FOCUS

International Congress Will Not be Held in August 1982

Due to the political situation in Poland, the International Congress of Mathematicians, which was scheduled to be held in Warsaw, August 11-19, 1982, will not be held at that time. According to G. D. Mostow, Chairman, U.S. National Committee for Mathematics, the Executive Committee of the International Mathematical Union (IMU) will meet next November to decide whether to hold the Congress in Warsaw in August 1983 or to cancel it. In either case, invited addresses will be published in the proceedings of the Congress.

This announcement comes after months of uncertainty about the fate of the Congress. Officers of the IMU visited Poland in February to ascertain the feasibility of holding the Congress in Warsaw in 1982 as scheduled. There was general agreement that the Congress could not be held under the conditions then prevailing. The visitors were, however, deeply impressed by the fervent desire of all Polish

The Medical Sciences Building of the University of Toronto on King's College Circle, one of the two locations at which the Summer Meeting sessions will be held.

NSF Proposes Elimination of Science Education Directorate

Citing lack of consensus on remedies for the problems in precollege training in science and mathematics and ineffectiveness and fragmentation in National Science Foundation (NSF) science education programs, NSF Director John B. Slaughter has proposed to eliminate NSF's Science Education Directorate and await guidance on future NSF science education activities from the new National Science Board Commission on Precollege Education in Mathematics, Science, and Technology. Due to 1982 budget cuts, the staff of the Science Education Directorate has already been cut from 80 to about 10 employees. If Slaughter's proposal goes through, the sole FY 1983 Foundation activity in science education will be a $15 million program of graduate fellowships. No funds are included for implementation of Commission recommendations.

In testimony at the National Science Foundation Authorization Hearings on February 25 before the House Committee on Science and Technology, Dr. Slaughter stated that he believes the Commission "can identify the boundaries of a new consensus" on the role of the Federal government and the Foundation in developing strategies for addressing the problems in precollege science and mathematics education. Slaughter also stated, "I am personally excited by the opportunities presented to us with the establishment of this Commission and look forward to receiving the results of its work. It could well turn out to be one of the most significant steps we will have taken during the 1980's for the long-run improvement of precollege science and mathematics education in this country."

The wisdom of Slaughter's proposals was sharply questioned by Committee members and by others presenting testimony at the Hearings. Representative Doug Walgren,

Meeting Program Inside

The center section of this issue contains the program and housing and preregistration forms for the **MAA Summer Meeting** which will be held August 23-26, 1982 at the University of Toronto, Toronto, Canada.
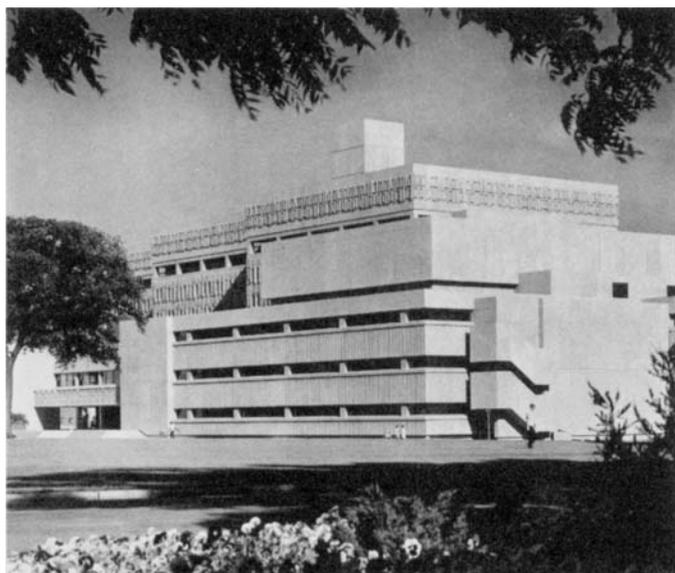
International Congress *(continued from page 1)*

mathematicians that the Congress be held in August 1982. At that time IMU President Lennart Carlsen submitted to the Polish government a list of assurances that would be a prerequisite for the Congress to be held. These include, among other stipulations:

1) the free circulation of mathematicians seeking to attend the Congress,
2) the release from jail of the mathematicians under arrest,
3) the lifting of the 11 p.m. to 5 a.m. curfew.

The Executive Committee of the IMU met in Paris on April 2 and made the decisions not to hold the Congress as scheduled and to meet again in November to consider the possibility of rescheduling it for August 1983. They did, however, decide to hold the General Assembly in Warsaw as scheduled. The General Assembly transacts the organizational business of the IMU including election of a new Executive Committee and receipt of reports from the Site Committee which decides on the location of the Congress in 1986. The Executive Committee also decided to award the Fields Medals at the General Assembly.

Statement on ICM-82

Richard D. Anderson, MAA President

The decision not to hold the International Congress of Mathematicians (ICM) in Warsaw in August 1982 was made only after much soul searching. The quadrennial Congress, held regularly since the turn of the century except for interruptions caused by the two World Wars, has become the major occasion both for verbal exchange of information on research mathematics and for recognition of research accomplishments represented by invited talks and, in recent years, by the presentation of the prestigious Fields Medals.

The International Mathematical Union has been faced with a very difficult decision. Mathematicians everywhere have wanted to honor the wishes (to hold the Congress) of many of our mathematical colleagues in Poland, a group worthy of our genuine respect and admiration. Mathematicians everywhere have also wanted to protest the imposition of military tyranny confronting all human beings now in Poland, and they have wanted to insure that local conditions were suitable so that a Congress, if held, would be free and open and in the exemplary traditions of past Congresses.

As one who has attended all but one of the Congresses held since World War II, as one who has recently visited Poland and has many personal friends there, and as one who has great and sincere respect for the contributions of Polish mathematics, I share deeply the concerns of those responsible for the decision.

Let us hope that conditions will permit rescheduling of the Congress for August 1983 in Warsaw.

NSF *(continued from page 1)*

Democrat of Pennsylvania, expressed dismay at the proposed elimination of the Science Education Directorate and doubts about the effectiveness of the Commission: "Certainly, no one is questioning Dr. Slaughter's or the Administration's rights for reorganization and management. However, this decision goes far beyond a simple organizational change. It is a policy change of far-reaching and critical importance. Rather than build on the experience and expertise that exists, they are proposing to dismantle what is there and put in its place a Commission. Presumably the Commission will come forward at some point in the distant future, and make its recommendations. We will then be forced to rebuild once again. Given my experience, and given the atmosphere of this Administration to cut back federal personnel, I fear that rebuilding will be very difficult and very expensive at a future date."

Others urging continuation of NSF science education activities included Sarah Klein, President of the National Science Teachers Association, James Rutherford of AAAS, and Saul K. Fenster, President of the New Jersey Institute of Technology. Fenster told the Subcommittee that the proposed cutback in funding for science and engineering comes at a time when the position of the United States as a world leader in science and technology is being severely challenged and "ultimately will jeopardize our national security and economic well-being by undermining American industrial, commercial, and military strengths."

Following the Hearings, the House Subcommittee on Science, Research, and Technology prepared a mark-up of the proposed NSF budget which includes an additional $30 million for science education activities. The FY 1983 Foundation budget will not be made final until late in the summer at the earliest.
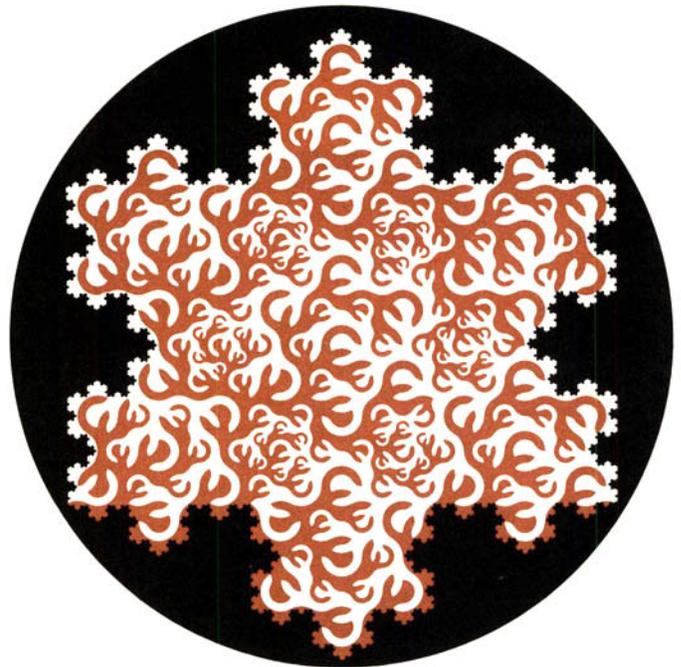
This is a Peano curve devised by Benoît B. Mandelbrot to fill the inside of the Koch snowflake, thus bringing together these two beautiful fractal shapes. Illustration from *The Fractal Geometry of Nature* by Mandelbrot, W.H. Freeman and Company 1982, © 1982 by Benoît B. Mandelbrot and reproduced by his kind permission.

Cannon to Lecture in Toronto on Fractals

Sets called "fractals," many of which are extremely beautiful, will be the subject of the Earle Raymond Hedrick Lectures at the MAA Summer Meeting at the University of Toronto. Professor James W. Cannon of the University of Wisconsin will present the following series of lectures on August 24, 25, and 26:

Topological, Combinatorial, and Geometric Fractals
    Lecture 1. Elementary Fractals
    Lecture 2. Fractals in Topological Manifolds
    Lecture 3. Hyperbolic Groups and Fractals at Infinity.

These lectures have dual purposes, esthetic and mathematical. The esthetic purpose is to exhibit some beautiful fractals that have played an important role in mathematics. Professor Cannon will show slides, transparencies, drawings, and computer graphics. The mathematical purpose is to outline some of the things that particularly representative fractals tell us about topological manifolds, groups, and geometry.

The term "fractal" was coined in 1975 by Benoît B. Mandelbrot to denote a mathematical set or a concrete object whose form is extremely irregular or fragmented at all scales. A process which intersperses iterated construction with change of scale is likely to give rise to fractals. Since the construction of the real numbers from the integers may be viewed as just such a process, it is not surprising to find that fractals are pervasive in mathematics. They are a natural consequence of iteration.

Dr. Cannon received both his bachelor's degree and his Ph.D. from the University of Utah, where he studied under C. E. Burgess. He held an NSF postdoctoral fellowship at the University of Wisconsin for one year and then joined the Wisconsin faculty in 1970. During the academic year 1971-72, Cannon was a Member of the Institute for Advanced Study at Princeton. In 1975-76, he returned to his boyhood home, Logan, Utah, for a year as Visiting Professor of Mathematics at Utah State University. He was also named a Sloan Foundation Research Fellow for the two-year period 1971-73.

Professor Cannon gave invited addresses at the 1977 AMS Summer Meeting and the International Congress in Helsinki in 1978. He has a unique ability to describe, for audiences of various levels, the nature of topological problems and the ways in which some of these problems have been solved.

ICME 5 to be Held in Australia in 1984

The Fifth International Congress on Mathematical Education (ICME 5) will be held at the University of Adelaide, Australia, August 24-30, 1984. It is expected that the program will span all levels of education and discuss problems of general interest while recognizing different cultural perspectives.

A principal objective of the Congress will be to facilitate professional and personal contact among its participants. In particular, the organizers seek to encourage existing work-

ing groups in mathematics education to meet at the Congress and to encourage overseas participants to visit Australian colleagues in their home educational institutions. The closing dates for applications for support to visit Australian institutions in 1984 will begin to fall due starting in October 1982. The Organizing Committee will prepare a list of interested prospective visitors for circulation to Australian tertiary institutions late in 1982. Anyone interested in being listed should send appropriate details by September 30, 1982 to: Dr. John Mack, Department of Pure Mathematics, Sydney University, NSW 2006, Australia.

The Organizing Committee also requests comment from prospective participants who might assist in planning Congress activities. Remarks on the weaknesses and strengths of previous Congresses and other relevant international meetings will be greatly appreciated. Responses received before July 1982 will be especially helpful. Write to: ICME 5, Wattle Park Teachers' Centre, 424 Kensington Road, Wattle Park, South Australia 5066, Australia.

The Organizing Committee expects to issue a first announcement of ICME 5 by May 1982 and a second announcement by May 1983.

from the Editor's mailbox . . .

It seems to me that Morris Kline in his recent guest editorial in *FOCUS* "sells mathematics short" in his claim that the appeal of the subject should be based primarily on its applications. I find this especially sad coupled with his claim that there is hardly any aesthetic appeal in the mathematics that is taught in the schools. I wonder how long it has been since he has visited a school.

Observing patterns is something most youngsters can do well and with enthusiasm. To discover that 111,111,111 divided by 9 is 12,345,679 is intrinsically interesting, especially with the jump from 7 to 9 in the quotient. There are ramifications here that can be explored. Repeating decimals have great aesthetic appeal; e.g., one can notice that the repeating part of the decimal for 1/7 is 142857 and that multiplying this number by the numbers from 2 to 6 permutes the digits cyclically. There are many "whys" and "what ifs" to be explored here. Such sources of appeal are possible with almost any topic at any level.

If we consider aesthetic appeal to be that to the spirit rather than to the mind, we must include the joy of getting the right answer after laborious work. One needs only notice how children's eyes light up when a teacher announces that he or she "got it right." The child does not really care what the answer is, but what gives him joy and reward is the fact that *he or she* found it.

It is hard to find a truly "practical" problem at the elementary level and when one succeeds, it is not the practicality that holds the attention. Most youngsters have really very little interest in applications though they like to work with their hands along with their minds. For example, they are probably not especially interested in finding how tall a tree is, but it does appeal to them to go out of doors and see how to do it.

Certainly the applications of mathematics are of fundamental importance. They form the basis of much of its support and they also keep our feet on the ground, assuming that we want to keep them there. However, even when it is purely esoteric, mathematics is still part of "the world" just as much as physics and economics are. Why should not the appeal of mathematics be for itself just as is the case most of the time for music and the other arts! We are not as crassly materialistic as we think we are and certainly children don't even pretend to be.

Burton W. Jones

MAA Governors Elected

The following individuals have been elected by their MAA Sections to serve as MAA Governor from July 1982 through June 1985: **Kansas** Sister Jo Ann Fellin, Benedictine College; **Missouri** H. Keith Stumpff, Central Missouri State University; **New Jersey** Richard F. Gabriel, Seton Hall University; **Northeastern** Donald B. Small, Colby College; **Ohio** William H. Beyer, University of Akron; **Seaway** Violet H. Larney, SUNY, Center at Albany; **Pacific Northwest** Calvin T. Long, Washington State University; **Southeastern** Ivey C. Gentry, Wake Forest University; **Southwestern** Allan B. Gray, Northern Arizona University.

Each Spring about one-third of the 29 MAA Sections elect a new Governor.

Annual High School Exam Results Announced

Over 400,000 students from the United States, Canada, and 13 foreign countries participated in the 1982 Annual High School Mathematics Examination held on March 9, 1982. Two of the foreign countries, Colombia and Guatemala, were participating for the first time. In addition, the Examination was administered at 30 APO/FPO American schools abroad.

Two hundred and thirteen students scored 100 or more on the multiple choice test, out of a possible 150 points, to place on the Honor Roll. Of these, 102 students, by scoring 106 or more, earned the privilege of participating in the USA Mathematical Olympiad on May 4, 1982.

The top-scoring students, with 145 points each, were Brian Hunt of Montgomery Blair High School in Silver Spring, Maryland, and Noam Elkies of Stuyvesant High School in New York City. Both young men were 1981 USA Mathematical Olympiad winners and members of the USA's 1981 International Mathematical Olympiad team. Hunt also ranked among the ten highest individuals on the 1981 Putnam Competition as a member of the team fielded by the University of Maryland, College Park.

62nd SUMMER MEETING

August 23-26, 1982

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Toronto, Canada

Mathematical Association of America

The Sixty-Second Summer Meeting of the Mathematical Association of America will be held on the campus of the **University of Toronto,** from Monday, August 23, through Thursday, August 26, 1982 in conjunction with meetings of the American Mathematical Society, the Association for Women in Mathematics, and Pi Mu Epsilon.

Sessions of the Association will be held on each of the days of the meeting. This meeting will be the first to feature **simultaneous as well as joint sessions** of the MAA and AMS. The officers of the MAA and AMS have initiated this experiment in the hope of obtaining greater program diversity as well as a decrease from a five-day to a four-day meeting.

Joint MAA-AMS sessions on the history of mathematics will be held on Monday at 3:20 p.m. and Wednesday at 2:10 p.m. The titles and lecturers are: "Mathematics and Mathematicians in World War II" by J. Barkley Rosser, University of Wisconsin; "Homotopy Theory: The First Twenty-Five Years" by George W. Whitehead, Massachusetts Institute of Technology; "The Influence of Elasticity on Analysis" by Clifford A. Truesdell, III, Johns Hopkins University; "The Work of Bourbaki During the Past Thirty Years" by Jean A. Dieudonne, Nice, France.

Another innovation at this meeting will be **MAA Contributed Paper Sessions** which will be held at various times throughout the meeting. Papers will be presented on: "The Undergraduate Mathematics Curriculum"; "Special Concerns: Remediation, Articulation, and Math Anxiety"; "The Use of Computers in Undergraduate Mathematics Instruction"; "Classroom Notes." Persons wishing to submit papers for any of these sessions are referred to the announcement on page 5 of this issue of *FOCUS*.

The **Board of Governors** will meet at 9:00 a.m. on Sunday. This meeting is open to all members of the Association.

There will be two **MAA Mini-Courses,** "Introduction to Microcomputers in Mathematics Instruction" and "Uses of Computers in Undergraduate Mathematics Instruction," Registration information is on page iii of this program.

The CUPM Panel on Teacher Training will present a preliminary draft of its **Recommendations for the Training of Teachers** at a meeting at 7:00 p.m. on Monday.

James W. Cannon of the University of Wisconsin will deliver the **31st Earle Raymond Hedrick Lectures.** The Lectures, to be given at 11:00 a.m. on Tuesday, Wednesday, and Thursday, are titled "Topological, Combinatorial, and Geometric Fractals."

At the **Business Meeting** of the Association, 4:30 p.m. on Tuesday, the **Carl B. Allendoerfer, Lester R. Ford,** and **George Pólya Awards** for expository writing will be presented. Also, the members present at this meeting will be asked to approve an amendment to the Bylaws to shorten the term of the Past-President as a member of the Finance Committee from two years to one year, effective with the tenure of the 1984 President-Elect.

On Wednesday evening, the Association will sponsor its seventh annual **Twenty-Five Year Member Banquet.** The dinner will be held at 6:30 p.m. and will be preceded by a social hour from 5:30 p.m.-6:30 p.m. The emcee for the dinner will be G. Baley Price and the after-dinner speaker will be Peter J. Hilton who will speak on "The Next Twenty-Five Years."

The **Section Officers Annual Meeting** will be held at 7:00 p.m. on Wednesday.

There will be continuous showings of **films and videotapes** throughout the meeting.

The dates and times of other MAA meeting events are listed on pages iv and v of this program.

Registration

Registration Fees

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. The fees for registration at the meetings, which are 30 percent more than the preregistration fees, are listed below:

Joint Mathematics Meetings

Member of MAA, AMS, ΠME	$48
Emeritus Member of MAA, AMS	$12
Nonmember	$74
Student/Unemployed	$12

MAA Minicourses #1 and #2

All Participants	$15 each

AMS Short Course

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

Registration fees may be paid at the meetings in cash, by personal or travelers' checks, or by Visa or MasterCard credit cards.

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 persons who have voluntarily resigned or retired from their latest position.

The emeritus status refers to any person who has been a member of the AMS or MAA for twenty years or more, and is retired on account of age from his or her latest position.

Nonmembers who register at the meetings and pay the $74 nonmember registration fee are entitled to a discount of the difference between the member registration fee of $48 and the nonmember registration fee of $74 as a $26 credit against dues in either the AMS or MAA or both, provided they join before September 26, 1982.

Nonmember students who register at the meetings and pay the $12 registration fee are also entitled to a discount of the difference between the student preregistration fee of $8 and the registration fee of $12 as a $4 credit against dues in either the AMS or MAA or both, provided they join before September 26, 1982.

Nonmembers and nonmember students who thus qualify may join at the meetings, or by mail afterwards up to the deadline.

Exhibits

The book and educational media exhibits will be open from 1:00 p.m. to 5:00 p.m. on Monday, August 23, and from 8:30 a.m. to 4:30 p.m. on Tuesday and Wednesday, August 24-25. All participants are encouraged to visit the exhibits during the meeting.

Registration Dates and Locations

Joint Mathematics Meetings
[and MAA Minicourses (until filled)]

Entrance Lobby, Sidney Smith Hall

Sunday, August 22	4:00 p.m. to 8:00 p.m.
Monday, August 23	8:00 a.m. to 4:30 p.m.
Tuesday, August 24, and Wednesday, August 25	8:30 a.m. to 4:30 p.m.

AMS Short Course

Outside Room 3153, Medical Sciences Building

Saturday, August 21	11:00 a.m. to 4:00 p.m.
Sunday, August 22	8:00 a.m. to 2:00 p.m.

Information on the publications and activities of the MAA and AMS may be obtained at the Information Section of the Registration Desk. Also available is information on audio-visual aids, baggage and coat checking, lost and found, check cashing, and local information.

The Joint Mathematics Meetings Registration Desk will not be open on Thursday, August 26, and the telephone message center (see below) will not be in operation that day. Other services provided during the meeting at the Registration Desk will also no longer be available. There will, however, be a small desk set up outside the Auditorium in the Medical Sciences Building where local information will be available and where a staff member will provide limited assistance to participants. No registration or cash transactions will be possible at this desk.

Assistance and Information Desk

Outside Medical Sciences Auditorium

Thursday, August 26	8:30 a.m. to 1:30 p.m.

Mail

All mail and telegrams for persons attending the meetings should be addressed to the participant, %Joint Mathematics Meetings, Department of Mathematics, University of Toronto, Toronto, Ontario, Canada M5S 1A1. Mail and telegrams so addressed may be picked up at the mailbox in the registration area during the hours the Registration Desk is open. First class 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 meetings 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 will be located in the registration area to receive incoming calls for participants. The center will be open from August 22-25 only, during the same hours as the Joint Mathematics Meetings Registration Desk. 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.

MINI-COURSES
INTRODUCTION TO MICROCOMPUTERS IN MATHEMATICS INSTRUCTION

USES OF COMPUTERS IN UNDERGRADUATE MATHEMATICS INSTRUCTION

Introduction to Microcomputers in Mathematics Instruction, a mini-course intended for novices, will be conducted by Klaus E. Eldridge and Donald O. Norris, both of Ohio University. This course, which is a repeat of the very popular course offered in Pittsburgh in August 1981 and in Cincinnati in January 1982, will meet from 7:00 p.m.-10:00 p.m. on Sunday, August 22, and Tuesday, August 24. It will consist of a brief introduction to BASIC followed by a discussion of how computers can be used in a variety of courses. The discussion will include traditional examples from calculus and differential equations as well as simulation models in liberal arts courses or mathematics education courses. It is planned that microcomputers will be available for use by the participants.

Uses of Computers in Undergraduate Mathematics Instruction, a more advanced workshop intended for users, will be held 1:00 p.m.-5:00 p.m. on Sunday, August 22. Uses of *existing* microcomputer software to enhance instruction in full courses in the undergraduate mathematics curriculum will be demonstrated, including software for use in multi-variable calculus, differential equations, and topics at the lower division college level. Presentations/demonstrations will be given by mathematicians who have developed the software *and* have had extensive experience with its use in their courses. It is planned for participants to have the opportunity to work with the software themselves on microcomputers. Speakers will include: David A. Smith, Duke University and Series Editor in Mathematics for CONDUIT, and John L. Van Iwaarden, Hope College.

Both mini-courses will be held in Sidney Smith Hall 1088. They are open only to persons who have registered for the Joint Mathematics Meetings and have paid the registration fee. Each mini-course has a registration fee of $15 and is limited to 30 participants.

Book Sales

Books published by the MAA and the AMS 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 Joint Mathematics Meetings Registration Desk, and are located in the meeting registration area.

Summer List of Applicants

At the direction of the AMS-MAA-SIAM Committee on Employment Opportunities, the Society will publish a Summer List of mathematical scientists seeking employment for distribution at the meeting.

Copies of the 1982 summer list will be available at the Transparencies Section of the Registration Desk for $2. Following the meeting, they may be purchased from the AMS Office in Providence for $3. This list should prove useful to employers who have last minute openings in the latter part of the summer or in the fall.

Applicant forms were mailed to all MAA members along with the preliminary meeting announcement. The deadline for receipt of applicant forms is July 9, 1982.

Instead of an Employment Register at the meeting, there will be an opportunity for posting of both applicant résumé forms and employers' announcements of open positions in or near the main meeting registration area. There will be no special room set aside for interviews. No provisions will be made for interviews: arrangements will be the responsibility of each employer and applicant. Messages may be left in the message box located in the registration area.

Special applicant and employer forms will be available at the Transparencies section of the Registration Desk both for applicants to post résumés and for employers to post forms announcing positions. Employers who do not plan to attend, but who wish to display literature only, may do so at no charge. This material must, however, be received in the Providence office no later than July 9, 1982. Information cannot be taken over the telephone, either in Providence after July 9, or at the meeting.

Applicants who submit an applicant form, but do not plan to attend the meeting will be listed on the printed list only. There is no provision made for posting résumés for participants who do not attend the meeting.

Meetings of Other Organizations

The **American Mathematical Society** (AMS) will feature four lectures in the Colloquium series by Morris W. Hirsch of the University of California, Berkeley. Also featured will be eight invited hour addresses and fifteen special sessions.

The AMS will also sponsor a one and one-half day **short course** on Saturday and Sunday, August 21 and 22, entitled "Statistical Data Analysis." The short course will feature talks by Ram Gnanadesikan, Paul A. Tukey, Colin B. Mallows, Joseph B. Kniskal, and John R. Kettenring, all of Bell Laboratories, Murray Hill.

Pi Mu Epsilon will hold its annual meeting on Wednesday and Thursday, August 25 and 26. The J. Sutherland Frame Lecture will be given at 8:30 p.m. on Wednesday, August 25.

The **Association for Women in Mathematics** (AWM) will hold a panel discussion at 9:30 a.m. on Wednesday, August 25. The AWM membership meeting will take place in conjunction with a 7:45 a.m. breakfast also on Wednesday, August 25.

MAA PROGRAM

MAA Program Committee: Edward J. Barbeau, Jr., Gerald Berman, John D. Bradburn, Leonard Gillman (Chairman), Richard K. Guy, Mabel D. Montgomery, Gerald Porter, Alan C. Tucker, Daniel Wagner.

SUNDAY, August 22

MAA Board of Governors Meeting

9:00 a.m.-4:00 p.m.
Governing Council Chamber,
Simcoe Hall

1:00 p.m.-5:00 p.m.
Sidney Smith Hall 1088
MAA Mini-Course #1: "Uses of Computers in Undergraduate Mathematics Instruction"

7:00 p.m.-10:00 p.m.
Sidney Smith Hall 1088
MAA Mini-Course #2: "Introduction to Microprocessors in Mathematics Instruction"

MONDAY, August 23

8:40 a.m.
Medical Sciences Building 4171
Contributed Paper Session: "The Use of Computers in Undergraduate Mathematics Instruction"

9:50 a.m.
Medical Sciences Building 4279
Contributed Paper Session: "Classroom Notes"

2:10 p.m.-3:10 p.m.
Medical Sciences Building 2158
"The Last Thirty Years of Harmonic Analysis—A Personal View"
Guido L. Weiss, Washington University

2:10 p.m.-3:10 p.m.
Medical Sciences Building 3154
"Validation of the MAA Placement Examinations"
William L. Drezdzon, Oakton Community College
Anita Sikes, Delgado Community College

3:20 p.m.-5:30 p.m.
Medical Sciences Building 2158
AMS-MAA JOINT SESSION: "History of Mathematics I"

3:20 p.m.-4:20 p.m.
"Mathematics and Mathematicians in World War II"
J. Barkley Rosser, University of Wisconsin

4:30 p.m.-5:30 p.m.
"Homotopy Theory: The First Twenty-Five Years"
George W. Whitehead, Massachusetts Institute of Technology

7:00 p.m.-8:00 p.m.
Sidney Smith Hall 2106
Open Meeting: "Retraining Mathematicians to Teach Computer Science"
Ed Dubinsky, Clarkson College

7:00 p.m.-8:30 p.m.
Medical Sciences Building 2158
"CUPM Recommendations for the Training of Teachers"
Presider: **Donald W. Bushaw,** Washington State University
John A. Dossey, Illinois State University
Marjorie M. Enneking, Portland State University
Bruce E. Meserve, University of Vermont

8:45 p.m.
Wetmore Hall Cafeteria, New College
Beer Party (Purchase tickets at Registration Desk)

TUESDAY, August 24

8:40 a.m.-9:40 a.m.
Medical Sciences Building 2158
"Greedy Algorithms"
Alan J. Hoffman, IBM

8:40 a.m.-9:40 a.m.
Medical Sciences Building 3154
"The Pending Death of the Mathematics Major"
Clarence F. Stephens, State University of New York, College at Postdam

9:50 a.m.-10:50 a.m.
Medical Sciences Building 2158
"Some Mathematical Morsels"
Ross A. Honsberger, University of Waterloo

11:00 a.m.-12:00 noon
Medical Sciences Building 2158
The EARLE RAYMOND HEDRICK LECTURES: "Topological, Combinatorial, and Geometric Fractals"
HEDRICK LECTURE I: "Elementary Fractals"
James W. Cannon, University of Wisconsin

2:10 p.m.-3:10 p.m.
Medical Sciences Building 2158
"Recent Results in Non-Commutative Galois Theory"
M. Susan Montgomery, University of Southern California

2:10 p.m.-3:10 p.m.
Medical Sciences Building 3154
"Cognition and the Classroom"
Warren Page, New York City Technical College (CUNY)

PREREGISTRATION AND HOUSING FORM, TORONTO, CANADA

AMS Short Course	Joint Mathematics Meetings	MAA Minicourses
August 21-22, 1982	August 23-26, 1982	August 22 and 24, 1982

MUST BE RECEIVED IN PROVIDENCE NO LATER THAN JULY 9, 1982

Please complete this form and return it with your payment to

MATHEMATICS MEETINGS HOUSING BUREAU
P.O. Box 6887, Providence, Rhode Island 02940, Telephone: (401) 272-9500, Ext. 239

DEADLINES:

PREREGISTRATION: July 9, 1982 for preregistration fee(s)

RESIDENCE HALL ROOM DEPOSIT: July 9, 1982 (NOT REFUNDABLE AFTER JULY 15)

CANCELLATIONS: Preregistrations may be cancelled until August 20 by writing or calling the Mathematics Meetings Housing Bureau (see above). 50% of the preregistration fee(s) will be refunded if notification is received by this date. Confirmed residence hall reservations may be cancelled until July 15 when deposit will be refunded; however, after that date, no refunds will be allowed.

CHANGES: Changes in arrival and departure dates must be made with the Mathematics Meetings Housing Bureau by August 20 (See address and number above.). Please refer to meeting announcement for number to call after this date.

REGISTRATION FEES

	Preregistration (by mail prior to 7/9)	At Meeting
JOINT MATHEMATICS MEETINGS		
Member of AMS, MAA, ΠME	$34	$48
*Student, Unemployed or Emeritus	$ 8	$12
Nonmember	$52	$74
AMS Short Course		
Member/Nonmember	$25	$30
*Student or Unemployed	$ 5	$10
MAA MINICOURSE #1	$15	$15
MAA MINICOURSE #2	$15	$15

Please affix AMS or MAA label here. If none, complete 1-3 below.

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

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

Joint Mathematics Meetings [ ]   MAA Minicourse #1 [ ]

AMS Short Course   [ ]   MAA Minicourse #2 [ ]

1) _____
NAME (Please print)   SURNAME   FIRST   MIDDLE

(3) { AMS member code _____
{ MAA member code _____

2) _____
ADDRESS   NUMBER AND STREET   CITY   STATE   ZIP CODE

4) _____
ADDRESS FOR CONFIRMATION OF ROOM RESERVATION (if other than above)

5) Employing institution _____   Unemployed [ ]

6) I am a student at _____   (7) Name of spouse _____
(list only if accompanying to meeting)

8) Accompanying children (number) _____ (names, ages, sexes) _____

9) Member of AMS [ ]   MAA [ ]   ΠME [ ]   NONMEMBER [ ]   (Member discount applies only to members of AMS, MAA, or ΠME)
Member of other organizations: AWM [ ]   NAM [ ]

10) Joint Meetings fee enclosed $ _____   (11) MAA Minicourse #1 fee enclosed $ _____

12) AMS Short Course fee enclosed $ _____   (13) MAA Minicourse #2 fee enclosed $ _____

14) $15 deposit for residence hall accommodations enclosed $ _____ (non-refundable after July 15, 1982)

15) TOTAL AMOUNT ENCLOSED FOR 10 THROUGH 14 $ _____ (NOTE: Make checks payable to AMS; Canadian checks must be marked "In U. S. Funds".)

NOTE: A $4 charge will be imposed for all invoices prepared when preregistration/housing forms are submitted without an accompanying check for preregistration fee(s), or are accompanied by an insufficient amount.

[ ] Check here if you will not require a room.

PLEASE BE SURE TO COMPLETE THE SECTION ON REVERSE SIDE IF YOU WILL REQUIRE HOUSING.

UNIVERSITY HOUSING SECTION

[ ] I WILL NOT REQUIRE A ROOM.

Please read section on "Types of Accommodations" in meeting announcement.

Please reserve the following residence hall accommodations: (Rates are given in <u>Canadian</u> dollars and include Provincial Sales Tax.)

<u>AIR-CONDITIONED ROOMS — PLEASE CIRCLE NIGHT(S) OF OCCUPANCY</u>:

<u>MALES</u>:

$20.00 [ ]	Wetmore — Single	Night(s) of 8/20 21 (no breakfast)
$21.50 [ ]	Wetmore — Single	Night(s) of 8/22 23 24 25 26 (breakfast included)
$13.50 [ ]	Wetmore — Double/per person	Night(s) of 8/20 21 (no breakfast)
$15.50 [ ]	Wetmore — Double/per person	Night(s) of 8/22 23 24 25 26 (breakfast included)

<u>FEMALES</u>:

$21.50 [ ]	Wilson — Single	Night(s) of 8/20 21 (no breakfast)
$20.00 [ ]	Wilson — Single	Night(s) of 8/22 23 24 25 26 (breakfast included)

<u>NON-AIR-CONDITIONED ROOMS — PLEASE CIRCLE NIGHT(S) OF OCCUPANCY</u>:

<u>MALES</u>:

$19.00 [ ]	Devonshire — Single	Night(s) of 8/20 21 (no breakfast)
$20.50 [ ]	Devonshire — Single	Night(s) of 8/22 23 24 25 26 (breakfast included)
$18.73 [ ]	Trinity — Single	Night(s) of 8/20 21 22 23 24 25 26 (no breakfast)
$12.31 [ ]	Trinity — Double/per person	Night(s) of 8/20 21 22 23 24 25 26 (no breakfast)
$16.59 [ ]	Trinity (Student) — Single	Night(s) of 8/20 21 22 23 24 25 26 (no breakfast)
$18.73 [ ]	St. Michael's — Single	Night(s) of 8/21 22 23 24 25 26 (no breakfast)
$12.31 [ ]	St. Michael's — Double/per person	Night(s) of 8/21 22 23 24 25 26 (no breakfast)
$16.05 [ ]	Knox — Single	Night(s) of 8/20 21 22 23 24 25 26 27 (no breakfast)
$12.84 [ ]	Knox (Student) — Single	Night(s) of 8/20 21 22 23 24 25 26 27 (no breakfast)

<u>CO-ED</u> and <u>FAMILIES</u>:

$19.00 [ ]	Sir Daniel Wilson — Single	Night(s) of 8/20 21 (no breakfast)
$20.50 [ ]	Sir Daniel Wilson — Single	Night(s) of 8/22 23 24 25 26 (breakfast included)
$19.00 [ ]	Whitney — Single	Night(s) of 8/20 21 (no breakfast)
$20.50 [ ]	Whitney — Single	Night(s) of 8/22 23 24 25 26 (breakfast included)
$12.50 [ ]	Whitney — Double/per person	Night(s) of 8/20 21 (no breakfast)
$14.50 [ ]	Whitney — Double/per person	Night(s) of 8/22 23 24 25 26 (breakfast included)
$20.50 [ ]	Victoria (Margaret Addison) — Single	Night(s) of 8/20 21 22 23 24 25 26 (breakfast included)
$14.50 [ ]	Victoria (Margaret Addison) — Double/per person	Night(s) of 8/20 21 22 23 24 25 26 (breakfast included)

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

I will share a double room with _____ who will arrive on_____

at_____ a.m./p.m. and depart on _____ at _____ a.m./p.m.

List sex(es) and age(s) of accompanying children _____

_____ $7.49 daily mattress charge for child 10—14 occupying room with parents in Whitney Hall only (no breakfast).

_____ $5.35 daily cot charge for child 4—12 occupying room with parents in Margaret Addison Hall at Victoria University (no breakfast).

<u>SCARBOROUGH COLLEGE APARTMENTS</u>: (11 units) Rates do not include breakfast. Weekly rates do not include towels, face cloths or soap. All rates include Provincial Sales Tax.

Daily rates: $16.05 — Single
$13.91 — Double/per person
$10.71 — Child under 12 occupying bed

[ ] Unit of 4 singles at above single rate or $176.55 weekly rate
[ ] Unit of 6 singles at above single rate or $214.00 weekly rate
[ ] Unit of 2 singles and 2 doubles at above rates or $214.00 weekly rate

Apartment unit will be shared by _____

Number of children and ages _____

Unit will be occupied on night(s) of   8/19   20   21   22   23   24   25   26.   Please circle night(s) of occupancy. (Check-out time is noon on 8/27.)

We will arrive on _____ at _____ a.m./p.m., and depart on _____ at _____ a.m./p.m.

University Housing

Please refer to the map of the campus included in this meeting announcement for location of the following residences: Wetmore, Wilson, Whitney, Devonshire, Sir Daniel Wilson, and Margaret Addison Halls, as well as those in Knox, Trinity and St. Michael's Colleges.

Participants desiring confirmed reservations for on-campus housing must preregister prior to the July 9, 1982 deadline. Rooms may be available for those who do not preregister, but this cannot be guaranteed.

No university residence halls may be occupied prior to August 20, with the exception of Scarborough College, where families or groups may take up residence on August 19. Rates for some residence halls include breakfast; others do not. Rooms in St. Michael's College may not be occupied until August 21.

All participants must be checked out of the residence halls in St. Michael's College, Trinity College, New College, Scarborough College, and Whitney, Devonshire and Sir Daniel Wilson Halls by noon on Friday, August 27. The exceptions are those participants residing in Knox College and in residence halls in Victoria University who may check out a day later at noon on August 28. Check-out time on other days is also noon, and anyone failing to check out by this time will be charged an additional night's lodging by the university.

There are three types of accommodations available for participants at the University of Toronto: air-conditioned rooms, non-air-conditioned rooms, and family units at Scarborough College, a half-hour's to one hour's drive by auto, or one hour's to one-hour-and-a-half's ride on public transportation.

Scarborough College is located about 17 miles from the University of Toronto in a rural area just south of route 401. There is free parking for participants near the town house units on campus. There are eleven units; each unit is fully equipped for housekeeping. There is no maid service provided. The town houses contain 4 or 6 single beds, or 2 singles and 2 doubles for a total of 6 occupants. Parents may bring cribs for infants; however, cribs may also be rented. (See section on Crib Rental.) Bed linen is provided, as are towels, face cloths, and soap for those participants paying a daily rate; however, towels, face cloths and soap are not included in the weekly rates. (See Types of Accommodations.) It may also be advisable to bring coat hangers. Scarborough College is northeast of Toronto and can be reached from route 401 east or west by taking exit 61. Go south on Morningside Avenue and turn left on Military Trail. The campus is located south of Ellesmere Road on the right.

In each residence hall (with the exception of Knox College which does not supply towels, face cloths or soap), two sheets, a pillow, one pillowcase and blanket are provided for each bed occupied, as well as a set of towels, soap and drinking glass. No face cloths are supplied. It is also suggested that the participant bring clothes hangers. Housekeeping will clean rooms daily, but will not make the beds. Rooms are equipped with desks, chairs, dressers, and lamps. There are elevators serving each floor in the high-rise dormitories. All residences halls have smoke alarms.

No pets are allowed in the residence halls.

There are coin-operated laundromats in each hall; however, participants are advised to bring their own detergent.

No more than two adults may occupy a room at the same time. Only one child may occupy the same room with its parents. Rules regarding children vary in the three residences set aside for families: Victoria University, Whitney Hall, and Scarborough College. Please refer to the section below for information on accommodations for families. No cribs for children are available from the university. (See the section on Crib Rental.)

Those preregistering and requesting university housing before the July 9 deadline must include a $15 room deposit (nonrefundable after July 15) for all residences except Scarborough College. The deposit must be submitted at the same time as the preregistration/housing form. Forms received without the deposit will be returned.

NOTE: Should it be necessary for participants to cancel their preregistration and housing, they should be aware that the housing deposits can be refunded only up to July 15. Those wishing to cancel should write or telephone the Mathematics Meetings Housing Bureau (401-272-9500, ext. 239) before this deadline.

As has been the custom, 50 percent of the preregistration fee(s) will be refunded if the Mathematics Meetings Housing Bureau is notified of the cancellation prior to the deadline date of August 20.

All those who request university housing in advance will receive a written confirmation from the Mathematics Meetings Housing Bureau. This confirmation should be presented to the university clerk at time of check-in. The remainder due for the duration of each participant's stay as originally requested on his or her preregistration/housing form is due in full at time of check-in. Cash, personal checks and travelers' checks in Canadian Funds will be accepted. U.S. funds will be taken at par. Credit cards will not be accepted.

Refundable key deposits of $3 to $5 are mandatory at check-in. This deposit will be forfeited if a key is lost.

Individuals who fail to preregister and obtain confirmed university accommodations must go to the meeting Registration Desk (Housing section) in the lobby of Sidney Smith Hall (#33 on map) on St. George Street in order to receive a room assignment, if rooms are still available. It is suggested that these individuals bring a set of towels, face cloths, soap, and clothes hangers in the event they are assigned to Knox College.

Food Services

Breakfast for those participants staying in Wetmore, Wilson, Whitney, Sir Daniel Wilson, and Devonshire Halls will be served in the cafeteria located in Wilson Hall, New College beginning on Monday, August 23, and ending on Friday, August 27. No meals will be served in the Wilson Hall, New College cafeteria on weekends. Participants staying in Margaret Addison Hall, Victoria University, will use the cafeteria in Brennan Hall (#411 on campus map). It is anticipated that this cafeteria will be open on the weekend prior to the Joint Meetings. Participants staying in residence halls on campus whose room rates include breakfast will be issued vouchers at check-in as proof of payment. Children's room rates (if not occupying a bed) do not include breakfast.

It is likely that those attending the AMS Short Course on August 21-22 or still on campus on Saturday, August 28, must eat off-campus.

Breakfast will be served in the cafeterias from 7:30 a.m. to 9:00 a.m.; lunch from noon to 1:30 p.m.; and dinner from 5:00 p.m. to 6:30 p.m.

The cost of breakfast in the cafeterias for those not on the breakfast plan is $2.50-$2.75, and for those participants and their families who prefer to take their meals in the cafeteria, the cost of lunch is $3.90-$4.10, and dinner $5.00-$5.50.

Scarborough College provides full food service a la carte in their cafeteria which is open Monday through Friday from 9:00 a.m. to 4:00 p.m.

Scarborough College (Block A), Military Trail, West Hill, Ontario (south of route 401)

Check-in will be handled on an individual basis if arrival time is given on housing form, or go to residence trailer next to Block A, which is open on weekdays from 9:00 a.m. to 5:00 p.m.

Check-in Times and Locations of Residence Halls and Scarborough College

Whitney Hall, St. George Street and Hoskins Avenue (#13 on map)
11:00 a.m.-11:00 p.m.
Porter on duty 24 hours

Wilson Hall, New College, Willcocks Street and Huron Street (#32a on map)
11:00 a.m.-11:00 p.m.
Porter on duty 24 hours

Sir Daniel Wilson, St. George Street (next to Whitney) (#29 on map)
11:00 a.m.-11:00 p.m.
Porter on duty 24 hours

Wetmore Hall, Classic Avenue and Huron Street (#32 on map)
11:00 a.m.-11:00 p.m.
After 11:00 p.m., go to Wilson Hall for key.

Devonshire Hall, Devonshire Place and Hoskin Avenue (#12 on map)
11:00 a.m.-11:00 p.m.
After 11:00 p.m., go to Whitney Hall for key.

St. Hilda's College, Trinity College, 44 Devonshire Place (#608 on map)
9:00 a.m.-5:00 p.m.
After 5:00 p.m., porter is on duty

Knox College, St. George Street and Willcocks Street (#575 on map)
9:00 a.m.-4:00 p.m.
Check-in at Bursar's Office, East Academic Wing, 59 George Street. After 4:00 p.m., pick up key from don on duty (aka resident)

St. Michael's College, 81 St. Mary Street and Bay Street (#401-432 on map)
8:00 a.m.-8:00 p.m.
Check-in at Porter's Office, lower Elmsley Hall at Mail Room. After 8:00 p.m. go to switchboard at 50 St. Joseph Street located in Clover Hill Wing east of church.

Margaret Addison Hall, Victoria University—Charles Street West at University Avenue (#508 on map)
24 hour check-in at desk in
Margaret Addison Hall

Hotel Accommodations

Blocks of rooms have been set aside for use by participants at the hotels listed below. Participants should make their own reservations early, either directly with the hotels, or with the Toronto Meetings Travel Hotline when booking airline reservations. In either case, participants should identify themselves as participants in the Joint Mathematics Meetings. The rates listed below are subject to change, and to a 7 percent Ontario Sales Tax; all rates are quoted in Canadian dollars.

The following codes apply: AC = Air Conditioned; CL = Cocktail Lounge; FP = Free Parking; RT = Restaurant; SP = Swimming Pool; TV = Television. The age limit for children below which there is no charge, providing a cot is not required and they are in the same room as a parent, is shown in parentheses on the same line as the charge for an extra person in the room. 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 beds. A rollaway cot for an extra person can be added to double or twin rooms only. Participants will be advised of deposit requirements by the hotels at time of confirmation.

Park Plaza Hotel (A on campus map)
4 Avenue Road, Toronto, Ontario (M5R 2E8)
Telephone: (416) 924-5471
Single: $85   Double: $95
Extra person in room: $10 (15 years)
Code: AC, TV (in-home movies), CL, RT
The deadline for reservations is July 26.

Royal York (20-30 minute walk)
100 Front Street West, Toronto, Ontario (M5J 1E3)
Telephone: (416) 368-2511
Single: $76   Twin: $91
Extra person in room: $16 (15 years)
Code: AC, TV, CL, RT
The deadline for reservations is July 28.

Carlton Inn (20-30 minute walk)
30 Carlton Street, Toronto, Ontario (M5B 2E9)
Telephone: (416) 977-6655
Single: $39
Extra person in room: $7 (13 years)
Code: AC, TV, CL, RT, SP, sauna, small refrigerator in each room
The deadline for reservations is August 1.

The Park Plaza Hotel has underground parking for $5.75 for 24 hours; the Royal York has sheltered parking for $6 per day; the Carlton Inn has underground parking for $2.50 per day.

AMS-MAA Joint Program Committee: Raymond G. Ayoub, Edward J. Barbeau, Jr., Leonard Gillman (Chairman), Ronald L. Graham, Richard K. Guy, Hugh L. Montgomery, George D. Mostow, Gerald Porter, Everett Pitcher.

MAA PROGRAM

3:20 p.m.-4:20 p.m.
Various Locations

Contributed Paper Sessions (tentative)

4:30 p.m.-5:30 p.m.
Medical Sciences Building 2158

MAA Business Meeting

7:00 p.m.-10:00 p.m.
Sidney Smith Hall 1088

Continuation of **MAA Mini-Course #2:** "Introduction to Microprocessors in Mathematics Instruction"

WEDNESDAY, August 25

8:40 a.m.
Medical Sciences Building 3163

Contributed Paper Session: "The Undergraduate Mathematics Curriculum"

8:40 a.m.
Medical Sciences Building 3171

Contributed Paper Session: "Special Concerns: Remediation, Articulation, and Math Anxiety"

11:00 a.m.-12:00 noon
Medical Sciences Building 2158

HEDRICK LECTURE II: "Fractals in Topological Manifolds"
James W. Cannon

1:00 p.m.-2:00 p.m.
Medical Sciences Building 3154

"Calculus Examination and Grading by Computer"
Edward L. Spitznagel, Washington University

2:10 p.m.-4:20 p.m.
Medical Sciences Building 2158

AMS-MAA JOINT SESSION: "History of Mathematics II"

2:10 p.m.-3:10 p.m.

"The Influence of Elasticity on Analysis"
Clifford A. Truesdell, III, Johns Hopkins University

3:20 p.m.-4:20 p.m.

"The Work of Bourbaki During the Past Thirty Years"
Jean A. Dieudonne, Nice, France

5:30 p.m.-8:30 p.m.

MAA Twenty-Five Year Member Banquet

7:00 p.m.-10:00 p.m.
Governing Council Chamber
Simcoe Hall

MAA Section Officers Annual Meeting

THURSDAY, August 26

8:40 a.m.-9:40 a.m.
Medical Sciences Building 2158

"Numerical Solution of Navier-Stokes Problems by the Dual Variable Method"
Charles A. Hall, University of Pittsburgh

8:40 a.m.-10:10 a.m.
Medical Sciences Building 3154

Panel Discussion: "Problems of Academic Computing Centers in Four-Year Colleges"
Moderator: **Thomas Kurtz,** Dartmouth College
Marvin L. Brubaker, Moravian College
Burt Mendelson, Smith College

9:50 a.m.-10:50 a.m.
Medical Sciences Building 2158

"The Geometry of Some Flows in 3-Space"
John M. Franks, Northwestern University

11:00 a.m.-12:00 noon
Medical Sciences Building 2158

HEDRICK LECTURE III: "Hyperbolic Groups and Fractals at Infinity"
James W. Cannon

1:00 p.m.-2:00 p.m.
Medical Sciences Building 3154

"Some New Proofs of Some Old Theorems"
Dorothy Maharam Stone, University of Rochester

2:10 p.m.-3:10 p.m.
Medical Sciences Building 2158

"The Fruitful Analogy: Algebraic Number Theory, Algebraic Geometry, and Topology"
Stephen S. Shatz, University of Pennsylvania

The Toronto Meetings Travel Hotline—Call 800-556-6882

In Rhode Island and outside the continental U.S. call 401-884-9500 or Telex 952165

CONVENIENCE, SAVINGS, IMMEDIATE CONFIRMATION ON HOTEL & AIRLINE ARRANGEMENTS

Hours of Operation: 9 a.m.-8 p.m. Eastern Time Monday through Thursday, Fridays until 6 p.m.
Another Member Service to Assist You if You're Attending the Toronto Meetings and Use a Major Credit Card.

One free call answers all your travel questions and supplies you with all your needs, including hotel rooms and/or reduced-rate airline arrangements. Meeting preregistration and university housing can only be handled through the Mathematics Meetings Housing Bureau, which can not be reached through this 800 number.

Travel

In August, Toronto is on Eastern Standard Time. There is regular airline service to Toronto International Airport by several major airline carriers.

The airport in Toronto is approximately 18 miles from city center, and the trip takes between 25 and 60 minutes. A taxi costs $18-$20; limousine $20; the Airport Express bus to Islington subway station $2, then 75 cents to the city; the bus to York Mills station $2.50, then 75 cents to the city; and the Charterways Bus to downtown (stops at Royal, York and Sheraton Centre) $5.50. None of these services, except the taxi or limousine, will bring one directly to the university campus. Participants are advised to utilize cab service for the last leg of the trip. Most major car rental agencies maintain desks at the airport.

VIA has eight trains daily from Montreal to Toronto, and one a day from Vancouver. One can take Amtrak to Detroit, and then the bus to Windsor, where VIA provides six trains daily to Toronto. Both Amtrak and VIA provide daily New York-Toronto Services.

From all U.S. points, routes lead directly to Toronto on Highway 401. To get to the main (St. George) University of Toronto campus from 401, take exit 52 (Avenue Road). Take Avenue Road south approximately five miles, where it becomes University Avenue after crossing Bloor Street. Then, see the campus map.

Entering Canada is usually no problem for U.S. citizens, and involves nothing more than answering questions about where they were born, where they are going, and how long they will stay, and showing some form of proof of citizenship such as a voter's or birth certificate. Permanent U.S. residents who are not citizens are required to bring their alien registration receipt card (U.S. form I-151 or I-551). Entry requirements vary for people coming to Canada from countries other than the United States. As a general rule, the visitor should have a valid national passport.

Local Information

The Bank of Montreal, 262 Bloor Street West at St. George, will exchange U.S. currency for participants at no charge, provided either cash or recognized travelers' checks are presented. Canadian funds can also be obtained through MasterCard; however, the Bank of Montreal will not cash personal checks. Their hours of operation are from 10:00 a.m. to 3:00 p.m. Monday through Thursday, and from 10:00 a.m. to 6:00 p.m. on Friday. It is suggested that participants with confirmed housing reservations on campus plan on paying for their accommodations at check-in time in Canadian funds, since U.S. funds will be accepted by the university housing clerks at par.

The Toronto Transit Commission operates subways, streetcars, trolley buses, and suburban buses. All fares are 75 cents each, or eight for $5.

Taxi rates are $1.10 at flag drop and 20 cents each additional ⅛ mile.

In addition to the activities listed under the section titled Social Events, Toronto has many other sights and attractions, such as the Royal Ontario Museum, the CN Tower, Casa Loma, Toronto Islands, Old Fort York, Ontario Place, and The Art Gallery of Ontario in Grange Park. Further information can be obtained on these places at the Local Information section of the meeting Registration Desk.

Social Events

The Department of Mathematics is planning entertainment for mathematicians and their families during the meeting. At 8:45 p.m. on Monday, August 23, there will be an evening beer party at Wetmore Hall Cafeteria, New College. Tickets to this event will be sold in advance at the Transparencies section of the meeting Registration Desk.

During the week of the meeting, there will be many entertainment events in Toronto and vicinity. A number of theatres will be giving regular performances at this time. At Niagara-on-the-Lake there is the Shaw Festival, and at Stratford a Shakespeare festival. Both of these places are relatively close to Toronto, and return transportation for any evening is easy to arrange. In addition to theatrical events, Toronto has a wide variety of musical events during the summer. The Canadian National Exhibition will be in progress the week of the meeting, and is easily accessible from the university by public transportation. Tours can be arranged during the daytime to such local places of interest as the Ontario Science Centre, the McMichael Collection, and the large Metropolitan Zoo. Participants interested in these events should check with the Local Information section of the Registration Desk.

Weather

The normal daytime high temperature during this period is 79°F. Normal night-time low is 61°F. Rainfall in August averages 2.65 inches, with a 30 percent average daily probability of precipitation. Humidity ranges from a daytime high of 67 percent to a night-time low of 55 percent. The record high and low temperatures for August are 102° and 39°F respectively. Light sweaters and jackets are advised for evening wear. Temperatures in Canada are given in the Celsius scale, so the preceding temperatures would read: normal high 26, normal low 16, record high 39, record low 4.

Athletic Facilities

Meeting participants may use the swimming pool and track for a $5 guest fee. Upon proof of meeting registration, guest cards will be issued at the Booking Office in the Athletic Center. As this is the maintenance week for the facility, squash and tennis will not be available, and the towel service may not be operating.

Book Stores

There are three book stores located on campus. The U of T Bookroom, located on King's College Circle, and the U of T Textbook Store, located on Huron Street, are both open from 8:45 a.m. to 4:30 p.m., Monday through Friday. The Student Christian Movement Bookstore, located on the edge of campus at the corner of Bloor and St. George, is open 9:00 a.m. to 6:00 p.m., Monday through Friday, and 10:00 a.m. to 6:00 p.m. Saturday.

Camping

There are no suitable camping sites located near the university. Those persons wishing to camp should contact their local KOA office for the current issue of *Handbook and Directory for Campers.*

Child Care

Daycare may be arranged by interested individuals by contacting the director of the Margaret Fletcher Daycare Centre, who will take children on a first-come, first-served basis. Write to Ms. Mercedes Chacin de Fuchs, Margaret Fletcher Daycare Centre, 100 Devonshire Place, University of Toronto, Toronto, Ontario, Canada M5S 2C9.

Crib Rental

Cribs are available for $2.50 per day, plus 7 percent provincial sales tax, and a $10 total delivery and pickup charge. Strollers, high chairs, and infant (under 20 lbs.) car seats are also available; rates on request. Those persons wishing to rent any of these items should write to the undernamed as soon as possible, giving dates required. In the case of cribs, full payment must be enclosed in Canadian funds: Annette Sunter, Department of Mathematics, University of Toronto, Toronto, Ontario, Canada M5S 1A7.

Libraries

The Mathematics Department Library, located on the second floor of Sidney Smith Hall, will be open from 9:00 a.m. to 9:00 p.m. for the duration of the meetings. Information concerning books located in other libraries is available from the Department Library. The main collection of books is in the Science and Medicine Library, located on King's College Circle. The Robarts Library houses the Humanities collection. Summer hours for the university libraries are:

Robarts	8:30 a.m. to 11:00 p.m. Monday-Thursday
	8:30 a.m. to 6:00 p.m. Friday
	9:00 a.m. to 5:00 p.m. Saturday
Sci-Med	8:30 a.m. to 9:00 p.m. Monday-Thursday
	8:30 a.m. to 5:00 p.m. Friday
	9:00 a.m. to 5:00 p.m. Saturday

Medical Services

The University Health Service is open from 9:00 a.m. to 4:30 p.m. daily for medical attention. Emergencies occurring during the evening or weekends can be handled at the Emergency Department of any of the local hospitals: Toronto General Hospital, College at University; Women's College Hospital, 76 Grenville Street (College at Bay); the Hospital for Sick Children, 555 University Avenue. In addition, the Academy of Medicine can advise of local doctors who are on emergency call. Their telephone number is 922-1134. Dental service can be arranged through the University Health Centre.

Parking

Parking throughout the university is extremely limited as the campus was not designed for motor traffic. Parking stickers for pay lots will be available at the meeting Registration Desk for $3 per day. A 400 car parking lot on St. George Street will be open Monday through Friday, for which a $3 parking fee, payable on site, is charged. There are also several areas where on-street parking is free from 9:00 a.m. to 4:00 p.m. and 6:00 p.m. to 7:00 a.m. Metered parking is also available. Maps indicating these parking areas will also be available at the Registration Desk. Participants are urged to drive as little as possible between the dormitories and the meeting areas.

Participants attending the AMS Short Course on Saturday and Sunday, August 21-22, or MAA Minicourses on Sunday, August 22, will find free parking for the weekend only on King's College Circle and Hart House Circle.

Local Arrangements Committee

Morton Abramson, James G. Arthur, Raymond G. Ayoub (ex officio), Edward J. Barbeau, Jr. (publicity director), L. Terrell Gardner, William J. LeVeque (ex officio), James McCool, Stephen J. Pierce (chairman), David P. Roselle (ex officio), Annette Sunter, James R. Vanstone, and John B. Wilker.

UNIVERSITY OF TORONTO   ST. GEORGE CAMPUS

Numerical directory and location guide

1 University College [3C]
2 Hart House [4C]
3 Sigmund Samuel Library Bldg. [4D]
4 McMurrich Building [4D]
5 Medical Sciences Building [4D]
6 John P. Robarts Research Lib. [2B]
6a Library Science Building [2B]
6b Thomas Fisher Rare Book Lib. [2B]
7 Mining Building [3E]
8 Wallberg Building [3E]
8a Metallurgy Building [3E]
9 Sandford Fleming Labs. [3E]
10 Simcoe Hall [3D]
10a Convocation Hall [3D]
11 Botany Building [4E]
12 Devonshire House [3B]
13 Whitney Hall [3C]
14 Faculty of Education [2A]
15 Lillian Massey Building [5A]
16 Banting Institute [5E]
17 U. of T. Press/Bookroom [3D]
20 Rosebrugh Building [3D]
21 Engineering Annex [3E]
22 Mechanical Engineering Bldg. [3E]
23 Women's Union [3C]
24 Haultain Building [4E]
25 FitzGerald Building [4E]
26 Cumberland House [3E]
27 Forestry Building [3D]
28 Architecture Building [2E]
29 Sir Daniel Wilson Residence [3C]
30 Varsity Stadium [3A]
31 16 Hart House Circle [4C]
32 Varsity Arena [4A]
32a New College (Wetmore Hall) [2C]
33 New College (Wilson Hall) [1C]
34 Sidney Smith Hall [2C]
35 Massey College [3B]
36 Royal Conservatory of Music [4A]
37 Nursing Building [2D]
38 David Dunlap Observatory (below)
38a Woodsworth College [3A]
38b Drill Hall [3A]
39 49 St. George st. [3D]
40 Flavelle House [4B]
43 School of Graduate Studies [3D]
44 44 St. George St. [2D]
45 Infirmary [2D]
46 Benson Building [2C]
49 Aerospace Building (below)
50 Falconer Hall [4B]
51 Edward Johnson Building [4B]
52 Best Institute [5E]
53 Graduate Students' Union [2D]
54 1 Spadina Crescent [1D]
55 Institute of Child Study (below)
57 Textbook Store [2D]
58 Health Service [2D]
59 Bancroft Hall [2D]
61 South Borden Building [2D]
61a North Borden Building [2D]
65 631 Spadina Ave. [1C]
67 215 Huron Street [2E]
68 Benson Building [2C]
68a Athletic Complex
       (proposed) [1C]
69 Alumni House [1D]
71 Galbraith Building [3E]
72 92 College St. [6E]
73 Ramsay Wright Zoological Labs.
       [2C]
74 Lash Miller Chemical Labs. [2D]
75 581 Spadina Ave. [1D]
76 Faculty Club [2D]
77 Information Services Dept. [1D]
78 Sussex Court [2B]
78 McLennan Physical Labs. [2D]
79 Hughes Pharmacy Bldg [2D]

81 St. George Grad Residence [3A]
83 254-56 McCaul St. [3E]
84 91 St. George St. [3B]
88 Industrial Relations Centre [3A]
89 Admissions Office [3A]
90 88 College St. [6E]
91 Studio Theatre [2B]
95 43 Queen's Park Cres E. [5C]
96 47 Queen's Park Cres E. [5C]
97 39 Queen's Park Cres E. [5C]
97a Culture & Technology Centre
       [5C]
99 121 St. Joseph St. [5C]
103 Sch. of Continuing Studies [2A]
104 Institute for Policy Analysis [2A]
110 Media Centre [3A]
111 246 Bloor St West [3A]
113 651 Spadina Ave (Vladimir
       House) [1B]
115 97 St. George St. [3B]
117 W. B. MacMurray Field House
       [1B]
120 Old Observatory (SAC) [4C]
125 703 Spadina Ave [1A]
132 Inns College [2B]
138 370 Huron St. [2B]
141 Margaret Fletcher Day Care
       Centre [3A]
170 167 College St. [3E]
171 455 Spadina Ave [1E]
172 MacDonald-Mowat House [3D]
174 203 College St. [3E]
178 342-44 Bloor St. W. [1A]
180 Faculty of Educ. Registrar [2A]
181 Ont Inst for Studies in Educ. [3A]

401-432 St. Michael's College
501-524 Victoria University
550 Toronto Sch. of Theology [6A]
575 Knox College [3D]
600-608 Trinity College
675 Wycliffe College [4C]

Teaching Hospitals (below)
961 Toronto Western Hospital
962 Princess Margaret Hospital
963 Wellesley Hospital
964 St. Michael's Hospital
965 Hospital for Sick Children
966 Sunnybrook Medical Centre
967 Mt. Sinai Hospital
968 Women's College Hospital
969 Toronto General Hospital
970 Clarke Institute of Psychiatry
971 Addiction Research Clinical Inst.
972 Lyndhurst Hospital

Alphabetical directory

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Simcoe Hall 10
Trinity College 600
Victoria University 501
Wetmore Hall (New College) 32
Whitney Hall 13
Wilson Hall (New College) 32a
Wilson (Sir Daniel) Residence 29

Ⓐ = Park Plaza Hotel
Ⓢ = Subway station
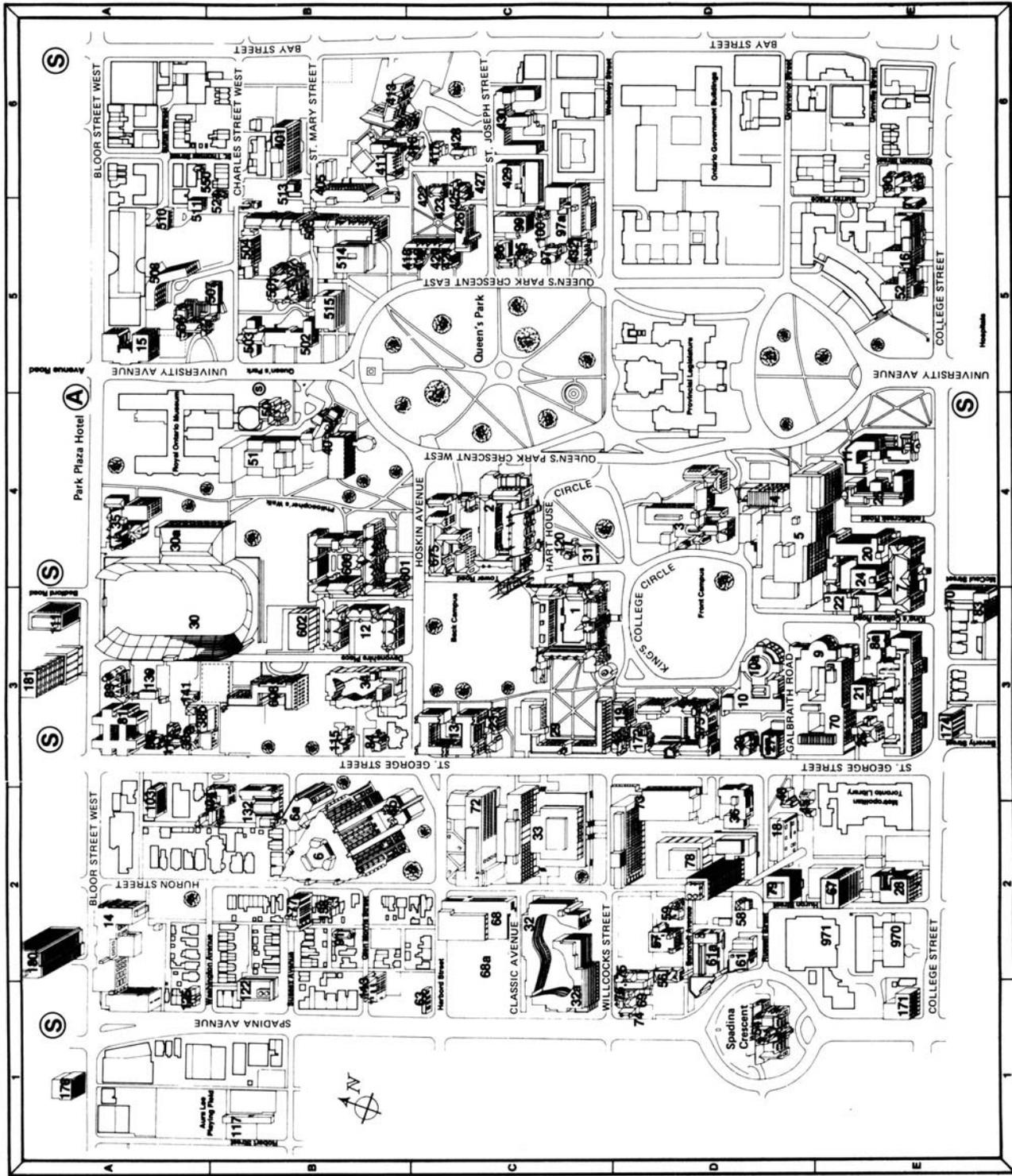
Washington University Wins Putnam

Three mathematics students from Washington University, St. Louis, won first place for their school in the 1981 William Lowell Putnam Mathematical Competition held on December 5, 1981. Two of the team members, Kevin P. Keating and Edward A. Shpiz, were members of Washington University's winning team last year. The third, Richard A. Stong, is a 1981 USA Olympiad winner and a member of the USA team which took first place in the International Mathematical Olympiad last summer.

The next four winning schools, in rank order, and their teams are: **Princeton University**—Gregg N. Patruno, David P. Roberts, Charles H. Walter; **Harvard University**—Michael J. Larsen, Laurence E. Penn, Michael Raship; **Stanford University**—Richard J. Beigel, Thomas C. Hales, Kenneth O. Olum; **University of Maryland, College Park**—Ravi B. Boppana, Andrew E. Gelman, Brian R. Hunt.

The first place team receives an award of $5000 and each member of the team receives $250. The awards for second place are $2500 and $200; for third place $1500 and $150; for fourth place $1000 and $100; and for fifth place $500 and $50. Awards are also given to the ten highest ranking individuals.

A total of 2043 students from 343 colleges and universities in Canada and the United States participated in the competition. There were teams from 251 schools. More complete details will appear in a forthcoming issue of the *American Mathematical Monthly.*

Contributed Papers for Toronto Meeting Due June 7

Papers are being accepted on four topics in collegiate mathematics for presentation in contributed paper sessions at the MAA Summer Meeting in Toronto. The topics and the session leaders are:

- The undergraduate mathematics curriculum—Stephen B. Maurer, Swarthmore College
- Special concerns: Remediation, Articulation, and Math Anxiety—John A. Dossey, Illinois State University
- The use of computers in undergraduate mathematics instruction—Ronald H. Wenger, University of Delaware
- Classroom notes—JoAnne Growney, Bloomsburg State College.

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

Individuals wishing to submit papers for any of the sessions at the Toronto meeting should send the following information to the MAA's Washington Office (Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036) before June 7, 1982:
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, movie projector, videotape player).

This information will be sent to session leaders who will arrange for refereeing. Selection of papers will be announced by July 15, 1982.

In Memoriam

Homer V. Craig, Professor Emeritus from the University of Texas, died November 30, 1981 at the age of 81. He was a member of the MAA for 52 years.

Lester L. Gavurin, Professor and Chairman at CUNY—Brooklyn College, died October 16, 1981 at the age of 59. He was a member of the MAA for 27 years.

Joseph F. Kubis, Professor Emeritus from Fordham University, died January 20, 1982 at the age of 70. He was a member of the MAA for 44 years.

George F. Lowerre, Professor at Northern Virginia Community College, Woodbridge Campus, died February 26, 1982 at the age of 49. He was a member of the MAA for 22 years.

H. Walter McCurdy, Jr., Associate Professor at Bradley University, died January 3, 1982 at the age of 52. He was a member of the MAA for 24 years.

James E. Thompson, retired from Pratt Institute, died January 21, 1982 at the age of 89. He was a member of the MAA for 55 years.

The MAA has also been informed of the deaths of these individuals: **Martin H. Dull** of South Bend, Indiana, an MAA member for 14 years; **E. H. Moulton** of Miami, Florida, one of the 1045 charter members who organized the MAA in 1915 and a member of the MAA for 67 years.

Conference Board Reorganized

At the January meeting of its Council in Cincinnati, the Conference Board of the Mathematical Sciences (CBMS) completed a reorganization that had been in progress since Spring 1981. Dictated by financial considerations, the reorganization has had as its main objective to preserve the most essential function of CBMS as a Washington interface for the professional community in the mathematical sciences. The other major functions of CBMS—securing and carrying out grant-supported projects of joint concern to member societies—has been largely eliminated.

When CBMS Executive Director Truman Botts retires at the end of May, it is expected that the Washington Office of CBMS will be shifted to the Mathematical Association of America Headquarters and that CBMS headquarters activities will be carried out on a part-time basis by the MAA Associate Director, Marcia Peterson Sward.

The member societies of CBMS are: American Mathematical Association of Two-Year Colleges, American Mathematical Society, American Statistical Association, Association for Computing Machinery, Association for Symbolic Logic, Association for Women in Mathematics, Institute of Mathematical Statistics, Mathematical Association of America, National Council of Teachers of Mathematics, Operations Research Society of America, Society of Actuaries, Society for Industrial and Applied Mathematics, and The Institute of Management Sciences.

The new CBMS Council consists of presidents of these member societies together with four officers who are not necessarily otherwise members of the Council. These are a chairman, a past-chairman or chairman-elect, a secretary, and a treasurer, with the possibility open that the last two offices be combined.

Distinguished Service Award to Thornton Fry

At the 65th Annual Meeting in Cincinnati, Dr. Thornton Carl Fry was awarded the 1982 Award for Distinguished Service to Mathematics in recognition of his outstanding contributions as an industrial mathematician. The complete text of his citation, written by G. Baley Price, appeared in the February 1982 issue of the *American Mathematical Monthly*.

Dr. Fry joined the Bell System in 1916 at a time when there were few professional mathematicians in industry. He was a pioneer in defining the role of the mathematician in industrial research. In 1922 he established a small, separate mathematics section in the Engineering Research Department of Western Electric which eventually became the present-day Mathematics and Statistics Research Center of Bell Laboratories.

During both World Wars, Dr. Fry was deeply engaged in industrial research on war problems. In 1948 he received the Presidential Certificate of Merit for his National Defense Research Committee achievements.

Dr. Fry's work at Bell Laboratories contributed broadly to the development of Information Age technologies such as computing and software controlled switching systems for telecommunication and information management. He was Assistant to the President of Bell Labs when he retired in 1956 after completing more than 40 years of Bell System service.

In addition to his involvement in industrial research, T. C. Fry has, at various times, taught courses at Bell Laboratories, Massachusetts Institute of Technology, and Princeton University. He has been a member of the MAA since 1921, frequently giving talks at national and sectional meetings. He served as an MAA trustee in 1931, as MAA Vice-President in 1936, and as an associate editor of the *Monthly* for at least six years beginning in 1935.

1982-83 Visiting Lecturers and Consultants Program Announced

The MAA is pleased to announce the 1982-83 Program of Visiting Lecturers and Consultants. This will be the 29th consecutive year the MAA has sponsored this program through which it offers the services of over 100 visiting mathematicians to two- and four-year colleges and universities in the United States and Canada. Complete information on the program is contained in the 1981-82 program brochure. This brochure may be obtained by writing to: Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036. The 1981-82 brochure may be used until a new brochure is issued, probably in September 1982.

Although colleges and universities are expected to pay the full cost of a visit if possible, a limited number of subsidies are available through the Walter B. Ford Fund. Applications for subsidized visits during Fall 1982 should be submitted by July 1, 1982. (Application forms for subsidized visits are included in the program brochure.) Applicants will be notified about the decision by August 15, 1982.

Workshop on Case Study Approach to Applied Mathematics Offered by Northeastern Section

The MAA Northeastern Section will offer a "Workshop for a Case Study Course in Applied Mathematics" at the University of Maine at Orono, June 14-18, 1982. The workshop will be conducted by Jeanne Agnew and Marvin Keener of Oklahoma State University. Special features will include: demonstration of a case-study teaching technique, interaction with industry representatives, experience in developing a classroom problem from a real world situation, discussion of ways in which problems from industry may be used in the classroom, examples of problems which have been obtained from and which use undergraduate mathematics. For further information, contact: Professor Grattan Murphy, Department of Mathematics, University of Maine at Orono, Orono, ME 04469, or Professor Don Small, Department of Mathematics, Colby College, Waterville, ME 04901.

Sloan Sponsors Two Planning Conferences

Retraining Mathematicians to Teach Computer Science

A conference funded by a grant to Clarkson College from the Alfred P. Sloan Foundation, scheduled for April 22-25, 1982 at Airlie House in Virginia, was called to discuss various approaches to retraining mathematicians to teach computer science courses and mathematics courses in which the computer plays a central role. The goal of the conference is to develop a fairly complete picture of one or more projects that could achieve the desired level of retraining and to generate ideas for implementation, including possible sources of funding. Assuming financial support can be obtained, it is hoped that the first project(s) can start in 1983.

The conference has been organized by a planning committee consisting of Ed Dubinsky of Clarkson College, Sam W. Goldberg of Oberlin College, Donald L. Kreider of Dartmouth College, and Gail S. Young of the University of Wyoming.

For more information contact: Professor Ed Dubinsky, Department of Mathematics, Clarkson College, Potsdam, NY 13676.

Calculus Versus Discrete Mathematics

Another conference sponsored by the Sloan Foundation, this one to be held June 28-July 1, has been organized to re-examine the role of calculus in the first two years of college mathematics. Approximately twenty mathematicians, computer scientists, engineers, and others have been invited to this conference and will present papers on the feasibility, content, format, and implementation of a new mathematics curriculum which emphasizes discrete mathematics.

This invitation-only conference has been organized by Anthony Ralston of State University of New York at Buffalo and Gail S. Young of the University of Wyoming. Ralston and Young propose that discrete mathematics be considered an alternative to, or at least co-equal to, calculus in the first two years of college mathematics. This proposal arises out of

their perception of the relationships between mathematics and computer science and the need of computer science students for non-traditional, lower division discrete mathematics courses. (See Ralston's article "Computer Science, Mathematics, and the Undergraduate Curricula in Both" in the August-September 1981 issue of the *American Mathematical Monthly*.)

focus on . . .
New Publications

▶ The MAA has just published three new books: Dolciani Mathematical Expositions #6, *Maxima and Minima Without Calculus*, by Ivan Niven; Dolciani Mathematical Expositions #7, *Great Moments in Mathematics After 1650*, by Howard Eves; *Two-Year College Mathematics Readings*, edited by Warren Page. See the advertisements in this issue for more information.

▶ A new booklet on career opportunities in mathematics, *Careers in Mathematics*, is now available from the Society for Industrial and Applied Mathematics (SIAM). This booklet is designed for high school students and collegiate underclassmen. It is a companion to the SIAM booklet, *Profiles in Applied Mathematics*, which describes the role of applied mathematics within specific industrial concerns, government agencies, and national laboratories. Single free copies of each booklet may be obtained from: SIAM, 1405 Architects Building, 117 South 17th Street, Philadelphia, PA 19103. Quotations for bulk orders are available upon request.

▶ Cooperation between science teachers and mathematics teachers is the subject of a series of booklets published by the Committee on the Teaching of Science of the International Council of Scientific Unions: *Functions and Physics; Links Between Geography and Mathematics; Our Inheritance: Common Ground for the Mathematics and Biology Teacher; Mathematics and Chemistry; Mathematical Modelling; Mathematical Modelling with Calculus*. These are the first publications in an international effort to publicize the uses of mathematics. The cost is £5.00 or US $12 for the set by surface mail. Write to: Publications Officer, The Association for Science Education, College Lane, Hatfield, Hertfordshire, U.K.

▶ *Collegiate Microcomputer* is a new quarterly journal devoted to all aspects of microcomputers in the undergraduate curricula. Papers and subscription orders are now being accepted. The first issue will appear in February 1983. Write to: *Collegiate Microcomputer*, Rose-Hulman Institute of Technology, Terre Haute, IN 47803.

▶ A new *Directory of Women in the Mathematical Sciences* has recently been published by the AMS-MAA-NCTM-SIAM Committee on Women in Mathematics which contains biographical and bibliographical information on nearly one thousand female mathematicians, essentially all of whom are at the doctoral level. Copies are $3 each (prepaid). Write to: Professor Alice T. Schafer Women's Research Center, Wellesley College, Wellesley, MA 02181.

▶ The first issue of the new quarterly journal of the Association for Computers in Mathematics and Science Teaching (ACMST)—*Journal of Computers in Mathematics and Science Teaching*—was published last fall. ACMST membership dues ($7 a year) include a subscription to the journal. Write to: JCMST, P.O. Box 4455, Austin, TX 78765.

Calendar

National MAA Meetings

62nd Summer Meeting, Toronto, Canada, August 23-26, 1982
66th Annual Meeting, Denver, Colorado, January 7-9, 1983

63rd Summer Meeting, SUNY at Albany, New York, August 8-10, 1983
67th Annual Meeting, Louisville, Kentucky, January 27-29, 1984

Sectional MAA Meetings

North Central University of Minnesota, Duluth, Minnesota, October 29-30, 1982.
Northeastern University of Maine, Gorham, Maine, June 18-19, 1982.

Pacific Northwest Western Washington University, Bellingham, Washington, June 18-19, 1982.
Southern California Pepperdine University, Malibu, California, November 13, 1982.

Other Meetings

JUNE 1982

7-11. NSF-CBMS Conference on Large Deviations, Southern Illinois University, Carbondale. Lecturer: Srinivasa R.A. Varadhan. Contact: Philip Feinsilver, Department of Mathematics, East Carolina University, Greenville, NC 27834.

8-11. MAA Ohio Section Short Course—Teaching Computer Science in a Mathematics Department, Denison University, Granville, Ohio. (*FOCUS* March-April 1982)

14-18. MAA Maryland-DC-Virginia Section Summer Workshop—Algebraic and Symbolic Computing, Salisbury State College, Salisbury, Maryland. (*FOCUS* March-April 1982)

14-18. MAA Northeastern Section Workshop—A Case Study Course in Applied Mathematics, University of Maine at Orono. (See **Workshop** on page 6 of this issue.)

14-18. NSF-CBMS Conference on Mathematical Theory of Laminar Combustion, Colorado State University. Lecturer: Goeffrey Lunford. Contact: James W. Thomas, Department of Mathematics, Colorado State University, Fort Collins, CO 80523.

21-25. MAA Maryland-DC-Virginia Section Summer Workshop—Teaching Problem-Solving, Salisbury State College, Salisbury, Maryland. (*FOCUS* March-April 1982)

22-26. NSF-CBMS Conference on Nonlinear Waves and Integrable Systems, East Carolina University. Lecturer: Alan C. Newell. Contact: Lokenath Debnath, Department of Mathematics, East Carolina University, Greenville, NC 27834.

23-26. MAA Wisconsin Section Workshop—What Every Mathematician Should Know About Computer Science, and Vice Versa, Ripon College, Ripon, Wisconsin. (*FOCUS* March-April 1982)

28-30. 1982 National Educational Computing Conference, Kansas City, Missouri. Contact: E. Michael Staman, Campus Computing Services, University of Missouri-Columbia, 305 Jesse Hall, Columbia, MO 65211.

28-July 3. Second World Conference on Mathematics at the Service of Man, Las Palmas (Canary Islands), Spain. (*FOCUS* September-October 1981)

JULY 1982

12-16. NSF-CBMS Conference on Competition Models in Ecology, Utah State University, Logan, Utah. Lecturer: Paul E. Waltman. Contact: Robert McKelvey, c/o Rocky Mountain Mathematics Consortium, Arizona State University, Tempe, AZ 85281.

19-23. Society for Industrial and Applied Mathematics 30th Anniversary Meeting, Stanford University, Stanford, California. Contact: H. B. Hair, 117 S. 17th Street, Suite 1405, Philadelphia, PA 19103.

19-24. NSF-CBMS Conference on Second Order Asymptotics in Statistics, University of Oregon. Lecturer: Willem R. van Zwet. Contact: Fred C. Andrews, Department of Mathematics, University of Oregon, Eugene, OR 97403.

AUGUST 1982

2-6. NSF-CBMS Conference on Closed Geodesics on Riemannian Manifolds, University of Florida. Lecturer: Wilhelm Klingenberg. Contact: Su-shing Chen, Department of Mathematics, University of Florida, Gainsville, FL 32611.

9-13. International Conference on Teaching Statistics, Sheffield, England. (*FOCUS*, September-October 1981)

16-19. Institute of Mathematical Statistics Annual Meeting, Cincinnati, Ohio. Contact: American Statistical Association, 806 15th Street, N.W., Washington, D.C. 20005.

23-27. American Mathematical Society Summer Meeting, Toronto, Ontario, Canada. Contact: AMS, P.O. Box 6248, Providence, R.I. 02940.

25. Association for Women in Mathematics Meeting, Toronto, Ontario, Canada. Contact: AWM, Women's Research Center, Wellesley College, 828 Washington Street, Wellesley, MA 02181.

OCTOBER 1982

1-2. Tenth Annual Mathematics and Statistics Conference—Mathematics and Computing, Miami University. Speakers: Harold Abelson, William Buttelmann, James T. Fey, Stephen C. Kleene, Bruce Weide. Contributed papers are welcome. Send abstracts by June 1 to: Don Koehler or Fred Schuurmann, Department of Mathematics and Statistics, Miami University, Oxford, OH 45056. Information concerning preregistration, housing, etc. will be available from this address after July 15.

1-2. Annual Student Conference of the Ohio Delta Chapter of Pi Mu Epsilon, Miami University. Contributed papers from undergraduate and graduate students are welcome. Send abstracts to: Milton Cox, Department of Mathematics and Statistics, Miami University, Oxford, OH 45056.

IN THIS ISSUE: Summer Meeting Program and Housing and Preregistration Forms