

FOCUS

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ICME 5—A Preliminary Report

James R. C. Leitzel

“**A** mature consideration of the problems in mathematics education”—this is what Shirley Hill and F. Joe Crosswhite say was provided by the recently completed Fifth International Congress on Mathematical Education (ICME 5). Hill, of the University of Missouri at Kansas City, and Crosswhite, of The Ohio State University and current President of the National Council of Teachers of Mathematics (NCTM), were both participants in the Congress which was held in Adelaide, South Australia, August 24-30.

The Congress attracted 1,984 people (a coincidence much-noted at the Congress), representing 68 nations. It was held jointly with a national meeting of teachers from Australia and New Zealand, ensuring participation by a large number of classroom teachers. Over 250 delegates to the Congress came from the United States, including 30 persons partially supported by a National Science Foundation grant to the MAA and NCTM.

According to Henry Pollak of Bell Communications Research, the International Committee on Mathematical

Instruction (ICMI), the organizing body for the ICME's, made a concerted effort to have every participant involved in some discussion group. (Pollak is a member of the Executive Committee of ICMI).

During the proceedings, seven Action Groups, seven Theme Groups, and ten Area Topics Groups met in daily sessions. Topics for the Action Groups were organized along age-level lines from early childhood to adult. The Theme Groups addressed common concerns crossing over these age-level boundaries, such as Mathematics for All; Professional Life of Teachers; The Role of Technology; Theory, Research and Practice; Mathematics Curriculum; Applications of Mathematics; and Problem Solving. Additional special areas of interest were addressed through organized study groups. *(continued on page 2)*

Meeting Program Inside

The center section of this issue contains the program, housing and preregistration forms, and Employment Register forms for the January 1984 Joint Mathematics Meetings in Anaheim, California. **Note: These are the only forms for this meeting which will be mailed to MAA members.**

The meetings include the *68th Annual Meeting of the MAA*, *91st Annual Meeting of the American Mathematical Society*, and the annual meetings of the *Association for Symbolic Logic*, *Association for Women in Mathematics*, and *National Association for Mathematicians*. MAA sessions will be held on January 11-13.

The MAA meeting will feature eight fifty-minute invited addresses, ten minicourses, five contributed paper sessions, panel discussions, workshops, and various other events of interest to MAA members and anyone else who enjoys collegiate mathematics. Tickets for Disneyland will be available at a special discount rate.

The deadlines for preregistration, contributed papers, and the Employment Register are all *November 15*. Participants who preregister *before October 26* will be eligible for drawing for a complimentary hotel room. See the program for details.



Some of the 251 Americans attending the Fifth International Congress on Mathematical Education. At the left and right, respectively, in the front row are the two American members of the International Commission on Mathematical Instruction—Henry Pollak (ICMI Executive Committee) and Don Hill (U.S. National Representative to ICMI).

ICME 5 (continued from page 1)

Some study group topics were: Women and Mathematics; Mathematics Competitions; Theory of Mathematics Education; Teaching of Statistics.

Two main themes recurred throughout the Congress: *problem solving* and *technology in education*. Sessions featuring these topics attracted large numbers of participants and both topics were referred to in the major plenary talks. Calvin Long, of Washington State University, was particularly excited about the attention paid to problem solving. While admitting that the term means different things to different people, he nevertheless was pleased about the concern for teaching students to think, rather than worrying only about inculcating skills.

An impression gathered by Richard Shumway, of The Ohio State University, was that all of the developed countries represented at the Congress appear to be at a similar stage with regard to implementation of educational technology—the technology is available but is not fully utilized in the classrooms. This situation may stem from lack of a common philosophy as to the correct use of technological capabilities.

Many participants at the Congress stressed that great care must be taken in the use of technology in the classroom, cautioning that technology should not become the dominant theme. The devices ought to be used, not as ends in themselves, but to enhance the student's ability to think. All agreed that, used properly, technology can be an extremely powerful force in learning.

Henry Alder, University of California—Davis, reported intense interest among ICME participants in mathematics competitions. The session he organized on the International Mathematical Olympiad (IMO) drew more than 80 people, among them delegates from countries which had not previously participated in the IMO. Alder expects more of these countries to participate in the next competition.

Donovan Lichtenberg of the University of South Florida observed that there seemed to be widespread agreement among participating countries that geometry teaching should emphasize the development of spatial perception and that there has been a shift away, particularly in European countries, from the concentration on teaching geometry through formal deduction.

There was general agreement among participants that the plenary sessions were excellent. Ubi D'Ambrosio of Brazil gave a memorable talk on the interaction between society and mathematics education and change; Ren Potts of Australia showed some beautiful applications of discrete mathematics; and Jean-Pierre Kahane of France, President of ICMI, presented an elegant development of the theories of dimension, with applications to the coastline of Australia. Particular high praise was accorded to the presentation by Jeremy Kilpatrick of the University of Georgia; his talk treating the scholarly aspects of mathematics education set an appropriate tone for the entire Congress.

As with past ICME's, this Congress served to reaffirm that participating countries have many common concerns in the area of mathematics education. The ICME's are an important international forum for sharing ideas and receiving confirmation that problems can be addressed effectively and solutions achieved.

According to Don Hill, Florida A&M University and Chairman of the U.S. Commission on Mathematical Instruction, planning is well underway for ICME 6, which is scheduled for the summer of 1988 in Hungary. Many mathematicians

and mathematics educators are looking forward to a continuation of the mature dialogue centering on problems and concerns of mathematics education as evidenced in ICME 5.

The MAA will publish a fuller report on the Congress, *ICME 5: An American Perspective*, edited by Warren Page, Editor of the *College Mathematics Journal*. It is expected to be available before the end of the year. There will also be a panel report on ICME 5 at the MAA Annual Meeting in Anaheim on Sunday, January 13. See the program in this issue for more information.

Ulam to be Honored at Northwestern State University

Festivities honoring Stan Ulam will be held October 26-27, 1984, at Northwestern State University. Featured speakers will include R. D. Anderson, Mark Kac, Dan Mauldin, Jan Mycielski, and Gian Carlo-Rota.

For further information, contact Professor Don Ryan, Department of Mathematics, Northwestern State University, Natchitoches, LA 71497.



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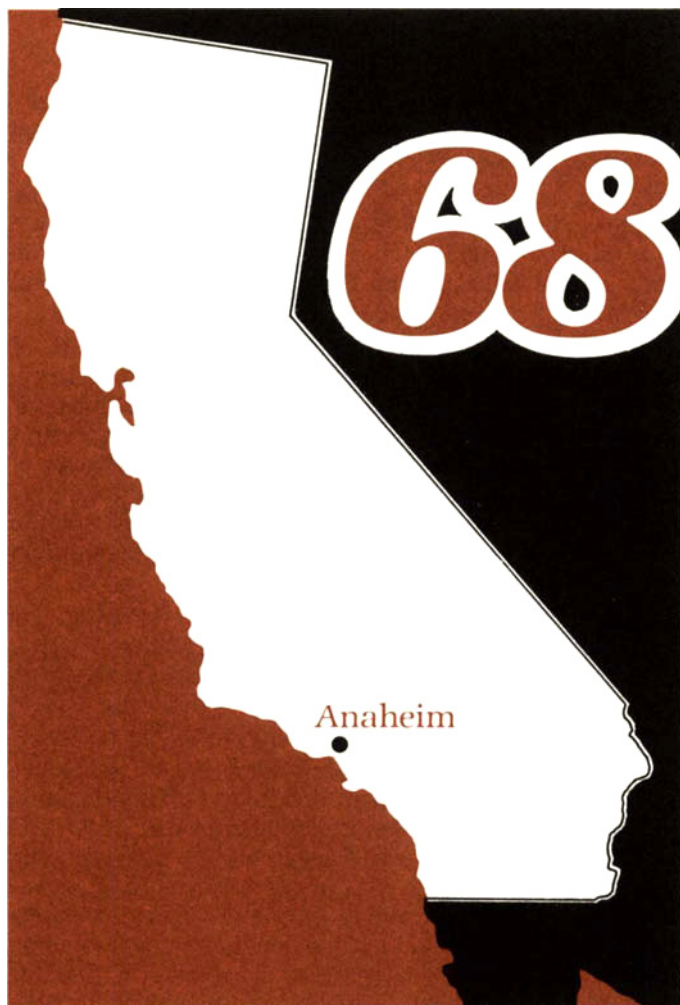
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Mathematical Association of America

68th ANNUAL MEETING

January 11-13, 1985



The January 1985 Joint Mathematics Meetings, including the 68th Annual Meeting of the Mathematical Association of America, the 91st Annual Meeting of the American Mathematical Society, and the 1985 annual meetings of the Association for Symbolic Logic, the Association for Women in Mathematics, and the National Association for Mathematicians will be held January 9-13 (Wednesday-Sunday), 1985, in Anaheim, California. MAA sessions will take place in the Anaheim Convention Center, 800 West Katella.

68th Annual Meeting of the MAA January 11-13, 1985

Invited Addresses

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

The search for randomness, Persi Diaconis, Stanford University, 10:00 a.m. Sunday.

Algorithms, geometry, and $GL(n, Z)$, Helaman R. P. Ferguson, Brigham Young University, 9:00 a.m. Saturday.

Toolkit for nonlinear dynamics, John M. Guckenheimer, University of California, Santa Cruz, 11:00 a.m. Saturday.

The many lives of invariant theory, Gian-Carlo Rota, Massachusetts Institute of Technology, 10:00 a.m. Saturday.

Some diophantine problems, Murray M. Schacher, University of California, Los Angeles, 11:00 a.m. Sunday.

Combinatorial set theory and its applications to topology, Franklin D. Tall, University of Toronto, 10:00 a.m. Friday.

Some recent advances in real, complex, and harmonic analysis, Guido L. Weiss, Washington University, 9:00 a.m. Sunday.

Trusting computers, Joseph Weizenbaum, Massachusetts Institute of Technology, 11:00 a.m. Friday.

Minicourses

Ten Minicourses are being offered by 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: *The teaching of applied mathematics* is being organized by W. Gilbert Strang, Massachusetts Institute of Technology. Part A is scheduled from 10:00 a.m. to noon and Part B from 7:00 p.m. to 9:00 p.m. on Saturday, January 12. Total enrollment for this Minicourse is limited to 80 persons.

In this Minicourse one possible framework for an introduction to modern applied mathematics will be discussed. After basic courses in calculus and linear algebra, there is an important need that is not met by the traditional advanced calculus. The course should include both discrete and continuous problems, and numerical and combinatorial algorithms, bringing out their analogies and developing the mathematical ideas that are shared by different applications. The organizer is convinced that this syllabus is also the right way to organize the mathematics needed by engineers and computer scientists; that subject does not have to be old-fashioned and boring. This course is the subject of the organizer's teaching and writing, and he hopes for discussion and correspondence about effective ways to introduce applied mathematics.

Minicourse #2: *APL - A functional computer language for mathematicians* is being organized by Garry A. Helzer, University of Maryland, College Park. Part A is scheduled from 10:00 a.m. to noon and Part B from 7:00 p.m. to 9:00 p.m. on Friday, January 11. Total enrollment for this Minicourse is limited to 30 persons.

This is a four-hour, self-contained, and hands-on introduction to the APL computer language. No previous computer experience is expected.

The first session will introduce some of the unique functions and operators defined in APL. The participants

will then use these functions and operators to do computations from among probability theory, calculus, matrix algebra, logic, and set theory. These computations will be done without programming in APL's calculator mode.

The second session will emphasize the functional character of the language. Functional programming languages allow very flexible applications packages to be easily built and maintained. This will not be a session on the details of entering and editing APL programs. Rather the structure of a few such packages will be discussed and the packages will be made available to the participants for hands-on experience. Examples will be chosen from packages for descriptive statistics, linear algebra, number theory, two and three dimensional graphics, and polynomial arithmetic.

Minicourse #3: *Teaching problem solving* is being organized by Alan H. Schoenfeld, University of Rochester. Part A is scheduled from 10:00 a.m. to noon and Part B from 7:00 p.m. to 9:00 p.m. on Friday, January 11. Total enrollment for this Minicourse is limited to 80 persons.

The MAA Committee on the Teaching of Undergraduate Mathematics (CTUM) recommends that "a series of problem solving courses at various levels of sophistication be developed and made regular offerings in the standard curriculum." This Minicourse develops the following five themes related to introducing a problem solving course:

1. Heuristics á la Polya. An introduction to Polya's "basic" problem solving strategies, with collections of sample problems.
2. On thinking mathematically: The big picture. What, beyond "basics", contributes to expertise? The notion of "control" or "executive" decisions.
3. What we know about thinking. Tidbits from the world outside mathematics, ranging from developmental psychology to artificial intelligence.
4. What students don't know about thinking. A close look at what really happens when students try to solve problems.
5. Teaching problem solving. A "nuts and bolts" discussion of problem solving in "ordinary" and special classes. Pointers to useful sources.

Minicourse #4: *Applications of discrete mathematics* is being organized by Fred S. Roberts, Rutgers University. Part A is scheduled from 10:00 a.m. to noon and Part B from 7:00 p.m. to 9:00 p.m. on Friday, January 11. Total enrollment for this Minicourse is limited to 80 persons.

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

involving telecommunications and mobile radio transmission, urban sciences, computer graph plotting of electrical networks, and keypunching errors in computing.

Minicourse #5: *Groups, graphs, and computing* is being organized by Eugene M. Luks, University of Oregon. Part A is scheduled from 10:00 a.m. to noon and Part B from 7:00 p.m. to 9:00 p.m. on Saturday, January 12. Total enrollment for this Minicourse is limited to 80 persons.

The course will explore some exciting applications of group theory to problems in theoretical computer science. A focus will be on divide-and-conquer algorithms for manipulating large permutation groups. These algorithms are the basic tools in the solutions of a number of problems, including some inspired by Rubik's Cube. They also form the machinery behind some new attacks on the computationally-significant problem of testing graph isomorphism.

Minicourse #6: *PROLOG* is being organized by Frederick Hoffman, Florida Atlantic University. Part A is scheduled from 10:00 a.m. to noon and Part B from 2:00 p.m. to 4:00 p.m. on Sunday, January 13. Total enrollment for this Minicourse is limited to 30 persons.

The intention of this Minicourse is to introduce the programming language PROLOG (PROgramming in LOGic) to an audience of mathematicians. PROLOG is many things: mechanized logic; a good programming language for beginners; a major artificial intelligence language, with applications to game playing, theorem proving, robot motion, natural language understanding and expert systems development; a powerful tool for database management; and the initial choice for the "machine language" of the Japanese Fifth Generation Computer Project. In the Minicourse, PROLOG will be described, evidence will be given that these statements are at least arguable, and some hands-on experience with microPROLOG will be provided. No computer background will be assumed; those attending should have seen a syllogism before, but no advanced knowledge of logic is required.

Minicourse #7: *Linear programming* is being organized by Charles E. Haff, University of Waterloo. Part A is scheduled from 9:00 a.m. to noon and Part B from 2:00 to 5:00 p.m. on Sunday, January 13. Total enrollment for this Minicourse is limited to 80 persons.

Linear programming is the study of maximizing or minimizing linear functions subject to linear constraints. In addition to its theoretical richness, linear programming has wide applicability to such real-world problems as capital budgeting, design of diets, resource management, games of strategy, economic growth prediction and transportation management.

This course is designed to acquaint the participant with the skills to formulate, solve and analyze solutions to linear programming problems. Emphasis will be placed upon the computational techniques known as the simplex and revised simplex algorithms and upon applications of duality theory. Also included will be pedagogical pointers to the instructor who is new to the teaching of linear programming. Those who hope to gain the most from the course may wish to review those parts of linear algebra dealing with solutions to systems of linear equations and with elementary properties of vector spaces.

Minicourse #8: *Microcomputer software in mathematics instruction* is being organized by Roy E. Myers, Pennsylvania State University, New Kensington. Part A is scheduled from 10:00 a.m. to noon and Part B from 7:00 p.m. to 9:00 p.m. on Saturday, January 12. Total enrollment for this Minicourse is limited to 30 persons.

A wide variety of instructional software is becoming available for use with IBM compatible microcomputers. It varies in nature, including drill and practice, tutorial, and materials for use as lecture aids. Software is available for use in courses from introductory algebra through calculus, statistics, differential equations, and linear algebra. In this Minicourse, various types of software will be demonstrated, and issues relating to their uses will be discussed. It is planned that a large variety of software will be available and that Minicourse participants will have the opportunity to work with the software on microcomputers.

Minicourse #9: (A COMET Minicourse) *Teacher in-service programs* is being organized by Eugene A. Maier, Mathematics Learning Center and Portland State University. Part A is scheduled from 10:00 a.m. to noon and Part B from 2:00 to 4:00 p.m. on Sunday, January 13. Total enrollment for this Minicourse is limited to 40 persons.

Mathematicians are becoming more aware of the responsibility of the mathematics community for developing programs to improve mathematics teaching at all levels in the schools. The CUPM Panel on Continuing Mathematical Education of Teachers (COMET) is sponsoring this Minicourse for mathematicians who are interested in designing quality in-service programs. Mathematicians with no prior involvement in "math education" are especially welcome. The course will investigate strategies and procedures for offering continuing education that serves to increase teachers' competence and confidence in teaching mathematics. Topics discussed will include: types of programs, funding, judging needs and interests of teachers, program design and selection of content, instructional approaches, examples of exemplary programs, and reflections of a mathematician as a mathematics educator.

Minicourse #10: *Constructing placement examinations* is being organized by Richard E. Prosl, College of William and Mary and Chairman of the Committee on Placement Examinations. Part A is scheduled from 10:00 a.m. to noon and Part B from 7:00 p.m. to 9:00 p.m. on Friday, January 11. Total enrollment for this Minicourse is limited to 80 persons.

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.

The Minicourses are open only to persons who have registered for the Joint Mathematics Meetings and paid the Joint Meetings registration fee.

The Minicourses have separate registration fees of \$25 each. This fee entitles the registrant to attend all

sessions of the Minicourse for which he/she has registered. Please note in the descriptions the dates and times when these Minicourses meet. Participants are limited to two Minicourses each. It is advised that alternate choices be given in the event the first and/or second choice Minicourse(s) are full. Payment of the fee(s) must be made to the Minicourse Cashier at the meeting registration desk in Anaheim two working hours prior to the beginning of the Minicourse, or the reservation will be relinquished to someone on the waiting list. When making payment, the participant should present the confirmation to the Minicourse Cashier. "Standby" reservation confirmations will be issued to participants whose preregistration was received after the Minicourse was filled. These individuals should check with the Minicourse Cashier one working hour prior to the Minicourse to see if any openings have occurred.

If the only reason for registering for the Joint Meetings is to gain admission to a Minicourse, this should be indicated by checking the appropriate box on the 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.

Contributed Papers

Papers are being accepted on five topics in collegiate mathematics for presentation in contributed paper sessions at Anaheim. The topics, session leaders, their affiliations and days they will meet are:

- Teaching introductory statistics: topics, trends, and techniques (Ann Watkins, Pierce College, Session Leader), Saturday morning.
- Making mathematics majors marketable: undergraduate training for nonacademic careers (Ann K. Stehney, Institute for Defense Analyses, Session Leader), Sunday morning.
- Strategies, tactics, and techniques in teaching lower division and remedial courses (Ann D. Holley, San Diego Mesa College, Session Leader), Sunday afternoon.
- Teacher training and retraining (Calvin T. Long, Washington State University, Session Leader), Friday morning.
- Does research in mathematics learning at the college level exist? (James J. Kaput, Southeastern Massachusetts University, Session Leader), Sunday afternoon.

Presentations are normally limited to ten minutes, although selected contributors may be given up to twenty minutes.

Individuals wishing to submit papers for any of these sessions in Anaheim should send the following information to the MAA Washington office (1529 Eighteenth Street, NW, Washington, DC 20036) **before November 15, 1984.**

1. Title
2. Intended session
3. A one-paragraph abstract (for distribution at the meeting)

4. A one-page outline of the presentation
5. A list of special equipment required for the presentation (e.g., computer, film projector, videotape player).

Late papers will not be accepted.

This information will be sent to session leaders who will arrange for refereeing. Selection of papers will be announced by December 1.

Other MAA Sessions

The Committee on Secondary School Lectures is sponsoring a panel discussion on *How to give a successful talk to secondary school students* from 9:00 a.m. to 10:30 a.m. on Saturday, January 12. There will be individual presentations by Peter J. Hilton, David E. Logothetti, and Jean J. Pedersen, followed by a panel discussion with five participants including Professors Hilton, Logothetti, and Pedersen.

The Committee on the Teaching of Undergraduate Mathematics (CTUM) is sponsoring a session titled *Training programs for adjunct faculty and teaching assistants—an informal exchange*. Bettye Anne Case of Florida State University is organizing and presiding at this session, which will be held from 11:00 a.m. to noon on Sunday, January 13.

A panel discussion on *Calculus instruction: Crucial but ailing* will take place from 10:00 a.m. to noon on Friday, January 11. The organizers are Ronald G. Douglas, on leave at the University of California, Berkeley and Stephen B. Maurer of Swarthmore College and the Alfred P. Sloan Foundation. This panel is jointly sponsored by the AMS and MAA.

There will be a presentation of, and discussion about, a preliminary proposal from the Panel on Discrete Mathematics. This session, led by Martha J. Siegel, Towson State University, will take place from 8:00 a.m. to 9:50 a.m. on Friday, January 11. The panel will have published its preliminary report by December 1, 1984, and invites the MAA membership to react to it in an open discussion session. Copies of the report will be made available from the Washington, DC office of the MAA and at the MAA Book Sale in Anaheim.

There will be a panel report of the Fifth International Congress on Mathematical Education from 9:30 a.m. to 10:50 a.m. on Sunday, January 13. The presider will be Donald M. Hill of Florida Agricultural and Mechanical University. Professor Hill is Chairman of the U.S. Commission on Mathematical Instruction. Members of the panel are Henry L. Alder, Katherine P. Layton, Warren Page and Henry O. Pollak.

There will be a panel discussion on Sunday afternoon, January 13, from 2:00 p.m. to 3:30 p.m., sponsored by the Committee on Computers in Mathematics Education (CCIME). This session, organized by Christopher Nevison of Colgate University, will concern the use of computing in upper level undergraduate courses.

There will be a panel discussion on Project Equality, an undertaking of the College Board, from 2:00 p.m. to 3:30 p.m. on Sunday, January 13. This panel discussion is cosponsored by the MAA and the National Council of Teachers of Mathematics (NCTM).

A get-together cocktail hour for those interested in two-year college mathematics will be held from 4:30 p.m. to 6:00 p.m. on Friday, January 11. It will be hosted by Donald J. Albers, Menlo College, Second Vice President and chairman of the Committee on Two-Year Colleges, and will include the following: Discussion and distribution of the recommendations of the Sloan Foundation conference *New directions in two-year college mathematics* (Donald J. Albers, Stephen Rodi, and Ann E. Watkins); review of the continuing work of the CUPM Panel on the Mathematics Curriculum in Two-Year Colleges by the panel chairman, Ronald M. Davis; report on the College Mathematics Journal by its editor, Warren Page; and an open forum to identify concerns of those assembled.

A presentation of *Challenge of the Unknown*, an American Association for the Advancement of Science (AAAS) project, is scheduled for Friday evening, January 11. James C. Crimmins, executive producer of this seven-part film series for schools, will discuss the problem of making a film series on problem solving. The presentation will describe how the production team, working closely with a distinguished advisory board, designed the series not only to illustrate problem solving concepts, but also to involve students through the films and accompanying teaching materials in the challenge of devising and solving their own nonroutine problems. It will also focus on the role of films in schools, what they can do in motivating students and enlarging the classroom environment and what they cannot do.

Deane Arganbright of Whitworth College will make a presentation titled *The electronic spreadsheet—a creative program for mathematics and mathematicians*. The presentation is scheduled from 1:00 p.m. to 1:50 p.m. on Sunday, January 13.

A special program on computer science is being sponsored by the ACM/MAA Joint Committee on Retraining for Computer Science. There will be three separate, but related, events which will take place on Friday morning, Saturday morning, and Sunday morning. There will be six 40-minute talks in special sessions, scheduled on Friday and Sunday. There will be workshops on Friday and Saturday and there will be a panel discussion on Saturday. For more information, write to Ed Dubinsky, Department of Mathematics, Clarkson College of Technology, Potsdam, New York 13676.

Business Meeting

The Business Meeting of the MAA will take place at 4:30 p.m. on Saturday, January 12. The 1985 Award for Distinguished Service to Mathematics, the Chauvenet Prize, and the MAA Book Prize will be presented. This meeting is open to all members of the Association.

Board of Governors

The MAA Board of Governors will meet at 9:00 a.m. on Thursday, January 10. This meeting is open to all members of the Association.

Section Officers

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

MAA PROGRAM

Thursday, January 10

9:00 a.m. – 4:00 p.m. **Board of Governors' Meeting**
7:00 p.m. – 8:30 p.m. **Section Officers' Meeting**

Friday, January 11

– morning **Contributed Paper Session:** *Teacher training and retraining*, Calvin T. Long, Washington State University
8:00 a.m. – 9:50 a.m. **Panel on Discrete Mathematics Panel Discussion:** *A preliminary proposal*, Presider: Martha J. Siegel, Towson State University
8:00 a.m. – 10:00 a.m. **ACM/MAA Joint Committee on Retraining for Computer Science:** Special Session, Part A
10:00 a.m. – 10:50 a.m. **Invited Address:** *Combinatorial set theory and its applications to topology*, Franklin D. Tall, University of Toronto
10:00 a.m. – noon **AMS/MAA Panel Discussion:** *Calculus instruction: Crucial but ailing*, Co-organizers: Ronald G. Douglas, University of California, Berkeley and Stephen B. Maurer, Swarthmore College and the Alfred P. Sloan Foundation
10:00 a.m. – noon **Minicourse #2 (Part A):** *APL—A functional computer language for mathematicians*, Garry A. Helzer, University of Maryland, College Park
10:00 a.m. – noon **Minicourse #3 (Part A):** *Teaching problem solving*, Alan H. Schoenfeld, University of Rochester
10:00 a.m. – noon **Minicourse #4 (Part A):** *Applications of discrete mathematics*, Fred S. Roberts, Rutgers University
10:00 a.m. – noon **Minicourse #10 (Part A):** *Constructing placement examinations*, Richard E. Prosl, College of William and Mary and Chairman of the Committee on Placement Examinations
10:00 a.m. – noon **ACM/MAA Joint Committee on Retraining for Computer Science:** Workshop I
11:00 a.m. – 11:50 a.m. **Invited Address:** *Trusting computers*, Joseph Weizenbaum, Massachusetts Institute of Technology
4:30 p.m. – 6:00 p.m. **Committee on Two Year Colleges Social Hour and Discussion:** Host: Donald J. Albers, Menlo College
7:00 p.m. – 9:00 p.m. **Minicourse #2 (Part B):** *APL—A functional computer language for mathematicians*, Garry A. Helzer, University of Maryland, College Park
7:00 p.m. – 9:00 p.m. **Minicourse #3 (Part B):** *Teaching problem solving*, Alan H. Schoenfeld, University of Rochester
7:00 p.m. – 9:00 p.m. **Minicourse #4 (Part B):** *Applications of discrete mathematics*, Fred S. Roberts, Rutgers University
7:00 p.m. – 9:00 p.m. **Minicourse #10 (Part B):** *Constructing placement examinations*, Richard E. Prosl, College of William and Mary and Chairman of the Committee on Placement Examinations
7:30 p.m. – 9:30 p.m. **A National Meeting of Department Chairs,** Sponsor: AMS-MAA-SIAM Joint Policy Board for Mathematics
8:00 p.m. – 9:00 p.m. **Presentation:** *Challenge of the unknown*, an American Association for the Advancement of Science project

Saturday, January 12

– morning **Contributed Paper Session:** *Teaching introductory statistics: topics, trends, and techniques*, Ann Watkins, Pierce College
8:00 a.m. – 10:00 a.m. **ACM/MAA Joint Committee on Retraining for Computer Science:** Workshop II
9:00 a.m. – 9:50 a.m. **Invited Address:** *Algorithms, geometry, and $GL(n, Z)$* , Helaman R. P. Ferguson, Brigham Young University
9:00 a.m. – 10:30 a.m. **Committee on Secondary School Lectures Panel Discussion:** *How to give a successful talk to secondary school students*, Peter J. Hilton, SUNY, Center at Binghamton, David E. Logothetti, University of Santa Clara, and Jean J. Pedersen, University of Santa Clara
10:00 a.m. – 10:50 a.m. **Invited Address:** *The many lives of invariant theory*, Gian-Carlo Rota, Massachusetts Institute of Technology
10:00 a.m. – 11:00 a.m. **ACM/MAA Joint Committee on Retraining for Computer Science:** Panel Discussion

- 10:00 a.m. – noon **Minicourse #1 (Part A):** *The teaching of applied mathematics*, W. Gilbert Strang, Massachusetts Institute of Technology
- 10:00 a.m. – noon **Minicourse #5 (Part A):** *Groups, graphs, and computing*, Eugene M. Luks, University of Oregon
- 10:00 a.m. – noon **Minicourse #8 (Part A):** *Microcomputer software in mathematics instruction*, Roy E. Myers, Pennsylvania State University, New Kensington
- 11:00 a.m. – 11:50 a.m. **Invited Address:** *Toolkit for nonlinear dynamics*, John M. Guckenheimer, University of California, Santa Cruz
- 4:30 p.m. – 5:30 p.m. **Business Meeting,** Presentation of the 1985 Award for Distinguished Service to Mathematics, the Chauvenet Prize, and the MAA Book Prize
- 7:00 p.m. – 9:00 p.m. **Minicourse #1 (Part B):** *The teaching of applied mathematics*, W. Gilbert Strang, Massachusetts Institute of Technology
- 7:00 p.m. – 9:00 p.m. **Minicourse #5 (Part B):** *Groups, graphs, and computing*, Eugene M. Luks, University of Oregon
- 7:00 p.m. – 9:00 p.m. **Minicourse #8 (Part B):** *Microcomputer software in mathematics instruction*, Roy E. Myers, Pennsylvania State University, New Kensington

Sunday, January 13

- morning **Contributed Paper Session:** *Making mathematics majors marketable: undergraduate training for nonacademic careers*, Ann K. Stehney, Institute for Defense Analyses
- 8:00 a.m. – 11:00 a.m. **ACM/MAA Joint Committee on Retraining for Computer Science:** Special Session, Part B
- 9:00 a.m. – 9:50 a.m. **Invited Address:** *Some recent advances in real, complex, and harmonic analysis*, Guido L. Weiss, Washington University
- 9:00 a.m. – noon **Minicourse #7 (Part A):** *Linear programming*, Charles E. Haff, University of Waterloo
- 9:30 a.m. – 10:50 a.m. **Panel Report:** *Fifth International Congress on Mathematical Education*, Presider: Donald M. Hill, Florida Agricultural and Mechanical University and Chairman of the U.S. Commission on Mathematical Instruction. Panel: Henry L. Alder, Katherine P. Layton, Warren Page, and Henry O. Pollak
- 10:00 a.m. – 10:50 a.m. **Invited Address:** *The search for randomness*, Persi Diaconis, Stanford University
- 10:00 a.m. – noon **Minicourse #6 (Part A):** *PROLOG*, Frederick Hoffman, Florida Atlantic University
- 10:00 a.m. – noon **Minicourse #9 (Part A):** *Teacher in-service programs (A COMET Minicourse)*, Eugene A. Maier, Mathematics Learning Center and Portland State University
- 11:00 a.m. – 11:50 a.m. **Invited Address:** *Some diophantine problems*, Murray M. Schacher, University of California, Los Angeles
- 11:00 a.m. – noon **Committee on the Teaching of Undergraduate Mathematics Session:** *Training programs for adjunct faculty and teaching assistants—an informal exchange*, Presider: Bettye Anne Case, Florida State University
- afternoon **Contributed Paper Session:** *Strategies, tactics, and techniques in teaching lower division and remedial courses*, Ann D. Holley, San Diego Mesa College
- afternoon **Contributed Paper Session:** *Does research in mathematics learning at the college level exist?*, James J. Kaput, Southeastern Massachusetts University
- 1:00 p.m. – 1:50 p.m. **Presentation:** *The electronic spreadsheet—a creative program for mathematics and mathematicians*, Deane Arganbright, Whitworth College
- 2:00 p.m. – 3:30 p.m. **Committee on Computers in Mathematics Education Panel Discussion:** *The use of computing in upper level undergraduate courses*, Organizer: Christopher Nevison, Colgate University
- 2:00 p.m. – 3:30 p.m. **MAA and NCTM Panel Discussion:** *Project EQuality, an undertaking of the College Board*
- 2:00 p.m. – 4:00 p.m. **Minicourse #6 (Part B):** *PROLOG*, Frederick Hoffman, Florida Atlantic University
- 2:00 p.m. – 4:00 p.m. **Minicourse #9 (Part B):** *Teacher in-service programs (A COMET Minicourse)*, Eugene A. Maier, Mathematics Learning Center and Portland State University
- 2:00 p.m. – 5:00 p.m. **Minicourse #7 (Part B):** *Linear programming*, Charles E. Haff, University of Waterloo

Program Committee: Jeanne L. Agnew, George E. Andrews, Donald G. Babbitt, C. E. Burgess, Solomon W. Golomb, Sandy Grabiner, Melvin Henrikson, Kenneth A. Ross.

Local Arrangements Committee: Lorraine T. Foster (publicity director), James O. Friel, Robert M. Guralnick, Alfred W. Hales (chairman), Phocion G. Kolaitis, William J. LeVeque (ex-officio), Kenneth A. Ross (ex-officio), Hugo Rossi (ex-officio), Bernard Russo, David B. Wales, and Arthur Wayman.

91st Annual Meeting of the AMS January 9–13, 1985

The **American Mathematical Society** (AMS) program will feature a series of four Colloquium Lectures on *The classification of the finite simple groups* presented by Daniel Gorenstein. The fifty-eighth Josiah Willard Gibbs Lecture on *Randomization in mathematics and computer science* will be given by Michael O. Rabin. There will be nine one-hour invited addresses given by Ruth M. Charney, Ohio State University, *Stable properties of moduli spaces*, 9:00 a.m. Wednesday; Louis de Branges, Purdue University, *The Riemann hypothesis for Hilbert spaces of entire functions*, 11:15 a.m. Thursday; Ron Donagi, Northeastern University, title to be announced, 2:15 p.m. Wednesday; Lawrence Craig Evans, University of Maryland, College Park, *Some recent directions in nonlinear elliptic partial differential equations*, 9:00 a.m. Thursday; Dorian Goldfeld, Harvard University, *On Gauss' class number problem*, 10:15 a.m. Wednesday; William M. Kantor, University of Oregon, title to be announced, 2:15 p.m. Saturday; William H. Meeks III, Rice University, *Beauty and symmetry in the theory of minimal surfaces*, 3:30 p.m. Wednesday; Laurence C. Siebenmann, University of Paris, Orsay, *From Gromov's group compactification to wild sphere topology*, 2:15 p.m. Friday; and W. Hugh Woodin, California Institute of Technology, *Recent developments in set theory*, 3:30 p.m. Friday.

The American Mathematical Society will also present a two-day short course entitled *Fair Allocation* on Monday and Tuesday, January 7 and 8, at the Anaheim Convention Center in Anaheim, California. The program is being coordinated by H. Peyton Young, who is a professor at the School of Public Affairs at the University of Maryland, College Park.

Fair allocation is concerned with principles and procedures for allocating objects among competing claimants according to standards of equity. It has important applications to public sector allocation problems, including the apportionment of representation, the sharing of common costs of public facilities, voting, and other problems of distribution and redistribution.

The mathematics is mainly combinatorial in spirit but also involves applications of real and convex analysis and game theory. While no special background in these subjects is presumed, some acquaintance with them would be helpful. A suggested reference in game theory is G. Owen, *Game Theory*, second edition, Academic Press, 1982 (Chapters 1, 2, 8, and 11).

Synopses of the talks and accompanying reading lists appear in the October issue of the *Notices*. The course will consist of six 75 minute survey lectures: "The Apportionment of Representation," by H.P. Young of the University of Maryland and M.L. Balinski of the Centre National de Recherche Scientifique, Paris; "Cost Allocation," by H.P. Young; "Inequality Measurement," by J.E. Foster of the Krannert School, Purdue University; "Fairness and Strategy in Voting," by H. Moulin of the Virginia Polytechnic Institute (presented in two 75 minute lectures); and "Auctions and Competitive Bidding," by R. Weber of the J.L. Kellogg Graduate

School of Management, Northwestern University. The program will conclude with a discussion session with audience participation.

The short course is open to all who wish to participate upon payment of the registration fee. Please refer to the sections titled **Preregistration, Housing, Registration at the Meetings, and Registration, Dates, Times and Locations** for details.

ACTIVITIES OF OTHER ORGANIZATIONS

Section A of the **American Association for the Advancement of Science** (AAAS) will sponsor a special symposium on *Order in chaos*, to be held from 7:00 p.m. to 10:00 p.m. on Tuesday, January 8.

Recent work in many fields of science, as different as meteorology, turbulence of fluids, physiological control mechanisms, and molecular action, show that apparently dissimilar types of random behavior in these fields all have common features susceptible to mathematical modelling. The work raises new mathematical problems, and affords opportunities for application of many areas of pure mathematics. The three speakers, Mitchell Feigenbaum of Cornell University, Joseph Ford of the Georgia Institute of Technology, and Jerry P. Gollub of Haverford College, all professors of physics, all among the leaders in this new area of science.

The discussion is intended to be expository, to introduce mathematicians to the new field, and to indicate directions for new mathematical research.

This will be the first of an annual series of symposia, intended by Section A to help bring mathematics and the parts of science using and needing new mathematical methods together.

The **Association for Symbolic Logic** (ASL) will hold its 1985 Annual Meeting on Saturday and Sunday, January 12–13. In addition to the contributed papers, there will be six invited talks. A partial list of speakers is L. van den Dries, J. McCarthy, T. Slaman, K. Fine, and H. Becker. (Note that the related AMS Invited Address on logic by W. Hugh Woodin has been scheduled for 3:30 p.m. on Friday, January 11.)

The fifth annual Emmy Noether Lecture will be presented to the **Association for Women in Mathematics** (AWM) at 9:00 a.m. on Friday, January 11, by Jane Cronin Scanlon, Rutgers University.

AWM will sponsor a panel discussion on *Nonacademic careers in mathematics* at 10:15 a.m. on Thursday, January 10. The moderator for this panel is Patricia C. Kenschaft, Montclair State College.

The AWM Business Meeting will be held at 11:15 a.m. on Thursday, January 10.

A reception is being planned by AWM for 5:45 p.m. on Thursday, January 10.

The **Mathematical Programming Society's** (MPS) 1984 Milestone Prize in Automated Theorem Proving will be awarded to J. A. Robinson on Friday, January 11 at 7:00 p.m. for his fundamental contributions to the field. Professor Robinson's address will follow the presentation.

The **National Association of Mathematicians** (NAM) will receive the William W. S. Claytor Lecture at 10:00

a.m. on Saturday, January 12, from David Blackwell, Department of Statistics, University of California, Berkeley, who will speak on *Some recent developments in statistics* (tentative).

NAM will sponsor a Panel Discussion titled *Graduate students in mathematics: "Increasing the pool"* at 11:15 a.m. on Saturday, January 12. The panel will be moderated by Rogers Newman, Southern University. Panelists are Tepper Gill, Gloria Hewitt, J. Arthur Jones, and Dwight Lahr.

The NAM Business Meeting will take place at 6:30 p.m. on Friday, January 11.

John C. Polking, Director of the Division of Mathematical Sciences of the **National Science Foundation** (NSF) will speak at 4:45 p.m. on Wednesday, January 9, on the NSF budget.

At 7:15 p.m. on Wednesday, January 9, the Office for Advanced Scientific Computing of the NSF will present a discussion of *The NSF supercomputer initiative*. Larry Lee, Program Director for Supercomputer Centers, is organizing this presentation, and will speak from 7:15 to 7:45 p.m. There will be three additional speakers.

The NSF will again 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 from 9:00 a.m. to 5:00 p.m., Thursday and Friday, January 10–11.

OTHER EVENTS OF INTEREST

A National Meeting of Department Chairs

The AMS-MAA-SIAM Joint Policy Board for Mathematics will sponsor a National Meeting of Department Chairs at 7:30 p.m. on Friday, January 11.

Book Sales

Books published by the AMS and MAA will be sold for cash prices somewhat below the usual prices when these same books are sold 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 the Anaheim Room of the Anaheim Convention Center.

Exhibits

The book and educational media exhibits are located in the Anaheim Room of the Anaheim Convention Center and will be open Wednesday, January 9, through Saturday, January 12. The exhibits will be open from 1:00 p.m. to 5:00 p.m. on Wednesday; from 9:00 a.m. to 5:00 p.m. on Thursday and Friday; and from 9:00 a.m. to noon Saturday. All participants are encouraged to visit the exhibits during the meeting. **Participants visiting the exhibits will be asked to display their meeting badge in order to enter the exhibit area.**

ACCOMMODATIONS

Hotels

The rates listed below are subject to an 8 percent sales tax. The number in parentheses after the name

of the hotel is the number it carries on the map. The estimated walking distance from the hotel to the Anaheim Convention Center is given in parentheses following the telephone number.

Participants should be aware that when major conventions occur in any large city, additional safety problems are created, especially at night. Those who are attending the meetings alone, or who are concerned about walking to and from the meetings after dark, are encouraged to choose a hotel in close proximity to the Convention Center. Participants are also urged to read the *Words to the Wise* in the centerfold of the program they receive at the meetings.

Reservations at these hotels cannot be made by calling the hotel directly until after **December 31**. Also, after that date, the rates below may not apply.

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 single beds; and "twin double" refers to two persons in two double beds. A rollaway cot for an extra person can be added to double or twin rooms only; however, not all hotels are willing to do so.

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 one-night's deposit 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 then, the room is then released for sale, and the hotel retains the deposit. 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 January 1, 1985**. The telephone number in Providence is 401-272-9500 (extension 239). After that date, changes should be made directly with the hotel. Cancellations must be made 48 hours prior to date of arrival.

Hilton at the Park (5)

1855 South Harbor Boulevard
Anaheim, California 92802

Telephone: 714-750-1811 (2 minutes)

Singles	\$ 60
Doubles/Twin Doubles	\$ 60 (1 or 2 beds)
Triples	\$ 70 (2 beds)
	\$ 70 (2 beds plus cot)

Quads	\$ 80 (2 beds)	\$47 (2 beds plus cot)
Suites	\$155-\$380	

Children of any age are free in same room with parents. **No advance deposit is required for room reservations.** The Hilton will request deposits when confirmations are sent; payment for deposits may be made by check, American Express, Diners Club, and Carte Blanche. Balance due may be paid in the same manner, as well as by Visa and MasterCard. There is a \$1 daily parking fee for guests of the Hilton with in/out privileges. Airport bus will discharge passengers at the Grand Hotel where a Hilton phone is available to request shuttle service to the hotel. A 48-hour cancellation notice is required.

Holiday Inn—Anaheim (6)

1850 South Harbor Boulevard
Anaheim, California 92802

Telephone: 714-750-2801 (3 minutes)

Singles	\$58
Twin Doubles	\$64 (2 beds)
Triples	\$70 (2 beds)
	\$70 (2 beds plus cot)
Quads	\$76 (2 beds plus cot)

Children 12 years of age and under are free; \$6 will be charged if a cot is used. **A \$50 room deposit is required by check made payable to AMS, or Visa or MasterCard.** Balance due may be paid in the same manner, as well as by American Express, Diners Club and Carte Blanche. Airport bus will discharge passengers at the Grand Hotel where a Holiday Inn phone is available to request shuttle service to the motel. A 48-hour cancellation notice is required.

Inn of Tomorrow (1)

1110 West Katella Avenue
Anaheim, California 92802

Telephone: 800-854-8175 (10 minutes)

Singles	\$36
Doubles	\$40 (1 or 2 beds)
Triples	\$44 (2 beds)
	\$48 (2 beds plus cot)
Quads	\$48 (2 beds)
	\$52 (2 beds plus cot)

Children 18 years of age and under are free; \$4 will be charged if a cot is used. **A \$50 room deposit by check made payable to AMS, or MasterCard, Visa, American Express, Carte Blanche, or Diners Club.** Balance due may be paid in the same manner. Airport bus will discharge passengers at the Grand Hotel where the Inn of Tomorrow meets incoming arrivals. A 48-hour cancellation notice is required.

Jolly Roger Inn (4)

640 West Katella Avenue
Anaheim, California 92802

Telephone: 714-772-7621 (6 minutes)

Singles	\$41
Doubles	\$42 (1 or 2 beds)
Triples	\$45 (2 beds)
	\$47 (2 beds plus cot)
Quads	\$45 (2 beds)

Children 3 years of age and under are free in same room with parents. Cribs, complete with linen are available for this age group at no charge. **A \$50 room deposit is required by check made payable to AMS, or Visa or MasterCard.** Balance due may be paid in the same manner. Airport bus will discharge passengers at the Grand Hotel where phones are available to request shuttle service to the motel. A 24-hour cancellation notice is required.

Magic Carpet (3)

1016 West Katella Avenue
Anaheim, California 92802

Telephone: 714-772-9450 (7 minutes)

NOTE: It is the practice of this motel not to send out confirmations. The acknowledgment sent by the Mathematics Meetings Housing Bureau in Providence will serve as confirmation of room reservation.

Singles	\$28
Doubles	\$32 (1 or 2 beds)
Triples	\$36 (2 beds)
	\$38 (2 beds plus cot)
Quads	\$38 (2 beds)
	\$40 (2 beds plus cot)

Children 3 years of age and under are free; \$2 will be charged if a cot is used. **A \$50 room deposit is required by check made payable to AMS, or Visa, MasterCard, or American Express.** Balances due may be paid in cash or by any of the credit cards indicated above; **no personal checks will be accepted.** Airport bus will discharge passengers at the Grand Hotel where phones are available to request shuttle service to the motel. A 48-hour cancellation notice is required.

Magic Lamp (2)

1030 West Katella Avenue
Anaheim, California 92802

Telephone: 714-772-7242 (7 minutes)

NOTE: It is the practice of this motel not to send out confirmations. The acknowledgment sent by the Mathematics Meetings Housing Bureau in Providence will serve as confirmation of room reservation.

Singles	\$28
Doubles	\$32 (1 or 2 beds)
Triples	\$36 (2 beds)
	\$38 (2 beds plus cot)
Quads	\$38 (2 beds)
	\$40 (2 beds plus cot)

Children 3 years of age and under are free; \$2 will be charged if a cot is used. **A \$50 room deposit is required by check made payable to AMS, or Visa, MasterCard, or American Express.** Balances due may be paid in cash or by any of the credit cards indicated above; **no personal checks will be accepted.** Airport bus will discharge passengers at the Grand Hotel where phones are available to request shuttle service to the motel. A 48-hour cancellation notice is required.

Marriott Hotel (7)

700 West Convention Way

Anaheim, California 92802

Telephone: 714-750-8000 (4 minutes)

Singles	\$55
Doubles	\$60 (1 or 2 beds)
Triples	\$66 (2 beds)
	\$70 (2 beds plus cot)
Quads	\$68 (2 beds)
	\$72 (2 beds plus cot)
Suites	Upon request

Children 18 years of age and under are free; \$10 will be charged if a cot is used. **A \$50 room deposit is required by check made payable to AMS** or Visa, MasterCard or American Express. Balances due may be paid in the same manner. Airport bus discharges passengers at the Marriott Hotel. Parking for Marriott guests is free. A 48-hour cancellation notice is required.

Quality Inn (8)

616 Convention Way

Anaheim, California 92802

Telephone: 714-750-3131 (5 minutes)

Singles	\$50
Doubles	\$58 (1 or 2 beds)
Triples	\$64 (2 beds)
	\$66 (2 beds plus cot)
Quads	\$64 (2 beds)
	\$66 (2 beds plus cot)

Children 16 years of age and under are free; \$8 will be charged if a cot is used. **A \$50 room deposit is required by check made payable to AMS**, or Visa, MasterCard, or American Express. Balances due may be paid in the same manner. Airport bus discharges passengers at the Grand Hotel where phones are available to request shuttle service to the motel. A 72-hour cancellation notice is required..

Anaheim Town and Country Inn (9)

2040 South Harbor Boulevard

Anaheim, California 92802

Telephone: 800-772-6100 (7 minutes)

Singles	\$ 38
Doubles	\$ 42 (1 or 2 beds)
Triples	\$ 46 (2 beds)
	\$ 47 (2 beds plus cot)
Quads	\$ 50 (2 beds)
	\$ 55 (2 beds plus cot)
Minisuites (1 bath)	\$ 49 (2 persons)
	\$ 5 cot charge for 3rd and 4th occupant
Family suites (1 bath)	\$ 66 (4 persons)
	\$ 5 cot charge for 5th and 6th occupant
Suites	\$100 (6 persons)
	\$ 5 cot charge for 7th and 8th occupant

Children 12 years of age and under are free; \$5 will be charged if cot is used. **A \$50 room deposit is required by check made payable to AMS**, Visa, MasterCard, or American Express. Balance due may be paid in the same manner. Continental breakfast is included in room rates. Airport bus discharges passengers at the Grand Hotel

where phones are available to request shuttle service to the motel. A 48-hour cancellation notice is required.

Anaheim Travelodge International Inn (10)

2060 South Harbor Boulevard

Anaheim, California 92802

Telephone: 714-971-9393 (8 minutes)

Singles	\$40
Doubles	\$40 (1 or 2 beds)
Triples	\$40 (2 beds)
	\$44 (2 beds plus cot)
Quads	\$42 (2 beds)
	\$46 (2 beds plus cot)
Suites	\$75-79
	\$95-99

Children 12 years of age and under are free; \$4 will be charged if a cot is used. **A \$50 room deposit is required by check made payable to AMS** or Visa, MasterCard or American Express. Balance due may be paid by these credit cards only. Complimentary breakfast is included in room rate. Airport bus discharges passengers at the Grand Hotel where phones are available to request shuttle service to the motel. A 48-hour cancellation notice is required; however, a \$5 penalty for cancellation will be charged.

Registration Desk**Registration at the Meetings**

Meeting preregistration and registration fees only partially cover expenses of holding meetings. All mathematicians who wish to attend sessions are expected to register, and should be prepared to show their meeting badge, if so requested. **Badges are required to enter the exhibit area, to obtain discounts at the AMS and MAA Book Sales, to cash a check with the meeting cashier, and to attend sessions scheduled in the Pacific Room of the Anaheim Convention Center. (If a preregistrant should arrive too late in the day to pick up his/her badge, he/she may show the acknowledgment 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.

Joint Mathematics Meetings

Member of AMS, ASL, MAA, NCTM	\$ 72
Emeritus Member of AMS, MAA	\$ 18
Nonmember	\$109
Student/Unemployed	\$ 18

Employment Register

Employer	\$100
Applicant	\$ 20

AMS Short Course

Student/Unemployed	\$ 10
All Other Participants	\$ 30
One-day Fee (Second Day Only)	\$ 15

MAA Minicourses #1 through #10

All Participants	\$ 25 each
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U.S. Treasury regulation §1.162-5 allows an income tax deduction for education expenses (registration fees, cost of travel, meals, and lodging) incurred to (i) maintain or improve skills in one's employment or other trade or business or (ii) meet express requirements of an employer or a law imposed as a condition to retention of employment, job status, or rate of compensation. This is true even for education that leads to a degree.

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.

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 register at the meetings and pay the \$109 nonmember registration fee are entitled to a discount of the difference between the member registration fee of \$72 and the nonmember registration fee of \$109 as a \$37 credit against dues in either the AMS or MAA or both, provided they apply for membership before February 13, 1985.

Nonmember students who register at the meetings and pay the \$18 registration fee are entitled to a discount of the difference between the student preregistration fee of \$14 and the registration fee of \$18 as a \$4 credit against dues in either the AMS or MAA or both, provided they apply for membership before February 13, 1985.

Nonmembers and nonmember students who thus qualify may apply for membership at the meetings, or by mail afterward up to the deadline.

Registration Dates, Times, and Locations

AMS Short Course

California Room, Anaheim Convention Center

Monday, January 7 9:00 a.m. to 4:00 p.m.

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

Joint Mathematics Meetings

[and MAA Minicourses (until filled)]

North Lobby, Anaheim Convention Center

Tuesday, January 8 4:00 p.m. to 8:00 p.m.

Wednesday, January 9 8:00 a.m. to 5:00 p.m.

Thursday, January 10,

through 8:00 a.m. to 4:00 p.m.

Saturday, January 12

Assistance and Information Desk

Heritage Lobby, Anaheim Convention Center

Sunday, January 13 8:30 a.m. to 1:30 p.m.

Registration Desk Services

AMS/MAA Information

Information on the publications and activities of both organizations may be obtained at this section of the registration desk.

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 meetings director, 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 their audio-visual requirements.

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

Check Cashing

The meeting 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 attendees 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 or hotels.

Local Information

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

Lost and Found

See the meeting cashier.

Mail

All mail and telegrams for persons attending the meetings should be addressed to the participant, c/o Joint Mathematics Meetings, Anaheim Convention Center, 800 West Katella Avenue, Anaheim, California 92802. 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 8 through 12 only, 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 is 714-635-8440.

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. **Please note that this service will not be available on Sunday, January 13.**

Visual Index

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

MISCELLANEOUS INFORMATION

Child Care

The Marriott Hotel has eight sitters on call at \$5 per hour. All of the other hotels which are blocking rooms for the meeting provide telephone numbers of bonded babysitting agencies and/or licensed individual babysitters. Rates vary from \$4 to \$5, some with initial four-hour minimums, ranging from \$23 to \$26. Agency rates are subject to change. It is therefore advisable to contact the individual agency to establish their particular hourly rate and any transportation fees.

Disneyland

The Local Arrangments Committee has negotiated a special discount in the adult rate at Disneyland for participants in the January 1985 Joint Mathematics Meetings. Disneyland Exchange Cards may be purchased through preregistration or at the meeting for \$9 each. This card may be exchanged at the Disneyland main entrance ticket booth or Monorail station for one Disneyland Passport Ticket. The current rates for these tickets are \$14 for adults and \$9 for children from three to eleven years of age (children under three years of age are free). Disneyland will be closed Monday and Tuesday, January 7-8, but will be open from 10:00 a.m. to 6:00 p.m. Wednesday through Friday, January 9-11 and from 10:00 a.m. to 7:00 p.m. on Saturday and Sunday, January 12-13. The park will be closed on Monday, January 14, but will be open from 10:00 a.m. to 6:00 p.m. on Tuesday, January 15. The Exchange Cards are good for the period January 5-15.

Local Information

Taxis presently cost \$1.40 plus \$1.20 per mile for one to five persons. Most local trips within the Convention

Center area are under \$3. The Orange County Transit District (OCTD) operates buses throughout Orange County. Local fares are 60 cents midday, weekends, and holidays, but 75 cents during weekday rush (6:00-9:00 a.m. and 3:00-6:00 p.m.). Note that riders must have exact change for the fare; bus drivers do not carry change.

Several sight-seeing and shopping shuttles operate in the area. *Fun Bus* offers scheduled and daily door-to-door service from most Convention Center area hotels and motels to Disneyland, Knott's Berry Farm, Movieland and Buena Park Shopping Center; prices vary according to route. The *City Shopper* provides convenient transportation to the City Shopping Center in Orange and local hotels; the fare is \$1. The *Anaheim Plaza Express* operates during mall hours daily providing roundtrip transportation to Anaheim Plaza from local Anaheim hotels; the fare is \$1.

In addition to the local Anaheim attractions mentioned above, greater Los Angeles offers an enormous variety of cultural, historical, and recreational attractions. Information on these will be available at the Local Information section of the registration desk.

Parking

There is adequate parking at the Anaheim Convention Center. The charge is \$2.50 per day. A new charge is incurred if the car is taken from the lot and returned. The parking lot opens in the morning and closes after the last events. There is no parking in the residential areas surrounding the Convention Center. Cars parked in this area risk being ticketed.



Anaheim Meeting—SuperPhone Exclusive

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SUPERPHONE exclusive does it again! Discount roundtrip airfare for Anaheim is available for the Joint Mathematics Meetings, January 7–13, 1985.

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Remember these special fares are available **ONLY THROUGH THE ANAHEIM MEETING SUPERPHONE EXCLUSIVE**.

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(In Rhode Island and outside the Continental U.S. call 401-884-9500.)

Hours of Operation: 9:00 a.m. to 7:00 p.m. EST, Monday through Thursday, Fridays until 6:00 p.m.

There is parking available at the surrounding hotels. The Hilton Towers has its own five-level parking structure. Self-parking there is \$3 for a 24-hour period. The car can be removed and returned at no additional charge. The Hilton Towers is adjacent to the Anaheim Convention Center.

Parking at the Anaheim Marriott is free for guests and \$3 per day otherwise. There are no in and out privileges.

Social Events

The Local Arrangements Committee has arranged a No-Host Cocktail Party for Friday, January 11, from 8:30 to 11:00 p.m. at the Anaheim Marriott.

Travel

In January, Anaheim is on Pacific Standard Time.

The Anaheim Convention Center is located near the junction of the Santa Ana Freeway (Interstate 5) and Harbor Boulevard, 27 miles from downtown Los Angeles.

All major airlines provide regular service to the Los Angeles International Airport (LAX). Airport Service, Inc. (telephone 714-778-3141) operates "The Airport Bus" between LAX and Anaheim with frequency varying between 20 minutes and 60 minutes depending on the hour of the day. No reservations are required for the bus. Present cost is about \$9 per person and the trip takes from one to one-and-one-half hours. Buses board passengers at all LAX terminals and stop at several major hotels near the Anaheim Convention Center.

To reach Anaheim from LAX by car, take the San Diego Freeway (Interstate 405) South to Artesia Freeway (Highway 91) East, to Santa Ana Freeway (Interstate 5) South, and exit on Harbor Boulevard. The trip by car takes at least 45 minutes.

Some major airlines fly daily to the John Wayne (Orange County) Airport (SNA). There are direct flights to Orange County from Chicago, Dallas, Phoenix, Salt Lake City and many cities in California. The trip by bus from the Orange County Airport to the Anaheim Convention Center

takes about 40 minutes. The present bus fare is \$3.60 per person. Participants are warned, however, that service is infrequent and they should be prepared to wait an hour or more depending upon the arrival time of their flight. To reach Anaheim from the Orange County Airport by car, take the Costa Mesa Freeway (Highway 55) North to Santa Ana Freeway (Interstate 5) and exit on Harbor Boulevard. This trip takes about 20 minutes.

Los Angeles can be reached by car via I-5 from the north and south, and I-10, I-15, and I-40 from the east. There is a major AMTRAK terminal in downtown Los Angeles and an AMTRAK station in Anaheim itself.

Weather

Winters in Anaheim are generally mild. The average high temperature in January is 68°F while the average low is 44°F. On rare occasions, temperatures may range from the upper twenties to the eighties. Contrary to popular belief, it does rain in Southern California. The average rainfall in January is slightly over three inches.

Preregistration

Preregistration for these meetings **must be completed by November 15, 1984**. Those wishing to preregister must complete the form which appears at the back of this issue and submit it together with the appropriate preregistration fee(s) to the Mathematics Meetings Housing Bureau in Providence by **November 15**.

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.

As stated on the facing page, all requests for hotel accommodations, except for rooms at the Hilton at the Park, **must be accompanied by one night's deposit for each room requested**. Preregistration fees and hotel deposits 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, number (and 4-digit bank code in the case of MASTERCARD) **exactly** as they appear on the credit card, and to include the expiration date.

Those who preregister for the Joint Mathematics Meetings pay fees which are 30 percent lower than those who register at the meetings. The preregistration fees are as follows:

AMS Short Course

Student/Unemployed	\$ 5
All Others	\$25

Joint Mathematics Meetings

Member of AMS, ASL, MAA, NCTM	\$55
Emeritus Member of AMS, MAA	\$14
Nonmember	\$84
Student/Unemployed	\$14

Employment Register

Employer	\$75
Applicant	\$15

U.S. Treasury regulation §1.162-5 allows an income tax deduction for education expenses (registration fees, cost of travel, meals, and lodging) incurred to (i) maintain or improve skills in one's employment or other trade or business or (ii) meet express requirements of an employer or a law imposed as a condition to retention of employment, job status, or rate of compensation. This is true even for education that leads to a degree.

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 15** 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 January 4. **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 refunds will be made of the Joint Mathematics Meetings preregistration fee, **provided the preregistrant has checked the box** on the Preregistration/Housing Form that this was his or her intent. Individuals who preregister for both the Joint Meetings and a Minicourse and who intend to participate in the Joint Meetings, even if the Minicourse is not available, should, of course, **not** check the box on the Preregistration/Housing Form. In this case the Joint Meetings preregistration will be processed.

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 Anaheim meetings. The attention of applicants is particularly directed to the box 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

Special Bonus for Early Preregistrants!

Participants who preregister before the *early* preregistration deadline of **October 26** will be eligible for a complimentary room at the Holiday Inn-Anaheim, Inn of Tomorrow, Jolly Roger Inn, Magic Carpet, Magic Lamp, Quality Inn-Anaheim, or the Town and Country Inn. (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 31. **So, preregister early!**

New Acknowledgment Form

Beginning with the Anaheim meeting, 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, except for the Magic Carpet and the Magic Lamp, who do not confirm.

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 15, 1984. Housing requests received after the deadline of November 15 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 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 Anaheim are required to submit housing deposits 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 or MASTERCARD credit card number on the Preregistration/Housing Form. Please be sure to give the name, number (and 4-digit bank code in the case of MASTERCARD) **exactly** as they appear on the credit card, and to include the expiration date. Please note that the Hilton at the Park requires no deposit. Also please note that several of the hotels will accept an American Express credit card number for deposit. **Please read the section on Hotels carefully regarding deposits.**

The number of rooms being held by the Anaheim hotels at each rate is limited. Housing assignments

are made on a first-come, first-served basis, so participants desiring low-cost accommodations are urged to get 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 31.**

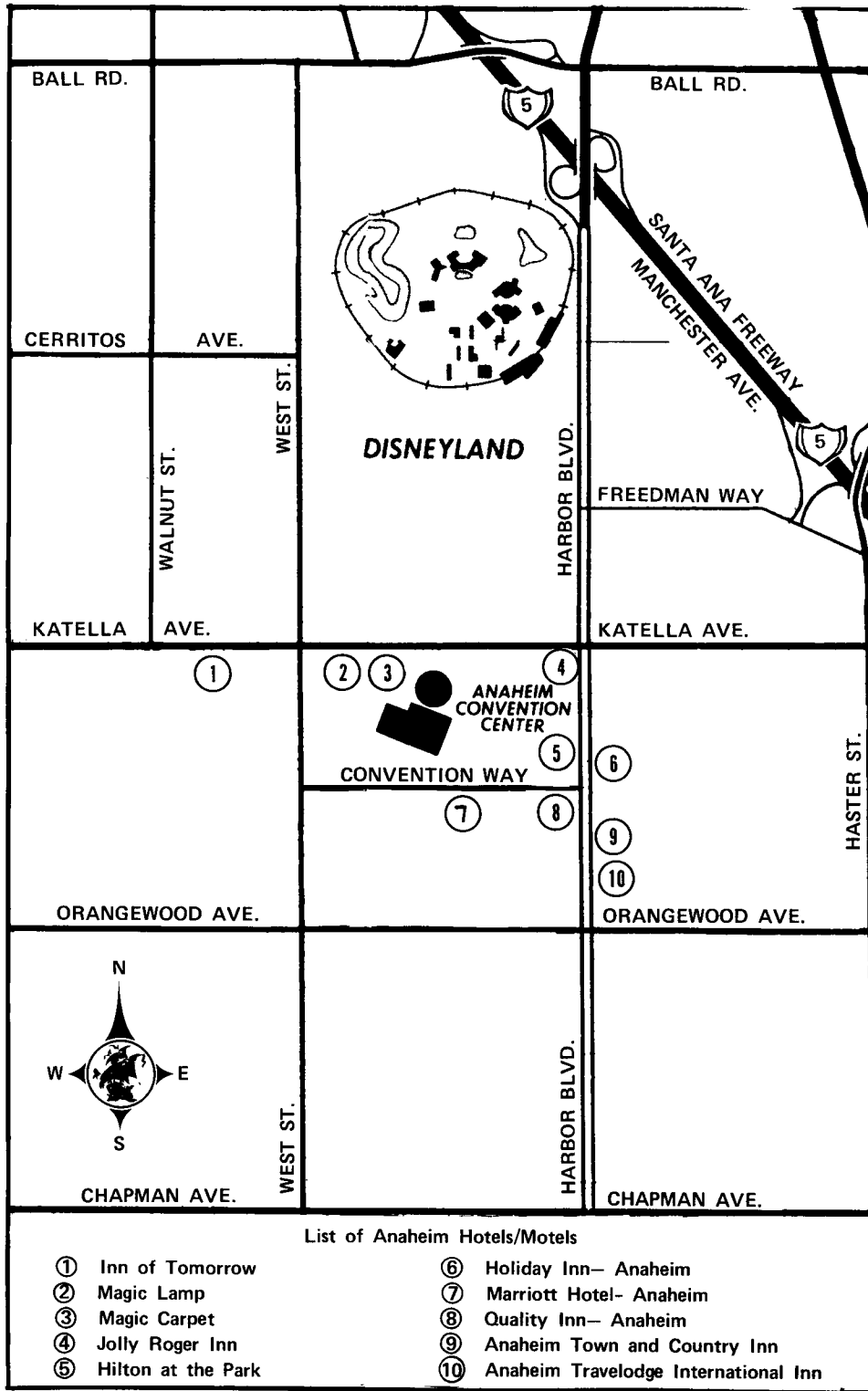
Participants are strongly urged to rank **every** hotel on the housing form in the order of preference, and circle the type of room and the rate desired. Reservations will be made in accordance with preferences indicated on the reservation form insofar as this is possible. Participants who rank only a few of the hotels may find themselves assigned to a hotel which is not satisfactory. 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 or disappointment, parties planning to share rooms should send their forms together in the same envelope. The participant requesting the room should submit the deposit.

Please make all changes to or cancellations of hotel reservations with the Housing Bureau in Providence **before January 1, 1985, by calling 401-272-9500, extension 239.** 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 deposits with Preregistration/Housing Form.



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AUTOMOBILE CLUB OF SOUTHERN CALIFORNIA

ONE KILOMETER EQUALS .62 MILE

HOUSING SECTION:

JANUARY 1985

Please rank all hotels in order of preference by writing 1, 2, 3, etc., in spaces at 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 best 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 lowest rate. The rates listed below are subject to 8% tax.

1) Name (as it appears on credit card) _____ Phone number: _____
 2) Will arrive (date) _____ at _____ a.m./p.m., and depart (date) _____ at _____ a.m./p.m.

NOTE: Please supply address for confirmation on reverse of form.

3) Please be sure to complete sections 3 and 11 on the reverse and to include payment of \$50 deposit where applicable.

Order of choice	Numbers in parentheses indicate location on map in meeting announcements.	Single	Double	Twin double	Triple (2 beds)	Triple (2 beds w/cot)	Quad (2 beds)	Quad (2 beds w/cot)	Suites	Deposit Requirements
	Hilton at the Park (5)	\$60	\$60	\$60	\$70	\$80	\$80	N/A	\$155-\$380	N/A
	Holiday Inn - Anaheim (6)	\$58	\$64	\$64	\$70	\$70	\$76	N/A	N/A	A, B, C
	Inn of Tomorrow (1)	\$36	\$40	\$40	\$44	\$48	\$48	\$52	N/A	A, B, C, D
	Jolly Roger Inn (4)	\$41	\$42	\$42	\$45	\$47	\$45	\$47	N/A	A, B, C, D
	Magic Carpet (3)	\$28	\$32	\$32	\$36	\$38	\$38	\$40	N/A	A, B, C, D
	Magic Lamp (2)	\$28	\$32	\$32	\$36	\$38	\$38	\$40	N/A	A, B, C, D
	Marriott (7)	\$55	\$60	\$60	\$66	\$70	\$68	\$72	On request	A, B, C, D
	Quality Inn - Anaheim (8)	\$50	\$58	\$58	\$64	\$66	\$64	\$66	N/A	A, B, C, D
	Town and Country Inn (9)	\$38	\$42	\$42	\$46	\$47	\$50	\$55	\$ 49-\$100	A, B, C, D
	Travelodge International Inn (10)	\$40	\$40	\$40	\$40	\$44	\$42	\$46	\$ 75-\$ 95	A, B, C, D

A = Check; B = VISA; C = MasterCard; D = American Express

4) List other room occupants:

FULL NAME

ARRIVAL DATE

DEPARTURE DATE

MUST BE RECEIVED IN PROVIDENCE NO LATER THAN NOVEMBER 15, 1984

Please complete this form and return it with your payment to

Mathematics Meetings Housing Bureau, P.O. Box 6887, Providence, RI 02940, Telephone 401-272-9500, extension 239

CHANGES/CANCELLATIONS: Before January 1, 1985, make all changes to or cancellations of hotel reservations with the Mathematics Meetings Housing Bureau in Providence; after that date, changes or cancellations should be made directly with the hotel. **REFUNDS:** 50% of preregistration fee(s) will be refunded in Providence on or before January 4, 1985. After this date, there will be no refunds.

	REGISTRATION FEES	
	<u>Preregistration (by mail prior to 11/15)</u>	<u>At Meeting</u>
JOINT MATHEMATICS MEETINGS		
Member of AMS, ASL, MAA, NCTM	\$55	\$ 72
Nonmember	\$84	\$109
*Student, Unemployed, or Emeritus	\$14	\$ 18
AMS SHORT COURSE		
Member/Nonmember	\$25	\$ 30
*Student or Unemployed	\$ 5	\$ 10
EMPLOYMENT REGISTER – Employer fee	\$75	\$100
– Applicant fee	\$15	\$ 20
MAA MINICOURSES (payable at meeting)		
#1 – The teaching of applied mathematics	#6 – PROLOG	
#2 – APL – A functional computer language	#7 – Linear programming	
#3 – Teaching problem solving	#8 – Microcomputer software in mathematics	
#4 – Applications of discrete mathematics	#9 – Teacher in-service programs	
#5 – Groups, graphs, and computing	#10 – Constructing placement examinations	

*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. Persons who are emeritus members of either the AMS or MAA may register at the emeritus rate.

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

Joint Mathematics Meetings

AMS Short Course

MAA Minicourses: (Maximum of 2; please indicate alternate choices)

#1 <input type="checkbox"/>	#6 <input type="checkbox"/>
#2 <input type="checkbox"/>	#7 <input type="checkbox"/>
#3 <input type="checkbox"/>	#8 <input type="checkbox"/>
#4 <input type="checkbox"/>	#9 <input type="checkbox"/>
#5 <input type="checkbox"/>	#10 <input type="checkbox"/>

Employment Register

Applicant fee – \$15 **NOTE:** Applicants who wish to be included in the special issue of EIMS must submit applicant forms with preregistration form and fees by November 15.
Employer fee – \$75 Please be sure to complete and return herewith the appropriate Employment Register form.

NOTE: I am preregistering for the Joint Meetings only in order to attend the MAA Minicourse(s).

1) Last name _____ First name _____ Middle initial _____

2) Employer _____ Unemployed Emeritus

3) Address for confirmation of room reservation:

Line 1 _____ Line 2 _____

City _____ State _____ Zip Code _____ Phone # _____

4) I am a student at _____ (5) Accompanied by spouse _____; number of children _____

5) Member of AMS ASL MAA NCTM NONMEMBER (Member discount applies only to members of AMS, ASL, MAA, and NCTM.) Member of other organizations: AWM NAM

6) Joint Meetings fee enclosed \$ _____ (7) AMS Short Course fee enclosed \$ _____ (8) Employer fee enclosed \$ _____

9) Applicant fee enclosed \$ _____ (10) TOTAL AMOUNT ENCLOSED FOR 6 through 9 \$ _____ NOTE: May be paid by check payable to AMS (Canadian checks must be marked "In U.S. Funds") or VISA or MasterCard credit cards.

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

(Signature)

11) HOTEL DEPOSIT ENCLOSED: Check payable to AMS (where applicable) \$ _____ or credit card

(See reverse for appropriate card type) Credit card type _____; Card number: _____

Expiration date: _____ 4-digit bank code (for MasterCard only) _____

PLEASE CHECK HERE IF YOU WILL NOT REQUIRE A ROOM. (Signature)

PLEASE BE SURE TO COMPLETE THE SECTION ON NEXT PAGE IF YOU WILL REQUIRE HOTEL ACCOMMODATIONS.

For Office use only:				
Codes:	Options:	Dates:	Hotel:	Room Type:
Special remarks:			Amt. pd:	CC <input type="checkbox"/> Check <input type="checkbox"/>

Mathematical Sciences Employment Register

January 1985 Meeting in Anaheim

The Mathematical Sciences Employment Register, held annually at the Joint Mathematics Meetings in January, provides opportunities for mathematical scientists seeking professional employment to meet employers who have positions to be filled. Job listings (or descriptions) and résumés prepared by employers and applicants are 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.

1985 Employment Register in Anaheim

The Employment Register at the Anaheim meeting will take place in the Marriott Hall of the Anaheim Marriott Hotel on Thursday, Friday, and Saturday, January 10, 11, and 12, 1985. A short (optional) orientation session will be conducted by the AMS-MAA-SIAM Committee on Employment Opportunities at 9:00 a.m. on Thursday, January 10. 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 of the Employment Register can pick up their interview request forms. Computer-scheduled interviews will be held on Friday and Saturday, January 11 and 12. No interviews will be held on Thursday.

Fifteen-minute intervals are allowed for interviews, including two or three minutes between successive interviews. The interviews are scheduled in half-day sessions: Friday morning and afternoon, and Saturday 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 sessions and fourteen time periods (1:15–5:00 p.m.) in the afternoon sessions. 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 to take place during the two sessions on Friday must be submitted on Thursday between 9:30 a.m. and 4:00 p.m. Requests for interviews to take place during the Saturday sessions must be submitted on Friday before 4:00 p.m.

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

The Saturday 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 filing the Interview Request Form for Saturday, indicating that they will attend the afternoon session that day. **Request Forms for the "employers' choice" session must be submitted by 4:00 p.m. on Friday in order for the interviews to be scheduled for Saturday afternoon.**

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

All participants in the Employment Register are required to register for the Joint Mathematics Meetings. For applicants there is a \$15 preregistration fee and \$20 for those who register at the meeting.

For employers, additional fees for participation in the Employment Register are \$75, if paid before the November 15 deadline for Joint Meetings preregistration, or \$100 if paid at the meeting.

The preregistration deadline is November 15, 1984.

Employers and applicants who wish to participate in the Register and who have neither preregistered nor

Background of Applicants

Employers who preregistered for the Employment Register in January 1984 sought to fill 178 positions, 10 of which were nonacademic jobs. For 98% of the positions, holders of doctoral degrees were preferred, for 62% of the positions only applicants with doctorates were acceptable, for 28% of the positions, holders of masters degrees were considered eligible. One of the nonacademic employers indicated an interest in holders of bachelors degrees in mathematics.

paid the Employment Register fee must go to the Joint Mathematics Meetings registration desk in the North Lobby of the Anaheim Convention Center in order to complete their registration. Registration for the Joint Meetings is required to use the Employment Register facilities. (No provision will be made to handle cash transactions at the site of the Employment Register in the Marriott Hall Foyer.)

Employers and applicants who have completed registration for the Employment Register, and employers and applicants who have preregistered, may pick up their MSER material after 9:30 a.m. on Thursday, January 10, in the Marriott Hall Foyer, where the Employment Register will be held. All who wish to have interviews scheduled for Friday or Saturday, must submit their Interview Request Forms on the preceding day by 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 both to preregistered employers and applicants, and to those registering at the meeting.

These forms are given to participants at the meeting. These are not the forms that are completed with preregistration.

Employers who do not plan to participate in the Employment Register, but who wish to display job descriptions, may do so (subject to approval) provided the material, using special forms available from Carole Kohanski, MSER, P. O. Box 6248, Providence, RI 02940, is received in the Providence Office by November 15, 1984 in order to qualify for the reduced fee of \$10. A fee of \$15 will be charged for listings received after the November 15 deadline. The fee should be paid at the

Joint Mathematics Meetings desk before the material can be exhibited.

The MSER 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 November 15 deadline; it also contains a copy of the summary Winter List of Applicants. The résumés themselves will be posted at the site of the Register in addition to the résumés of those who register at the meeting. Additional copies of the December Issue of EIMS and both the summary Winter Lists (of Applicants and of Employers) will be available for sale at the AMS Book Sale at the meeting, as long as supplies last. Prices at the meeting are \$2 each for the summary lists and \$3 for the December issue. Any copies remaining after the meeting will be available from the Providence office of the Society for \$3 and \$6, respectively. (Attention is called to the fact that the December issue of EIMS contains the Winter List of Applicants, but does not contain the Winter List of Employers.)

The Winter List of Employers consists of summaries of the position listings submitted by the employers who preregistered for the meeting; it will be distributed to the applicants participating in the Register. Others may purchase the Winter List of Employers at the AMS Book Sale at the meeting or from the Providence office later, as long as the supply lasts. (See previous paragraph for prices.)

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.

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 15**. Offprints of the list will be available for \$1 to AMS members and \$2 to nonmembers from the Mathematical Sciences Employment Register, American Mathematical Society, P.O. Box 6887, Providence, Rhode Island 02940.

Preregistration Information

MSER PREREGISTRATION – Employers

Employers who plan to participate in the Employment Register are urged to preregister for it. The MSER Preregistration Form for Employers (which appears in this issue) should be submitted along with the Housing and Preregistration Form for the Joint Meetings. **Deadline** for receipt of both forms is **November 15**. Preregistration for the Employment Register, in addition to permitting inclusion in the printed lists, 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 Anaheim.

Employers are encouraged to provide more than one interviewer, when they are able to do so, in order to increase the number of interviews which may be scheduled. Please take care to indicate on the form the number of interviewers for whom simultaneous interviews may be scheduled. (If all interviewers will be interviewing for the same position, or for the same set of positions, only one form should be submitted and only one employer code number will be assigned; therefore, each interviewer would then receive a separate computer schedule and separate table number.) More than one employer code will be required if some interviewers will not interview for all positions. Thus, if there are two disjoint sets of positions, two forms are required and two employer codes will be assigned.

A coded strip summarizes the information on each form; it appears at the bottom of the form. Employers' job listings will be posted at the meeting, so that applicants may study them when choosing which employers they wish to interview. All employers are required to complete the Summary Strip. The strip provides an abbreviated version of the information on the form and is used to prepare a computer-printed list of preregistered employers for distribution to the applicants, called the Winter List of Employers.

Employers who have preregistered **must** pick up their MSER material in the Marriott Hall Foyer, after 9:30 a.m. on Thursday, January 10, 1985, and **must submit an interview request form by 4:00 p.m. in order to receive a computer printed schedule for the following day. The interview request form is handed out at the meeting only. This is not the form that is submitted with preregistration.**

In order for interviews to be scheduled on one day, the Employer's Interview Request Form must be submitted by the 4:00 p.m. deadline on the previous day; it will not be possible to assign any interviews to employers who do not submit the Request Forms in good time even if they choose not to identify particular applicants to be interviewed. Submission of the form is required in order to indicate availability for the session in question, whether or not any specific interviews are to be requested.

MSER PREREGISTRATION – Applicants

Applicants planning to participate in the Employment Register in Anaheim are urged to preregister for it. The special Applicants Preregistration Form for the Employment Register (which appears in this issue) should be completed and submitted with the Housing and Preregistration Form for the Joint Mathematics Meetings prior to the deadline of November 15.

Applicants' résumés will be made available to employers in printed form, so that they may be studied carefully at leisure. The December issue of *Employment Information in the Mathematical Sciences* which will be printed a few weeks before the Anaheim meeting will contain photographic reproductions of the résumés of applicants who have preregistered by **November 15**. Forms not received in time cannot be included in the issue. Applicants (as well as others planning to attend the Joint Meetings) should note that those who preregister well in advance of the final deadline have access to a wider selection of accommodations, including, in particular, those in the lower price range, which (being in limited supply) tend to be exhausted early in the preregistration process.

The **deadline** for receipt of applicant forms to be included in the December issue of EIMS is **November 15**. They must be accompanied by the Housing and Preregistration Form, since registration for the Joint Meetings is a prerequisite for registration for the Employment Register. The special forms for the Employment Register, as well as the Housing and Preregistration Form for the Joint Meetings, appear in this issue.

Applicants who preregister for the Employment Register may pick up their MSER material anytime after 9:30 a.m. on Thursday, January 10, 1985, in the Marriott Hall Foyer. **Interview Request Forms must be submitted the day before interviews are to be scheduled; applicants who fail to submit the form before the 4:00 p.m. deadline on the previous day, cannot be included in the pool of participants available for interviews on the day in question. The forms are given out the day before the interviews to be completed and returned. These are not the forms that are submitted with preregistration.**

December Issue of Employment Information in the Mathematical Sciences

The December issue of EIMS contains résumés of persons seeking professional positions in the mathematical sciences. Résumés of applicants taking part in the January 1985 Mathematical Sciences Employment Register at the Joint Mathematics Meetings in Anaheim will be included in the December 1984 issue provided both that they are received before the November 15 deadline specified below 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.

Copies of the December issue of EIMS will be distributed both to subscribers and to the employers who participate in the Mathematical Sciences Employment Register at the Joint Mathematics Meetings in Anaheim in January 1985. Job applicants planning to participate in the Employment Register in Anaheim are therefore strongly urged to preregister so that their résumés can appear in the December issue.

Applicants who will participate in the Employment Register in Anaheim and wish to have their résumés included in the December issue of *Employment Information in the Mathematical Sciences* should complete both the special MSER Applicant Form and the Preregistration and Housing Form in this issue. Both forms must be received in Providence by the November 15, 1984 deadline. Forms received after the November 15 deadline cannot be included in the printed booklet.

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.

The forms **must** be carefully typed using a new black ribbon. 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.

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 nonetheless be posted at the Employment Register in Anaheim, along with those of the other participants.

MATHEMATICAL SCIENCES EMPLOYMENT REGISTER

Instructions for Applicant's Form

The form. Applicants' forms submitted for the Employment Register at the Joint Mathematics Meetings in Anaheim will be photographically reproduced in the December issue of *Employment Information in the Mathematical Sciences* to appear in December 1984. They will also be posted at the Employment Register.

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 15, 1984 in order to appear in the special issue of *EIMS*, and must be accompanied by the Preregistration and Housing Form. Forms received past the deadline will be returned.

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

Ⓐ Specialties

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

Ⓑ Career Objectives

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

Ⓕ Ⓖ Duties

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

Location

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

Ⓖ U.S. Citizenship Status

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

MATHEMATICAL SCIENCES EMPLOYMENT REGISTER

APPLICANT FORM

January 10-12, 1985

ANAHEIM, CALIFORNIA

(please see instructions on facing page)

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 _____

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**
 Fri. AM 9:30-11:45 Fri. PM 1:15-5:00 Sat. AM 9:30-11:45 Sat. PM 1:15-5:00

SUMMARY STRIP

Family Name _____ First Name _____ Mailing Address _____

Address (cont'd.) _____ Address (cont'd.) _____ State & Zip Code _____ **(A) Specialties** _____

(B) Career objectives _____ **(C) Highest Degree** _____ **(C) Yr.** _____ **(C) Institution** _____ **(D)** _____ **(E)** _____ **(F)** _____ **(G) Most recent employer** _____

(H) Present duties _____ **(I) Desired duties** _____ **(J) Available mo./yr.** _____ **(L)** _____ **(M) Sessions** _____

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

EMPLOYER FORM	Institution	Dept.			
	Name of Interviewer(s)				
	City, State, Zip				
(A) Title(s) of Position(s)	Number of Positions		Number of People Supervised		
(C) Starting Date	Salary	Term of Appointment	(E) Renewal	() Possible	Tenure Track Position
	mo. / yr.	_____ yrs.	() Impossible	() Yes	() No
Teaching hrs./week	Specialties Sought				
(G) Degree Preferred	(H) Degree Accepted	(I) Duties	(J) Experience	(K) Citizenship	Restriction
(L) Available for Interviews	Session 1 () Fri. AM, 9:30-11:45	Session 2 () Fri. PM, 1:15-5:00	Session 3 () Sat. AM, 9:30-11:45	Session 4 ()*	Sat. PM, 1:15-5:00
(M) Number of Interviewers:	_____ Interviewers	_____ Interviewers	_____ Interviewers	_____ Interviewers	_____ Interviewers

Institution	State	(A) Title of position	(B) No.	(C) Start mo. / yr.
□□□□□□□□□□	□□	□□□□□□□□□□	□□	□□/□□
(D) (E)	(F) Specialties sought	(G) (H)	(I) Duties	(J) Experience
□□	□□□□□□□□□□	□□	□□□□□□□□□□	□□□□□□□□□□

NOTES: (A) Inst, Lect, Asst Prof, Asso Prof, Prof, Dean, Open, MTS (Member Technical Staff), OPAN (Operations Analyst), PREN (Project Engineer), RESC (Research Scientist); (B) Date 01/83, e.g.; (C) Possible=P, Impossible=I; (D) Algebra=AL, Analysis=AN, Biomathematics=BI, Biostatistics=BS, Combinatorics=CB, Communication=CM, Control=CN, Computer Science=CS, Circuits=CT, Differential Equations=DE, Economics=EC, Mathematical Education=ED, Functional Analysis=FA, Financial Mathematics=FI, Fluid Mechanics=FL, Geometry=GE, History of Mathematics=HM, Logic=LO, Mathematical Biology=MB, Mechanics=ME, Modeling=MO, Mathematical Physics=MP, Management Science=MS, Numerical Analysis=NA, Number Theory=NT, Operations Research=OR, Probability=PR, Systems Analysis=SA, Statistics=ST, Topology=TO; (G) (H) Bachelor=B, Master=M, Doctor=D; (I) Teaching=T, Undergraduates=U, Graduates=G, Research=R, Consulting=C, Administration=A, Supervision=S, Industry=IND, Government=GOV, Data Processing=DP, No experience required=N; (K) U.S. Citizen=C, U.S. Citizen or permanent resident=CP, No restriction=NR; (L) Periods available for interviews: List 1, 2, 3, and/or 4, see the FORM above.
* Interviews are scheduled in this session on the basis of employers request only.

Mathematics Salaries: Up and Competitive

R. D. Anderson
Louisiana State University

Data gathered by the College Placement Council recently provide evidence that mathematicians are in increasing demand and are doing very well in the "real world." Mathematics training as well as training in computer science and engineering is being recognized as increasingly important in our society. Those of us in mathematics should get the word out to high school students and undergraduates.

The College Placement Council Salary Survey analyzes initial (non-teaching) offers to bachelor's and master's candidates in various disciplines and by various categories of employment. The 1983-84 report (July 1984) uses data from 187 placement offices at 162 colleges and universities in the United States. The table below gives data for all those curricula with at least 500 offers reported for bachelor's candidates in 1983-84 (with monthly salary reports converted to an annual basis).

CURRICULUM (for all types of employers)	AVERAGE 1983-84 OFFER	% CHANGE FROM 1982-83
Chemical		
Engineering	\$27,420	+2.6
Electrical		
Engineering (incl. Comp. Eng.)	26,556	+4.0
Mechanical		
Engineering	26,280	+4.5
Industrial		
Engineering	25,224	+2.6
Engineering		
Technology	24,936	+3.6
Computer		
Science	24,552	+5.4
Mathematics	23,400	+8.4
Civil		
Engineering	22,764	+1.5
Economics	19,980	+4.7
Accounting	19,524	+4.0
Business-		
General (incl. Management)	18,660	+4.6
Marketing &		
Dist.	17,820	+5.2
Humanities	17,724	+7.0
Other social sciences	17,424	+10.0

Of the 18 categories of employment listed in the report about a third of the 533 offers to mathematicians were in the "banking, finance and insurance" category and another third were in the "aerospace, electronics and instruments" category, with the remaining third scattered among the other 16 categories. Interestingly in each of these two employment categories with high employment of mathematicians, the average offer to mathematicians was slightly in excess of the average offer to computer scientists in the same employment category.

The average master's candidate offer in Mathematics (78 offers reported) was \$28,764, about \$1300 below that for

Computer Scientists and \$2200 below that for Electrical Engineers, but about \$5500 above that for master's candidates in Accounting. The average mathematics offer was up 12.9% from the 1982-83 level, more than twice the increase in the three other disciplines cited here.

A word of caution—the size of salary offers depends on supply, demand, the state of the economy, tradition, and many other factors. One cannot tell with certainty what the market would be like under a really large increase in the supply of mathematics majors. However, the central and pervasive role of mathematics in the age of technology should help prevent the boom-or-bust employment phenomena that occasionally affect more specialized areas of science and engineering.

Permission to publish data from the 1983-84 College Placement Council Salary Survey was granted by the College Placement Council, 62 Highland Avenue, Bethlehem, PA 18017.

Bieberbach Conjecture Proved

The 68-year-old Bieberbach conjecture, one of the most renowned problems in mathematics, has been solved by Professor Louis de Branges of Purdue University. An article by Paul Zorn of St. Olaf College describing this exciting new result will appear in the November issue of *FOCUS*.

MAA Section Leaders Honored in Eugene

The first recipients of the MAA's new Certificate for Meritorious Service were honored at the MAA Business Meeting in Eugene, Oregon, last August. Each of the twenty-nine MAA Sections is invited once each five years to select an MAA member to be nationally honored for his/her contributions to the work of the Section.

The individuals so honored last August, and their Sections, are:

Indiana Section Gerhard N. Wollan, Purdue University (retired)

Louisiana-Mississippi Section Paul K. Rees, Louisiana State University (retired)

Nebraska Section Henry M. Cox, University of Nebraska (retired)

Ohio Section Samuel W. Hahn, Wittenberg University (retired)

Southeastern Section John D. Neff, Georgia Institute of Technology.

Sections invited to select individuals to be honored at the next Summer Meeting are: Allegheny, Intermountain, Maryland-D.C.-Virginia, New Jersey, Oklahoma-Arkansas, and Southern California.

This new October issue of *FOCUS* has been inaugurated by the MAA to provide MAA members with more timely and complete information about the Winter Joint Mathematics Meetings and expanded coverage of news of the mathematical community. Issues of *FOCUS* now appear as follows:
January-February, March-April, May-June (Summer Meeting Program) September, October (Winter Meeting Program), and November-December.

Highlights of the Board of Governors' Eugene Meeting

MAA Secretary Elected

Kenneth A. Ross, University of Oregon, was unanimously elected by the Board for a five-year term as MAA Secretary, starting in January 1985. Ross has already served one year in this post. In August 1983 he was elected by the Board to serve the remaining year of David P. Roselle's term.

Distinguished Service Award

Everett Pitcher, American Mathematical Society Secretary, was unanimously elected by the Board to receive the Award for Distinguished Service to Mathematics in January 1985 at the MAA Annual Meeting in Anaheim.

Mathematics Magazine Editor Elected

Gerald Alexanderson, University of Santa Clara, was elected by the Board for a five-year term as *Mathematics Magazine* Editor, starting in January 1986. Alexanderson will succeed Doris Schattschneider of Moravian College.

Hedrick Lecturer for 1985 Summer Meeting

The Board selected Arthur M. Jaffe, Professor of Mathematical Physics at Harvard University, to present the series of three Hedrick Lectures at next summer's national meeting. Jaffe served on the National Research Council committee which produced the report *Renewing U.S. Mathematics: Critical Resource for the Future*. (See *FOCUS*, September 1984). Jaffe is the author of the section of the report titled "Ordering the Universe: The Role of Mathematics" in which he documents the profound and useful contributions which mathematics makes to society.

Summer Meetings

The Board voted to hold the 1985 Summer Meeting at the University of Wyoming. August 12-15. The list of all future meetings for which sites and dates have been selected is as follows:

Anaheim, California	January 11-13, 1985
University of Wyoming	August 12-15, 1985
New Orleans, Louisiana	January 9-11, 1986
San Antonio, Texas	January 23-25, 1987
Atlanta, Georgia	January 8-10, 1988

There will be no summer meeting in 1986 in deference to the International Congress of Mathematicians, scheduled for August 1986 at the University of California, Berkeley. As to the summer of 1987, the American Mathematical Society Council has authorized their Executive Committee and Board of Trustees to decide this November whether they will meet jointly with the MAA. If not, the MAA ad hoc Committee on Summer Meetings will use the Anaheim meeting and other means to get input from MAA members on how to proceed. At the end of the Anaheim meeting, the committee will have an in-depth session to consider various options for MAA Summer Meetings.

News from the Nation's Capital

Kenneth Hoffman, Massachusetts Institute of Technology, reported to the Board on the National Research Council report *Renewing U.S. Mathematics: Critical Resource for the Future* and on the massive science and mathematics education bill which was signed into law by President Reagan just a few days before the Board meeting.

In his role as AMS-MAA-SIAM Secretary for National Affairs, Hoffman is working to represent the interests of the mathematical community in Washington, D.C. His Washington, D.C. activities also include service as Chairman of the Advisory Committee to the NSF Science and Engineering Education Directorate.

Kent State to Open Institute for Retraining in Computer Science

A new Institute for Retraining in Computer Science will be opened at Kent State University next summer. This institute will be conducted under the auspices of the Joint ACM/MAA Committee on Retraining for Computer Science, together with the Clarkson Institute which was established in 1983.

The two institutes have been established in response to the critical and growing shortage of college teachers of computer science. The programs are designed to retrain faculty from other fields such as mathematics. Training takes place during two consecutive summers, with a project to be conducted at the participant's home institution during the intervening academic year.

Interested candidates should write for more information and application forms to either of the institute directors: Ed Dubinsky, Department of Mathematics and Computer Science, Clarkson University, Potsdam, NY 13676; or Darrell Turnidge, Department of Mathematical Sciences, Kent State University, Kent, OH 44242.

FOCUS

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