

FOCUS

New Sculpture Unveiled at MAA Headquarters

The collection of mathematical sculptures at the MAA's Washington DC headquarters grew to three on Friday, 17 May 1991, with the unveiling of *Time Shell* by Craig Schaffer.

The new sculpture now sits prominently in a niche in the wall bordering the elegant, spiral staircase of the Vaughn Building, nestled between the photographs of all the past MAA presidents. The unveiling ceremony followed a luncheon reception hosted by the MAA and attended by about forty-five people, including the MAA's Executive and Finance Committees, who were in Washington DC for their annual meeting that weekend.

Coincidentally, the Executive Committee and Board of Trustees of the American Mathematical Society (AMS) were also meeting in Washington DC at the time, so they too were invited to attend, and following MAA President Deborah Tepper Haimo's welcome speech, AMS president Michael Artin stepped forward to say a few words.

It turned out to be the first time that the AMS had made an "official" visit to the Dolciani Mathematical Center, which made the occasion the more special, since it was the AMS who had given the MAA the second of its three mathematical sculptures, Robert Szcza's *Three Pentagons*, presented to the Association on 8 August 1990 to commemorate its Seventy-Fifth Anniversary. (*Sculpture Unveiling continues on page four.*)

MAA Establishes Awards for Outstanding Teaching

The MAA has established a system of annual awards for college or university mathematics teaching. There will be awards at both the Sectional and national level, with recipients of Section Awards being considered for the national award. National award winners will be honored at the MAA annual meeting in January each year, where they will receive a certificate and a check for \$1,000. The national awards will be known as the *Awards for Distinguished College or University Teaching of Mathematics (ADCUTM)*, and will be administered by a standing committee of the Association chaired by Henry L. Alder of the University of California at Davis.

The suggestion for the new awards came from the ad hoc Committee on Awards, chaired by the then-incoming MAA President Deborah Tepper Haimo, which noted the absence of any official MAA recognition of meritorious teaching. At its 1991 Annual Meeting in San Francisco, California, the MAA Board of Governors formally recommended that the new awards be implemented immediately.

In the first stage of the award process, each of the twenty-nine Sections will select a recipient of the Section Award, to be honored by the Section. In early September 1991, the Section secretaries will be sent the necessary information and materials for each Section to name one of its members as the first (1992) recipient of this *Section Teaching Awards* continues on page five.)

Photograph courtesy of Mary Jackson



From left to right: Emily Begle, daughter of Edward G. Begle; Thomas W. Tucker, MAA First Vice-President; Deborah Tepper Haimo, MAA President; and Craig Schaffer, sculptor of *Time Shell*.

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FOCUS EDITORIAL

How important is mathematics? Readers of FOCUS will have no hesitation in answering. And recent pronouncements from the White House indicate that we have friends in high places. But by no means does everyone share our sense of the crucial and fundamental place mathematics occupies in modern society. This was indicated in dramatic fashion by an article by the syndicated *Washington Post* columnist Colman McCarthy on the weekend of 19--20 April 1991, coincidentally (?) the start of this year's Mathematics Awareness Week (MAW).

Prompted by the efforts of the Dayton, Ohio public school superintendent, Franklin L. Smith, to make basic algebra a requirement of all ninth graders in the Dayton public school system, McCarthy's piece makes for mind-popping reading, and FOCUS readers with a blood-pressure problem should think twice before reading any more of this article, let alone looking up the original *Washington Post* column.

"Algebra isn't essential to much of anything," claims McCarthy. "Once adding, subtracting, multiplying, and dividing are mastered---by eighth grade usually---why insist on more? Algebra has little to do with mathematics. It's a language, a way of symbolic communication that a few people find fascinating and practical, while most don't."



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Editor: Keith J. Devlin, Colby College

Associate Editors: Donald J. Albers, Menlo College

Barbara Tramer Faires, Westminster College

Advertising Manager: Siobhán B. Chamberlin

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

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Then, after taking a blast at the National Council of Teachers of Mathematics (NCTM), he continues: "I happen to think algebra is a useless torture. I have never seen a help wanted ad for an algebraist, and in 25 years of interviewing I have not met anyone who even mentioned algebra, let alone said it was beneficial."

Granted the secret to success as a columnist is to be highly provocative, it is also the case that columnists succeed in the same way as political cartoonists, by grossly exaggerating what is already there. And the plain fact is that outside the mathematical community, there are a great many who would nod in agreement to McCarthy's words. What is more, as I saw in my native Britain during the Thatcher years, given the right circumstances, such people can find themselves in positions of considerable influence, often with devastating consequences. As a community, we mathematicians need to be aware of the widespread prevalence of ludicrously inaccurate and negative views of the kind espoused by McCarthy. And we should ask ourselves what we can do in response.

Sitting secure in our own knowledge of the pivotal role mathematics plays in modern society is certainly not enough. We either go on the offensive or suffer the consequences, both for ourselves and for society at large. And there is plenty of evidence that we are already suffering some of those consequences in the form of college entrants with poor mathematics preparation and a dramatic decrease in the number of college mathematics majors.

Indeed, we have already lost so much ground that we have to accept that, for the time being at least, we have to use mathematical terminology the way others do, not the way we, as the "experts," think it should be used. For instance, McCarthy clearly uses both "mathematics" and "algebra" in a way quite alien to mathematicians. By the former he obviously means arithmetic, and by "algebra" he means symbolic (arithmetic) manipulation. This usage is now widespread, and may even be one held by some (but certainly not all) of those in the White House who are currently pushing for more mathematics education.

At my own college, Colby, which recently passed a requirement that all students take at least one "mathematical" course, we had difficulty coming up with a suitable name: any mention of the word "mathematics" itself conjuring up quite the wrong picture to everyone outside the Mathematics Department. In the end, we settled for Quantitative Reasoning, which is a quite incorrect description of many of the courses to be covered by this term, but was the only name that did not conjure up thoughts (and fears) of yet another tedious course on algebra (high school variety) or calculus. And this was at an institution committed to the concept.

(Editorial continues on opposite page, bottom.)

Algebra ■ Is Not Just Math ■ It's the Language of Science

Whether by coincidence or by design, Colman McCarthy kicked off Mathematics Awareness Week with an April 20 column suggesting that it is algebra that should be kicked off—off the list of courses required in our nation's schools.

He reasoned that teaching algebra to everyone will not address such problems as crime and drugs or pollution; that algebra has little to do with mathematics, and that he has never seen a help-wanted ad for an algebraist.

The temptation to the mathematician, after getting over the initial sputtering and grinding of chalk dust in one's teeth, is to respond with the kind of overstatement in defense of algebra that McCarthy has employed in his attack. The damage he has done is too serious, however, and calls for a more reasoned response.

Do the majority of adults use algebra? Of course not.

I think we can go further, and say that there are working engineers and other people with technical jobs who do not use algebra on a day-to-day basis.

McCarthy's physician may well have forgotten algebra; but that physician without doubt needs the background provided by his or her chemistry course, and one can't learn chemistry without first taking algebra.

That is the point to remember. Mathematics is not just another science; it is the language through which all of science and much of management science is taught.

The student who closes the door on high school algebra (and so on all of mathematics) closes the door on much more: all of engineering and science, the world of computer programming, anything that requires an understanding of statistics, electronics, medicine and medical technology, most management and MBA programs, and more. Make no mistake. The young person who drops out of algebra has dropped out of a lot more than he or she realizes.

Must algebra be difficult? Not really. Is it sometimes poorly taught? Certainly. Do some students get by with memorization instead of understanding? Of course. These are not arguments for abandoning algebra, however, but for teaching it better, a goal toward which renewed efforts of the National Council of Teachers of Mathematics are directed.

McCarthy is certainly right to worry about drugs and crime. We are not experts on the subject, but social scientists have led us to believe that a root cause is the inability of people to get jobs and the resultant poverty and sense of being left out. He is also right to identify pollution as part of the national mess; we do need cleaner sources of energy, and better handling of the waste we generate.

To whom will we turn for help? We don't know. We can't go into our grade schools and identify the problem solvers of tomorrow. We can say with reasonable assurance, however, that they won't come from the ranks of those who decided not to study algebra.

In all of this, we have focused on jobs and said nothing about the need for informed citizens to understand statistics as they face a medical choice, to have a feel for rate of growth when listening to economic forecasts, or to understand the concept of future value when they choose among retirement options.

Neither have we spoken of our need for teachers at all levels to know at least enough about the use of algebra so as to help their students do what McCarthy says he cannot: distinguish between the importance in our society of algebra and Sanskrit. In the best of all worlds, we could even hope for columnists who would not write such nonsense as "Algebra has little to do with mathematics."

Think of your own child, or a neighbor child, or the disadvantaged child in whom you have taken an interest. Do what you can to help that child experience a little more of what it means to have equal opportunity. Tell that young person to keep options open; to take algebra, and to follow it with geometry, and all the mathematics he or she can master; and to ignore Colman McCarthy. ■

Wayne Roberts is Chair of the Department of Mathematics and Computer Science at Macalester College. This article first appeared in the Star Tribune, Minneapolis on 27 April 1991.

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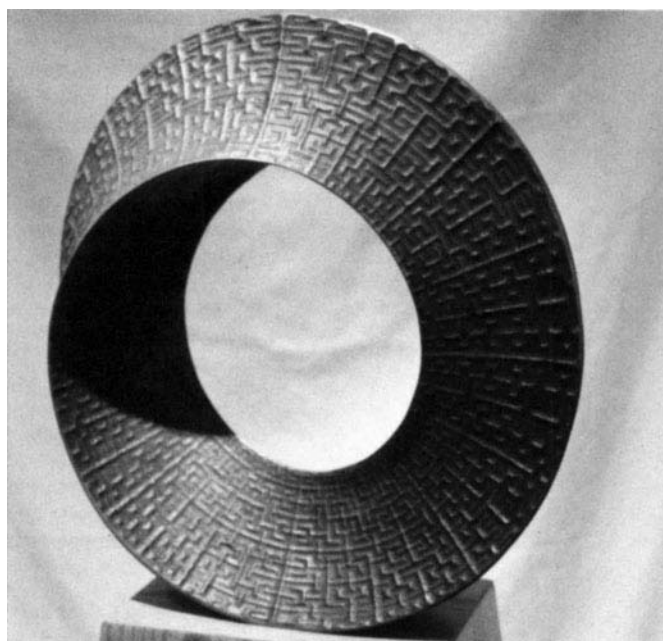
(Editorial continued from opposite page.)

So how do we start to change the hopelessly misguided common perception of our subject? Certainly not by overstating our case. Nor by trying to make sure that everyone knows how to solve a quadratic or differentiate a polynomial. The first, urgent priority is to raise the public awareness of what mathematics is, its nature, and the scope of its applications. An excellent example of how to go about this is provided by the response to the McCarthy column written by Wayne Roberts, the Chair of the Department of Mathematics and Computer Science at Macalester College in St. Paul, Minnesota, which appeared

in the *Star Tribune*, Minneapolis (though not, regrettably, in the *Washington Post*) a week after the original McCarthy piece. I think Roberts' letter deserves greater distribution than just one local newspaper. Of course, reproducing it in full, as I do in this month's FOCUS (see shaded box above), will not in itself further our cause; FOCUS simply preaches to the converted. But if FOCUS readers across the country took it upon themselves to use their local media to put across Roberts' message, then maybe we can start to make some progress.

Keith Devlin ■

Photograph courtesy of Carol Baxter

Craig Schaffer's *Time Shell*Helaman Ferguson's *Umbilic Torus NC*

Photograph courtesy of Carol Baxter

(*Sculpture Unveiling continued from front page.*)

The actual unveiling of *Time Shell* was performed by Emily Begle, daughter of Edward G. Begle, the Stanford professor and long-time director of the School Mathematics Study Group, who is the person perhaps most closely identified with the New Math revolution of the 1960s. Edward Begle died in 1978.

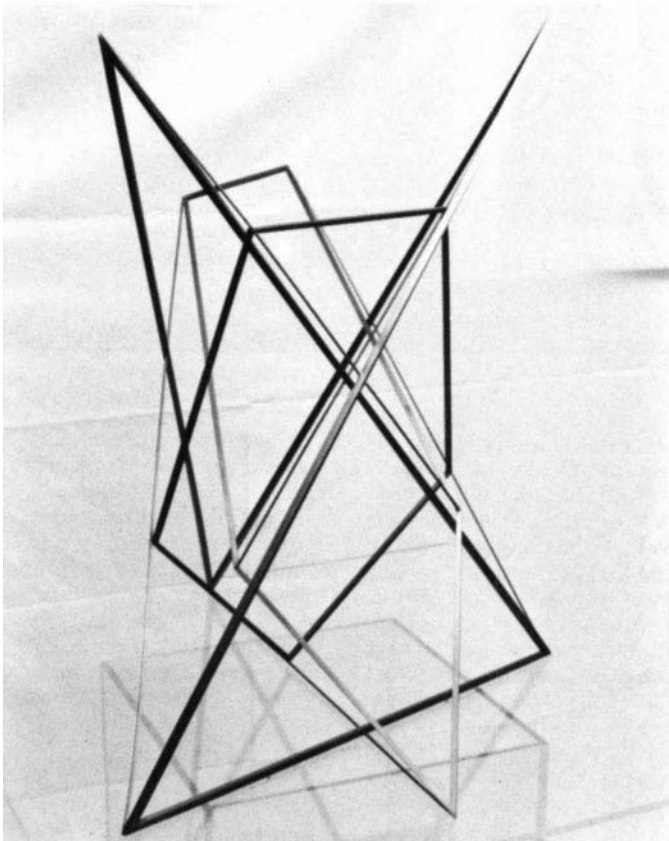
The sculpture was purchased for the MAA in Begle's honor by Alice C. Beckenbach, widow of Edwin F. Beckenbach, who for many years was chair of the MAA Committee on Publications and for whom the MAA awards the Beckenbach book prize.

All three mathematical sculptures now housed in the Vaughn Building seek to present an artistic representation of a mathematics theme, but each does so in a quite unique way that reflects the approach of the sculptor. The first piece, Helaman Ferguson's *Umbilic Torus NC*, acquired in 1990, was described in the January–February 1991 issue of FOCUS (Volume 11, Number 1).

Szczarba's *Three Pentagons* is based on a theorem of Jesse Douglas on skew pentagons (*Scripta Mathematica* 25 (1960): 5–9). Casual observers of the sculpture will see an elegant and pleasing geometric construction in three dimensions; those who delve a little into the mathematics behind the artistry will gain a lot more. The relevant mathematics is described in full in Chapter Nine of Isaac Schoenberg's *Mathematical Time Exposures*, published by the MAA in 1982, the cover of which in fact illustrates the same result. Schoenberg himself constructed a wooden model of just such a sculpture, a precursor of the beautiful Szczarba structure that now stands in the MAA's Begle Room on the Vaughn Building's second floor.

Considered from a mathematical standpoint, Schaffer's *Time Shell* is somewhat more abstract than either of the other two, in that it does not set out to depict any particular mathematical structure or result. As the Pataskala, Ohio based sculptor himself explains, "My sculptures are not meant to be solutions to an equation. I prefer to dance with nature on the edge of symmetry, in the midst of [this] ordered chaos." And yet *Time Shell*, like many of the artist's other pieces, strikes the viewer as very definitely "mathematical." For like mathematicians, Schaffer finds himself "inspired by shapes that owe their structure to the type and sequence of forces that created them." Observing nature with an artist's eye has led him to create a number of other "mathematical" sculptures, among them *Double Helix Candlestick*, *Spiral Ascent*, and *Infinite Hourglass*, the latter commissioned by the Institute for Advanced Studies at Princeton. ■

Photograph courtesy of Carol Baxter

Robert Szczarba's *Three Pentagons*

(Teaching Awards continued from front page.)

tion Award. Section secretaries will be asked to solicit nominations from within the Section, and to publicize the nomination process in any additional ways they think appropriate, such as in the Section newsletter or the local news media.

Anyone is entitled to make a nomination, but nominations from chairs in departments of mathematical sciences are to be especially solicited. Self-nomination is not permitted. Each Section will appoint its own Selection Committee to choose one of the nominees for the Section Award. At the spring 1992 meeting of the Section, the awardee will receive special recognition, which will be widely publicized and acknowledged within the Section. The awardee will then be the official Section candidate for the national award.

The ADCUTM Committee will choose the national award winners from the pool of Section awardees except that one winner may be selected from another source. There will be at most seven national awardees in the first year, and at most three in subsequent years.

The eligibility rules and guidelines for the new award are as follows.

ELIGIBILITY

(1) College or university teachers assigned at least halftime during the academic year to teaching a mathematical science in a public or private college or university (from two-year college teaching through teaching at the PhD level) in the United States or Canada. Those on approved leave (sabbatical or other) during the academic year in which they are nominated qualify if they fulfilled the requirements in the previous year; (2) at least five years teaching experience in a mathematics science; (3) membership in the Mathematical Association of America.

GUIDELINES FOR NOMINATION

Nominees should (1) be widely recognized as extraordinarily successful in their teaching; (2) have teaching effectiveness that can be documented; (3) have had influence in their teaching beyond their own institutions; (4) foster curiosity and generate excitement about mathematics in their students.

Nominations must be submitted on the "Nominations Form," prepared by the national Committee and to be distributed by the Section Secretary. It is important to follow the instructions on that form precisely to assure uniformity in the selection process both at the Section and national levels.

Nominations must be submitted to the Section secretaries by the deadline specified by them, generally expected to be about 1 January 1992. The Section Selection Committee will select the Section awardee during January and communicate its selection to the national committee no later than 1 February 1992, so that the national committee can then make its selections.

We look forward to widespread participation in this exciting MAA venture of taking substantive action to honor extraordinarily successful teaching. The MAA wants to see such teaching recognized at all postsecondary school levels. ■

* teaching is to be interpreted in its broadest sense, not necessarily limited to classroom teaching (it may include activities such as preparing students for mathematical competitions at the college level, for example, the Putnam Prize Competition or the Mathematical Contest in Modeling, or attracting students to become majors in a mathematical science or PhD candidates).

** "influence beyond their own institution" can take many forms, including demonstrated lasting impact on alumni, influence on the profession through curricular revisions in college mathematics teaching with national impact, influential, innovative books on the teaching of college mathematics, etc.

Ivars Peterson Receives Communications Award

This year's Joint Policy Board For Mathematics (JPBM) Communications Award has gone to the science journalist and best-selling mathematics writer Ivars Peterson, author of *The Mathematical Tourist: Snapshots of Modern Mathematics*, and the more recent *Islands of Truth: A Mathematical Mystery Cruise*. Peterson, who is the Mathematics and Physics Editor at *Science News*, received the award on 10 July 1991 at the Sheraton Washington Hotel in Washington, DC, at a ceremony held in conjunction with ICIAM '91, the Second International Conference on Industrial and Applied Mathematics. The award consists of a citation, a \$1,000 prize, and, of course, recognition by the mathematics community.

Peterson has been writing articles on mathematics for *Science News* since 1981. His book, *The Mathematical Tourist*, published in 1988 by W. H. Freeman and Company, has sold over 70,000 copies and will soon be available in several foreign languages. It has been a Library of Science and Book of the Month Club selection. *Islands of Truth*, published in 1990, seems destined to follow in the same footsteps.

"Few science writers command the respect of the scientific community in this country as Ivars Peterson does," says Jeremiah Lyons, mathematics publisher from W. H. Freeman. "Ivars has identified stories and topics of potential interest to lay readers which other publications have then picked up—he is there first."

Peterson earned bachelor's degrees in physics and chemistry as well as in education from the University of Toronto. He taught high school mathematics and science for eight years before turning to science journalism.

Popularizing mathematics is not without its dangers, as Peterson pointed out in his remarks at the award ceremony, recalling an occasion when he persuaded the editor of *Science News* to run a front cover illustration featuring the number 561, along with the caption "Prime or Not Prime?" That was on 6 March 1982 and was intended to accompany a feature on primality testing. To Peterson, 561 was a good example, since it is a pseudoprime, that is, a composite number that passes the Fermat primality test. But to many *Science News* readers, it was not at all appropriate. Since the sum of the digits of 561 is divisible by 3, the number is definitely not prime, as many a high school student will observe at a glance.

Fortunately, Peterson was not deterred by this early mishap, and went on to write a number of articles that have even helped spread the news of new mathematical discoveries to other scientists who went on to make use of what they have read in *Science News*.

The award to Peterson marks the third time the JPBM has granted its Communications Award. The JPBM, D. C. Heath, and Pergamon Press sponsor the award. Previous awardees were James Gleick, author of *Chaos*, and Hugh Whitmore, for *Breaking the Code*. ■

Photograph courtesy of the Joint Policy Board for Mathematics



From left to right: Michael Artin, AMS President; Ivars Peterson, JPBM Communications Award recipient and writer at *Science News*; Deborah Tepper Haimo, MAA President; and Robert E. O'Malley, Jr., SIAM President.

Contributed Papers in Baltimore

From Wednesday, 8 January through Saturday, 11 January 1992, the Mathematical Association of America will hold its Joint Annual Meetings, with the American Mathematical Society (AMS), in Baltimore, Maryland. The complete meetings program announcement will appear in the October 1991 issues of both FOCUS and the *Notices of the American Mathematical Society*. The Association publishes this preliminary announcement to encourage participation and to provide lead-time for organizing the MAA contributed paper sessions. Please note that the days scheduled for these sessions are tentative. The organizers mentioned below solicit contributed papers pertinent to their sessions' interests and concerns; you may submit your proposal to the appropriate organizer(s) at the address(es) provided. For additional information on these contributed paper sessions, please consult pages two and three of the June–July 1991 issue of FOCUS.

■ **ACTUARIAL MATHEMATICS EDUCATION AND RESEARCH**
Saturday, 11 January 1992

James W. Daniel
Department of Mathematics
RLM 8-100
University of Texas at Austin
Austin, Texas 78712

■ **ENVIRONMENTAL MATHEMATICS**
Thursday morning, 9 January 1992
and Saturday, 11 January 1992

Ben A. Fusaro
Department of Mathematical Sciences
Salisbury State University
Salisbury, Maryland 21801

■ **INNOVATIONS IN MATHEMATICS COURSES FOR BUSINESS**
Wednesday morning, 8 January 1992
and Thursday afternoon, 9 January 1992

Wade Ellis, Jr.
Department of Mathematics
West Valley College
14000 Fruitvale Avenue
Saratoga, California 95070

Barbara A. Jur
Department of Mathematics
Macomb Community College
Warren, Michigan 48093

■ **MATHEMATICS FOR THE HEALTH SCIENCES**
Friday, 10 January 1992

Henry Clay Foehl
Philadelphia College of Pharmacy and Science
Woodland Avenue at Forty-Third Street
Philadelphia, Pennsylvania 19104

■ **MATHEMATICS PLACEMENT TESTING PROGRAMS:
THEIR ORGANIZATION, ADMINISTRATION, AND PROBLEMS**
Wednesday, 8 January 1992

Rose C. Hamm
Honors Program
College of Charleston
Charleston, South Carolina 29424

John G. Harvey
Department of Mathematics
480 Lincoln Drive
University of Wisconsin at Madison
Madison, Wisconsin 53706

■ **RESEARCH IN UNDERGRADUATE EDUCATION**
Thursday morning, 9 January 1992
and Friday morning, 10 January 1992

Ed Dubinsky
Department of Mathematics
Purdue University
West Lafayette, Indiana 47907

■ **THE "SEVEN INTO FOUR" PROBLEM**
Wednesday afternoon, 8 January 1992
and Friday afternoon, 10 January 1992

David H. Carlson
Department of Mathematical Sciences
San Diego State University
San Diego, California 92182

Ann E. Watkins
Department of Mathematics
California State University at Northridge
Northridge, California 91330

■ **A TOOLBOX FOR LIBERAL ARTS MATHEMATICS COURSES**
Thursday afternoon, 9 January 1992
and Friday morning, 10 January 1992

John Wesley Emert and Kay Meeks
Department of Mathematical Sciences
Ball State University
Muncie, Indiana 47305

■ **USING SPREADSHEETS TO TEACH MATHEMATICS**
Wednesday morning, 8 January 1992
and Thursday afternoon, 9 January 1992

Robert S. Smith
Department of Mathematics and Statistics
Miami University
Oxford, Ohio 45056

Science Scholars Sought

The Mary Ingraham Bunting Institute of Radcliffe College will award eight *Science Scholars Fellowships* for 1992–1993. These fellowships, funded by the Office of Naval Research, include a minimum of \$29,000 stipend plus research allowance for a one-year appointment, 1 September 1992–31 August 1993. Women scientists who are US Citizens or permanent residents of the US and have held the PhD for two years prior to appointment are eligible for this program. The Institute will accept applications in several scientific fields including computer science and mathematics. It will judge applications on three criteria: quality and significance of proposed project; the difference the fellowship might make in advancing the applicant's career; and balance among scientific disciplines. Science Scholars must reside in the Cambridge-Boston area during the entire term of appointment. The Institute does not provide housing. If your proposed research project requires a laboratory affiliation, you must establish such an affiliation with a laboratory in the greater Boston area. For application materials, contact: Fellowships Office, The Mary Ingraham Bunting Institute of Radcliffe College, 34 Concord Avenue, Cambridge, Massachusetts 02138; (617) 495-8212. FAX: (617) 495-8136. Application deadline: **15 October 1991 (postmarked)**.

Mathematics Sails into Baltimore!

An exciting program, with an environmental thread, awaits participants at the 1992 Joint AMS-MAA Annual Meetings in Baltimore, Maryland, scheduled from Wednesday through Saturday, 8–11 January 1992. Details of the program, including preregistration, housing, and minicourse information, will appear in the October 1991 issue of FOCUS.

The MAA program features five invited speakers: David H. Carlson of San Diego State University; Ingrid Daubechies of Rutgers University and AT&T Bell Laboratories; James W. Demmel of the University of California at Berkeley; Jeffrey Shallit of the University of Waterloo; and Harold Stevenson of the Department of Psychology at the University of Michigan. In addition, Lida K. Barrett of the National Science Foundation (NSF) and forty-third President of the MAA, will deliver her *Retiring Presidential Address*.

Four Joint AMS-MAA Invited Speakers will also deliver addresses during the meetings: Joan Birman of Rutgers University; Simon A. Levin, Charles A. Alexander Professor of Biological Sciences at Cornell University; Isadore M. Singer of the Massachusetts Institute of Technology; and J. Ernest Wilkins of Clark Atlanta University.

The environmental thread will feature a major invited address, an environmental breakfast, a contributed paper session on *Environmental Mathematics*, a panel discussion on *Getting Started*, and an AMS special session. In addition, Robert McKelvey of the Environmental Research Lab-EPA in Corvallis, Oregon will lead a minicourse on *Environmental Modeling*, and the ad hoc Committee on the Environment and the Committee on Student Chapters will cosponsor a student workshop.

On the meeting's first day, John Von Neumann's brother, Nicholas A. Vonneumann, will deliver a special presentation on *The Philosophical Legacy of John Von Neumann*. Nicholas Vonneumann, perhaps the only living witness to Von Neumann's early years, will report on the evolution of his brother's formative years and will discuss John's attitude concerning manifestations of nature, pragmatism, positivism, pure versus applied science, responsibility of scientists, geopolitics, etc. The book display and sales area will include a fascinating exhibit of memorabilia and photographs from the Von Neumann family.

Naomi D. Fisher of the University of Illinois at Chicago and the Mathematics and Education Reform Network (MER), Harvey B. Keynes of the University of Minnesota, and Philip Wagreich of the University of Illinois at Chicago have organized a Joint AMS-MAA Special Session on *Mathematics and Education Reform*. If you wish to participate in this Joint AMS-MAA Special Session, you should submit an abstract by 11 September 1991 to: Josephine Faria, The American Mathematical Society, PO Box 6248, Providence, Rhode Island 02940.

The meeting will also include familiar MAA program elements: sixteen minicourses, nine sessions of contributed papers, and various panel discussions. The program has also incorporated several elements designed to appeal particularly to students, including the first *Career Fair* ever mounted for a national meeting. Approximately thirty companies and agencies that employ mathematically trained people will discuss the work mathematicians do for these companies and the kind of mathematical expertise they seek.

In addition, the AMS has also assembled an enticing program. Michael E. Fisher of the Institute for Physical Sciences and Technology at the University of Maryland will deliver the Gibbs Lecture and Robert P. Langlands of the Institute for Advanced Study at Princeton University will deliver the Colloquium Lectures. AMS Invited Speakers include Yakov M. Eliashberg of Stanford University; Marina Ratner of the University of California at Berkeley; Walter Rudin of the University of Wisconsin at Madison; and Michael Shearer of North Carolina State University. ■

Mathematical Poetry in Baltimore

A lyrical interlude promises to entertain and delight participants during the 1992 Annual Meetings in Baltimore, Maryland when, on Friday, 10 January 1992, 7:00–10:00 pm, the Humanistic Mathematics Network hosts a poetry reading session. Session organizers JoAnne S. Growney of Bloomsburg University, Daniel Kalman of Aerospace Corporation, and Elena A. Marchisotto of California State University at Northridge especially seek original poetry on mathematics and invite mathematicians to read or recite their work. If time permits, the session will also include work of other poets. The organizers will reproduce the selected poetry in a booklet for distribution during the session. Potential participants should forward three copies of each poem by 31 October 1991 to: JoAnne S. Growney, Department of Mathematics, Bloomsburg University, Bloomsburg, Pennsylvania 17815. You should include each poem's reading or recital time and, if you submit more than one poem, you should rank them in order of preference.

In addition, on Saturday, 11 January 1992, 1:00–2:00 pm, the Humanistic Mathematics Network invites participants to another special reading, entitled *The Calculus Virgin*. Mathematician Louis Leithold and artist-poet d'Arcy Hayman will read poetry and display drawings which communicate Hayman's passionate and thrilling response to Leithold's seminar on calculus for teachers of advanced placement calculus.

Summer Meetings in 1992

Kenneth A. Ross, MAA Secretary
Robert M. Fossum, AMS Secretary

The year 1992 is a very special one for summer meetings. ICME-7, the International Congress for Mathematics Education, is meeting in Québec City, 17–23 August 1992, at the Université Laval. As in 1986, when the joint AMS-MAA summer meeting was cancelled in deference to the ICM '86 in Berkeley, there will be no joint AMS-MAA summer meeting in 1992. Again as in 1986, we hope that many mathematicians will attend the international congress instead.

Since many MAA leaders will be attending ICME-7 in Québec, the MAA Board of Governors will meet just prior to that meeting on Saturday, 15 August, at the Hôtel des Gouverneurs in Québec City. In addition, several MAA committees will be meeting there during the period 13–16 August. For additional information on this international event, see pages ten and eleven of this issue of FOCUS. More information about ICME-7 will appear in subsequent issues of FOCUS and the *Notices of the American Mathematical Society*.

There will be a joint meeting of the American Mathematical Society and the London Mathematical Society in Cambridge, England, 29 June–1 July 1992. This meeting will be similar to usual AMS sectional meetings in that there will be five invited addresses and several special sessions. Professors John M. Ball, Lawrence Craig Evans, Benedict H. Gross, Nigel J. Hitchin, and Edward Witten have accepted invitations to deliver invited addresses. Several interesting special sessions are being organized and others are in the planning stage. An additional treat that meeting participants will enjoy will be the official opening ceremony of the Isaac Newton Institute for Mathematical Sciences. Further details about this meeting will appear in *Notices*.

The Council of the AMS usually meets during the joint AMS-MAA summer meeting. A meeting of the Council will probably be necessary, but a time and place have not yet been determined. ■

e-MATH: An Electronic Service for Mathematicians

Kevin Curnow

e-MATH—a node on the Internet—has been in operation since October 1990. Partially funded with a three-year National Science Foundation (NSF) grant, e-MATH consists of a dedicated computer facility and associated software maintained and supported by American Mathematical Society Staff members. e-MATH's primary mission is to become an electronically-based clearinghouse for timely professional and research information in the mathematical sciences.

This is an ambitious goal and one that will only be attained by progressive stages of development and implementation. e-MATH's commitment to act as a clearinghouse for information relevant to mathematicians means not only inhouse development of key applications, but also the inclusion of applications developed by other individuals and organizations. Since it is possible to open and close a telnet connection from inside the e-MATH shell, e-MATH can support applications developed by any site that offers Internet connectivity. In addition, e-MATH actively seeks cooperative participation with other professional organizations in the development of new applications that serve the entire mathematics community.

e-MATH has been developed to be accessible to as many mathematicians as possible. Thus, usage is dependent only on having an Internet connection and VT100 terminal emulation. Under e-MATH's design, it will be possible to implement new components that take advantage of evolving hardware and software technology (such as X-Windows) with minimum discontinuity to the user view of the system.

Currently, the e-MATH system consists of a core group of applications (described below) that have attempted to address the objective of providing professional information. Attention is now being turned to the larger and more complex task of providing tools that will facilitate timely sharing of research information and results.

Mathematics Awareness Week 26 April–2 May 1992

Every April, Mathematics Awareness Week (MAW) salutes the richness and relevance of mathematics. During a week-long celebration from Sunday, 26 April–Saturday, 2 May 1992, the festivities will focus on mathematics and the environment. Mark your calendars now and plan to organize a Mathematics Awareness Week event.

The 1992 celebration also offers an opportunity to contribute to Mathematics Awareness Week. The Office of Governmental and Public Affairs (OGPA) of the Joint Policy Board for Mathematics (JPBM) seeks slogans, slides, and graphics that reflect next year's mathematics and the environment theme. The originator(s) of the selected material will receive credit on all printed material and complimentary posters and postcards.

Please submit your ideas and materials by **30 September 1991** to: Joint Policy Board for Mathematics, Office of Governmental and Public Affairs, 1529 Eighteenth Street Northwest, Washington, DC 20036-1385.

These tools include:

- electronic conferencing with moderated and unmoderated conferences on selected topics of research interest
- a database of abstracts that point to on-line preprint and software repositories
- a prototype electronic journal

CURRENT FEATURES e-MATH currently supports these features:

- an on-line database consisting of entries in the *Combined Membership List* featuring membership information from the American Mathematical Society (AMS), the MAA, and the Society for Industrial and Applied Mathematics (SIAM);
- a professional opportunities register that includes employment position listings from the AMS publications, *Employment in the Mathematical Sciences*, and the ability to post brief resumés which can be mailed electronically to employers listed in the register;
- a distribution archive for AMS-supported T_EX software;
- document delivery services for reference material collected by the AMS;
- the *Mathematical Reviews* subject classification scheme, selected classifications of which can be mailed electronically. The entire classification scheme can be viewed on-screen or downloaded via anonymous FTP; and
- a command-driven name look-up for *Combined Membership List* searches.

ACCESSING e-MATH The requirements for a successful connection to e-MATH are: 1) a connection to an Internet host; 2) VT100 connectivity in communications software and host operating system; 3) terminal tabs set at every eight columns.

To log on to e-MATH, type:

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telnet e-math.ams.com
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or

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telnet 130.44.1.100.
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Login and password are **e-MATH**.

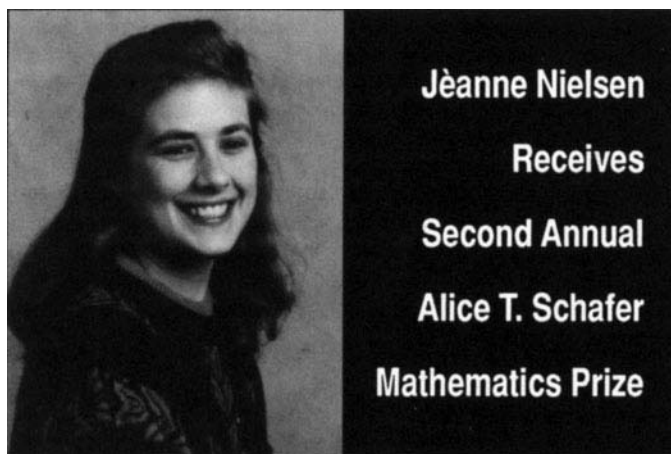
To access the e-MATH CML name look-up service, type:

```
telnet 130.44.1.100 2050 (UNIX hosts)
telnet 130.44.1.100/port=2050 (VMS hosts)
```

At the "Enter Name" prompt, enter the last name of the person you would like to look up in the CML database. First names may be given in the following manner: "Last:First", with no spaces around the ":". The search wildcard "*" may be used in the name string.

ADDITIONAL INFORMATION Help screens are available for each e-MATH application. For additional information, or for assistance accessing and using e-MATH services, send e-mail to: support@e-math.ams.com. ■

Kevin Curnow is a member of the e-MATH support group.



Photograph courtesy of the Association for Women in Mathematics

Jèanne Nielsen, a senior at Duke University, was awarded the second annual Alice T. Schafer Mathematics Prize, sponsored by the Association for Women in Mathematics (AWM). The Prize carries a stipend of \$1,000 and is given to an undergraduate woman in recognition of excellence in mathematics. The criteria for selection include, but are not limited to, the quality of the nominee's performance in mathematics courses and special programs, an exhibition of real interest in mathematics, the ability to do independent work, and performance in mathematical competitions, if any. The Prize is named for AWM former president and one of its founding members, Alice T. Schafer, who has done so much for women in mathematics throughout her career. This year's selection committee consisted of Bhama Srinivasan (chair) of the University of Illinois at Chicago, Alice T. Schafer of Marymount University, and Jill P. Mesirov of Thinking Machines Corporation.

Zvezdelina Stankova, a junior at Bryn Mawr College, was declared runner-up, and eight other exceptionally talented undergraduate women received Honorable Mentions. A sophomore and a first-year student were singled out for outstanding performances so early in their mathematical careers. The Association received ninety nominations, more than twice the number received for the first Prize awarded in 1990. The selection committee was gratified by the response and the high level of achievement of young women studying mathematics around the country. The committee also made note of the significant number of older women with families who had been nominated this year.

The prize is funded by an endowment with the initial contributions coming from the AWM, the American Mathematical Society (AMS), and the Mathematical Association of America (MAA), as well as from individual contributors. Additional contributions will help to ensure the long-term viability of the Prize. Checks made payable to "ATS Math Prize" may be sent to the Association for Women in Mathematics, Box 178, Wellesley College, Wellesley, Massachusetts 02181.

Jèanne Nielsen, the winner of the award, was described as a "highly original, enthusiastic, and talented young mathematician" and one of the best undergraduate mathematics majors her nominators had seen anywhere. Nielsen began to show promise as a research mathematician the summer after her sophomore year when she obtained results in finite group theory which have been submitted for publication. More recently, her interest in algebraic and differential geometry has yielded some impressive research results there. Professor Robert Bryant, in his letter nominating her for the prize, said, "Her mathematical maturity and insight are astonishing." Nielsen received an Honorable Mention in this year's Putnam examination, a national mathematical competition for undergraduates, finishing 30th out of 2,347 contestants.

Zvezdelina Stankova is on a full scholarship at Bryn Mawr College. She won a competition in Bulgaria to identify gifted students to study in the United States. As a high school student, she participated in the International Mathematical Olympiad on the Bulgarian team which won silver medals in 1987 and 1988. Stankova finished 101st in the 1991 Putnam Competition. Next year, her senior year at Bryn Mawr, she will be taking graduate courses at the University of Pennsylvania and hopes to graduate with both a bachelor's and a master's degree in mathematics. "One of the brightest young people I have ever known, Zvezde is truly a star, as her name suggests," said Professor Rhonda J. Hughes in her nomination letter.

The following women undergraduates received honorable mentions.

Sarah Marie Belcastro is a senior at Haverford College. She has written a senior thesis in algebraic combinatorics and a paper with Gary Sherman based on her participation in a Research Experience for Undergraduates program (REU) at Rose-Hulman Institute of Technology.

Debra Boutin is a senior at Smith College. In joint work with Michael Albertson of the Smith faculty, she wrote a research paper in graph theory. She is also thirty-something and a single parent.

Cheryl Grood is a junior at the University of Michigan who has successfully completed some very demanding courses in the department. She participated in an REU program at Rose-Hulman Institute of Technology in 1990 and this resulted in a paper in computational group theory.

Karen King is a senior at Spelman College and will begin graduate work at the University of Maryland in the fall. She has been engaged in research projects on coding theory at NASA and Spelman. She gave a talk at the Conference on Undergraduate Research at the California Institute of Technology (Caltech) and at a spring 1991 meeting of the Mathematical Association of America.

Speranta Marcu is a senior at Santa Clara University. Her results in a summer research project were presented at the Conference on Undergraduate Research at Caltech in March 1991.

Edith Mooers is a senior at the University of Washington who, to quote her nominating faculty member, "performed at a stellar level" in an advanced Lie theory course. She has participated in an REU program at the University of Washington, as a result of which she has written a research paper with the conference organizers.

Jessica Polito is a junior at Harvard University who has taken Harvard's accelerated program with great success and is at the level of some of the first year graduate students. She was one of the top 200 in the 1991 Putnam Competition.

Diana Thomas is a senior at the University of Montana. She is writing a senior thesis on fluid flows and turbulences. Her work resulting from an REU program at the University of Colorado at Boulder was presented at the Conference on Undergraduate Research at Caltech in March 1991.

In addition, two nominees were given special recognition by the Prize Committee for their outstanding achievements in mathematics so early in their careers. **Yick Chan** is a sophomore at Barnard College who won the annual mathematics prize competition at Barnard-Columbia. Her answer to one of the problems was described as "more enlightening than the answer designed by the creators of the exam." She is described by a Barnard faculty member as "the most talented undergraduate we have seen at Barnard in my seventeen years here." **Millie Niss** is a first year student at Columbia University. She wrote a research paper in combinatorics in her very first semester. She is described by a faculty member as the "strongest undergraduate student I have ever worked with, irrespective of year, sex, or any other arbitrary category." ■



Photograph courtesy of Bernard R. Hodgson

Jeremy Kilpatrick

The Seventh International Congress on Mathematical Education (ICME-7) will be held at the Université Laval, Québec, Canada, from 17–23 August 1992. This will be the first ICME in North America since the ICME-4 at Berkeley, California in 1980. Université Laval is close to the historic walled city of Québec, the first site in North America to be declared part of the world's heritage by UNESCO. The congress is being organized on behalf of the International Commission on Mathematics Instruction (ICMI) by the Canadian National Committee for ICME-7. ICMI is a commission of the International Mathematical Union; its congresses are every four years, alternating in even-numbered years with International Congresses of Mathematicians (ICM).

ICME-7 is expected to attract around 3,000 mathematics teachers, teacher educators, mathematicians, curriculum developers, and researchers in mathematics education. Because mathematics education touches many disciplines but is not a discipline itself, its international congresses are organized differently from those of mathematics. The seven-day congress will contain a mixture of lectures and discussion sessions, together with posters, videotaped national presentations, projects, exhibitions, and workshops. An excursion is scheduled for one of the days. The program will allow ample opportunities for choice and for interaction with colleagues. English and French are the official languages, with most sessions expected to be in English and some services in Spanish.

Topics that are likely to receive considerable attention at the congress include the use of new technology in mathematics teaching, the social and cultural contexts of mathematics education, assessment and its effects, and national efforts to promote curriculum change. Congress participants will have many opportunities to hear about developments in mathematics and in mathematics education around the world. Plenary addresses are to be given by A. Geoffrey Howson (United Kingdom), Colette Laborde (France), and Benoit B. Mandelbrot (France and the USA). The forty or so lecturers include A. D. Alexandrov (USSR) on geometry as an element of general culture; Desmond Broomes (West Indies) on mathematics education in the Caribbean; Yves Chevallard (France) on a social ethic for mathematics teaching; Michael Closs (Canada) on mathemati-

cians and mathematics education in ancient Mayan society; Ronald L. Graham (USA) on applied discrete mathematics; Miguel de Guzmán (Spain) on the evolution of the theory of differentiation of integrals; Bernard R. Hodgson (Canada) on nonstandard analysis and the teaching of calculus; Glenda Lappan (USA) on teacher education in mathematics; and Jack H. van Lint, Jr. (Netherlands) on the present state of discrete mathematics.

A special half-day miniconference on calculators and computers will be held the first afternoon of the congress. The miniconference will consist of plenary talks and demonstrations, simulated classrooms, and short presentations. Participants will work in one of five groups according to their interest in different levels of education.

Each participant will also select one of twenty-three working groups in which to work for four ninety-minute sessions, one each morning for four of the congress days. Working groups will study subjects ranging from the formation of elementary mathematics concepts at the primary level to students' difficulties in calculus, and from mathematics education with reduced resources to theories of learning mathematics. In the afternoons, there will be opportunities for participants to present short communications through posters, videotapes, or computer software. There will be exhibitions of mathematics in arts and crafts and of children's work, workshops on games and other activities, and a "math trail."

Also in the afternoon will be meetings of various topic groups and study groups. Each participant can choose one of sixteen topic groups (with topics such as mathematics competitions, the theory and practice of proof, teaching mathematics through project work, and the philosophy of mathematics education) and meet with the group for a ninety-minute session on each of two afternoons. Each of the three ICMI study groups (the International Group for the Psychology of Mathematics Education, the International Group on the Relations between History and Pedagogy of Mathematics, and the International Organization of Women and Mathematics Education) will organize four ninety-minute sessions. Three of the recent studies produced by ICMI (on the influence of computers and informatics, the popularization of mathematics, and assessment and its effects) will each be presented in two or four ninety-minute sessions. (ICME-7 continues on opposite page, bottom.)

Annual Ohio State Technology Conference Relocates to Portland

The Fourth Annual Conference on Technology in Collegiate Mathematics, previously hosted by The Ohio State University, has moved to Portland, Oregon. The conference will be held Friday–Sunday, 15–17 November 1991 at the Portland Hilton. The host institution is Portland State University and Jeanette R. Paimter of the Department of Mathematics is in charge of local arrangements. Bert K. Waits and Franklin D. Demana, both of The Ohio State University, remain the conference cochairs.

The conference will feature more than fifty invited presentations on topics such as the use of technology in collegiate and high school mathematics from high school algebra through linear algebra, differential equations, and abstract algebra; testing with technology; current research and future trends in the role of technology in mathematics learning; and the role of technology in calculus. In addition, there will be forty-four free two-hour "hands-on" graphing calculator workshops on the latest products from Texas Instruments, Hewlett-Packard, and Casio, and twenty two-hour "hands-on" computer mini-courses. A large exhibit area will be available for textbook publishers and hardware vendors.

CALL FOR PAPERS AND POSTERS Interested persons may submit a one-page abstract for the paper sessions or a proposal for the poster sessions along with two self-addressed, stamped envelopes to: Lewis Lum, Department of Mathematics and Computer Science, University of Portland, 5000 North Willamette Boulevard, Portland, Oregon 97203. Abstracts and proposals must be received by 1 October 1991. In the poster sessions, one easel will be provided; no hardware or any other equipment will be provided. Selected candidates will be notified by 15 October 1991.

The conference is sponsored by Addison-Wesley Publishing Company. For registration information, contact: Addison-Wesley Publishing Company, Conventions Department, One Jacob Way, Reading, Massachusetts 01867-9984. ■

(ICME-7 continued from previous page.)

The congress will provide an unparalleled occasion for anyone interested in the teaching and learning of mathematics to find out what is happening elsewhere in the world, to meet old and new friends, and to exchange views on theory, research, and practice. The *Second Announcement* is available now. It contains not only more information about the program, but also forms for registration, accommodation, and short presentations. It can be obtained by contacting: Congrès ICME-7 Congress, Université Laval, Québec, QC, Canada G1K 7P4; (418) 656-7592; icme-7@vm1.ulaval.ca. FAX: (418) 656-8000. Telex: (021) 051-31621 UNILAVAL QBC. Registration fees are less if paid before 15 June 1992 and are even lower if paid by 15 December 1991. Applications for accommodation must be made by 1 July 1992, and applications to make a short presentation or to present a project must be made by 31 January 1992. Full program details will be contained in the *Third Announcement*, which will be available in April 1992 and will be sent to those who register by 15 June 1992. The MAA will not hold a summer meeting in 1992, so MAA members are cordially invited to join us in Québec next August. ■

Jeremy Kilpatrick, Professor of Mathematics Education at the University of Georgia, is Vice President of the International Commission on Mathematical Instruction (ICMI) and a member of the International Program Committee for ICME-7.

1991 Mathematical Sciences Department Chairs Colloquium

The Board on Mathematical Sciences (BOMS) of the National Research Council (NRC) will hold its 1991 Mathematical Sciences Department Chairs Colloquium on 18 and 19 October 1991 in Arlington, Virginia. The theme of the 1991 colloquium is *Encouraging Talent in the Mathematical Sciences Pipeline*. The program is designed to provide information and materials chairs may use in the design of recruiting and nurturing programs for their departments.

Conferees will be provided with handouts containing information concerning the various aspects and levels of the mathematical sciences pipeline. On Friday, 18 October, 1991, a panel presentation and floor discussion on these issues will be held. The following morning, workshops on what department chairs may do to encourage talented students to enter and remain in the mathematical sciences will be held. There will be separate workshops for research universities and liberal arts and/or teaching institutions. The information presented the preceding day will serve as the basis for the workshops. New department chairs are encouraged to attend the session planned for their benefit. Topics to be discussed include resource allocation and faculty evaluation.

The keynote speaker for the colloquium is Mary Good, Chair of the National Science Board. The program also includes sessions providing information on encouraging members of underrepresented groups in the mathematical sciences, the PhD job market, and the pipeline in statistics. In addition, there will be two panels of representatives of federal agencies that fund mathematical sciences projects: one panel will discuss programs concerned with research-oriented programs and the other will discuss education-pipeline-infrastructure programs.

The registration fee is \$160.00 and includes all colloquium sessions, materials, and related meals and social activities. For further information, contact: Board on Mathematical Sciences, National Research Council, 2101 Constitution Avenue Northwest, Room NAS 312, Washington, DC 20418; (202) 334-2421. ■

TOURIST INFORMATION Québec, cradle of French civilization in North America, lies 250 kilometers northeast of Montréal and is easily accessible by air or by land. Québec City is a natural citadel perched astride a cliff, Cap Diamant, dominating the majestic Saint Laurent river which flows at its feet. Samuel de Champlain founded the city in 1608 and today, with 600,000 residents, it remains the only walled city north of Mexico. Québec offers some of the best, yet affordable restaurants in Canada and ICME-7 participants will enjoy diverse recreations from the Cap Tourmente Wildlife Reserve, Québec Zoo, and the splendid Montmorency Falls to the sidewalk cafés along the Place d'Armes and the city's numerous museums. In August, the average high temperature is 74 degrees.

Laval Université, host to the ICME-7 festivities, is the oldest francophone university in America. 33,000 regular students and 14,000 extension and summer students contribute to its dynamic, cosmopolitan atmosphere. The Laval campus offers impressive facilities and services—its student residences can accommodate more than 2,000 people. In addition, many hotels and quaint auberges can be found near the university.

For additional information on Québec and its many attractions, contact: Québec City Region Tourism and Convention Bureau, a Department of La Communauté Urbaine de Québec, 60 d'Auteuil Street, Québec, QC Canada G1R 4C4; (418) 692-2471. ■

Focus on MAA Sections

ALLEGHENY MOUNTAIN The Section's annual meeting was part of the Centennial Celebration at West Virginia State College in Institute, West Virginia. The local arrangements, hospitality, and program were outstanding. Early Friday afternoon before the meeting, there was a minicourse on writing in mathematics by David A. Smith of Duke University. The opening invited address, *Random Strategy Experimentation*, was given by Charles Hendrix of the Applied Statistics Group at Union Carbide. Other invited speakers were David A. Cusick of Marshall University, Robert L. Devaney of Boston University, and Thomas W. Tucker of Colgate University. George B. Thomas, Jr., Professor Emeritus at MIT, who now lives in State College, Pennsylvania, gave a contributed talk on formulas for sums of series. In another contributed talk, Charles W. Zimmerman of Robert Morris College showed how to determine the optimal allocations for flexible benefit plans. The annual pizza party on Friday evening was held at the lovely Shawnee Park clubhouse. The Section and Allegheny College cosponsored a summer short course on Discrete Dynamical Systems with principal lecturer James T. Sandefur, Jr. of Georgetown University.

EASTERN PENNSYLVANIA AND DELAWARE The Section sponsored two regular meetings, each with four invited addresses. The fall meeting was organized around general interest topics, while the spring meeting focused on decision sciences. Both meetings included student-contributed paper sessions. The spring meeting, held at LaSalle University, included hour addresses by Janos Galambos of Temple University, Fred S. Roberts of Rutgers University, and William E. Rosenthal of Ursinus College. James M. Landwehr of AT&T Bell Laboratories gave an invited address entitled *What Should Be In An Introductory Statistics Course?* There were two one-hour sessions for contributed student papers.

In October the Section sponsored a symposium, *Underrepresented Groups in Mathematics: Overcoming the Obstacles*, which was coordinated by Joanne S. Darken of the Community College of Philadelphia. A follow-up workshop on *Freshmen Programs to Increase Access* was cosponsored by the University of California at Berkeley's Charles A. Dana Center for Mathematics and Science Education in April. Marvin L. Brubaker of Messiah College continues to coordinate the Section's annual workshop which this year was entitled, *Writing in Mathematics Classes*, with Barbara J. Rose of Roberts Wesleyan University as chief presenter. The Section also has a visiting lecturer and consultant program which is coordinated by JoAnne S. Growney of Bloomsburg University. This Section is planning a student day for September 1991.

FLORIDA The Section honored Professor Robert Kalin of Florida State University with the Distinguished Service Award for 1991. The Section's spring 1991 newsletter devoted a full page to the citation for Bob Kalin who served as newsletter editor and then as secretary-treasurer for six years. This Section gave *An Introduction to Inequalities*, Volume Three of the New Mathematical Library, to the thirty-five top scorers on the American High School Mathematics Examination (AHSME). Expenses were paid for the fifteen undergraduates who presented papers at the annual meeting. This annual meeting included the following speakers: Philip Lee Bowers of Florida State University, Robert D. Campbell and Michael J. Mears, both of Manatee Community College, David W. Kammler of Southern Illinois University, Arnold J. Mandell of Florida Atlantic University, Thomas W. Tucker of Colgate University, and Peter M. Winkler of Emory University. The Florida section is divided into seven regions, six of which had meetings this past year; the total attendance at these meetings exceeded the attendance at the Florida Section annual meeting

The Program Committee is representative of the Section's various constituencies one each from a PhD institution, liberal arts college, and community college. The success of their meetings is due to their program's quality and diversity and to the fact that many related mathematics organizations use the annual meeting as a time to meet. This list of organizations includes: the Florida Two-Year College Mathematics Association, the Special Interest Group in Computer-Assisted Learning in Mathematics, the Florida Association of Mathematics Educators, the State University System Chairs of Mathematics Departments, and the Two-Year College Chairs of Mathematics Departments.

ILLINOIS A short course in Applied Combinatorics by Alan C. Tucker of the State University of New York at Stony Brook preceded the annual meeting at Eastern Illinois University. This meeting included an hour talk by Robert V. Hogg of Iowa University. A new aspect of this year's meeting was the reports of recent developments in research in topology, algebra, and analysis. This seventieth meeting also featured sessions on knot theory and its applications and on computer modeling of cognitive processes of the brain, and a panel report on the Illinois Cooperative Mathematics Placement Test, as well as student paper and classroom notes sessions.

The Section sponsors an excellent lecture program to provide high schools in Illinois with an opportunity to host mathematicians from local colleges, universities, or businesses. Transportation costs for the speakers are covered by the Section; sometimes high schools pay a modest honorarium; R. Devadoss Pandian of North Central University chairs this Committee on Secondary School Lectures.

The Illinois Section's Committee on Teacher Preparation and School Mathematics, currently chaired by Larry J. Morley of Western Illinois, keeps the Section informed about the requirements and national recommendations. Illinois is another Section which has institutional memberships through which the institutions in the Section help to sponsor the programs. The Section supports the Illinois Mathematics Coalition, which is an alliance of leaders working to provide statewide support for excellence in mathematics education. Other projects of this active Section are the outreach to minorities and their integrated two-year/four-year involvement.

INDIANA Rick Gillman of Valparaiso University and Roger G. Lautzenheiser of Rose-Hulman Institute of Technology report that the Indiana Section was treated to a stimulating and thought-provoking fall meeting at Valparaiso University. The meeting began with a Friday evening banquet which was followed by a lively discussion with regard to curricular revisions in mathematics departments around the State. Participants were G. Daniel Callon of Franklin College, Mary V. Connolly of St. Mary's College, Notre Dame, G. Elton Graves of Rose-Hulman, Richard Smock of DePauw University, and Patrick J. Sullivan of Valparaiso University. While faculty members attended the Friday evening program, students enjoyed a pizza party hosted by members of the Valparaiso Student Chapter and planned by the president of the chapter, Kathleen E. Tanner. Speakers on Saturday morning included Louis H. Kauffman of the University of Illinois at Chicago, John O'Bryan, a student at Rose-Hulman, Richard R. Patterson of Indiana University-Purdue University at Indianapolis, Arlo W. Schurle of Rose-Hulman, Dennis M. Snow of Notre Dame University, and Mary T. Treanor of Valparaiso University.

The twenty-sixth annual Indiana College Mathematics Competition was held during the Section's spring meeting at Anderson University. Each of the twenty-three teams (from fourteen different colleges) consisted of three students working together to solve seven problems in two hours. The winning team was from Rose-Hulman with Purdue and Goshen Universities finishing second and third. Talks were given by William W. Dunham of Hanover College and MAA President Deborah Tepper Haimo. Student speakers were Joel E. Atkins of Rose-Hulman and Kathleen E. Tanner of Valparaiso

University. Saturday afternoon talks at the spring meeting were given by Stephen C. Carlson of Rose-Hulman, Amos Carpenter of Butler University, Michael Greenwich of Purdue University at Calumet, Ruben Schweiger of Indiana Wesleyan University, John Synowiec of Indiana-Northwest University, and Peter Yff of Ball State University.

Cathy Murphy of Purdue University at Hammond and Steve Carlson of Rose-Hulman are assembling a history of the Indiana Section and would like any information concerning the Section sent to them. The Indiana Section is also soliciting ideas which can be used in mathematical exhibits in children's museums in the state. The Section would appreciate assistance from any MAA members and asks that you send your suggestions to Roger Lautzenheiser.

INTERMOUNTAIN The annual spring meeting, held at Ricks College in Rexburg, Idaho, included a session for MAA representatives and a minicourse, *An Introduction to Chaos*, by Russell B. Walker of Montana State University. Invited speakers included MAA Secretary Gerald L. Alexanderson of Santa Clara University, Patrick M. Lang of Idaho State University, and T. Benny Rushing of the University of Utah. Faculty who gave contributed papers were Lee Badger of Weber State College, Lawrence O. Cannon and Stanley C. Williams, both of Utah State University, Daris Howard of Ricks College, and Vencil Skarda and Donald R. Snow, both of Brigham Young University. A panel discussion on using technology in teaching included, in addition to Don Snow, Boyd L. Cardon and Dan Chidix, both of Ricks College, Kendall H. Hyde of Utah State University, and Lawrence J. Kratz of Idaho State University. Thirteen student speakers completed this gathering of enthusiastic speakers; expenses of student speakers are covered by their institution.

IOWA This year marks the seventy-fifth anniversary of the Iowa Section! They hope to mark the occasion with a short history of the Section, which will include anecdotes and personal recollections, and request that these be sent to Elgin H. Johnston at Iowa State University. The Iowa Section held its annual meeting jointly with the American Statistical Association (ASA) and the American Mathematical Association of Two-Year Colleges (AMATYC) at Drake University. Sessions included a talk on *Life after the Bachelor's Degree* by Jennifer Rowley of the University of Nebraska and Wayne L. Woodworth of The Principal Company. One-hour presentations were given by Robert Stephenson of Iowa State University and Wayne Roberts of Macalester College. In addition to student papers, there were three sessions of contributed faculty talks.

KANSAS The Kansas Section joined the Kansas Association of Teachers of Mathematics and the Kansas Mathematical Association of Two-year Colleges (KAMATYC) in a spring conference at Southwestern College. This meeting included a mathematics education roundtable, contributed paper sessions, and a talk by Ray C. Shifflett, Executive Director of the Mathematical Sciences Education Board (MSEB). At the Saturday luncheon, Bill Richardson spoke on *Kansas Mathematical Sciences Education Coalition*.

KENTUCKY A successful annual meeting at Northern Kentucky University included social time after the invited address on Friday evening (Aftermath), breakfast on Saturday morning, and a campus tour. Bart Braden of Northern Kentucky University presented a short course (with no fee) on *Enhancing Calculus with Mathematica*. Joseph B. Fugate of the University of Kentucky gave the opening address, *The Fixed Point Property*, and Christine A. Shannon of the University of Kentucky gave the closing address, *Mathematics which Arises in the Study of Algorithms*. Students are included in all aspects of the Section meeting, and seven students were involved in contributed papers. Jacqueline C. Moss of the Kentucky Section is involved in an examination and review of the mathematics sequence for elementary education majors, the topic of a conference which was held in November at Elizabethtown Community College.

LOUISIANA AND MISSISSIPPI The annual meeting in Biloxi, Mississippi was one of the best ever, with 264 attending. A student career panel with representatives from the space program, the actuarial field, information systems, and software development was professionally recorded by a local television station. Steve Ligh of Southwestern Louisiana University coordinates the student team competition in which, this year, seventeen teams of four students each participated. First place went to Northwestern State University, second to the University of Mississippi, and third to Mississippi University for Women.

Awards were given for student paper presentations at the annual meeting, with three awards given for undergraduate papers, of which there were a total of seven, and three awards given for graduate student presentations, of which there were four. Sixty-six students attended the meeting. Franklin D. Demana of Ohio State University and Wade Ellis of West Valley College gave workshops. This annual meeting, which was held at the Royal d'Iberville Hotel in New Orleans, provided the opportunity for students to meet with industry representatives in a night session.

MARYLAND-DISTRICT OF COLUMBIA-VIRGINIA

This year marks the seventy-fifth anniversary of the founding of the Maryland-District of Columbia-Virginia Section! The Section is interested in preparing a history and would appreciate any materials relating to its early days. These materials can be sent to John G. Milcetic at the University of the District of Columbia. Both the fall and spring meetings of the Section included contributed papers, invited addresses, and workshops. An interesting part of their spring meeting is that teams from the Section who earn a meritorious rating in the Mathematical Competition in Modeling are invited to the meeting. This Section fielded 20 of the 235 teams in 1991. The fall meeting included a student chapter swap session for chapter advisors and students; invited speakers were Bill E. Bompert of Augusta College, and Joseph A. Gallian of the University of Minnesota at Duluth. The workshop presented by Gregory D. Foley of Ohio State University was on *Graphing Calculators in the Classroom*. This meeting also included a panel discussion on local mathematics coalitions. The workshop in the spring was on *GyroGraphics* by the invited speaker, Jerry A. Johnson of Oklahoma State University.

METROPOLITAN NEW YORK The 1991 Annual Meeting was a two-day event to celebrate the Section's Fiftieth Annual Meeting. Peter J. Hilton of the State University of New York at Binghamton discussed breaking German codes with the Enigma Machine during World War II. Gilbert Strang of MIT addressed *The Teaching of Calculus: Careful Changes*. The Annual Metropolitan New York Math Fair was also a success, with many outstanding student papers.

MICHIGAN The Michigan Mathematics Prize Competition, now in its 34th year, was featured in 475 of the 750 high schools in the state; 18,529 students participated. This two-part competition has been hosted by Eastern Michigan University for the past three years, with Christopher J. Gardiner, Christopher E. Hee, and Don R. Lick playing significant roles in its success. The competition will be hosted by Lawrence Technological University, with guidance from William C. Arlinghaus and Ruth G. Favro. The Michigan Section has its own Distinguished Service Award which is presented to one or more members at the annual Michigan Section meeting each May. Harold T. Slaby, Professor Emeritus of Mathematics at Wayne State University, received the Section's fifth Distinguished Service Award in ceremonies at the annual meeting banquet in Grand Rapids. The very complete Michigan Section newsletters include full-page citations to those individuals who receive the Section's Service Awards. Newsletters also provide a forum for discussion of issues of importance to the mathematical community by soliciting opinion features for public education.

At the Section's annual meeting at Calvin College, its Women's Study Group convened a meeting of mathematicians interested in its goals and those of the Association of Women in Mathematics (AWM). The annual meeting also included a workshop on graphing calculators, student papers, and invited addresses. This Section has a new Committee on Student Activities. Another committee of the Section is preparing a brochure which seeks to convince high school and middle school students that they should study mathematics. This is one of those section projects which will be of interest to all MAA members.

MISSOURI The annual meeting was preceded by two five-hour workshops on *Derive* and *Mathematica*, Thursday evening and Friday morning. The *Derive* workshop was presented by Bill Huston of Missouri Western University. *Mathematica* was presented by faculty at the University of Missouri at Rolla—Harry R. Gee, Leon M. Hall, Robert R. Roe, and Jack Scrivner—who have taught sections of calculus in which *Mathematica* has been used since 1989. One of the invited hour-lectures was cosponsored by a private foundation. The invited speakers included Katherine L. Pedersen of Southern Illinois University, MAA Executive Director Marcia P. Sward, and Stan Wagon of Macalester College. The Section sponsors an annual 5K run/walk bright and early on Saturday morning of the meeting, and also special breakfast sessions for department chairs and for MAA representatives. The Missouri Mathematics Association for the Advancement of Teacher Training conducted a business meeting and presented a speaker at one of the regular sessions of the Section meeting. Karen Pederson was the speaker for Missouri Mathematics Association for Advancement of Teacher Training. During Mathematics Awareness Week, the Section chair was on a local radio talk show.

NEBRASKA This Section is renewing efforts to include high school teachers by inviting the Nebraska Teachers of Mathematics Organization to become affiliated with the Section. The annual meeting, held at Nebraska Wesleyan University, included a panel discussion on teaching mathematics with computer technology, moderated by Steve R. Dunbar of the University of Nebraska at Lincoln. David B. Cooke of Hastings College, Thomas S. Shores of the University of Nebraska at Lincoln, and Richard L. Vogt of Nebraska Wesleyan University were panel members. Faculty from the University of Nebraska at Lincoln who contributed talks included: Linda Sue Fosnaugh, Steven P. Haataja, David A. Klarner, Dale Mesner, Donald W. Miller, Melvin C. Thorton, and Qiu-rong Wu. University of South Dakota faculty who delivered talks included: Jose D. Flores, Yuhlong Lio, Myron Mortazavi, and Richard Raposa. Other contributed papers were by David B. Cooke of Hastings College and Charles M. Warden of Omaha University.

NEW JERSEY The Section recognizes the great variety of mathematical interests in the current membership and tries to see that the Section programs are diversified to meet the needs of this membership. Their fall meeting was held at Seton Hall University and included talks by Aigli Helen Papantonopoulou of Trenton State College, Ann K. Stehney of the Center for Communications Research, and Donald Forbes of Chase Manhattan Bank, and a discussion on the future of New Jersey MATHNET. MATHNET, supported by the New Jersey Section, is a group which aids in furthering communication among the college mathematics community, state, and local organizations. Members of the Section are involved with state-wide groups concerning mathematics education at all levels.

The spring meeting at Georgian Court College was held jointly with the Mathematics Association of Two-Year Colleges of New Jersey. Speakers were Dean Chung of Mountain Lakes High School, John Conway of Princeton University, Cynthia Coyle of Trenton State College, Frank Morgan of Williams College, Linda Lesniak of Drew University, and Ronald E. Ruemmler of Middlesex County College. This Section is one of many which encourages students to attend meetings and give talks.

NORTH CENTRAL The biannual Section Summer Seminar, this year on Chaotic Dynamical Systems, was held in August at the University of Minnesota at Duluth, with principal lecturer Robert L. Devaney of Boston University. Harlen W. Stech of the University of Minnesota at Duluth was in charge of arrangements. North Central's fall meeting at South Dakota State included an informal gathering of the Association for Women in Mathematics (AWM) so students could meet and talk with established women mathematicians.

The spring meeting featured several presentations on regional and national mathematics education reform efforts. Joseph D. E. Konhauser's retirement from Macalester College was recognized in a presentation by Sy Schuster of Carleton College. One of the invited talks was by John H. Ewing of Indiana University, *Can We See the Mandelbrot Set?* Wayne Roberts of Macalester College and Anita Solon of Grinnell College both talked about calculus reform. Wayne gave an overview of efforts and Anita talked about special activities. Students and advisers participated in an informal coffee and rolls session to share concerns and plan future sessions.

NORTHEASTERN The Section inaugurated a program this year to bring successful national MAA minicourses to the Section. The first course, *Using History in Teaching Calculus*, was given by V. Frederick Rickey of Bowling Green State University at Bentley College. More than one hundred Section members from six New England states and two Canadian provinces representing two- and four-year colleges, high schools, and industries attended.

The Section established the Howard Eves Award for Meritorious Service to recognize outstanding contributions and service to the Northeastern Section. Most appropriately, the first recipient of this award was Howard Eves, the founder of the Section. This award was presented at the November 1990 meeting held at Framingham State College. This fall meeting included a presentation by Clayton W. Dodge of the University of Maine especially for students, *The Twin Circles of Archimedes: Are They Really Twins?* and a talk by Marjorie Senecal of Smith College on *Disorderly Patterns*. The regular student swap session for students and advisers was held during lunch on Saturday.

The Northeastern Section meeting programs include presentations by faculty in both colleges and high schools, students, and mathematicians from industry. The spring meeting included a panel discussion on writing to teach mathematics and computer workshops on Epic Mathematica, and ISETL. At the Student Chapter Session of the spring meeting, James Ward of Bowdoin College shared his experiences as a Fulbright Scholar at the National University of Lesotho. Plans are underway by the Section to begin a program of dinner meetings on a regional basis.

NORTHERN CALIFORNIA The format of having only invited addresses at the annual meeting was again successful. The speakers in February 1991 were Wade Ellis, Jr. of West Valley College, John H. Ewing of Indiana University, Joseph A. Gallian of the University of Minnesota at Duluth, Judith V. Grabiner of Pitzer College, and David E. Logothetti of Santa Clara University. Department chairs and MAA representatives informally discussed a program used in Northern California to increase the number of mathematics majors who are graduated from their institutions.

OHIO The Section continues its success with student activities at the spring meeting. This year there were thirty-three student talks with over sixty students in attendance. Activities for students included a minicourse by William W. Dunham of Hanover College on *The Bernoullis and the Harmonic Series* and an information session on graduate school. The spring meeting featured a

special paper session on ordered algebraic structures, which fit beautifully with the retiring president's address, *On Circles and Doughnuts (Or Locally Partially Ordered Groups,)* by Janet B. Roll of the University of Findlay. Robert S. Smith of Miami University presented a minicourse on Computer Assisted Learning in Abstract Algebra.

The fall meetings spotlighted applied and industrial mathematics with invited addresses by Peter E. Castro of Eastman Kodak and Peter Tuchinsky of Ford Motor Company. Castro's title was *Industrial Mathematics: More Than Applied Mathematics*. A swap session covering the broad spectrum of applied mathematics, mathematical modeling, computer applications and courses related to these topics was also part of the fall meeting.

The Committee on Student Members is compiling a list of speakers in the Section who are interested in giving talks to MAA student chapters and other undergraduate mathematics groups at Ohio colleges. This Committee coordinates the activities of the student chapters and is in charge of planning activities for the spring meeting.

OKLAHOMA AND ARKANSAS The annual meeting, held at Cameron University, included four sessions of student papers. Students attended a workshop on the *History of Mathematics* which was funded by a grant from the Cameron University Foundation and directed by Joel K. Haack of Oklahoma State University. Faculty attendees participated in a workshop on Combinatorial Games, directed by Richard K. Guy of the University of Calgary. The Section has a very successful model of involving students in meeting activities, including a breakfast on both Friday and Saturday mornings, a luncheon for faculty advisers of student mathematical organizations, and awards for student speakers.

A special recognition and appreciation were extended to John M. Jobe of Oklahoma State University as his thirteen-year term of office as secretary-treasurer came to a close. During those years, John has instituted many successful activities and programs. The Section believes through his leadership and energy they now have a Committee of Chairpersons of the Mathematics Departments in their Section which meets every year during the Section's spring meeting; a Section newsletter; a program which each year recognizes an outstanding Secondary School Mathematics Teacher; and a workshop series for Section members on current topics and issues in mathematics.

PACIFIC NORTHWEST The annual meeting included a workshop by Victor Klee of the University of Washington on unsolved problems, Thursday afternoon and Friday morning. Carl E. Swenson of Seattle University offered a short course on the TI 81. A presentation on the actuarial profession was given by two local actuaries. Invited speakers included Ivan Niven of the University of Oregon and John E. Hopcroft of Cornell University.

This Section meets in June which enables them to begin the meeting on Thursday afternoon with a short course with Thursday evening free to enjoy the area in which they are meeting and then continue the short course on Friday morning. The annual meeting at Seattle Pacific University was in conjunction with centennial celebrations at both Seattle Pacific and Seattle Universities.

ROCKY MOUNTAIN The annual Section meeting, held at the University of Northern California, included two workshops: Karen Tonson of Metropolitan State University presented *Nine Women Who Count*, and William D. Emerson, also of Metropolitan State University, presented *Teaching Calculus with Mathematics*. There were three panel discussions, *Quantitative Literacy*, *Mathematical Modeling*, and *Impact of NCTM Standards on the College Classroom*. MAA President Deborah Tepper Haimo's major address completed this meeting of twelve student papers and fourteen contributed faculty talks. The meeting felicitously coincided with Mathematics Awareness Week, which was designated a special week via a declaration signed by the Colorado governor. Donald B. Small of Colby College taught a Summer Short Course at Fort Lewis University on the use of computer algebra systems in teaching calculus.

SEAWAY In 1989-1990, the Section focused its fiftieth anniversary meeting at Colgate University. In 1990-1991, it emphasized its programs, increasing participation, variety, and vitality. Each meeting will in the future have a featured lecturer—the Gehman Lecture each spring and a newly instituted invited lecture in mathematics education in the fall. For 1990-1991 John Hubbard of Cornell University presented the Gehman Lecture, and Peter D. Taylor of Queen's University gave the special lecture in mathematics education at the fall meeting. At both meetings, H. Joseph Straight of the State University of New York, College of Fredonia, and the Program Committee provided greater variety in the program through special sessions on calculus reform, mathematics courses for elementary education majors, ideas on the teaching of mathematics, computers in the classroom, as well as a session on research mathematics. The Section experimented with student talks at both fall and spring meetings but student participation seems to favor this emphasis in the spring only.

Charles H. Webster of Utica College, the Section's public information officer, submitted information on the spring meeting at Oneonta to local papers highlighting the meeting and any participation by a speaker from the paper's circulation. (Some were published.)

SOUTHEASTERN The Section was fortunate to have three excellent invited speakers for the annual meeting: Stephen E. Puckette of the University of the South, who spoke on *The Future of Non-Standard Analysis*, Daphne Smith of the University of Georgia, whose title was *Classes of Sets with VC Dimension*, and Shirley M. Frye, Past-President of the National Council of Teachers of Mathematics, who chose for her topic, *Challenges for This Decade of Decisions or Decisions in This Decade of Challenges*. The short course, *Computers in the Mathematics Classroom*, conducted by Lester J. Senechal of Mount Holyoke College, and Ladnor D. Geissinger of the University of North Carolina at Chapel Hill was oversubscribed. A proportionately large number of students registered for the meeting, and a popular event with them was TA Rush. The student from this Section with the highest score on the Putnam examination, Jeffrey M. Vanderkam of Duke University, was presented a check for \$100.00 in recognition of this high achievement. The Section is making an effort under the leadership of Sylvia T. Bozeman of Spelman College, to enlist greater participation by minorities in its activities.

The Southeastern Section has grown approximately 100% during the last seven years from 1400 members to more than 2700 members. Along with this growth in membership has come a growth in Section activities. These activities are both coordinated and reported by a team of state directors who have all completed their terms during this past year. The original state directors are Carlton Woods of Auburn University for Alabama, David R. Stone of Georgia Southern University for Georgia, Ellen E. Kirkman of Wake-Forest University for North Carolina, Robert D. Fray of Furman University for South Carolina, and Horace E. Williams of Vanderbilt University for Tennessee. Activities supported by the membership of the Southeastern Section include the State Mathematics Coalitions whose goals are to encourage, coordinate and facilitate state level activities which will help implement national goals at the state level. Activities of these State Mathematics Coalitions are reported in the Southeastern Section Newsletter.

SOUTHERN CALIFORNIA The annual fall meeting, held jointly with the American Mathematical Society (AMS), featured a talk by Harvey B. Keynes of the University of Minnesota and a panel discussion/workshop session: *Leading Mathematics into the 21st Century*. In addition there were invited addresses by Brooks Redi and John de Pillis. There were ten contributed papers in two sessions: *Mathematical Notes* and *The Teaching of Mathematics*. The fall 1991 meeting, also a joint meeting with the AMS, will be at the University of California at Santa Barbara. A special effort has been made to include program materials both accessible and interesting to undergraduate mathematics students (including a panel discussing *There IS Life After the BA in Mathematics*). Invited Speakers include Michael H. Freedman of the University of California at San Diego, Paul R. Halmos of Santa Clara University, and Michael Townsend.

The Spring meeting of the Section, held jointly with the Southern California Section of the Society for Industrial and Applied Mathematics (SIAM) at El Camino College was the occasion of the Section's first session for papers contributed by students. The session of eighteen papers, presented by twenty students, was so successful that such a session will be a part of the program at the joint MAA-SIAM meeting in 1992. The occasion was also enhanced by donations of valuable gifts by industry for two of the students (chosen by lot). There were invited addresses by Andrew M. Bruckner of the University of California at Santa Barbara, Stanley J. Osher of the University of California at Los Angeles, and Herbert S. Wilf of the University of Pennsylvania. In addition, Charles S. Stanton and Peter D. Williams, both of California State University at San Bernardino, conducted a computer algebra workshop and James R. Bunch of the University of California at San Diego, David H. Carlson of San Diego State University, Jane M. Day of San Jose State University, and Roberto A. Mena of California State University at Long Beach held a panel discussion on curriculum reform for linear algebra. The spring 1991 meeting was truly a *joint* meeting in that the program was planned by a single program committee and each invited speaker gave a *MAA-SIAM Invited Address*. This was the first meeting of the Southern California Section to be held at a community college.

SOUTHWESTERN The annual meeting, held at New Mexico State University, included a short course (no fee) on *Projects in Calculus*, presented by David J. Pengelley of New Mexico State University. The meeting was held jointly with the New Mexico Mathematical Association of Two-Year Colleges which seemed to swell the attendance as well as the number of papers presented. Good presentations were given by Stephen B. Rodi of Austin Community College who discussed the relations between

two-year and four-year colleges and by Ray C. Shilllett, Executive Director of the Mathematical Sciences Education Board (MSEB) on *Retaining Minorities in Mathematics*.

TEXAS The annual meeting attracted 249 participants and featured a short course on *Dynamical Systems—Chaos and Fractals* by Marilyn B. Durkin of Bentley College, 7 invited addresses, 42 contributed papers, and 4 student papers. A student workshop on *Chaos and Fractals* was an abbreviated version of the short course. In addition, department heads, institutional representatives, two-year college members, and MAA student chapter sponsors met in special sessions. Graduate school representatives were available to interview prospective students during a two-hour session. James C. Bradford of Abilene Christian University, and Don E. Edmondson of the University of Texas at Austin were awarded Section distinguished service awards.

A Section Committee on Lower Division College Mathematics was established last spring to replace the Calculus Study Committee. With its charge now changed to reflect an interest in the mathematics curriculum for all lower division courses, a major new project is the trial publication of the Texas Mathematics Curriculum Newsletter. Work continues on establishing an MSEB Texas Coalition and on compiling a section-wide mathematics course related software inventory.

WISCONSIN The Fifty-Ninth Annual Meeting of the Wisconsin Section, held at the University of Wisconsin at Oshkosh, included a workshop on the use of the TI-81 graphics calculator in college mathematics classes by Franklin D. Demana of Ohio State University. This meeting, with a theme of modeling, featured five invited talks. One by William J. Lehr, a physicist with the National Oceanic and Atmospheric Administration, was on models of atmospheric plumes and models for oil spills. (These models are currently in use in the Persian Gulf.) The forty-four contributed papers were of high quality. The fact that Walter and Mary Ellen Rudin are retiring added human interest to their excellent addresses.

In an attempt to increase cooperation between secondary school and college teachers of mathematics, the Wisconsin Section and the Wisconsin Mathematics Council (WMC) will sponsor a joint fall meeting at University of Wisconsin-Centers at Fond du Lac. Robert W. Langer of the University of Wisconsin at Eau Claire has summarized data from an information sharing questionnaire concerning teaching load and budget issues. Bonnie A. Berken and Katherine L. Muhs, both of St. Norbert College, are in charge of the Section Mathematics Contest which involved almost 13,000 students this year.

In Memoriam

David H. Anderson, Professor, Southern Methodist University, died 12 April 1991 at the age of 51. He was an MAA member for 28 years.

Thomas A. Bronikowski, Associate Professor, Marquette University, died in June 1989 at the age of 56. He was an MAA member for 20 years.

Andrea Brown, Assistant Professor, Suffolk County Community College, died 1 August 1990 at the age of 61. She was an MAA member for 4 years.

Emil W. Brown, retired, American Telephone and Telegraph, died in May 1990 at the age of 65. He was an MAA member for 33 years.

Otto M. Carothers, Jr., Professor, University of Wisconsin at Platteville, died 26 December 1990 at the age of 60. He was an MAA member for 30 years.

Allen Byron Cunningham, Professor, West Virginia University, died 3 May 1991 at the age of 79. He was an MAA member for 50 years.

Americus J. D'Atri, Civil Engineer, died 17 November 1990 at the age of 90. He was an MAA member for 50 years.

Margaret Earl, retired, died 2 February 1991 at the age of 94. She was an MAA member for 18 years.

Edwin Earl Floyd, former Vice President and Provost, University of Virginia, died 9 December 1990 at the age of 66. He was an MAA member for 8 years.

Mary Cleophas Garvin, retired, Notre Dame College, died 16 January 1991. She was an MAA member for 55 years.

Harry Gonshor, Professor, Rutgers University, died 15 May 1991 at the age of 62. He was an MAA member for 26 years.

Albert A. Grau, retired, Northwestern University, died 5 February 1991 at the age of 72. He was an MAA member for 45 years.

Yvette S. Huisenfeldt, student, University of Nevada at Las Vegas, died in 1991 at the age of 19. She was an MAA member for one year.

Leon Kotin, Associate Professor, Georgian Court College, died 3 January 1991 at the age of 66. He was an MAA member for 32 years.

Robert J. Lambert, Professor and Associate Director Emeritus, Iowa State University, died 22 April 1991 at the age of 69. He was an MAA member for 44 years.

Sung J. Lee, Professor, University of South Florida, died in November 1990 at the age of 47. He was an MAA member for 2 years.

George P. Loweke, Associate Professor Emeritus, Wayne State University, died 22 March 1989 at the age of 87. He was an MAA member for 43 years.

Clarence I. Lubin, Professor Emeritus, University of Cincinnati, died 25 November 1989 at the age of 89. He was an MAA member for 69 years.

Robert B. Ludwig, Associate Professor, State University of New York, College at Buffalo, died 23 October 1990 at the age of 59. He was an MAA member for 28 years.

Kenneth A. Lueder, Instructor, Metropolitan Technical Community College, died in 1991 at the age of 48. He was an MAA member for 23 years.

Mary E. Maxwell, Assistant Professor, University of Akron, died 20 December 1990 at the age of 43. She was an MAA member for 15 years.

Randy H. Murphy, Instructor, Centralia Community College, died in August 1990 at the age of 49. He was an MAA member for one year.

Vern A. Nelson, Professor, Metropolitan State College, died 12 February 1990 at the age of 56. He was an MAA member for 27 years.

John J. O'Brien, Jr., retired, San Jose Unified School District, died in 1991 at the age of 77. He was an MAA member for 28 years.

John C. Oxtoby, Professor Emeritus, Bryn Mawr College, died 2 January 1991 at the age of 80. He was an MAA member for 47 years.

Wallace A. Raab, Professor, University of South Dakota, died in May 1991 at the age of 69. He was an MAA member for 33 years.

Carroll E. Rusch, Professor Emeritus, University of Wisconsin at Eau Claire, died in 1991 at the age of 76. He was an MAA member for 45 years.

Kanhaya L. Singh, Professor, Fayetteville State University, died in November 1990 at the age of 46. He was an MAA member for 15 years.

Robert R. Stoll, Professor Emeritus, Cleveland State University, died in 1990 at the age of 75. He was an MAA member for 42 years.

Paul Weiss, Professor Emeritus, Wayne State University, died 19 January 1991 at the age of 79. He was an MAA member for 30 years.

Lauren G. Woodby, Professor Emeritus, Ohio State University, died 14 March 1991 at the age of 66. She was an MAA member for 37 years.

Samuel Yates, retired, died 22 April 1991 at the age of 71. He was an MAA member for 9 years.

We have also received word of the following deaths:

Younes Borki, student, Massachusetts Institute of Technology; **Raj C. Bose**, Professor Emeritus, Colorado State University; **Paul Cramer**, Associate Professor Emeritus, Monmouth College; **Morton L. Curtis**, Professor Emeritus, Rice University; **Rudolf K. Festa**; **Siegfried R. Goldner**, Professor Emeritus, University of Stellenbosch; **Mark M. Lotkin**, retired; **Vincent P. Mango**, retired, Central New England College of Technology; **Stephen S. Wagner**, Professor, New York Institute of Technology; and **Max Wyman**, Professor Emeritus, University of Alberta.

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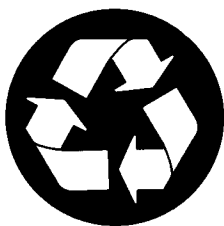
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MATHEMATICIAN

Mount Saint Mary's College, an independent, Catholic college, has an opening in academic year 1991-1992 for an entry level assistant professor of mathematics, tenure-track. A PhD in mathematics is required by September of 1991 (preferably in hand). Candidates should possess a dedication to quality teaching at a small liberal arts college. Computer experience is desirable as is an interest in mathematical modeling and applications. Duties include teaching mathematics courses at all levels and involvement in departmental and college-wide activities and committees. Salary is competitive. Letter of application, vita, and three letters of recommendation should be sent to: Dr. John August, Search Committee, Department of Mathematics & Computer Science, Mount Saint Mary's College, Emmitsburg, MD 21727. Application review begins October 16, 1991 and continues until the position is filled.

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



The MAA now prints FOCUS on recycled paper.

ALCORN STATE UNIVERSITY

Alcorn State University invites applications for the position of assistant professor of mathematical sciences. Qualifications include a doctorate in an area of computer science and the ability to teach a wide range of computer science courses. Applications are also sought for an instructorship in mathematics. Applicants for this position must have a master's degree which includes a minimum of 18 graduate hours in mathematics or computer science. All applications must include an official transcript and three letters of recommendation. The search will continue until positions are filled. Send all inquiries to: Search Committee, Mathematical Sciences, ASU, Box 30, Lorman, MS 39096.

ELON COLLEGE

Applications are invited for a tenure-track position at the assistant or associate professor level beginning fall 1992. Requirements are a PhD in mathematics and a strong commitment to teaching at the undergraduate level. Preference will be given to candidates with experience in teaching and a demonstrated interest in curriculum development. Evidence of experience in areas of applied mathematics or statistics is desired. Elon is a private, liberal arts college with 3,300 students located between Greensboro and Burlington, within an hour's drive of several colleges and universities. The math department has 10 full-time faculty members and 50 undergraduate majors. Duties include teaching 12 hours per semester, continuing scholarship, and service. Representatives will be attending the Baltimore AMS/MAA meetings in January 1992. Send letter of application, resumé, copies of undergraduate and graduate transcripts, and three letters of reference to: Dr. Rosalind Reichard, Department of Mathematics, Elon College, 2163 Campus Box, Elon College, NC 27244.

DEPARTMENT OF MATHEMATICS

Southern Illinois University at Carbondale
Carbondale, Illinois 62901

Applications are invited from qualified candidates for a tenure-track position at the assistant professor level beginning on August 16, 1992. PhD in statistics or in mathematics with a concentration in statistics is required. Preference is for mathematical statistics and statistical inference with interest in applications. Candidates must have demonstrated excellence in research or potential for such. Evidence of teaching effectiveness is required (foreign applicants *must* provide evidence of ability to teach in English effectively). Send letter of application, resumé, and three letters of recommendation to:

Statistics
c/o Ronald B. Kirk, Chair
Department of Mathematics
Southern Illinois University at Carbondale
Carbondale, Illinois 62901

The closing date for applications is **December 10, 1991** or until the position is filled. SIUC IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER. Women and minorities are particularly encouraged to apply.

DEPARTMENT OF MATHEMATICS

Southern Illinois University at Carbondale
Carbondale, Illinois 62901

Applications are invited from qualified candidates for a tenure-track position at the assistant professor level beginning on August 16, 1992. PhD in mathematics with specialization in numerical analysis required. Candidates must have demonstrated excellence in research or potential for such. Evidence of teaching effectiveness is required (foreign applicants *must* provide evidence of ability to teach in English effectively). Send letter of application, resumé, and three letters of recommendation to:

Numerical Analysis
c/o Ronald B. Kirk, Chair
Department of Mathematics
Southern Illinois University at Carbondale
Carbondale, Illinois 62901

The closing date for applications is **December 10, 1991** or until the position is filled. SIUC IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER. Women and minorities are particularly encouraged to apply.

DAVIDSON COLLEGE

Department of Mathematics
PO Box 1719, Davidson, NC 28036

Applications are invited for a tenure-track position in the Mathematics Department beginning August 1992. Completion or near completion of PhD is required. A candidate must be committed to outstanding teaching and continuing scholarly activity. Some computer science background is desirable. Teaching load will average 5.5 courses per year. Davidson is a liberal arts college with a Presbyterian heritage.

Applications consisting of a statement of professional aspirations and goals, resumé, graduate and undergraduate transcripts, and 3 letters of reference (at least one about teaching) should be sent to the attention of Prof. L. R. King at the address above. (E-mail: MATH@DAVIDSON.BITNET.) Applications received by **November 29, 1991** will receive first consideration. Davidson College is an Equal Opportunity Employer; women and minorities are encouraged to apply.

CARLETON UNIVERSITY
Ottawa, Canada

The Department of Mathematics and Statistics invites applications for a six-month term appointment, at the level of Assistant Professor, to commence January 1, 1992. Applications are invited from outstanding candidates, both female and male, with a PhD degree in the area of modern applied mathematics, with an emphasis in linear programming, optimization, and combinatorics. There is a possibility of this position becoming a tenure-track appointment. The successful candidate will be expected to be active in research, supervise graduate students, and support the department's tradition of excellence in teaching. In accordance with Canadian immigration requirements, this advertisement is directed first to Canadian citizens and permanent residents. Applications including curricula vitae should be addressed to:

Dr. John D. Dixon, Chairman
Department of Mathematics and Statistics
Carleton University
Ottawa, Ontario, Canada K1S 5B6

Candidates should also arrange for three letters of reference to be sent to the same address. Information concerning the department, including research interests of the faculty, may be obtained upon request. The closing date for receipt of applications is **October 1, 1991**.

CARLETON UNIVERSITY
Ottawa, Canada

The Department of Mathematics and Statistics invites applications for a tenure-track position (subject to budgetary approval), at a rank commensurate with the applicant's qualifications, to commence July 1, 1992. Applications are invited from outstanding candidates, both female and male, whose research interests are in the area of modern applied mathematics, namely: combinatorics, optimization, and operations research. The successful candidate will be expected to be active in research, supervise graduate students, and support the department's tradition of excellence in teaching. In accordance with Canadian immigration requirements, this advertisement is directed first to Canadian citizens and permanent residents. Applications including curricula vitae should be addressed to:

Dr. John D. Dixon, Chairman
Department of Mathematics and Statistics
Carleton University
Ottawa, Ontario, Canada K1S 5B6

Candidates should also arrange for three letters of reference to be sent to the same address. Information concerning the department, including research interests of the faculty, may be obtained upon request. The closing date for receipt of applications is **January 7, 1992**.

EAST TEXAS BAPTIST UNIVERSITY

Tenure-track position in mathematics starting in summer or fall of 1992. PhD (or near PhD) in mathematics or mathematics education desired. Strong commitment to undergraduate teaching is mandatory. ETBU is a small, four-year, liberal arts college located in the rolling hills and piney woods of east Texas, 35 miles west of Shreveport and 150 miles east of Dallas. Send resumé by **February 1, 1992** to: Rutledge McClaran, Chair, Search Committee, ETBU, Marshall, TX 75670-1498; (903) 935-7963, ext. 349. EOE/AA.

SOUTHERN CONNECTICUT STATE UNIVERSITY

New Haven, CT 06515
Department of Mathematics

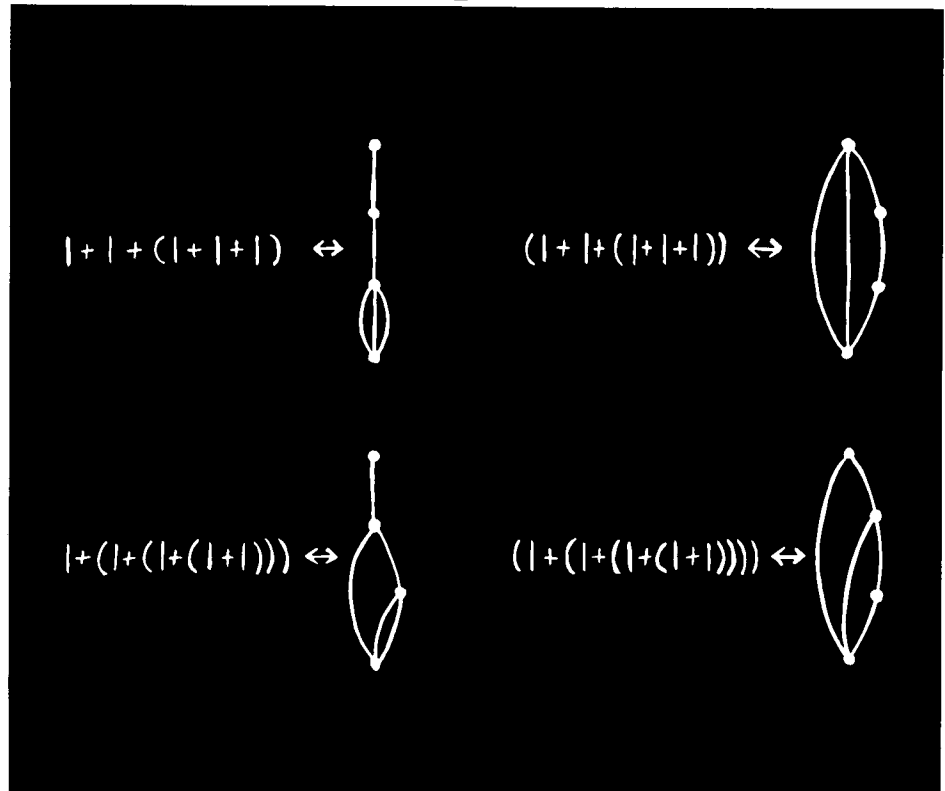
Tenure-track position (subject to funding) at asst-assoc rank beginning 8-21-92 to teach undergraduate-graduate mathematics courses, especially those involving applications. Teaching load: 12 hours per sem. Qualifications: doctorate in mathematics with appropriate specializations, e.g., discrete mathematics, numerical analysis, differential equations. Evidence of quality teaching, potential for scholarly growth; experience in business and/or industry desirable. Salary is competitive. Send letter of application, vita, transcripts, and three letters of recommendation to Dr. Helen Bass, Chair. Full consideration given to applications received by **12-13-92** or until position filled. (AA/AOE).

SOUTHERN CONNECTICUT STATE UNIVERSITY

New Haven, CT 06515
Department of Mathematics

Tenure-track position (subject to funding) at asst-assoc rank beginning 8-21-92 to teach undergraduate/graduate statistics and mathematics courses. Teaching load: 12 hours per sem. Qualifications: doctorate in statistics, evidence of quality teaching, potential for scholarly growth. Salary is competitive. Send letter of application, vita, transcripts, and three letters of recommendation to Dr. Helen Bass, Chair. Full consideration given to applications received by **12-13-91** or until position filled. (AA/AOE).

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Calendar

National MAA Meetings

8–11 January 1992 Seventy-Fifth Annual Meeting, Baltimore, Maryland (Board of Governors, 7 January 1992)
6–9 January 1993 Seventy-Sixth Annual Meeting, San Antonio, Texas (Board of Governors, 5 January 1993)
15–19 August 1993 Sixty-Eighth Summer Meeting, Vancouver, British Columbia (Board of Governors, 14 August 1993)

Sectional MAA Meetings

Allegheny Mountain Slippery Rock University, Slippery Rock, Pennsylvania: 10 and 11 April 1992
Eastern Pennsylvania and Delaware Drexel University, Philadelphia, Pennsylvania: 9 November 1991
Florida University of North Florida, Jacksonville, Florida: 6 and 7 March 1992
Illinois North Central College, Naperville, Illinois: 24 and 25 April 1992
Indiana Indiana University-Purdue University, Fort Wayne, Indiana: 18 and 19 October 1991
Intermountain Weber State University, Ogden, Utah: 10 and 11 April 1992
Iowa Graceland College, Lamoni, Iowa: 24 and 25 April 1992
Kentucky Bellarmine College, Louisville, Kentucky: 27 and 28 March 1992
Maryland-District of Columbia-Virginia Marymount University, Arlington, Virginia: 15 and 16 November 1991
Michigan Saginaw Valley State University, University Center, Michigan: 8 and 9 May 1992
Missouri Northwest Missouri State University, Maryville, Missouri: 10 and 11 April 1992
Nebraska Hastings College, Hastings, Nebraska: 10 and 11 April 1992
New Jersey County College of Morris, Randolph, New Jersey: 16 November 1991
North Central Bemidji State University, Bemidji, Minnesota: 18 and 19 October 1991
Northeastern Providence College, Providence, Rhode Island: 22 and 23 November 1991
Northern California University of the Pacific, Stockton, California: 29 February 1992
Ohio John Carroll University, University Heights, Ohio: 25 and 26 October 1991; University of Dayton, Dayton, Ohio: 27 and 28 March 1992
Oklahoma and Arkansas Henderson State University, Arkadelphia, Arkansas: 3 and 4 April 1992
Rocky Mountain Colorado College, Colorado Springs, Colorado: 10 and 11 April 1992
Seaway State University of New York, College at Fredonia, Fredonia, New York: 1 and 2 November 1991; Queen's College, Kingston, Ontario, Canada: 1 and 2 May 1992

Southeastern Kennesaw College, Marietta, Georgia: 10 and 11 April 1992
Southern California University of California at Santa Barbara, Santa Barbara, California: 9 November 1991
Southwestern University of Arizona, Tucson, Arizona: Spring 1992
Texas University of Houston-Downtown, Houston, Texas: 9–11 April 1992
Wisconsin University of Wisconsin—Centers at Fond du Lac, Fond du Lac, Wisconsin: 5 October 1991 (joint meeting with Wisconsin Mathematics Council); University of Wisconsin at Whitewater, Whitewater, Wisconsin: 24 and 25 April 1992

Other Meetings

1 and 2 November 1991 *The Sixth Annual Pi Mu Epsilon Regional Undergraduate Mathematics Conference*, St. Norbert College, De Pere, Wisconsin 54115-2099. The conference welcomes all students, faculty, and others interested in mathematics. Invited speaker: J. Douglas Faires of Youngstown State University. For additional information, contact: Richard L. Poss of the Department of Mathematics at St. Norbert College; (414) 337-3198.
1 and 2 November 1991 The Consortium for Computing in Small Colleges will sponsor its *Fifth Annual Southeastern Small College Computing Conference*, David Lipscomb University, Nashville, Tennessee. Theme: "In Support of Computing in Small Colleges." For additional information, contact: Frank D. Cheatham, Department of Mathematics, Campbellsville College, 200 West College Street, Campbellsville, Kentucky 42718; (502) 465-8158.
7–10 November 1991 *The Seventeenth Annual Convention of the American Mathematical Association of Two-Year Colleges*, (AMATYC), Westin Hotel, Seattle, Washington. For additional information, contact: Vicky Ringen, 1991 General Chair, Department of Mathematics, North Seattle Community College, 9600 College Way North, Seattle, Washington 98103; (206) 527-3746.
29 December 1991–2 January 1992 *First International Conference on Post High School Technical Education*, Jerusalem-Tel Aviv, Israel. An opportunity to discuss new programs and solutions to problems common to technical education throughout the world. Conference cochair Jakov Hecht of the Israel Ministry of Labour and Social Affairs invites topic suggestions and invited speaker nominations. For additional information, contact: ISAS, PO Box 574, Jerusalem 91004, Israel.
29–31 March 1992 *Fifteenth Annual Symposium on Developmental Education*, The Nevele Country Club, Ellenville, New York. The conference sponsor, New York College Learning Skills Association, seeks presentation proposals on all aspects of developmental education and learning support services at the college level. Submission deadline for proposals: **25 October 1991**. For additional information, contact: Barbara Risser, Department of English, Onondaga Community College, Route 173, Syracuse, New York 13215; (315) 469-7741, ext. 2424.

FOCUS

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