): *Laboratory projects for first year calculus***, L. Carl Leinbach, Gettysburg College
- 9:00 a.m. – 10:55 a.m. **Minicourse #9 (Part A): *Constructing placement examinations***, John G. Harvey, University of Wisconsin at Madison
- 9:30 a.m. – 10:55 a.m. **NAM-MAA Panel Discussion: *Impact of computer science on the mathematics program***, David W. Ballew, Western Illinois University (moderator)
- 10:00 a.m. – 10:55 a.m. **Panel Discussion: Sponsored by CTUM Subcommittee on Teaching Assistants and Part-Time Instructors**, Bettye Anne Case, Florida State University (organizer)
- 11:10 a.m. – noon **AMS-MAA Invited Address: *The European mathematicians' migration to America***, Lipman Bers, Columbia University
- 1:30 p.m. – 2:20 p.m. **Presentation: Sponsored by Committee on Participation of Women, *Academic structure and women faculty***, Donna Shavlik, Director of the American Council on Education, Office of Women in Higher Education
- 1:30 p.m. – 3:30 p.m. **Minicourse #10 (Part A): *Computer graphics in elementary statistics***, Florence S. Gordon, New York Institute of Technology, and Sheldon P. Gordon, Suffolk Community College
- 2:45 p.m. – 3:35 p.m. **Invited Address: *Calculus: Past, present, and future***, Ronald G. Douglas, SUNY at Stony Brook
- 3:50 p.m. – 4:40 p.m. **Retiring Presidential Address: *Celebrating mathematics***, Lynn A. Steen, St. Olaf College
- 5:00 p.m. – 6:00 p.m. **Prize Session and Business Meeting: Chauvenet Prize and Award for Distinguished Service**
- 7:00 p.m. – 9:00 p.m. **Minicourse #11 (Part A): *The use of computing in teaching linear algebra***, Eugene Herman and Charles Jepsen, Grinnell College
- 7:00 p.m. – 9:00 p.m. **Minicourse #12 (Part A): *Using computer algebra systems in undergraduate mathematics***, Paul Zorn, St. Olaf College
- 7:00 p.m. – 9:00 p.m. **Minicourse #13 (Part A): *Learning mathematics through discrete dynamical systems***, James T. Sandefur, Georgetown University

## Saturday, January 9

- 9:00 a.m. – 9:50 a.m. **Invited Address: *Codes and designs – existence and uniqueness***, Vera S. Pless, University of Illinois at Chicago
- 9:00 a.m. – 10:55 a.m. **Minicourse #10 (Part B): *Computer graphics in elementary statistics***, Florence S. Gordon, New York Institute of Technology, and Sheldon P. Gordon, Suffolk Community College
- 10:05 a.m. – 10:55 a.m. **Invited Address: *Title to be announced***, Donald L. Kreider, Dartmouth College
- 11:10 a.m. – noon **AMS-MAA Invited Address: *Georg Cantor – The battle for transfinite set theory***, Joseph W. Dauben, Graduate School & University Center, CUNY
- 1:00 p.m. – 3:00 p.m. **Panel Discussion: Sponsored by AAAS-AMS-MAA Committee on Opportunitites in Mathematics for Disadvantaged Groups, *How does ethno-mathematics make sense at the college level?*** Gloria Gilmer (organizer), Math-Tech, Inc.
- 1:00 p.m. – 3:00 p.m. **Minicourse #11 (Part B): *The use of computing in teaching linear algebra***, Eugene Herman and Charles Jepsen, Grinnell College
- 1:00 p.m. – 3:00 p.m. **Minicourse #12 (Part B): *Using computer algebra systems in undergraduate mathematics***, Paul Zorn, St. Olaf College
- 1:00 p.m. – 3:00 p.m. **Minicourse #13 (Part B): *Learning mathematics through discrete dynamical systems***, James T. Sandefur, Georgetown University
- 1:00 p.m. – 6:00 p.m. **Contributed Paper Session: *Teaching mathematical modeling***, Jeanne Agnew, Oklahoma State University
- 1:00 p.m. – 6:00 p.m. **Contributed Paper Session: *Strategies for teaching geometry***, Doris Schattschneider, Moravian College
- 3:15 p.m. – 3:45 p.m. **Special Presentation: *Teaching experiences in Soweto***, Terry Lloyd Jenkins, University of Wyoming
- 3:30 p.m. – 5:30 p.m. **Minicourse #7 (Part B): *Computer based discrete mathematics***, Nancy Baxter, Dickinson College and Ed Dubinsky, Purdue University
- 3:30 p.m. – 5:30 p.m. **Minicourse #8 (Part B): *Laboratory projects for first year calculus***, L. Carl Leinbach, Gettysburg College
- 3:30 p.m. – 5:30 p.m. **Minicourse #9 (Part B): *Constructing placement examinations***, John G. Harvey, University of Wisconsin at Madison

**MAA Program Committee:** Wade Ellis, Jr., John W. Kenelly (chair), Mary M. Neff, Rogers J. Newman, Carl Pomerance, David A. Smith, John M. Smith

**AMS-MAA Joint Program Committee:** H. W. Lenstra, Jr., Carl Pomerance, Paul H. Rabinowitz, and James W. Vick (chair)

**Local Arrangements Committee:** Jean H. Bevis, Sylvia T. Bozeman, W. Wistar Comfort (ex-officio), Frank J. Hall, Ray A. Kunze, Stephen L. Langston, Robert A. Leslie, William J. LeVeque (ex-officio), Fred A. Massey (chair), John D. Neff, Mary M. Neff, Kenneth A. Ross (ex-officio), Charles R. Stone, and Thomas R. Thomson



## A Year-long Celebration of a Century of Mathematical Achievement A Year-long Preview of the Future with Mathematics: 1988 Events

### January

**Banquet:** *100 Years of American Mathematics* AMS-MAA Special Program: *Forces for Change in Mathematics Education*—Joint Mathematics Meetings, Atlanta, GA

### February

*American Mathematics Entering its Second Century*—American Association for the Advancement of Science Annual Meeting, Boston, MA

### April

National Mathematics Awareness Week—JPBM Annual Event

### April

*A Century of American Mathematics*—National Academy of Sciences Annual Meeting, Washington, DC

### April

*The Impact of Mathematics*—Board on Mathematical Sciences Event Washington, DC

### May

*Mathematics Education: Wellspring of U.S. Industrial Strength*—Mathematical Sciences Education Board Symposium, Irvine, CA

### June

*The Legacy of John von Neumann*—Hofstra-AMS-SIAM International Symposium, Hempstead, NY

### July

*Applied Mathematics: Foundations for Science Technology*—SIAM Annual Meeting, Minneapolis, MN

### August

Mathematics into the 21st Century—AMS Centennial Celebration, Providence, RI

### October

*The Future of Mathematics Education in the U.S.*—MSEB-BMS Report to the Nation

For a detailed calendar of events, write: JPBM—100 Years, 1529 18th Street, NW, Washington, DC 20036, and watch for details in upcoming mathematics' society publications or call Kirsten Sampson at the JPBM office: (202) 387-5200.

### Sponsored by the Joint Policy Board for Mathematics:

American Mathematical Society, Mathematical Association of America, Society for Industrial and Applied Mathematics

### In cooperation with:

Board on Mathematical Sciences, Mathematical Sciences Education Board of the National Research Council

Dear MAA Member:

1988 is the centennial year of the American Mathematical Society. The Association and SIAM are joining forces with AMS to celebrate *100 Years of American Mathematics*. The year will feature ten special events, which will look to the future as well as celebrate the achievements of the past. These events will be well publicized.

The kick-off will be a banquet on January 7 at the Atlanta meeting, followed by a special session the next day on *Forces for Change in Mathematics Education*. The banquet, with AMS and MAA as co-hosts, is open to all members. The cost is \$30, with the option of buying an HP28C calculator, list price \$235, for \$60. This will be an enhanced model that Hewlett-Packard is producing for the occasion. Here, then, is a chance to acquire one of the significant forces for change in mathematics education while at the same enjoying a relaxed opportunity to see old friends in MAA and AMS and make new ones. In more materialistic language: for \$90 you get an HP28C with a dinner thrown in.

Sincerely,



Leonard Gillman  
President


**YEARS OF AMERICAN MATHEMATICS**  
 YEARS OF AMERICAN MATHEMATICS
 

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**Special Banquet, Thursday, January 7, 7:00 p.m.**

Presidents Leonard Gillman (MAA) and G. D. Mostow (AMS) will co-host a festive Thursday evening banquet to launch *100 Years of American Mathematics*, a year-long expansion of the AMS Centennial linking ten major events in 1988. A description of *100 Years* and a special banquet invitation from Leonard Gillman are found on the facing page.

The Banquet (cost to you \$30) will feature the Dollar-a-Year Centennial Package for all registrants who attend. This package includes a banquet ticket for \$30, and for an additional \$60 a specially-inscribed HP 28C calculator (list price \$235), plus an optional \$10 contribution to the support of *100 Years of American Mathematics*. The HP 28C offered to you will be an enhanced model of this state-of-the-art machine produced by Hewlett-Packard solely for *100 Years* and will be available for \$60 only on this banquet occasion.

Brief ceremonies to launch *100 Years* and entertainment will follow dinner. Emcee for the evening will be A. B. "Al" Willcox, MAA Executive Director.

**Don't Miss This Special Evening!**

Tickets will be available through preregistration **ONLY**. To purchase a ticket for the banquet or banquet/calculator, please fill in the appropriate box(es) on the Preregistration/Housing Form and enclose the necessary total amount along with your preregistration payment.

**AMS-MAA Special Program: *Forces for Change in Mathematics Education***  
**Friday, January 8, 7:30 p.m.**

The American Mathematical Society and the Mathematical Association of America—in cooperation with the Society for Industrial and Applied Mathematics, the Board of Mathematical Sciences and the Mathematical Sciences Education Board—have organized a program of three concurrent sessions involving national leaders in education in dialogue about impending major changes of which all mathematicians should be aware.

The proceedings of the October 1987 symposium at the National Academy of Sciences on the reform of the teaching of calculus, the rapidly changing picture of where the talent must come from in mathematics, and the new patterns of educating and certifying mathematics teachers which are developing will form the basis for informative presentations, brief prepared responses and general discussions.

The program will be preceded by a 6:15 p.m. Reception hosted by the exhibitors, free to registrants at the Joint Mathematics Meetings. The following sessions will run concurrently from 7:30 p.m. to 9:00 p.m.:

**Calculus for a New Century**

The views of a perceptive and witty mathematician turned provost on the current reform movement in the teaching of calculus.

**Speaker:** TIMOTHY O'MEARA, Provost, University of Notre Dame

**Respondent:** RONALD G. DOUGLAS, SUNY at Stony Brook

**Moderator:** LYNN A. STEEN, St. Olaf College

**The beauty of fractals: A force for reaching the public**

A compelling lecture to illustrate the effectiveness of fractals in creating understanding in a nonmathematical audience.

**Speaker:** HEINZ-OTTO PEITGEN, University of California, Santa Cruz, and University of Bremen

**Moderator:** HYMAN BASS, Columbia University

**Who will teach mathematics?**

A compelling description of the issues involved in attracting, educating and certifying tomorrow's teachers.

**Speaker:** MARC TUCKER, Executive Director, Carnegie Forum on Education and the Economy

**Respondent:** F. JOE CROSSWHITE, Northern Arizona University and Chairman, Conference Board of the Mathematical Sciences

**Moderator:** JOHN A. DOSSEY, Chairman, Mathematics Department, Illinois State University, and President, National Council of Teachers of Mathematics

# Mathematical Sciences Employment Register

## January 1988 Meeting in Atlanta

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.

### 1988 Employment Register in Atlanta

The Employment Register will take place in the International Hall South of the Atlanta Marriott Marquis, on Wednesday, Thursday, and Friday, January 6, 7, and 8, 1988. 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 6. 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 7 and 8. **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**

### 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.

**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 in the International Hall South.

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. The telephone number to be used after the Register begins will be announced later. 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 Atlanta meeting announcement.

### Preregistered Employers/Applicants

Preregistration for the Mathematical Sciences Employment Register **must be completed by November 6, 1987**. Applicants and employers (including all interviewers) who wish to preregister for the Employment Register must also register for the Joint Mathematics Meetings. Forms are found on pages xxiii, xxiv, xxxi, and xxxii. 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 Atlanta.

Employer or Applicant forms received after the November 6 deadline **cannot** be included in the printed lists. For details on registration and preregistration for the Atlanta 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 6, in the International Hall South. **(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 6 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 6**. 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.

**There is no additional charge for posting more than one position, provided they are in the same department.**

### Preregistered Employers

In addition to the Joint Meetings preregistration fee, there is a separate charge for each employer who will be interviewing applicants at the register. **Please note that for the first time there will also be a separate charge for each interviewer.**

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 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.

### 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 Ivy Hall, Hyatt Regency Atlanta, 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 on-site registration fees. 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 International Hall South in the Marriott to fill out the forms necessary to participate in the Employment Register.

### 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 6** in order to qualify for the reduced fee of \$10. There is a \$15 fee for listings received after the November 6 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 Atlanta

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 6. **(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 1987 issue provided they are received before the November 6 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 Atlanta to the employers who participate in the Employment Register.

Job applicants planning to participate in the Employment Register in Atlanta 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. (*continued on page xxv*)

For applicant form and instructions, see this page and pages xxiii - xxv.

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

Applicants' forms submitted for the Employment Register will be photographically reproduced in the December 1987 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 6, 1987** 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.

#### (A) Specialties

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

#### (B) Career Objectives

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

#### (H) (I) Duties

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

#### Location

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

#### (L) U.S. Citizenship Status

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



MATHEMATICAL SCIENCES EMPLOYMENT REGISTER  
 APPLICANT FORM JANUARY 6-8, 1988 ATLANTA, GEORGIA

**APPLICANT:** Name \_\_\_\_\_  
 Mailing address (include zip code) \_\_\_\_\_  
 \_\_\_\_\_

(A) Specialties \_\_\_\_\_  
 (B) Career objectives and accomplishments  
 ACADEMIC:  Research,  Teaching  
 NON-ACADEMIC:  Research and Development,  Consulting,  Supervision  
 Near-term career goals \_\_\_\_\_  
 \_\_\_\_\_

Significant achievements or projects, including role \_\_\_\_\_  
 \_\_\_\_\_

Honors and offices \_\_\_\_\_  
 Other (e.g., paper to be presented at THIS meeting) \_\_\_\_\_  
 \_\_\_\_\_

Selected titles of papers, reports, books, patents \_\_\_\_\_  
 \_\_\_\_\_

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

**EMPLOYMENT HISTORY:**

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

**DESIRED POSITION:**

(I) Duties \_\_\_\_\_  
 (J) Available mo. \_\_\_\_ /yr. \_\_\_\_ Location \_\_\_\_\_ Salary \_\_\_\_\_  
 (K) References (Name and Institution) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(L) Citizenship \_\_\_\_\_

**(M) AVAILABLE FOR INTERVIEWS:**  
 (Interviews for Session 4 scheduled on the basis of employer's request only.)  
 Session 1  Session 2  Session 3  Session 4   
 Thurs. AM 9:30-11:45 Thurs. PM 1:15-5:00 Fri. AM 9:30-11:45 Fri. PM 1:15-5:00  
 I do not plan to attend the Winter Meeting

**SUMMARY STRIP**

Family Name	First Name	Mailing Address
<input type="text"/>	<input type="text"/>	<input type="text"/>
Address (cont'd.)	Address (cont'd.)	State & Zip Code
<input type="text"/>	<input type="text"/>	<input type="text"/>
(B) Career objectives	(C) Highest Degree	(C) Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>
(C) Institution	(D)	(E)
<input type="text"/>	<input type="text"/>	<input type="text"/>
(H) Present duties	(I) Desired duties	(J) Available mo./yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>
	(L)	(M) Sessions
	<input type="text"/>	<input type="text"/>



### 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 Atlanta, along with those of the other participants. **Forms received past the deadline of November 6 will be returned.**

#### List of Retired Mathematicians Available for Employment

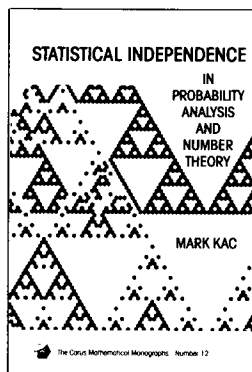
The annual *List of Retired Mathematicians* will be included in the December and January issues of the publication *Employment Information in the Mathematical Sciences*. Retired mathematicians who are interested in being included in the list may send the following information to the Mathematical Sciences 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**

**6.** Offprints of the list will be available from the Mathematical Sciences Employment Register, American Mathematical Society, P.O. Box 6887, Providence, Rhode Island 02940.

### An MAA Classic . . . Now in Paperback:



### Statistical Independence in Probability, Analysis, and Number Theory

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List: \$12.50 MAA Member: \$10.00

*"Terrific, friendly, and profound."*

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*"This is a splendid book. It ranges from the primitive idea of statistical independence to applications of the most diverse sort: coin-tossing, anharmonic oscillations, prime numbers, and continued fractions. And it does all that with Kac's customary clarity and charm. Every friend of probability should have it."*

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### The Underachieving Curriculum: Assessing U.S. School Mathematics from an International Perspective

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Edward Kifer, Jane O. Swafford, Kenneth J. Travers, and  
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Catalog Number - TUC

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*"The most illuminating and important document by far on our fundamental problems in precollegiate mathematics education, as well as the most concrete and thoroughly verified. It is also extremely interesting to read in its own right. Everyone concerned with mathematics or education should read it."*

Felix Browder

**Ordering Publications:** Orders should be sent to: **The Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036.** Payment must accompany orders of less than \$10.00. Postage and handling are free for prepaid orders only. Prices quoted are subject to change without notice.

**Now accepting orders on VISA or  
MASTERCARD at 1-800-331-1MAA.**

## Preregistration (Form on page xxxi)

Preregistration for these meetings and the Mathematical Sciences Employment Register **must be completed by November 6, 1987**. Those wishing to preregister must complete the form(s) which appear(s) at the back of this issue and submit it (them) together with the appropriate preregistration fee(s) to the Mathematics Meetings Housing Bureau in Providence by **November 6**. Please note that a space has been provided on the Preregistration/Housing Form if one wishes to have his/her nickname printed on the meeting badge.

Preregistration fees do not represent an advance deposit for lodgings. One must, however, preregister for the meetings in order to obtain hotel accommodations through the Mathematics Meetings Housing Bureau, as outlined on the facing page.

Preregistration fees may be paid by check payable to the American Mathematical Society (Canadian checks must be marked for payment in U.S. funds), or by providing a VISA or MASTERCARD credit card number on the Preregistration/Housing Form. **Please be sure to give the name and number exactly as they appear on the credit card, and to include the expiration date.**

The registration fees at the meeting will be 30 percent higher than the preregistration fees listed below.

### AMS Short Course

Student/Unemployed	\$10
All Others	\$35

### Joint Mathematics Meetings

Member of AMS, CMS, MAA	\$61
Emeritus Member of AMS, MAA	\$17
Nonmember	\$94
Student/Unemployed	\$17

### Employment Register

Employer	\$75
Each extra interviewer	\$35
Applicant	\$15
Employer posting fee	\$10

### AMS-MAA-TUG Workshop \$60

There will be 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.

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 from his or her latest position.

A \$5 charge will be imposed for all invoices prepared when Preregistration/Housing Forms are submitted without accompanying payment for the preregistration fee(s) and room deposits, or are accompanied by an amount insufficient to cover the total due. Preregistration/Housing Forms received well before the deadline of **November 6** which are not accompanied by correct payment will be returned to the participant with a request for resubmission and full payment. **This will, of course, delay the processing of any housing request so that it will be unlikely that the participant's first choices will still be available.**

A 50 percent refund of the preregistration fee(s) will be made for all cancellations received in Providence no later than December 23. **No refunds will be granted for cancellations received after that date**, or to persons who do not attend the meetings.

The only exception to this rule is someone who preregisters for the Joint Mathematics Meetings only in order to attend an MAA Minicourse, and is too late to obtain a slot in the Minicourse. In this case, full refund will be made of the Joint Mathematics Meetings preregistration fee, **provided the preregistrant has checked the box** on the MAA Minicourse Preregistration Form that this was his or her intent. Individuals who preregister for both the Joint Meetings and an MAA Minicourse and who intend to participate in the Joint Meetings, even if the MAA Minicourse is not available, should **not**, of course, check the box on the MAA Minicourse Preregistration Form. In this case the Joint Meetings preregistration will be processed.

Please note that a separate preregistration form for MAA Minicourses must be sent to Jane Heckler at the address given on the form.

Those who wish to preregister for the Employment Register should read carefully the special article titled "Mathematical Sciences Employment Register" which follows this announcement of the Atlanta meetings. The attention of applicants is particularly directed to the section regarding the December issue of *Employment Information in the Mathematical Sciences*.

Please read the facing page titled **Housing** carefully before completing the Preregistration/Housing Form.

## Housing (Form on page xxxii)

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### Special Bonus for Early Preregistrants!

Participants who preregister before the *early* preregistration deadline of **October 26** will be eligible for a complimentary room in Atlanta. (Multiple occupancy of these rooms is permissible.) Winners will be randomly selected from the names of all who preregister by October 26 and these lucky individuals will be notified by mail by December 23. **So, preregister early!** (A list of the winners in San Antonio appears in the section on Hotels.)

### Acknowledgment Form

Participants will receive an acknowledgement of their preregistration, room deposit, and hotel assignment from the Mathematics Meetings Housing Bureau, which will be followed by a confirmation of the room reservation from the hotel to which they have been assigned.

The Preregistration/Housing Form for requesting hotel accommodations will be found at the back of this issue. Use of the services offered by the Mathematics Meetings Housing Bureau requires preregistration for the meetings. Persons desiring confirmed hotel accommodations should complete the form, or a reasonable facsimile, and send it to the Mathematics Meetings Housing Bureau, Post Office Box 6887, Providence, Rhode Island 02940, **so that it will arrive no later than November 6, 1987. Housing requests received after the deadline of November 6 most surely cannot be honored.**

All reservation requests must be received in writing and will be processed through the Housing Bureau in Providence. Telephone requests will not be accepted. **Please do not contact the hotels directly.** Blocks of rooms and special rates have been set aside for the Housing Bureau, and the hotel will either refer you back to the Housing Bureau, or give you a room outside of the block, which may be at a higher rate. Please note that the room occupancy tax in Atlanta is 11 percent.

Please read carefully the section on **Hotels** before completing the form. Forms sent to the wrong address and thus incurring delay in delivery to the Housing Bureau until after the deadline cannot be accepted and will, therefore, be returned.

Participants requesting hotel accommodations in Atlanta are required to submit housing deposits or credit card information when preregistering. Deposits may be paid by check payable to the AMS (Canadian checks must be marked for payment in U.S. funds), or by providing a VISA, MASTERCARD or American Express (**for housing only**) credit card number on the Preregistration/Housing Form. Please be sure to give the name and number **exactly** as they appear on the credit card, and to include the expiration date. Please note that when you provide a credit card number in lieu of a \$50 check as a guarantee, no charge against your account will be processed by the hotel **unless you fail to claim the reserved room on your given arrival date, or if you fail to cancel your reservation directly with the hotel/motel 48 hours in advance of your given arrival date.** If either of the latter two circumstances apply, the

hotel will then charge your credit card account for one night's occupancy. **Please read the section on Hotels carefully regarding deposits.**

Housing assignments are made on a first-come, first-served basis, so participants desiring low-cost accommodations are urged to submit their housing requests in as early as possible. Participants should also be aware that the special rates being offered in the section titled **Hotels** may not be available **after December 14.**

Participants are strongly urged to rank **each** hotel on the housing form in the order of preference, and circle the type of room and the rate desired. Reservations will be made in accordance with preferences indicated on the reservation form insofar as this is possible. 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 lowest rate.

Participants who are able to do so are urged to share a room whenever possible as this procedure can be economically beneficial. The housing form should be fully completed to ensure proper assignment of rooms. Participants planning to share accommodations should provide the name(s) of the person(s) with whom they plan to occupy a room. Each participant should, however, complete a separate Preregistration/Housing Form. **In order to avoid confusion, parties planning to share rooms should send their forms together in the same envelope. The participant requesting the room should submit the deposit and will be the recipient of the hotel confirmation.**

Please make all changes to or cancellations of hotel reservations with the Housing Bureau in Providence **before December 23, 1987, by calling 401-272-9500, extension 290.** After that date, changes or cancellations should be made directly with the hotel assigned.

Please read the facing page titled **Preregistration** carefully before completing the Preregistration/Housing Form.

**Please be sure to send housing deposit or credit card information with Preregistration/Housing Form.**

## Focus Employment Advertisements

The advertising rates in FOCUS have been raised as of the November-December 1987 issue to reflect increased circulation (now over 28,000) and costs and design changes that will give our advertisers more words per running inch. Standard advertisements carried forward from previous issues will be charged at the old rates.

Rates for FOCUS Employment Ads are: 50 words or less: \$37.50  
More than 50 words: \$45.00 per inch

There is a 15% discount for the same ad in 3 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 ad in FOCUS should write to: FOCUS Employment Ads, Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036. Or for more information, call the MAA Washington Office at (202) 387-5200.

The deadline for submission for the November-December 1987 issue is October 5. The deadline for the January-February 1988 issue is December 7.

### **ALFRED UNIVERSITY DIVISION OF MATHEMATICS & COMPUTER SCIENCE ALFRED, NEW YORK 14802**

Tenure track position in mathematics, available Fall 1988. Ph.D. required, as is a commitment to teaching excellence. Rank and salary commensurate with qualifications and experience. Teaching load is three courses per semester. Scholarly activity encouraged and supported. Submit letter of application (outlining career goals and professional interests), vita, graduate transcripts and three letters of recommendation (at least one should address teaching) to Dr. Robert Williams, Chair. An EO/AA institution.

A tenure track position (Assistant Professor) in mathematics is available beginning in September 1988. Applicants should 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 reference to Dr. Richard Escobales, Chairman, Department of Mathematics, Canisius College, Buffalo, New York 14208. AA/EOE.

### **CARLETON COLLEGE DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE NORTHFIELD, MN 55057-4025**

Two tenure-track faculty positions beginning 1988-89. Ph.D. required. Teach six courses per year in mathematics, computer science and/or statistics. Excellent teaching ability essential; research encouraged. Interviewing at MAA/AMS meeting in January. Deadline January 18; applications accepted until positions are filled. Equal Opportunity Employer; applications specifically invited from women and minorities. Send letter of application, resume, and three recent letters of reference to David Appleyard, Chair. Carleton College is a small, highly selective liberal arts college 35 miles south of Minneapolis/St. Paul.

### **CENTRE COLLEGE MATHEMATICS POSITION**

Applications are invited for a tenure-track position at the rank of assistant or associate professor beginning September, 1988. Ph.D. in mathematics required. The position requires the teaching of a wide range of undergraduate courses and a strong commitment to liberal arts education. Ability to teach mathematical statistics or computer programming is desirable. Excellent fringe benefit program including home mortgage plan and tuition scholarship program for dependent children. Applications, resumes, transcripts, and three letters of reference to Leonard DiLillo, Dean, Centre College, Danville, KY 40422. EOE

### **CLAREMONT McKENNA COLLEGE Endowed Position in Computer Science and Applied Mathematics**

Applications are invited for an endowed tenure-track position in Computer Science and Applied Mathematics with rank and salary dependent on qualifications. Starting date fall 1988.

Claremont McKenna College is a liberal arts college with 800 students. It is a member of the Claremont Colleges (along with Pomona, Scripps, Harvey Mudd, and Pitzer Colleges and Claremont Graduate School). The Claremont Colleges have a total of forty-three mathematicians and computer scientists, and are located in Claremont, Southern California. Qualifications for the position include a Ph.D. in a computer-related field such as Computer Science, Mathematics, Operations Research, or Information Science. If the degree is in a field other than Computer Science, substantial formal education in Computer Science is required.

Applicants should have a strong commitment to undergraduate teaching, an established scholarly record, and practical experience with computer applications. The appointee will be expected to teach some applied mathematics courses in addition to computer science courses and to participate in course and program development.

The College is an equal opportunity/affirmative action employer. Applications will be reviewed as soon as received and a decision reached preferably by January 1988. Please send resume and the names of four references to Professor John Ferling, Chairman, Computer Science Search Committee, c/o Dean of Faculty's Office, Claremont McKenna College, Claremont, CA 91711.

### **FURMAN UNIVERSITY Greenville, SC 29609**

Two tenure track positions in mathematics beginning September 1988. A Ph.D. in a mathematical science or mathematics education is required. Excellence in teaching and continued scholarly activity are expected. Rank and salary will be based on qualifications. All areas of specialization are acceptable. Individuals with expertise in mathematics education are encouraged to apply for one of the positions. Vita, graduate and undergraduate transcripts, and three letters of recommendation should be sent to Dr. Robert Fray, Department of Mathematics. Application deadline: February 1, 1988. EOE/AEE

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**MARY WASHINGTON COLLEGE**  
**Department of Mathematics**

A tenure-track assistant professor in mathematics position is anticipated starting Fall '88. Candidates should have (by Aug. '88) a Ph.D. in pure or applied mathematics, and must possess both a strong commitment to teaching and to continuing scholarly development. MWC is a small (3200), state-supported, coeducational, selective, undergraduate, liberal arts college located 50 miles from Richmond and Washington, D.C. Teaching load is 12 hr/sem. Send resume, graduate transcript, and 3 letters of reference—all to arrive by January 11, 1988—to: John R. Tucker, Search Committee Chairman, Department of Mathematics, Monroe 209D, Mary Washington College, Fredericksburg, VA 22401-5358. AA/EEO

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**MILLS COLLEGE**  
**Department of Mathematics and Computer Science**  
**Oakland, California 94613**

Mills College is seeking outstanding candidates for a tenure-track position as Assistant, Associate or Full Professor of Mathematics commencing Fall 1988. Candidates must submit evidence of superior teaching and research abilities, and demonstrate a commitment to become involved in a highly innovative and energetic department. Rank and salary will depend on experience and qualifications. The initial contract will be for three years, subject to final administrative approval. Mills College is an Affirmative Action/Equal Opportunity Employer.

Send vita and direct three letters of reference to:  
Professor Richard Bassein  
Chair of the Mathematics Search Committee  
Mills College  
Oakland, CA 94613  
Deadline for application: January 15, 1988

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**CHAIR OF THE DEPARTMENT OF MATHEMATICS**  
**ROSE-HULMAN INSTITUTE OF TECHNOLOGY**  
**POSITION AVAILABLE BEGINNING JULY 1, 1988**

Applications and nominations are invited for the position of Chair of the Department of Mathematics at Rose-Hulman Institute of Technology. Candidates should have an appropriate (mathematics, operations research, statistics) earned doctorate, administrative potential, a record of scholarly activity and excellence in teaching. Responsibilities include scheduling classes, budgeting, recruiting, making promotion, tenure and retention recommendations and teaching one course per quarter.

Rose-Hulman is a small (1300 students) science and engineering college noted for its well-qualified and highly motivated undergraduates. The median SAT scores for the 1991 class are 660 in mathematics and 540 in verbal. There are no remedial courses (calculus is the entry level mathematics course) and mathematics students are encouraged to present papers at undergraduate conferences and to compete in mathematics contests (the Rose-Hulman team placed 16th in last year's Putnam exam).

The mathematics department consists of 12 full time faculty members with interest and expertise in mathematics, operations research and statistics.

Fringe benefits include TIAA-CREF, health and life insurance, tuition benefit for children, and a personal computer in each faculty member's office.

To apply, send a letter of application, a curriculum vita and the names, addresses and telephone numbers of at least three people who are willing to serve as references for you to

Mathematics Chair Search Committee  
Department of Mathematics  
Rose-Hulman Institute of Technology  
Terre Haute, IN 47803

Rose-Hulman Institute of Technology is an equal opportunity employer.

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**SIENA COLLEGE**  
**Loudonville, NY 12211**

One half-year visiting position at the Instructor (master's degree) or Assistant Professor (Ph.D.) level and one part time position for the Spring '88 semester at the same levels to teach undergraduate mathematics courses. Applicants should have strong desire to teach. Normal teaching load is 12 contact hours per semester for full-time faculty. Send application letter, vita, and two letters of recommendation to Head, Department of Mathematics, Siena College, Loudonville, NY 12211.

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**UNIVERSITY OF NORTH FLORIDA**  
**DEPARTMENT OF MATHEMATICAL SCIENCES**

Applications are invited for Visiting Instructor/Assistant Professor for the SPRING SEMESTER, 1988, (January 4—May 7). The M.S./Ph.D. in Mathematical Science is required. Duties include teaching major, graduate and/or service courses depending upon qualifications. Excellence in teaching is required. The Department offers the B.S. and M.S. in Mathematics and in Statistics and has a faculty with research interests in a variety of areas of both Mathematics and Statistics. Send vita, transcripts and three letters of recommendation by November 15, 1987, to Leonard J. Lipkin, Chairman, Department of Mathematical Sciences, University of North Florida, 4567 St. Johns Bluff Road, Jacksonville, Florida 32216. EEO/AA.

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**University of Missouri-Rolla**  
**Chair-Department of Mathematics and Statistics**

The Department invites applications for the position of Department Chair, to begin September 1, 1988. The Rolla campus is one of four within the University of Missouri system, has an enrollment of about 5500, and emphasizes engineering and science. The Department has 22 faculty, and offers bachelor, master, and doctoral programs in mathematics and statistics. Candidates should have a strong research and a commitment to excellent teaching. The review of applications will begin October 1, 1987, and will continue until the position is filled. A vita and at least three references should be sent to Professor Glen Haddock, Department of Mathematics and Statistics, University of Missouri-Rolla, Rolla MO 65401. Applications by minorities are encouraged. AA/EOE

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**SOUTHWESTERN UNIVERSITY—  
GEORGETOWN, TEXAS 78626**

Applications are being invited for a tenure track position in Mathematics at the Assistant Professor level beginning Fall semester 1988. 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 names and addresses of at least three current references to Theodore D. Lucas, Associate Provost.

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**ASSOCIATE DEAN  
MATHEMATICS AND PHYSICS**

Staff and program to be supervised include 10 full-time and 20–25 part time faculty and support personnel (8 FTE) in Mathematics, Physics, Engineering and Astronomy. Equipment includes a 68 seat Spitz Star Projector Planetarium and a four inch solar telescope facility. A Master's Degree or doctorate in a related discipline required; community college teaching experience desired. Demonstrated working knowledge and understanding of mathematical programs at community colleges required and additional experience in engineering, computer science, physics, astronomy or applied science desired. Experience in management or supervision at the community college level preferred.

This management position is for 225 service days in a full fiscal year. Contract will be pro rated for the 1987–88 fiscal year. Starting date is preferably January 4, 1988; a later starting date may be negotiated. Subsequent annual contracts are expected to be 225 service days beginning July 1. Salary range for 225 is estimated at \$37,700 to \$40,000. Closing date: Nov. 16, 1987. For more information call (503) 667-7219 or (503) 667-7645.

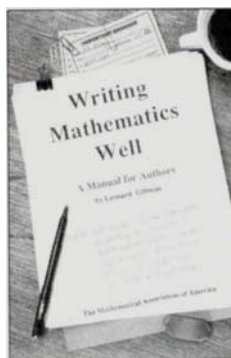
Mt. Hood Community College  
Patricia McGaffigan  
Director of Personnel Services  
7600 SE Stark St.  
Gresham, Oregon 97030

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Computer Science: Franklin and Marshall College invites applications for a faculty position in computer science starting Fall, 1988. The successful applicant will have the principal responsibility for continuing our development of a computer science program appropriate to a liberal arts college curriculum. The College is strongly committed to innovation and will actively support the efforts of a creative individual. A Ph.D. in Computer Science or a related discipline is required. The appointee will hold a tenure track position in the Department of Mathematics, or another department if that is more appropriate to his/her qualifications. The level of the appointment will be determined on the basis of the previous experience of the appointee. Teaching responsibilities will include introductory courses in computer science and higher level courses determined in part by the particular areas of expertise of the appointee. Members of the faculty at Franklin and Marshall College are expected to maintain active programs of research in their disciplines. Applicants should submit a letter of application, resume, graduate and undergraduate

transcripts, and three letters of recommendation to Professor John J. Farrell, Chairman, Computer Science Search Committee, Franklin and Marshall College, P.O. Box 3003, Lancaster, Pennsylvania 17604. Review of applications will begin on December 15, 1987. Franklin and Marshall College is an Equal Opportunity Employer.

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**New!**

**Writing Mathematics  
Well**

by Leonard Gillman

64 pp., 1987, Paper,  
ISBN 0-88385-443-0  
Catalog Number - WMW

List: \$6.00

MAA Member: \$4.50

Good writing conveys more than the author originally had in mind, while poor writing conveys less. Well-written papers are more quickly accepted and put into print and more widely read and appreciated than poorly written ones.

In *Writing Mathematics Well*, Leonard Gillman tells his readers how to develop a clear and effective style. All aspects of mathematical writing are covered, from general organization and choice of title, to the presentation of results, to fine points on using words and symbols, to revision, and finally, to the mechanics of putting your manuscript into print. No book can by itself make you a better writer, but this one will alert you to the opportunities for better and more forceful writing. It does this both by precept and by example.

A book to be read for its sharpness and wit as well as for enlightenment, *Writing Mathematics Well* should be on the shelf of anyone who writes or intends to write mathematics. It will amuse and delight the already careful writer and it will help reform and refine the sensibilities of those who may be somewhat careless about their writing.

**Ordering Publications:** Orders should be sent to: **The Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036.** Payment must accompany orders of less than \$10.00. Postage and handling are free for prepaid orders only. Prices quoted are subject to change without notice.

**Now accepting orders on VISA or  
MASTERCARD at 1-800-331-1MAA.**



## Preregistration/Housing Form, Atlanta, Georgia

January 6-9, 1988

**Must Be Received in Providence No Later Than November 6, 1987**

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 26, 1987
	Preregistration	November 6, 1987
	Hotel Reservations through Housing Bureau	December 9, 1987
	Changes/Cancellations	December 23, 1987
	50% Refund on Preregistration	December 23, 1987 (no refunds after this date)

REGISTRATION FEES		
	Preregistration by mail by November 6, 1987	At Meeting
	\$	\$
<b>JOINT MATHEMATICS MEETINGS</b>		
Member of AMS, CMS, MAA	61	79
Nonmember	94	122
* Student, Unemployed, or Emeritus	17	22
<b>AMS SHORT COURSE</b>		
Member/Nonmember	35	45
* Student or Unemployed	10	15
<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
<b>AMS/MAA TUG WORKSHOP</b>	60	80

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

\* 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 from his or her latest position.

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

Joint Meetings ; AMS Short Course (January 5-6, 1988) ; Employer ; Applicant ; Posting ; TUG Workshop (January 5, 1988)

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 \_\_\_\_\_ (List only if accompanying to meeting)

7) Member of AMS ; CMS ; MAA ; Nonmember ; (Member discount applies only to members of AMS, CMS, and MAA.)  
 Member of other organizations: AWM ; NAM

8) Joint Meetings fee \$ \_\_\_\_\_ 9) AMS Short course fee \$ \_\_\_\_\_ 10) TUG Workshop \$ \_\_\_\_\_ 11) Employer fee(s) \$ \_\_\_\_\_

12) Applicant fee \$ \_\_\_\_\_ 13) Posting fee \$ \_\_\_\_\_ 14) Hotel deposit \$ \_\_\_\_\_

15) \_\_\_\_\_ Banquet ticket(s) @ \$30 each = \$ \_\_\_\_\_ Banquet ticket(s)+one calculator @ \$90 each = \$ \_\_\_\_\_  
 \_\_\_\_\_ Dollar-A-Year Centennial Package(s) @ \$100 each = \$ \_\_\_\_\_

16) TOTAL AMOUNT ENCLOSED FOR 7 through 15 \$ \_\_\_\_\_ 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 section 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

# PREREGISTRATION AND HOUSING FORMS

HOUSING SECTION:

PREREGISTRATION/HOUSING FORM, Atlanta, Georgia

January 6-9, 1988

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 11% sales/occupancy tax.

GUARANTEE REQUIREMENTS: \$50 by check, VISA, or MasterCard credit cards. 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
	69	80	80	89	89	98	98	Upon Request
Hyatt Regency (Headquarters Hotel)	71	81	81	101	101	121	121	Upon Request
Marriott Marquis	60	65	65	70	86	75	91	Upon Request
Radisson	55	60	60	65	70	65	70	Upon Request
American	55	65	65	65	N/A	65	N/A	Upon Request
Days Inn Downtown								

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

Please list other room occupants.

FULL NAME

ARRIVAL DATE

DEPARTURE DATE

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### 100 Years of American Mathematics

(continued from page 2)

sor to the President on research opportunities in six fields. First to report is the Mathematics Panel, chaired by Professor William Browder, pointing out that mathematics is flourishing intellectually but its infrastructure is eroding rapidly.

1983 The JPBM The AMS, the MAA, and SIAM create a nine-member joint executive action arm, the Joint Policy Board for Mathematics (JPBM), to begin implementing the recommendations of the David Committee. JPBM emphasizes unity across the discipline, one of the five basic recommendations of the mathematics community later made by the David Committee.

1984 The David Report The June 1984 report, *RENEWING U.S. MATHEMATICS: CRITICAL RESOURCE FOR THE FUTURE*, highlights the flowering of mathematics and its uses since World War II and calls attention to serious signs of trouble: (i) the growing shortage of mathematicians; (ii) a marked imbalance between federal support of mathematics research and support for related fields of science and engineering. Based on careful analysis, it calls for more than a doubling of FY 1984 Federal support level, and lays out a ten-year implementation plan, with specific roles for the government, universities, and the mathematical sciences community.

1984 The BMS In September, 1984, the NRC establishes the Board on Mathematical Sciences (BMS) to provide objective advice to federal agencies, and to identify promising areas of mathematics research, along with suggested mechanisms for pursuing them.

1985 The MSEB Upon the recommendation of the Conference Board of the Mathematical Sciences (CBMS), which comprises the presidents of 14 professional societies in the field, the NRC establishes the Mathematical Sciences Educational Board (MSEB). The MSEB is charged to provide "a continuing national assessment capability for mathematics education"—kindergarten through college. A 34-member board is appointed, a unique working coalition of classroom teachers, college and university mathematicians, mathematics supervisors and administrators, members of school boards and parent organizations, plus representatives of business and industry. This step reflects another of the basic recommendations of the David Committee: strong involvement of all sectors of the mathematics community in issues of precollege education.

1986 The JPBM Washington Office The JPBM's Washington activities come to embrace enhanced congressional contact and a vigorous public information effort. An office of Governmental and Public Affairs is opened and it launches National Mathematics Awareness Week, to become an annual April event. Contact with media and resultant coverage of mathematics are increased, thus starting the "long-term, coordinated effort" in public information recommended by the David Committee.

1987 Project MS 2000 The MAA, with the subsequent support of AMS and SIAM, is launching a comprehensive review of the college/university mathematics enterprise, analogous to the David Committee's review of the health and support of mathematics research nationally, and also analogous to the MSEB's first overview and analysis of mathematics education in the nation's schools, planned for 1988 publication.

1988 Report to the Nation The first BMS/MSEB "Report to the Nation" on the state of mathematics education in the U.S., kindergarten through college, based on MSEB's precollege work

and preliminary work of MS 2000. It will emphasize the potential of a modified mathematics education for contributing to the national welfare, and will outline a national game-plan for bringing about needed change in the 1990's.

**YOUR PARTICIPATION** This special year-long celebration begins on the evening of January 7 at the Joint Mathematics Meeting in Atlanta, with a 100 Years of American Mathematics kick-off banquet (see pages xviii-xix in the Center Section of this issue of FOCUS). Whatever you had been planning to do, come to Atlanta and join in this festive occasion. It will cost you some money to attend, but it is a unique chance for us to get together to (i) celebrate a century of achievement by our community, and (ii) commit ourselves to a year of reflection and renewal. To help us on both counts, the Hewlett-Packard Company is producing an enhanced "100 Years" model of its state-of-the-art HP 28C calculator (list price \$235), which meeting registrants can purchase for \$60 if they attend the banquet. If you haven't seen the HP 28C and its competitors you should. Its numerical, graphical, and symbolic manipulation capabilities exemplify the power of the computer to markedly alter the way we teach mathematics—and all in a machine the size of a cigarette case. The computer is one of the "Forces for Change in Mathematics Education" to be discussed at Atlanta in a special session the following evening, January 8. And that will just be the beginning of 1988, a very special year.



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

Chairman of the MAA Newsletter Editorial Committee: Paul Zorn, St. Olaf College.

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Printed in the United States of America.

## Video Teleconference on Using Computers in Teaching

An interactive teleconference on instructional models that use computers, sponsored by De Anza College and the California Mathematics Councils for Community Colleges (both sections) will be broadcast November 11, from 1 to 3 P.M., Pacific Daylight Time. This is a program of the De Anza College Institute for Computer-Aided Instruction. The teleconference will focus on effective instructional models used in several school and college programs. The following topics will be discussed: Program modification by Wade Ellis of West Valley College and Vice President of CMC3; Skill building for effective remediation by Chris Barker of De Anza College; Exploratory techniques in pre-calculus and calculus courses by Chris Avery of De Anza College; Simulation applied to probability and statistics by Frank Soler of De Anza College; Relation of computer assisted instruction to the California Mathematics Framework by Sally Thomas of Orange Coast College Mathematics department and President Elect CMC3-South.

The teleconference will show instructional methodologies, lecture techniques using computers, and use of computers in mathematics curricula. Conferees will have an opportunity to ask questions of experienced CAI staffers.

To participate you must have access to a satellite dish. Even if your school does not have a dish, it is often possible to get access through an owner in your community or through a local vendor. For instructions on tuning your dish to receive this program, contact Dean Herb Everitt, De Anza College ((408) 996-4426). For further information on content, contact Chris Avery at De Anza ((408) 265-5659).

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### CONFERENCE ANNOUNCEMENT: CALL FOR PAPERS

The Institute for Writing and Thinking at Bard College will sponsor a conference for secondary and college teachers, November 6-7, and subsequent publication of a book of original essays on the role of writing in learning mathematics and science. The Institute invites participation in both projects, and Professor Paul Connolly, the Institute's Director, would like to hear from anyone with a theoretical interest or practical experience in how natural language, particularly written language, affects students' learning of mathematics and science. Contact: Institute for Writing and Thinking, Bard College, Annandale-on-Hudson, NY 12504 (914/758-6622).

## Calendar

### National MAA Meetings

- 71st Annual Meeting**, Atlanta, Georgia, January 6-9, 1988. (Board of Governors, January 5, 1988).
- 72nd Annual Meeting**, Phoenix, Arizona, January 11-14, 1989. (Board of Governors, January 10, 1989).
- 73rd Annual Meeting**, Louisville, Kentucky, January 24-27, 1990. (Board of Governors, January 23, 1990).

### Sectional MAA Meetings

- Allegheny Mountain**, Bethany College, Bethany, West Virginia, April 22-23, 1988.
- Eastern Pennsylvania & Delaware**, Franklin & Marshall University, Lancaster, Pennsylvania, November 21, 1987.
- Florida**, Rollins College, Winter Park, Florida, March 4-5, 1988.
- Illinois**, Bradley University, Peoria, Illinois, April 29-30, 1988.
- Indiana**, Tri-State University, Angola, Indiana, October 17-18, 1987.
- Intermountain**, Utah State University, Logan, Utah, April 22-23, 1988.
- Iowa**, Grinnell College, Grinnell, Iowa, April 15-16, 1988.
- Kansas**, Fort Hays State University, Hays, Kansas, April 15-16, 1988.
- Kentucky**, Georgetown College, Georgetown, Kentucky, April 15-16, 1988.
- Louisiana—Mississippi**, Northwestern State University, Natchitoches, Louisiana, February 27-28, 1988, Columbus, Mississippi, February 27-28, 1988.
- Maryland-DC-Virginia**, Northern Virginia Community College (Alexandria Campus), Alexandria, Virginia, November 13-14, 1987.

- Metro. New York**, Concord Resort Hotel, Kiamesha Lake, New York, April 22-24, 1988.
- Michigan**, Eastern Michigan University, Ypsilanti, Michigan, May 6-7, 1988.
- Missouri**, Washington University, St. Louis, Missouri, April 8-9, 1988.
- Nebraska**, Kearney State College, Kearney, Nebraska, April 15-16, 1988.
- New Jersey**, College of Saint Elizabeth, Convent Station, New Jersey, November 14, 1987.
- North Central**, Bemidji State University, Bemidji, Minnesota, October 23-24, 1987; College of St. Thomas, St. Paul, Minnesota, April 1988.
- Northeastern**, Bentley College, Waltham, Massachusetts, November 20-21, 1987.
- Northern California**, St. Mary's College, Moraga, California, March 5, 1988.
- Ohio**, College of Wooster, Wooster, Ohio, October 30-31, 1987.
- Oklahoma-Arkansas**, Hendrix College, Conway, Arkansas, Spring 1988.
- Pacific Northwest**, University of British Columbia, Vancouver, British Columbia, June 16-18, 1988.
- Seaway**, SUNY Center at Buffalo, Buffalo, New York, November 6-7, 1987.
- Southeastern**, Furman University, Greenville, South Carolina, April 15-16, 1988.
- Southern California**, UCLA, Los Angeles, California, November 14-15, 1987. Joint meeting with AMS. **Southwestern**, Northern Arizona University, Flagstaff, Arizona, Spring 1988.
- Wisconsin**, University of Wisconsin-La Crosse, La Crosse, Wisconsin, April 22-23, 1988.

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### FOCUS

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Washington, D.C. 20036

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