



# FOCUS

THE NEWSLETTER OF THE MATHEMATICAL ASSOCIATION OF AMERICA

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The Mathematical Association  
of America  
1529 Eighteenth Street, NW  
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For more pictures and highlights from the Joint Mathematics Meetings, please see page 6.



## MORE ON MATH HORIZONS

See pages 18 & 19

# FOCUS

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## A NEW LOOK FOR FOCUS

Welcome to Volume 14 of FOCUS, and to the new look.

In fact, the change in color and the appearance of the front page is just the last of a series of changes to the newsletter that have been going on since I took over as editor with the September 1991 issue. As a great believer in evolution rather than revolution, changes were made one at a time, spread over a long period. To me, and I suspect to almost all members of the Association, the appearance and contents of FOCUS constitute a large part of the identity of the MAA, so a rush of sudden changes was out of the question.

The first changes were to the contents, the most noticeable being the inclusion of more mathematics-news stories, the introduction of regular editorial and member opinion sections, and, in response to a request from the MAA's Committee on Electronic Services, the "Networks in FOCUS" section. I also tried to increase the number of photographs in each issue. Following reader requests, a listing of each issue's contents was added on a regular basis.

During 1993, we turned our attention to the appearance of the newsletter. We changed fonts, and moved from two- to three-column presentation. And this was very much a "we" operation. Each issue of FOCUS is put together by Amy Stephenson, the Washington-based Production Specialist, who has prior experience in the design of professional newsletters, so it was natural that she would play a major role in any design changes.

At the beginning of 1993, Amy had also been asked to produce a new cover design for FOCUS. The old design had served us well since FOCUS first appeared in March, 1981, and it was, I felt, time to let it enter a graceful retirement.

Times change, and new generations of mathematicians enter the profession, with new ways of looking at things, and surely the last thing the MAA wants to do is to portray itself as "old fashioned" and resistant to change. So the new-look FOCUS had to have a contemporary, "dynamic" appearance.

On the other hand, FOCUS should still look like "Focus"—evolution not revolution again. So, all in all, Amy's task was a tough one. What was more, any changes would have to meet with the approval of myself as Editor, Don Albers as MAA Director of Publications, and Marcia Sward as the MAA Executive Director, with the final result being subject to agreement by the Newsletter Editorial Committee. Tough indeed!

As always, Amy rose to the occasion, producing the design you now have before you. All of us involved in the production of FOCUS like it. I hope you do too.

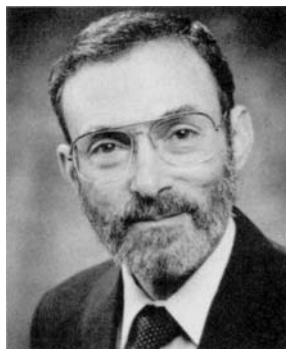
*Keith Devlin*  
FOCUS editor

## MAA Election Results

Kenneth A. Ross of the University of Oregon will be the next President of the MAA, following the term of Donald L. Kreider. Ross, who was elected in the balloting conducted this past spring and summer, will serve one year as President-elect, starting in January 1994, and succeed as President one year later, to serve a term of two years.

In the same election, Doris Schattschneider of Moravian College and James C. Donaldson of Howard University were elected First and Second Vice-President, respectively. Both will serve for two years beginning in January 1994.

Ross, who served as Associate Secretary of the AMS between 1970 and 1981, was Secretary of the MAA from 1984 until 1990 when he became Associate Secretary, the position he currently occupies. He has been a member of the MAA for 37 years. Having served on many committees and having visited twelve of the twenty-nine Sections as an invited speaker, Ross is thoroughly familiar with the work of the Association. He is the coauthor, with E. Hewitt, of *Abstract Harmonic Analysis I, II*, and, with C. R. B. Wright, of *Discrete Mathematics*, and author of *Elementary Analysis: The Theory of Calculus*.



Ken Ross, MAA's President-Elect

Schattschneider is a former editor of *Mathematics Magazine* and has served on two separate occasions as a member of the Board of Governors. She has chaired or been a member of a number of MAA committees. In 1993 she won the MAA's National Award for Distinguished College or University Teaching of Mathematics. She has been an MAA member for 23 years. Well-known for her work on M. C. Escher, her most recent book is *Visions of Symmetry*.

Donaldson has been editor of the *NAM Newsletter* and is on the Editorial Board of *UME Trends*. He has served the MAA on the Committee on the Undergraduate Program in Mathematics (CUPM), as well as various other committees, and is the MAA Representative on the COMAP Consortium Council. He has been a member of the MAA for 29 years.

## New National Science Foundation Initiative

### Mathematical Sciences and their Applications throughout the Curriculum (CCD-MATH)

Closing Date for Planning Grants: June 6, 1994

Closing Date for Comprehensive Proposals: February 6, 1995

The purpose of this initiative, managed by the Division of Undergraduate Education in cooperation with the Division of Mathematical Sciences, is to promote broad and significant improvements in undergraduate education that lead to increased student appreciation of and ability to use mathematics. Comprehensive projects are expected to serve as national models for improving student understanding in the mathematical sciences, better integrating mathematics into other disciplines, and improving instruction in the mathematical sciences by incorporating other disciplinary perspectives.

For more detailed guidelines on the goals and scope of this initiative, please call: (703) 306-1666, and request information on the Mathematical Science Initiative.

## The World's Largest Rhombicosidodecahedron

MAA Governor-at-Large S. Brent Morris helps a group of 4th and 5th graders hold up the polyhedron they have just made, which they believe is the largest rhombicosidodecahedron ever constructed. The students all belong to Mrs. Priscilla Shaver's Gifted and Talented math class at Longfellow Elementary School, in Columbia, Maryland.

Each polygonal face of the record-establishing figure measures 13 inches on a side. It took the group about two hours to construct it, spread over two days.

The group's next challenge is to produce the world's largest snub icosidodecahedron. In the meantime, if any FOCUS readers feel they want to take up the challenge and better the new record . . .



❄️ Sorry for the Delay ❄️

The February FOCUS was delayed due to the severe winter weather experienced in Washington, DC this past January. We are sorry for any inconvenience this might have caused. ❄️

# Getting Hired at a Teaching College

Sandra Z. Keith

St. Cloud State University, with close to 15,000 students, is one in a battery of six state universities in Minnesota. This perhaps contributes to the fact that we are not a household name as colleges go. Nevertheless, in many ways, we have a finger on the pulse of the average student, pay attention to trends in education, and are strongly motivated to move forward. Public-directed institutions tend to have public goals. This, plus the fact that we are a former normal school, contributes to our emphasis on excellence in teaching. We accept the upper 50% of the graduating class, and most of our students are first generation in college, hard-working, holding jobs, and ill-prepared. We are, in other words, known to Ph.D.-granting institutions as a "teaching college." We are also the type of college most Ph.D. advisors hope their students will not settle for, and that, to many, has come to be regarded as a natural repository for their research "failures," all of whom are "excellent teachers."

Recently we completed a search and, like many schools, had a record number of highly qualified applicants. Most of us on the search committee conceded that we ourselves would not have gotten jobs under the pressure of this competition. One can hardly offer the proper words of condolence to the many candidates who have chosen to spend years of their lives in one of the most difficult fields, only to be turned down.

However, as a member of that search committee, I would like to offer some feedback that might be helpful to candidates, their advisors, and their schools. Sometimes it is a matter of small things a candidate can do; in other places, it becomes a criticism of ivory tower aspects of graduate schools that have a casual disregard for placing their students at schools like ours, in spite of the fact that candidates might want to come.

## Job Description

Affirmative action rulings dictate that this is all-important; however, at a teaching school, there may be intangibles that are not reducible to area specialty, causing the description to be loosely framed. Call or write to ask if you have questions about our description. Perhaps we must fill a need for teaching a

course, want to drum up a student clientele in an area in which we wish to expand, or are seeking someone who is compatible with, or complementary to, the faculty on hand. Look at our catalogue in your library, but, by all means, ask.

## Teaching

Most candidates now submit a letter outlining their personal philosophy of teaching. This is valuable, but many statements are so routine (and some use the same key phrases) that one might almost suspect that a master form is going around. A school like ours is impressed by contact hours, personal engagement with students, and a sense of the reality—not the myths—about student learning. It is not enough to have an excellent philosophy of teaching; supporting letters should document that this philosophy is acted on and continually thought about.

Candidates usually include results from teaching evaluations; we appreciate seeing raw scores and an interpretation. Remember to inform us of the grading scale—a "1" can mean excellent or poor. Low scores seem honest (we've all had them); but by any account, it would be helpful to see included in the teaching philosophy statement, a self-evaluation from the candidate. This might discuss successes or areas in which the candidate wants to improve. Schools with an overall coordinator of teaching assistants and a formal method for reporting individual scores in context are doing their students a favor. Scores reported by the hand of the candidate do not seem to carry the same forcefulness. (We notice, incidentally, that almost all schools with such a system find their teaching assistants' scores higher than those of the faculty.) Schools that provide their students with awards, certificates of merit, letters of thanks from the chair, etc., appear to be especially conscientious about their teaching standards. Nevertheless, most schools have lackluster evaluation forms that do not give specific information about teaching capability and energy, but rather inform about the "likability" of the candidate—something that can also be associated with easy grading. The same applies to individual comments from evaluations such as, "This

is the best teacher I ever had." Comments like these are to be prized by the teacher, but in the flood of applications are not necessarily given much credence by the search committee. Candidates might consider designing their own (additional) evaluations, and asking for them to be approved, collected, and interpreted by a faculty member. Then there is the Brown University system, in which students intelligently comment on results of student summaries and publish these results. This is formidable perhaps, but highly impressive.

Letters by faculty evaluating teaching are perused seriously. These letters are most useful when they discuss specifics of teaching style. Candidates should know that in this day of open letters, it is rare to encounter a negative letter. A friend of mine says that at his (first-rate) institution, "good" is a condemnation—they look for the word "excellent." Schools also get their reputations from these letters. One excellent school sent forward several candidates with one-line references to their teaching, stating that, as well as they could gather, the candidate looked like a good teacher for a teaching college. We felt sorry for these abandoned candidates.

## Computer Experience

It is probably a good idea for any graduate student to have some experience with computers, and it is particularly exciting to see a teaching assistant given the opportunity to experiment with calculator or computer algebra systems in the classroom. Candidates should list in depth their experience with computers and include their teaching experiences in their personal philosophy statement. (This may be a loaded issue at some colleges, however, so go carefully.)

## Research

Most candidates have a teaching reference and a research reference. Advisors frequently claim that the candidate's research gives a world-class result. This is nice, but our search committee often had difficulty, in fact, understanding the advisor's commentary on the research. The candidate or advisor might offer a condensation, in layperson's terms, regarding what areas of

## Please supply three letters of reference

With the 1993–94 academic hiring season now fully underway, mathematicians fortunate enough to have a faculty position are likely to find themselves asked to write letters of reference for their students. For those of you who face this task, and are finding yourself at a loss as to what to say, FOCUS presents the following sample letter. We think it speaks for itself.

*Dear Search Committee Chair,*

*I am writing this letter for Mr. John Smith, who has applied for a position in your department. I should start by saying that I cannot recommend him too highly.*

*In fact, there is no other student with whom I can adequately compare him, and I am sure that the amount of mathematics he knows will surprise you.*

*His dissertation is the sort of work you don't expect to see these days. It definitely demonstrates his complete capabilities.*

*In closing, let me say that you will be fortunate if you can get him to work for you.*

*Sincerely,*

*A.D. Visor (Prof).*

expertise are involved, what courses the candidate can teach, his or her future prospects in research. It is useful to know about the energy and independence of the candidate.

Candidates today cannot assume that a “teaching” college is not interested in research, especially as departments like ours, catering to the needs of our students, become more applied. However, the term “research”—for us, not all colleges—is still loosely enough defined that scholarly activity is given substantial weight. Here, it seems to me, many Ph.D.-granting institutions fail their students. Most graduate students do not know about student mathematics competitions and have had no experience trying to obtain grants or work with students conducting research. They are unfamiliar with mathematics teaching journals and newsletters, in which publications (at our school) would be acknowledged. More importantly, if students would glance at these journals, they would be more informed about the trends which we are having to deal with. Nor have most graduate students been involved in curriculum reform, worked with underrepresented groups, or remedial coursework, etc. Enterprising graduate students might consider doing this on a

volunteer basis, but it would seem that the entire university would benefit if graduate students were given mentoring responsibilities, exposure to the grant-hunting process, and administrative experience in some of these activities. Far from distracting graduate students from their research, these opportunities are empowering and broadening; they prepare students realistically for what they will have to be doing when they graduate. Talks at regional MAA meetings and presentations at the school itself are also given credit; graduate students should take advantage of these opportunities. It may be a cliché, but we are primarily looking for leadership.

### Interview

Lastly, at the interview stage, candidates should understand that the college, like a sports team, is looking for a personal match, and a rejection is probably not at all personal. (This is easy to say, difficult to hear.) In preparing, candidates should request the school bulletin and they should come with questions. At our school, a talk for faculty and students is given significant weight because this is the opportunity for the department as a whole to give comments on the search committee's choices. A candi-

## Mathematics Awareness Week 1994

“Mathematics and Medicine”

April 24-30, 1994

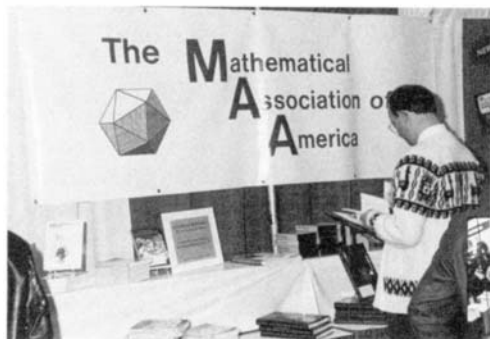
Mark your calendars now and plan to observe Mathematics Awareness Week in your area, institution, or organization. With the theme of Mathematics and Medicine, Mathematics Awareness Week provides an excellent opportunity to celebrate the beauty and power of the mathematical sciences. Please do your part to promote public awareness of mathematics from Sunday, April 24—Saturday, April 30, 1994. Look for further information from the Joint Policy Board for Mathematics, national sponsor of Mathematics Awareness Week, in future issues of FOCUS.

date might justifiably wonder how to plan a talk for faculty and first-year students in the same room—my personal advice is not to aim too low. A description of one's research is a good topic if it doesn't become glib through the need to arch over the details. A good talk is frequently a smaller related topic, similar to the articles in the MAA teaching journals. For us, the topic need not contain original results, but if it leaves us with questions, we will leave the room thinking. In the actual interview with the search committee at our school, questions must pass critical approval from the affirmative action officer and must be asked in the same way of all candidates. The candidate might be asked about experiences teaching women, minorities, and the handicapped, as well as questions about good and bad experiences in teaching, willingness to teach service courses, a plan for balancing research and teaching, and five-year goals. The main question is: How will the candidate fit with us? and, while past performance is a measuring rod, the forward-looking candidate has the advantage.

*Sandra Z. Keith teaches in the Department of Mathematics and Statistics at St. Cloud State University in St. Cloud, Minnesota.*

# Joint Mathematics Meetings

*Cincinnati, Ohio  
January 12-15, 1994*



## Math Chats

On Tuesday evening, well-known mathematicians representing a wide range of disciplines joined graduate students for informal chats and hot chili at Cincinnati's Skyline Chili. Approximately 100 students and 30 mathematicians attended the event. A good time was had by all.



*L - Bill Hawkins (MAA Director of SUMMA), enjoying Cincinnati's famous Skyline Chili with students.*



*Center - Ingrid Daubechies (AT&T Bell Labs and Princeton University), and Andrew Gleason, (Harvard University) talk with students over bowls of chili.*



*R - V. Fred Rickey (MAA Visiting Mathematician, and Bowling Green State University) caught between bites.*

*FOCUS Editor, Keith Devlin chats with some students.*





## MAA Author's Reception

Many recent MAA authors gathered to celebrate the success of the MAA Publications program, and to sign books.



◀ *Rosemary Schmaltz, author of Out of the Mouths of Mathematicians, and Underwood Dudley, author of Mathematical Cranks.*



▲ *L to R: Andrew Sterrett (MAA Assistant Director for Programs), editor of Using Writing to Teach Mathematics, Donald Kreider (MAA President.) and Zaven Karian (Denison University), Editor of Symbolic Computation.*



◀ *Marcia P. Sward (MAA Executive Director), and Alvin M. White (Harvey Mudd College), editor of Humanistic Mathematics.*



◀ *Constance Reid signs a copy of her newest book, The Search for E.T. Bell, for MAA Treasurer, Gerald Porter, editor of Computers in Mathematics*



▶ *Joan Hutchinson (Macalester College), and Anita Solow (Grinnell College, and MAA Visiting Mathematician), editor of Learning by Discovery.*

## Jerry Alexanderson Re-Elected as MAA Secretary

### Board of Governors Meeting, Cincinnati

The Board of Governors of the MAA, meeting in Cincinnati in January, re-elected Jerry Alexanderson of Santa Clara University for a further term as Secretary to the Association. Alexanderson was greeted with an enthusiastic round of applause when he re-entered the room after the vote.

The Board also elected Donovan van Osdol, of the University of New Hampshire, as the new Associate Secretary, to replace Kenneth Ross, who gives up the position following his recent election as the next MAA President.

In other elections, the Board chose Patrick McCray, of the G.D. Searle Company in Winnetka, Illinois, as Governor-at-Large representing mathematicians outside academia, and Genevieve Knight, of Coppin State College in Baltimore, Maryland, as Governor-at-Large concerned with teacher education.

Linda Hill, of Idaho State University, was elected Chair of the Committee on Sections, and Barbara Faires, of Westminster College, was re-elected to the Finance Committee.

Among the many other items discussed during the course of the day-long meeting was the future development of electronic services to members. V. Frederick Rickey, currently a Visiting Mathematician at the MAA Headquarters, outlined the Association's plans for installing a Gopher service, which would provide members with easy and rapid electronic access to a whole range of information posted by the headquarters staff.

Noting the enormous changes in the political situation in South Africa, the Governors voted to drop the rule put in place by the Board in 1987 which barred MAA investments in that country.

During the lunchtime recess, Board members discussed ways to ensure the future success of *Math Horizons*, the MAA's new



journal for undergraduate mathematics, which Don Albers had brought into being at the end of 1993.

Towards the end of the day, the Board was host to a visit from Ms. Roxanne Qualls, the Mayor of Cincinnati, who agreed to address the Governors on the matter of "Issue 3," the amendment to the city's charter which the citizens of Cincinnati had passed last November. Reminiscent of the Colorado vote that had caused the MAA and the AMS to move the January 1995 Joint Meetings from Denver to San Francisco, Issue 3 removed legal protection from discrimination based on sexual orientation. The Cincinnati vote had come too late for the MAA and AMS to do anything other than to express their concern about this development, which they did in the form of a joint letter to Mayor Qualls, signed by MAA President Kreider and AMS President Ronald Graham. The Mayor's visit was in response to that letter.

The Board stressed that their intention was not to pass comment on the internal affairs of the City of Cincinnati, rather they were concerned about the social climate that would surround their members attending the meeting, some of whom would be among the categories no longer offered protection from discrimination. The discussion was frank but cordial. The Mayor was thanked warmly for her visit.

Given the present climate of opinion in various parts of the country, and the possibility of similar occurrences elsewhere, there was some further discussion as to what to do about future meetings. When the Association finds it necessary to move its venue, as happened with the 1995 January meetings, it can become liable for financial penalties. It was felt prudent to try to include in any future contract for meetings accommodations, a clause that offers protection against such developments, but it was not clear how successful the Association is likely to be in this regard.

## The Employment Register

### Looking for The Right Match

Many students and institutions participated in the Employment Register in the hopes of finding the right match. Interviews were scheduled over two days and gave both parties a chance to get to know each other.





## First-Time Attendees Social — A Magical Success

S. Brent Morris (National Security Agency), provided magical entertainment at the First-Time Attendees Social, much to the delight of the crowd, and his assistant (victim), MAA President Donald Kreider.



## Governors Approve MAA Strategic Plan

The Board of Governors of the MAA, meeting at the Joint Mathematics Meetings in Cincinnati in January, gave their unanimous approval to the Association's Strategic Plan.

The Strategic Plan builds upon the long-range planning report, *The Fourth Quarter Century*, which was adopted by the Board of Governors in January 1987.

At its previous meeting, in Vancouver, Canada, August, 1993, the Board had already given approval to the mission and goals stated in the plan. The goals, which express the declared mission of the Association ("To advance the mathematical sciences, especially at the collegiate level"), are split into two groups, four programmatic goals, and five operational goals.

The program goals are:

A. Education. Stimulate active learning,

promote effective teaching, and encourage appropriate assessment in the mathematical sciences.

B. Professional Development. Foster scholarship, professional development, and a spirit of association among mathematical scientists.

C. Students. Enhance the interests, talents, and achievements of all individuals in the mathematical sciences, especially of members of underrepresented groups.

D. Public Policy. Influence institutional and public policy through advocacy for the importance, uses, and needs of the mathematical sciences.

The five operational goals are:

I. Sections. Strengthen local opportunities of MAA members for leadership and influence.

II. Publications. Advance quality exposition of mathematics for students, faculty, professionals, and the public.

III. Governance. Enhance effectiveness of MAA governance.

IV. Membership. Expand MAA membership to include all who have a professional stake in college-level mathematics.

V. Finance. Enhance financial support for current and new MAA programs.

The major portion of the Plan, which is seventeen typescript pages long, consists of a series of objectives and proposed initiatives, arranged under each of the program and operational goals. It was this more detailed list of recommendations that was under discussion in Cincinnati, and to which the Board ultimately gave its approval.

Please see *Strategic Plan* on page 35

# Prizes and Awards in Cincinnati

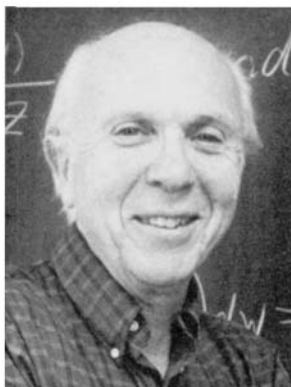
## Awards for Distinguished College or University Teaching of Mathematics

Instituted by the MAA in 1991, in future years these awards will be known as the Deborah and Franklin Tepper Haimo Awards. This change in name follows a recent major gift to the Association from Past-President Haimo, who instigated these awards.

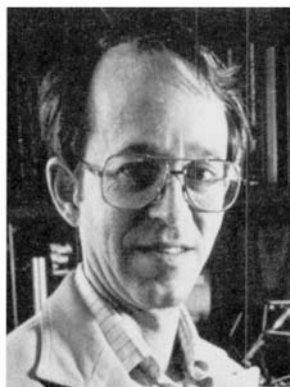
The three recipients in Cincinnati were Paul Halmos (Santa Clara University), Justin J. Price (Purdue University), and Alan Tucker (State University of New York at Stony Brook). Later in the meeting, the three award winners each gave a short lecture describing their approach to teaching.



Paul Halmos



Justin J. Price



Alan Tucker

## Certificate of Merit

The MAA Certificate of Merit is presented from time to time to "individuals who have made exemplary contributions to the MAA or the mathematical community in general." Eleven such presentations have been made since the program was established in 1977.

At Cincinnati, the Certificate of Merit was presented to Dr. I. Edward ("Ed") Block. As a young mathematician working at Philco Corporation, Dr. Block founded the Society for Industrial and Applied Mathematics (SIAM) in 1951, and remained its Managing Director from then until his official retirement from the Society last year.

The MAA awards ceremony took place in conjunction with that of the AMS (and, for the first time this year, the Association for Women in Mathematics). The AMS made a simultaneous presentation to Dr. Block.



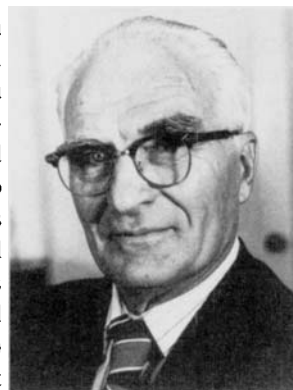
I. Edward Block



Barry Mazur

## Distinguished Service Award

The Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics was awarded to Dr. James Sutherland ("Sud") Frame. First given in 1990, this is the most prestigious award made by the Association.



Dr. Frame was instrumental in the growth of the mathematics honor society Pi Mu Epsilon, and personally installed more than fifty Chapters. In 1952, he created and developed the highly successful Pi Mu Epsilon Summer Student Paper Conferences in conjunction with the MAA and the AMS. He was President of Pi Mu Epsilon for nine years, from 1957 to 1966.

In addition to his work with Pi Mu Epsilon, Dr. Frame has been actively involved with many other professional and civic organizations, including a period as an MAA Governor. At the request of the Association, he organized the first MAA-AMS Employment Register, which he chaired from 1953 to 1958.

## Chauvenet Prize

The Chauvenet Prize for expository writing, first awarded in 1925, is given for an outstanding expository article on a mathematical topic by a member of the Association. This year, the prize went to Dr. Barry Mazur (William Petschek Professor of Mathematics at Harvard University), for his article "Number Theory as Gadfly," which was published in the *American Mathematical Monthly* 98 (1991), pp.593-610.

The award turned out to be unexpectedly timely. In his article, Mazur explains much of the mathematics that lies behind Andrew Wiles' recent proof of Fermat's Last Theorem. The article was chosen for the award in April, 1993. Wiles announced his proof in June!

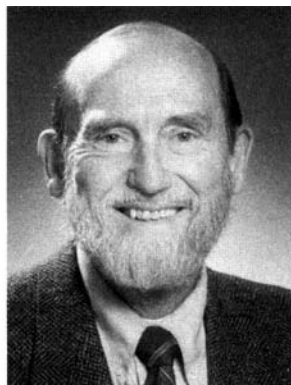
### Certificates for Meritorious Service

Ateach January meeting, the MAA presents Certificates for Meritorious Service to honorees from roughly six Sections. The Certificate marks recognition of service at the national or Sectional level.

The recipients at the Cincinnati meeting were Billy F. Bryant (Professor Emeritus, Vanderbilt University), from the Southeastern Section; Gerald A. Heuer (Sigurd and Pauline Prestegaard Mundhield Professor of Mathematics at Concordia College), North Central Section; Clifford A. Long (Professor of Mathematics and Statistics at Bowling Green State University), Ohio Section; Paul T. Mielke (Professor Emeritus, Wabash College), Indiana Section; David L. Skoug (Professor of Mathematics, University of Nebraska at Lincoln), Nebraska Section; and Jimmy L. Solomon (Professor of Mathematics, Mississippi State University), Louisiana–Mississippi Section.



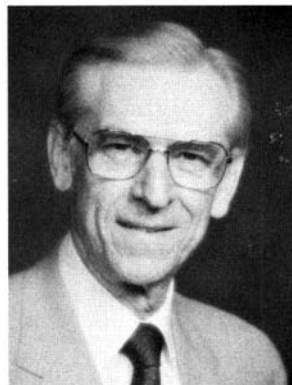
Billy F. Bryant



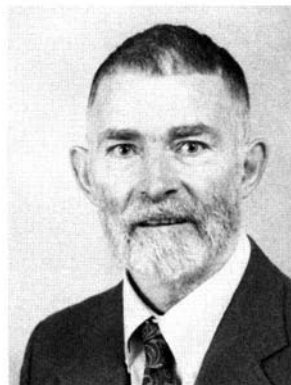
Gerald A. Heuer



Clifford A. Long



Paul T. Mielke



David L. Skoug



Jimmy L. Solomon

### Beckenbach Book Prize

Named for the late Edwin Beckenbach, and awarded for distinguished, innovative books published by the Association, the Beckenbach Book Prize for 1994



went to Professor Steven George Krantz (Washington University, Saint Louis), for his book *Complex Analysis: The Geometric Viewpoint*, published in the Carus Mathematical Monograph Series in 1990.

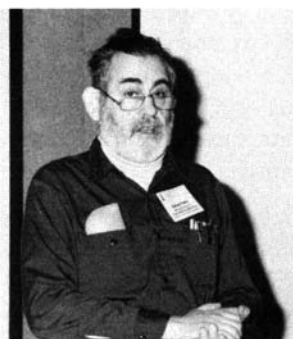
In 1992, Dr. Krantz was awarded the Association's Chauvenet Prize.

Joe Gallian (University of Minnesota-Duluth), outgoing chair of the MAA Newsletter Editorial Committee, on arriving for a long, early morning session of the MAA Publications Committee remarked:

*"Where's the breakfast?"*



There were numerous minicourses, short courses, lectures, panel discussions, and contributed paper sessions.



## Invited Addresses A Big Success



László Lovasz (Eötvös Loránd Tudományegyetem, Budapest, Hungary)



Subrahmanyan Chandrasekhar (University of Chicago)



Georgia M. Benkhart (University of Wisconsin)



William W. Dunham (Muhlenberg College)



## Haimo Gives Retiring Presidential Address

“Experimentation and conjecture are not enough.” This was the title of the MAA address given by former MAA President Deborah Tepper Haimo, on Friday, January 14, at the Cincinnati Joint Meetings.

As is customary, the retiring presidential address is given at the end of the year following the presidency, during which year the ex-president continues to serve in an official capacity. Dr. Haimo served as President of the Association from January 1991 to January 1993.

Dedicating her talk to her late husband, Franklin Tepper Haimo, Dr. Haimo began by observing that she had been president during a particularly exciting time, when the various special areas of mathematics were coming together, emphasizing the unity of the discipline. She was, she said, particularly heartened to note that there is now growing recognition that good teaching cannot be separated from good research, and declared that “we must be more successful in communicating the tenets of our field to the broader community.”

Mathematicians had responsibilities to many different sections of society, Dr. Haimo noted: to the creative investigators at the forefront of research; to the professionals who find practical applications of developed theories; to the teachers, from kindergarten to university level; to the amateurs who generate and maintain public interest in the field; and to the broad, mathematically literate citizenry, who are aware of the importance and power of mathematics, and appreciate its need for public support.

In a period of great change in mathematical education, she continued, we need to be careful that valuable new approaches are not followed at the expense of equally valuable old ideas. Experimentation, conjecture, and problem-solving are all highly important, she agreed, but so too is the one thing that, among the sciences, is particularly unique to mathematics—the notion of proof.

She regretted that an emphasis on proof is “all too often ignored in our educational process,” reminding the audience that, “Problem solving is not complete until the results have been firmly established. Proofs are an integral part of mathematics and must not be overlooked.”

“It is important that, in our efforts to make



mathematics more relevant, attractive, and accessible to a greater number of students, we avoid discarding its fascinating and surprising features. Since these features must have attracted most of us, it seems reasonable to believe that they would appeal also to a segment of our students.”

“We cannot afford to neglect the education of those students who are drawn to what generally are thought to be the more challenging aspects of mathematics; we cannot assume that they will manage well without our help and direction.”

To highlight her point that mathematics education must lay stress on its distinguishing notion of proof, she recounted the familiar



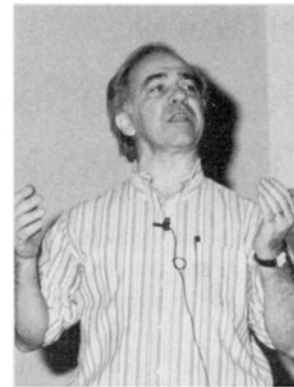
Deane Arganbright (Whitworth College)



Kenneth A. Ribet (University of California)



Brad G. Osgood (Stanford University)



Stephen Monk (University of Washington)



joke of the physicist, who concludes that all odd numbers are prime, on the basis of the evidence of the odd numbers from 3 to 11—with the unfortunate observation about 9 being an experimental error.

“In mathematics, there is no middle ground,” she proclaimed, “It is all or nothing.”

While acknowledging again the importance of providing students with experiences involving experimentation, conjecture, and justification, she presented a number of well-known examples from number theory that illustrate the danger of placing too great a reliance on these aspects of mathematics.

The Polya Conjecture was one of the examples she gave. This states that, for any  $N$ , the number of positive integers less than  $N$  having an odd number of prime factors is never less than the number having an even number of prime factors. Hand calculation confirms this for the first fifty values of  $N$ , and a computer search will verify the result into the hundreds of millions. And yet, in 1958, C. B. Haselgrove proved that the conjecture fails for infinitely many values of  $N$ . The first specific counterexample,  $N = 906,180,359$ , was discovered by R. S. Lehman in 1962. The smallest counterexample was not found until 1980, when M. Tanaka showed that the conjecture

fails at  $N = 906, 150, 257$ , but holds for all smaller values of  $N$ .

She gave the Riemann Hypothesis and the Fermat Conjecture as two very famous examples of problems where the enormous amount of case-by-case, computational evidence was still not enough to establish truth. Though a highly respected mathematician, Andrew Wiles, had recently announced that he could prove the Fermat Conjecture, the mathematical community would not be satisfied that the conjecture was true until a complete proof had been published and its correctness established.

Noting that the recent events surrounding the Fermat Conjecture had aroused considerable public interest, Dr. Haimo expressed concern at the image the mathematics community presents to the public at large.

“Solutions of deep and difficult problems lead to the persistent public impression that to work in mathematics, at whatever level, requires superhuman talent, and that those so endowed can understand the incomprehensible and arrive at seemingly miraculous conclusions without great effort. ...

“We need to extend public awareness to the realization that mathematics is more than arithmetic calculations, algebraic manipu-

lations, and Euclidean geometric proofs, and that studying calculus is not the ultimate attainment. We must counter the general perception of mathematics as a static subject, and the image of mathematicians as technicians who can solve any problem.”

Concluding her address with a return to her main theme—the importance of proof as part of a wide spectrum of skills in mathematics—Dr. Haimo pointed out that:

“By adopting a problem solving approach, we have a means of providing students with a significant mathematical experience and deeper understanding of the nature of the discipline. By introducing appropriate use of the new technology, with recognition of its limitation, we will be able to widen and enhance our students’ mathematical range.

“By emphasizing the importance of realizing that more is required in mathematics than mere experimentation and conjecture, and by expecting the ablest students to prove assertions and validate them, we can educate all to the full extent of their abilities. This will not only enrich their lives, but prepare them to take their place in, and contribute to, modern society, and assure the continuation of the discipline as a major force in the world.”

## Panel Discussion:

## Effective Job Seeking in Today's Market

Sponsored by the AMS–MAA–SIAM Committee on Employment Opportunities, this panel discussion advised job seekers of the realities of the current market and discussed the best methods for determining what jobs they should seek and how to effectively carry the employment process. Panelists included: from L–R in the first photograph: Leon H. Seitelmann (Pratt & Whitney Aircraft), Frank R. Demeyer (Colorado State University), Annalisa Crannell (Franklin and Marshall College), Lawrence Gilligan (University of Cincinnati), and Clark Benson (National Security Agency), and was moderated by Stanley J. Benkowski (Wagner Associates)



## Internet To Help Rural Mathematics and Science Teachers

The Annenberg/CPB Math and Science Project announced last November that four-thousand math and science teachers in rural areas, particularly the West, will gain expanded access to new teaching tools. Aimed at ending the isolation of such teachers, the rural telecomputing initiative will give them the technical skills, hands-on experience, and ongoing support to incorporate resources of the Internet and other computer networks into their lesson plans, and share their new skills and resources with peers.

Five projects, jointly funded by Annenberg/CPB and U S WEST Foundation, for a total of \$2.5 million, will enable elementary and secondary teachers to learn how telecomputing can bring a new world into their classrooms. Mara Mayor, director of the Annenberg/CPB Math and Science Project, said, "We'll start with helping teachers navigate on the computer networks, and move to establishing a computerized community of educators all working to improve math and science education."

"Before long, we expect to see students also regularly using telecommunications technologies to conduct scientific research and mathematical analysis and to share their ideas nationally and internationally," said the executive director of U S WEST Foundation, Jane Prancan.

The five chosen projects, scheduled to begin this year, are:

**Big Sky Telegraph of Western Montana College** The project will recruit an online group of mentor teachers to receive training to help them create math and science curricula using telecommunications. These teachers will learn to navigate and glean information from the Internet, and will use these skills to develop a library of problem-based math and science lessons.

**Boulder Valley School District, CO** The Boulder Valley project will help math and science teachers learn to navigate through the network to find the resources they need, and then to integrate up-to-date information about rural life and other topics into their

teaching. Regional centers will be established around the country to work with teachers in their own areas.

**Eastern Washington University** This project will develop a multi-media lesson package to help teachers learn to use and see the value of the Internet. The self-contained package will demonstrate telecomputing using sample teaching units, videos of lessons being taught in the classroom and of Internet users, and printed user's guides for computer networks.

**Technology and Information Education Services (TIES), MN** This statewide organization financed by the Minnesota school districts will test an approach to accelerating the pace of math and science reform with telecomputing. Local teams of teachers will help middle school students work on real problems in their community—problems of agriculture or the environment—that children can address if they learn to use the tools of math and science.

**The University of Tennessee at Chattanooga** As in the TIES project, Tennessee teachers will learn to use the Internet to design math and science lessons that involve solving local community problems. To practice their skills, the teachers and their classes will contribute to the Marsville Project. Marsville is a multi-disciplinary program in which participants use telecomputing and long distance communications to collaborate on the design of a human habitat on Mars.

The Annenberg/CPB Math and Science Project is funded by a \$60 million grant from The Annenberg Foundation to the Corporation for Public Broadcasting. Its goal is to help improve math and science education for all school-aged children.

The U S WEST Foundation manages charitable contributions and grantmaking programs on behalf of U S WEST, Inc., and its family of companies.

# Minnesota MathFest: August 94

## Call for Papers

The second MathFest will take place at the University of Minnesota in Minneapolis from Monday, August 15, through Wednesday, August 17. The first of these MathFests, jointly organized by the American Mathematical Society and the Mathematical Association of America, was held at the University of Maine in Orono in 1991 and was a big success. The program will include a series of Hedrick Lectures by AMS President Ronald L. Graham (AT&T Bell Laboratories), and three Joint AMS-MAA Invited Addresses by: Todd Arbogast (Rice University); Cameron McA. Gordon (University of Texas at Austin); and Carole Lacampagne (U.S. Department of Education). As with every MathFest, there will be minicourses, and panel discussions, as well as a full program of events especially prepared for students. The complete program of the meeting will appear in the April issues of FOCUS and the *AMS Notices*.

As usual, there will be sessions of contributed papers. The organizers below solicit contributed papers pertinent to their sessions. The following should be sent directly to the organizer of the session marked with an asterisk (\*): the name(s) and address(es) of the author(s), and a one-page summary of your paper. The summary should enable the organizer(s) to evaluate the appropriateness of your paper for the selected session, so you should include as much detailed information as possible within the one-page limitation. Your summary should reach the designated organizer by **Tuesday, April 26**. The organizer will acknowledge receipt of all paper summaries. If the paper is accepted, you will receive a standardized MAA abstract form and further instructions.

### Environmental Mathematics

Ben Fusaro \*  
Dept of Mathematics and Computer Science  
Salisbury State University  
Salisbury, MD 21801  
E-mail: E3FAFusaro@SAE.Towson.EDU  
phone: (410) 543-6470; FAX: (410) 548-5597

Papers that deal with concepts or contents that can be used in introductory mathematics courses such as Pre-Calculus, Applied ("baby") Calculus, and Mathematics in Culture, are especially welcome. However, all undergraduate applications of mathematics to the environment are welcome.

### Gateway to Mathematics on the Internet

Lawrence S. Husch \*  
Department of Mathematics  
University of Tennessee  
Knoxville, TN 37996  
E-mail: husch@math.utk.edu

Earl D. Fife  
Calvin College

Eugene A. Herman  
Grinnell College

This is a session dedicated to introducing a variety of services on the Internet beneficial to mathematicians. The workshop will begin with an introduction to the Mathematics Archives and will be followed by presentations of other major Internet sites of interest to the mathematical community. Short formal presentations will be followed by hands-on demonstrations.

### Innovative Projects in First Year Courses

Howard Lewis Penn \*  
Mathematics Department  
U.S. Naval Academy  
572 Holloway Road  
Annapolis, MD 21402-5002  
E-mail: HLP@USNA.NAVY.MIL  
phone: (410) 267-3892

Aaron I. Stucker  
Washburn University

This session, which is sponsored by the Committee on Computers in Mathematics Education, will focus on innovative teach-

ing approaches in first year mathematics courses such as College Algebra, Trigonometry, Precalculus, and Finite Mathematics. Projects that use technology are especially encouraged; however, other projects are also welcome.

### Recreational Mathematics and Computing

Charles Ashbacher \*  
DecisionMark Corp.  
300 2nd Ave. SE, Suite 300  
Cedar Rapids, IA 52401  
E-mail: 71603.522@compuserve.com  
phone: (319) 363-6235; FAX: (319) 365-5694

Mathematicians at all levels often engage in mathematical play and the results are always interesting and occasionally revolutionary. This session will feature papers describing such play. Due to the broad spectrum of possibilities, no topic should be considered forbidden. Problems where a computer was used in the solution are particularly welcome. To make the results understandable to the widest possible audience, all programs should be written in a well-known language such as BASIC, FORTRAN, Pascal or C.

### Winning Women into Mathematics

Marcelle Bessman \*  
644 Geneva Place  
Tampa, FL 33606  
E-mail: jtaylor@madonna.coedu.usf.edu.

Miriam P. Cooney  
Saint Mary's College, Indiana

Gerald J. Porter  
University of Pennsylvania

Papers on successful programs to recruit and retain women in mathematics are solicited. Submissions should include a description of the program, documentation of its success, discussion of its transferability to other institutions or groups, and available materials and resources for implementation.

# EDITORIAL

## Marginal Interest?

With Fermat's Last Theorem a theorem at last, FOCUS (August, 1993) asked readers for their suggestions as the next "Fermat Problem". To qualify for this honor, a mathematical problem would have to be simple to state, easy for the layperson to understand, likely to defy attempts at a solution for many years, and require some heavy mathematical machinery when that solution does finally come.

FOCUS readers were eager to take up the challenge, and the file of letters sent in soon grew quite large. And yet, there were remarkably few suggestions that seemed to fit the bill. Some were discarded because they were not readily understood by the layperson; so anything that required knowledge of, say, calculus or group theory in order even to state the problem was ruled out. Also eliminated were problems that depended on any prior definitions of new notions.

So what was left? Well, the most common suggestion was the familiar "hailstone number" problem concerning the sequence generator that starts with any number and then asks you to iterate the following operations: replace  $N$  by  $N/2$  whenever  $N$  is even; replace  $N$  by  $3N+1$  whenever  $N$  is odd. The conjecture is that, whatever number you start with, you always end up with the cycle 1, 4, 2.

Next in popularity, and suggested in roughly equal numbers, were the following three: the Goldbach Conjecture (every even number bigger than 2 is a sum of two primes), the Twin Prime Conjecture (there are infinitely many pairs of primes of the form  $N, N+2$ ), and the Mersenne Prime Conjecture (there are infinitely many primes of the form  $2^N - 1$ ).

Certainly, these are all well known and easy to understand. Moreover, if pressed to make a guess, most mathematicians would say these four conjectures are probably true. (I would.) And, as with the Fermat Problem in the latter decades of its life, the first three of these suggestions have been verified computationally to a degree that would convince any experimentalist.

Personally, of the ones mentioned so far, I prefer the hailstone number problem. There is something about its dynamic nature that makes it stand out from the others. But for a genuine successor to Fermat, maybe the "Integer Brick" problem is the best. Only two readers sent in this suggestion. Though not new, it seems to have led a remarkably sheltered life. I did not come across it myself until after Andrew Wiles' June 1993 announcement of his solution to the Fermat Problem, when I sat around with a group of colleagues discussing what might replace it as "the unsolved problem".

The problem asks if it is possible to construct a rectangular brick (i.e., a rectangular parallelepiped), all of whose edges and all of whose diagonals (both face-diagonals and cross-diagonals) are integers. The analogy to Fermat's Last Theorem would be to prove that there can be no such brick. (For a good discussion of the problem, see the article by John Leech, *American Mathematical Monthly*, Vol. 84 (1977), pp. 518-533.)

To my mind, this has to be the "winner". Not only is it simple to state, it has a very similar flavor to the Fermat Problem, having its origin in Pythagorean triples. And I can envisage a search for a solution leading to deep developments in number theory.

Mind you, I can also envisage someone like Noam Elkies coming along with a Connection Machine and finding an integer brick, much as he did in the case of the Euler Conjecture in 1988. (The Euler Conjecture claimed that it is not possible for an  $N$ th power to be a sum of  $N-1$   $N$ th powers. For  $N=3$ , this is just the first instance of Fermat's Last Theorem, the case Euler himself proved. A counterexample to the conjecture for  $N=5$  was found in 1966. Elkies found a counterexample for  $N=4$ .)

But, even if an integer brick is found, indeed, even if each of the other problems sent in by FOCUS readers turns out to have a fairly simple solution, I have no doubt that there will always be plenty of problems for tomorrow's mathematicians to work on that are every bit as challenging as the one Fermat scribbled in the margin. But that does not guarantee that there will ever be another "Fermat's Last Theorem". For the mathematical nature of the problem is only part of the story. There were a couple of other

features that made Fermat's teaser so very famous, and a contest in FOCUS is unlikely to address those features.

For one thing, there was the romantic nature of the beginnings of the Last Theorem: a scribbled note in the margin of a textbook, leaving the hint that an "amateur" had done something that subsequently defeated generations of "professionals". (The popular picture always seems to have Fermat working late at night, by the light of a candle. Maybe this was true; but it may also be that he did most of his mathematical thinking during the day, to alleviate the more tedious moments of his daily life as a government lawyer, an altogether far less glamorous picture.)

And then there was the sheer longevity of the thing. Nothing generates fame so much as fame itself. The longer the problem endured, and the more great minds that joined the assault and failed, the more famous it became. Given the number of mathematicians working today, I suspect it is unlikely that any one problem would resist major attempts at solution for hundreds of years.

If that is indeed the case, then it seems likely that we will never again have another "Fermat's Last Theorem". I have to say that, like many of my fellow mathematicians, this prospect leaves me a little sad.

Make no mistake about it, I wholeheartedly applaud Andrew Wiles' accomplishment. (I also hope that, when the dust has settled, the solution will come to be regarded as a joint accomplishment of Andrew Wiles and Kenneth Ribet, whose key 1986 breakthrough both motivated and facilitated Wiles' work.) But for me, and for almost all readers of FOCUS, the Fermat story was a large part of the culture that drew us into mathematics in the first place. It was always there, the unattainable carrot dangling before our eyes, the pot of gold at the end of the rainbow. And it was always clear that the hunt, and the history of that hunt, was likely to be far more rewarding than its culmination.

—Keith Devlin

*The above are the opinions of the FOCUS editor, and do not necessarily represent the official view of the MAA.*



# PERSONAL OPINION

## Back to the Blackboard

Dan Kalman

In September 1983, I resigned my position as an assistant professor in mathematics at the University of Wisconsin, Green Bay. I left academics in search of the greener pastures of industry. In September of 1993, I became the newest assistant professor in mathematics at the American University in Washington, DC. For most of the ten intervening years, I worked at the Aerospace Corporation in Los Angeles. Now I am back, an assistant professor once more.

Colleagues in both worlds—industrial and academic—have asked me about the transition. My career change is set against a background of major upheavals in the aerospace industry, and one of the tightest academic job markets in memory. My inquisitors want to know how I like teaching again, how I managed to find an academic job, whether I was scared out of industry by fears of layoffs or lured back to the university by the promise of greater job satisfaction, and even whether my academic salary is much of a pinch! In response I have written this account of my tenure in industry, the reasons for my return, and my reactions as the end of my first semester approaches.

My departure from the University ten years ago was motivated largely by curiosity. At the time, there was much popular and professional discussion of the exodus of teachers in technical fields to industry, fueled by the mushrooming of the computer industry and the promise of tremendous financial rewards. Concerns were voiced of a coming teacher shortage which would reach crisis proportions when superimposed on a mass retirement of college faculty in the mid 90's. I was well on my way to tenure, and seemed to have a secure future awaiting me. But I couldn't help wondering what it would be like to work in industry. I had no idea how I could fill up entire days and weeks doing anything actually useful. Were rumors true of industrial salaries two or three times what

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I earned as an assistant professor? The questions were enticing, and I thought about giving industry a try before deciding to spend the rest of my professional life as an academician.

To get an industrial job ended up taking about a year and a half. Part of the difficulty was the familiar two-body problem experienced by couples trying to coordinate two technical careers, but a lot of the problem was simple ignorance of what I was qualified to do, and who might be interested in me. Ultimately I was hired by a fellow who just *knew* that a PhD in mathematics indicated resourcefulness, problem solving ability, and a technical background of unparalleled power. He had grounds to know—he was one himself. As was his boss, the boss's boss, and the last five staff members he hired. I joined a young department of men and women with nearly identical backgrounds: Ph.D. in pure mathematics, some academic post-doctoral experience, and a desire to sample the real world.

My first assignment was to learn everything I needed to know to be a productive employee. In my group it was customary to interact with three different mainframe computer systems, one IBM and two CDCs. Upstart personal computers, IBM PCs, and Macintoshes were just appearing on the scene. Work stations existed only in rumor. I studied orbital mechanics (we modeled satellite orbits), graphics, numerical linear algebra, signal processing, parallel computer algorithms and architectures. There was an incredible amount to assimilate, and I got through it in good time. I always was a good student.

There was also a corporate culture to assimilate. I had to learn what our business was and how it was conducted; what was valued; how to be a success. The management structure at Aerospace was positively byzantine compared with my experiences in the academic world. The technical staff was organized into a hierarchy, with the CEO as the sole position in level 7, and entry level new hires at level 1. I learned to trace my

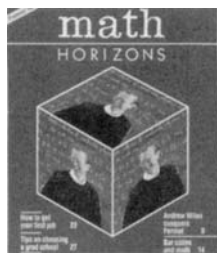


complete chain of command all the way up to the president, and to place employees in collateral organizations the way a genealogist traces family trees. Decision-making authority was carefully spelled out. For example, my supervisor reviewed and approved any internal memo I wanted to distribute; his supervisor approved any correspondence going outside the company on official stationery; approval from two levels further up was required for release of a technical paper to a journal or conference. A colleague at Argonne National Lab once joked about the situation, saying, "You need approval of the paper from your boss's boss's boss's boss? I would have thought that would be at least someone in the Pentagon, if not the President of the United States!"

As I worked, I absorbed without conscious effort an understanding of the corporate culture. On the other hand, the technical knowledge and skills I needed were acquired through deliberate and organized study. This is one of the great advantages I encountered in industry: there was constant stimulation to learn new subjects. Some of the subjects were mathematical, some not—but I always seemed to find some mathematical connection.

The contrast with my old university was striking. The faculty there were either deeply involved in their own pursuits, or had settled back into a comfortable routine of teaching and institutional service. A new faculty member was on his or her own when it came to finding interesting new subjects to study. In industry, I became an expert in anything that I had considered for five minutes more than anyone else on the hall. Other employees came to me, looking for the answers that an expert can give effortlessly but which the uninitiated might take weeks to unravel. Attempting to live up to my expert status, I was constantly propelled into new areas of study.

*Please see Personal Opinion on page 20*



# Math Horizons is

Bundles of the first issue of *Math Horizons* were sent free of charge to every department of mathematics in the United States and Canada. More than 160,000 copies were mailed — a number sufficient to reach all majors and others interested in mathematics. This unprecedented distribution was made possible through grants from the Exxon Education Foundation, the William and Flora Hewlett Foundation, and the National Science Foundation. In addition, all members of the MAA received a copy of *Math Horizons* along with their copies of the December issue of FOCUS. The second issue of *Math Horizons* also will be mailed free of charge in mid-March to the same groups. **This will be the last free issue.** Beginning in September 1994, your department and other groups can receive copies of *Math Horizons* **only** by ordering a bulk subscription. *Math Horizons* is a wonderful bargain and is aimed at supporting undergraduate students and others interested in mathematics. In order to help our students, it is vital that copies be distributed to them and that money for a *Math Horizons* bulk subscription be found.

At the January annual meeting of the MAA, several hours were devoted to getting ideas from MAA members on how to distribute *Math Horizons* to students, how to build support for it, and how to fund it. The collective wisdom of MAA members, the Board of Governors, Section Officers, and students is found below.

## WHAT IS MATH HORIZONS ?

*Math Horizons* is the MAA's new magazine for undergraduates (and others) interested in mathematics. The purpose of *Math Horizons* is twofold:

- To provide students with career information long before they graduate; and,
- To broaden their intellectual horizons through lively articles about contemporary mathematics.

## WHOM IS MATH HORIZONS FOR?

*Math Horizons* is aimed at undergraduate students and others interested in mathematics. Certainly that means mathematics majors, but it also means calculus students, upper division seminars, lower division classes, honors classes, and faculty.

High schools are ordering bulk subscriptions for their advanced placement students.

If you're not part of a math department, form a group of 20 or more so that you can get every issue of *Math Horizons*.

## HOW CAN DEPARTMENTS DISTRIBUTE MATH HORIZONS TO STUDENTS?

For distribution to mathematics majors:

- Use lists of majors to distribute individually. If your department does not have a list, obtain one from the registrar's office.
- Send a letter to all majors, asking them to pick up copies from their advisors, in the department office, or in their campus mail boxes.

For distribution to other students:

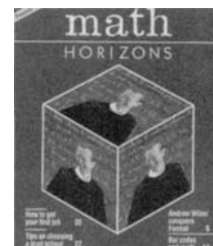
- Copies can be distributed by faculty in selected classes.
- Members of math clubs and MAA student chapters can assist with distribution. Ask them for their ideas.
- Copies can be placed in strategic locations — math commons rooms, math libraries, department offices.

## WHO CAN HELP DISTRIBUTE MATH HORIZONS ?

- MAA Department Representatives. (If you don't know the name of your MAA Representative, contact Jane Heckler at (800) 331-1622 or e-mail: [jheckler@maa.org](mailto:jheckler@maa.org))
- MAA Student Chapter Advisors or Math Club Advisors.
- Someone like you, who wants to get *Math Horizons* into the hands of students.

**Questions? Please call us at 1-800-331-1622 or E-mail: [horizons@maa.org](mailto:horizons@maa.org)**

# here... now what?



## HOW OFTEN WILL *MATH HORIZONS* BE PUBLISHED?

Beginning fall 1994, *Math Horizons* will be published four times per academic year: September, November, January, and March.

## WHY BULK SUBSCRIPTIONS?

The price (\$5.00 per year for four issues) is a terrific bargain. It can be kept this low only by the use of bulk subscriptions. Individual subscriptions would need to be priced much higher. Our goal is to reach all students interested in mathematics. A minimum bulk subscription consisting of 20 issues sent to a single address four times per year costs \$100.

## HOW TO ORDER *MATH HORIZONS*

There are several ways to order a bulk subscription. Choose the one most convenient for you.

- Fill out the order form below and send it in. **Be sure to order enough for everyone who might be interested!**
- Send in the card bound in the center of each issue of *Math Horizons*.
- Call the MAA at (800) 331-1622 and ask to speak to a *Math Horizons* representative.
- Send an e-mail to: horizons@maa.org.
- Write to *Math Horizons*, MAA, 1529 Eighteenth Street, N.W., Washington, DC 20036.

## HOW TO PAY FOR *MATH HORIZONS*

To keep *Math Horizons* inexpensive, it is available only in bulk subscriptions to department heads and other groups. It only takes 20 people to form a bulk subscription. Some ways that departments are obtaining bulk subscription funds are as follows:

- Use department supply or course funds.
- Ask students to share in costs.
- Ask your dean to pay.
- Sponsor special fund-raising events — car washes, used book sales, dances, etc.
- Enlist alumni and local business support in sponsoring bulk subscriptions.
- Attach *Math Horizons* subscriptions to grant proposals.

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Price	\$100	\$150	\$200	\$250	\$300	...	\$50n

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**Questions? Please call us at 1-800-331-1622 or E-mail: horizons@maa.org**

*Personal Opinion from page 17*

Now I come to one of the ironies of my life, both in and out of academe. At the university, I was starting to stagnate. The enjoyment in problem-solving and research that I had early on began to peter out, and I had little motivation or stimulation to move into other areas. In industry I was constantly thrust into new areas, and always uncovered interesting problems, but rarely had the time to delve into them. Unfortunately, what I thought was most interesting usually seemed far removed from the actual work that I was supposed to be doing. My supervisor gave me great freedom to investigate what I wanted, leaving it up to me to meet my obligations in a timely fashion. In response, I became a clock watcher. Had I wasted more time than I should pursuing the muse? Was I putting enough time into finishing that computer program? Would the corporation benefit sufficiently from the time I spent refereeing papers to justify my doing it during business hours? Business hours? In the university, I never knew such a thing existed.

Now, don't get the wrong idea here. I fondly recall most of my activities with Aerospace. Even in the most goal-specific tasks, there were technical challenges and rewards. On the whole, the work was intellectually stimulating and satisfying, but I felt just a hint of frustration in that I couldn't establish priorities based solely on idle curiosity. Even so, it was not the promise of more freedom to follow my fancy that lured me back to academics. The fact is, I just couldn't get teaching out of my blood.

Throughout my stay in industry, I remained a member of the MAA and the AMS, and received their publications, notably *FOCUS*, the *Notices*, and *UME Trends*. I read about trends and concerns of the profession, taking particular interest in the national upsurge of concern for teaching. I attended the Joint Meetings each January, witnessing the growth of program space devoted to teaching. My reaction was a desire to participate. I wanted to try teaching a course on fractals, and later on dynamical systems. I wanted to try a new approach to teaching calculus. Even the mathematical excursions I took on the job seemed to lead me to ideas that I wanted to try using in the classroom. I did some teaching as an adjunct faculty member. I became quite active in the local section of the MAA. I even toyed with the idea of split-

ting an appointment between industry and a university, envisioning a teaching load about half of a regular faculty member's but with full participation in the affairs of the department. Eventually it became clear that such an arrangement was not feasible and would not become feasible in the near future. Forced to choose between remaining full-time in industry or returning to teaching full-time, I chose teaching.

It was not an easy choice to make; there were many advantages to staying in industry. I was fortunate to be in an organization that provided excellent technical support, so that the latest computer hardware and software were provided with no effort on my part. As already described, the working environment was stimulating. And, yes, there was a significant financial penalty for leaving industry. In spite of all, the attractions of the academic setting proved impossible to resist.

If the decision to return to teaching was hard, the task of finding an opportunity was nearly impossible. I had one terrific advantage over most of my fellow job seekers—I had a secure position to hang on to if my job search failed; but I faced big disadvantages, including my absence from academia, my age, and my geographical constraints of that same two-body problem. In retrospect, the problem was so tightly constrained, it is not surprising that several years went by before a feasible point was discovered. In the end, I am amazed at how lucky I was to find a position I wanted, with a school that wanted me, in a place acceptable to the family, at a time of opportunity for my wife.

So here I am again, and everyone wants to know, how is it? So far it's great. I have stopped watching the clock. I am enjoying teaching. I am surrounded by friendly, supportive colleagues. That is not to say that it is all roses. I have the expected feelings of disorientation that accompany a transition to a new career, institution, and city. I worry about fitting my teaching style and philosophy into the culture at American University. I worry about living up to the expectations of those who hired me. I worry about getting tenure.

There are difficult problems at American University, as I expect there are at most colleges and universities today. From the day-to-day problems of helping an individual student over a bad spot in a class, to the long

term issues of attracting majors, maintaining a coherent program that serves the students, and finding more effective ways to teach, there are challenges aplenty. I still don't have enough time to do all that I want. There are papers to write, courses to improve, research to do, and always there are classes to teach. After ten years of absence, I feel I could devote all of my time just to my classes. But my overall reaction is exultation. I feel like a starving man suddenly arriving at a feast. There is so much to choose from, and I want to taste it all. It's okay if my plate is already full; there will be plenty of time to come back for seconds later.

If I had it to do over, I would do it all again. My years in industry will be a rich resource to draw on for teaching. I have hopes of contributing to a curriculum that prepares mathematics students for real-world jobs. I would like to help develop a clinic program here of the kind created at the Claremont Colleges. And I hope that I can maintain ties to industry through consulting and professional organizations.

In both worlds, I have found that one of the greatest sources of pleasure is the collegiality of our profession. Whether at local meetings of the MAA, the National Joint Meetings, or meetings of SIAM, the participants form a friendly and cooperative community. We are a small group. It doesn't take many trips to meetings before you start to recognize faces and form friendships.

This year I will be able to add to many of those friendships a new dimension of shared experience, that of colleague in the profession of teaching mathematics. You can count on me to be there at the winter meetings. Come on over and say hello, and help me celebrate my return. It's great to be back.

## New Mersenne Prime Discovered

Cray Research Inc., in Minnesota, has just announced the discovery of a new Mersenne prime:

2859,433 - 1

The new prime has 258,716 digits.

## The New Job Diary

Edward Aboufadel

*Our intrepid diarist continues his account of his first year as a university professor. This episode takes him from a classroom encounter with police in early February 1993, through reflections of his more innocent times the previous year, to the end of March (and rumors of more police on campus).*

**FEBRUARY 6:** Spring semester is off to a busy start. I have completed my "Renewal Folder" that I must submit as part of my Annual Evaluation. In it, I have included all of the tests, syllabi, and handouts that I have used in classes so far; the math education paper that I am working on; a list of accomplishments so far; and my student evaluations.

Some highlights from my student evaluations: for the most part, the students reacted positively to me. I want to share two extreme comments. The first:

*Although this instructor is young and inexperienced, his intellect is of superior capacity; his knowledge of the subject goes far above and beyond what is necessary to teach this course. He does, however, teach as though he has been a teacher in college for 20 years or more. Don't let his age fool you, this guy is a real pro, my choice over most or all other instructors in math.*

Talking to a few people about this comment made me conscious of my youth and how students might react to it. Do they think, at least initially, that I am too young to do a good job of teaching? I have to admit that one reason why I wear a tie to work is so that both students and faculty here can tell that I am a professor.

This second comment comes from a student that I just didn't get along with last semester. It is the worst comment I have ever gotten about my teaching from anyone, either here or at Rutgers:

*I feel that this professor is quite young and doesn't know how to relate to the students. I understand that he hasn't been teaching for a long period of time, but needs to understand that every class is different. He seems to teach all of his*

*classes the exact same. I don't think that his method is very productive because of the previously mentioned reason. I think he crammed too much information down our throats. I also don't appreciate the way he screws around with the problems on his tests. He seems to try and make the test too hard. He is not flexible as a teacher. It will be many years before he is even close to being seasoned.*

I was observed again this week by members of the department. Something curious happened at the beginning of the second class they observed. Two police officers came into the classroom and approached me, asking, "Can we talk to you for a minute?" They wanted to see a student who was on my roster, but who, it turned out, hadn't attended my class yet (this was the sixth meeting). After the policemen left, I kept my composure. The department observers told me later in jest that it didn't look good that police are coming to question me while I am attempting to teach.

Authority figures of a different sort have expressed concern about the episode of my Job Search Diary that is appearing right now in FOCUS. I guess this is similar to getting a research paper back from referees.

I've been awarded a reassigned-time-for-research grant for Fall 1993. As a result, I will be teaching only nine credit hours in the fall. This award has given me a lot of confidence about writing grant proposals. This week I applied for a Connecticut State University Research Grant, which is a grant of money, not time. I based that grant proposal on the reassigned-time proposal.

As a side note to that University grant, I almost missed the deadline to apply. Information flows around Southern in various ways. We get a lot of notices in our mailboxes. Other information is posted here or there. Then there is the information that somehow doesn't get around much due to some lack of coordination in the administration. The announcement of the University grant fit that third description. The people in charge assure me that things will be different next time around.

My classes are a decent size again this semester. The largest class has 27 students. The smallest has 15. My Calculus III class has more women than men in it, and the women are less shy during classroom dis-



*Edward Aboufadel demonstrates the 3-D graphing capabilities of the computer to calculus student Kirk Kudrna.*

cussions. I was talking to a student I had last semester about this. In that class, she had been the only woman in a class of twelve.

**FEBRUARY 16:** Well, I survived the first round of the evaluation and renewal process. After attending a few of my classes, studying my "Renewal Folder," and interviewing me, the Department Evaluation Committee has strongly recommended that my contract be renewed for next year. A survey of the department, by secret ballot, revealed the same recommendation. Hooray! Now all the paperwork gets sent up, first to the department chair, then to the Dean, and then to the Academic Vice President. Finally, if all goes well (and I expect it will), the President is to inform me by March 1 of my contract renewal. Then, next fall, rather than next spring, the whole process starts over again, and I will know by December 15, 1993 if I am rehired for the 1994-95 academic year.

Slowly, I am learning how the department budget process works around here. We do not have a budget committee to decide whether or not to buy a computer, some software, or some manipulatives. Rather, people who want something talk informally with others, including the chair, in the hopes of reaching some sort of consensus, then the chair makes the final decision. Since we need to spend the rest of our money by the end of this month, final decisions are being made. I have been lobbying for a new computer desk for the Department Computer Room, and (I'm keeping my fingers crossed) it looks like we will be getting one.

**MARCH 2:** Well, we got the computer desk and yesterday a colleague and I set it up. It is a good thing we did, too, since something weird happened to the budget. Suddenly, there is less money than there was last week,

and all other purchases by departments are being reevaluated.

We have begun the process of selecting a new department chair. Last week we had a department meeting which served two purposes. First, to get straight just how the voting works, and second, to begin a discussion of the future of the department. With the nation fresh off the recent presidential campaign, I have been expecting people to step forward, saying, "I want the job," bold statements about the future ("A computer in every office, a chicken in every pot!"), and heavy politicking ("If you vote for me, I'll write you a nice letter when it comes to renewing your contract."). OK, actually I wasn't expecting anything overtly political, but I have been surprised by how low-key this has all been. One of my colleagues had a lot to say at that department meeting—does that mean that he wants to be chair? Another colleague recommended that I consider voting for a certain person, but I don't know if that certain person wants to be chair. (By the way, all full-time faculty are on the ballot.)

Like the Presidential election, this election for chair eventually comes down to choosing among a small number of candidates, none of whom are perfect. Now if only I can figure out who in this department is Clinton, who is Bush, and who is Perot. ("Now, as you can see on this chart, the number of math majors we have has been declining....")

Note to other recent Ph.D.s: a friend of mine who just finished her Ph.D. has been sending her dissertation out to stars in her field. One of these stars sent E-mail back to her, saying that he enjoyed her work and, as a member of editorial boards of a few journals, would like to see her submit the work to those journals.

Another friend of mine, working on her Ph.D., but not in Mathematics, recently received advice from a faculty member at her school. She writes, "He gave me some good feedback on my quals. We also talked about my career in general and how he thinks I am on the right track to becoming faculty at a big name University. Then he warned me that I was on the right track AT THE MOMENT but I had to continue in this manner (publish, publish, publish) and stay away from activities that would sidetrack me (teaching). He said, 'You have to prove that you can do good research (publish, publish, publish) but you only have to look like you

can teach (give good job talk).'"

Ah, speaking of publishing, I still haven't sent any research to a journal. I am giving a talk in two weeks at a conference and am still waiting to hear about my proposal for the annual SIAM meeting. Well, somehow I will find time.

**MARCH 11:** My proposal to give a lecture at the annual SIAM meeting has been accepted! As Wayne and Garth would say, "Excellent!" Finally, I will let the world know about the work I did from 1990 to 1992. This will also give me an extra push to get a journal article prepared.

I am giving a talk this weekend at the Connecticut State University Computer Conference, and I have found that preparing this talk has been rather rewarding. The title of my talk is, "Using the Computer as a Mathematician." In it, I review the different points in my doctoral work where using the computer was vital. Putting the overhead slides together has reminded me of a year ago when I was feverishly finishing my dissertation. (Except that I'm not applying for jobs this year!)

The Preferential Poll for Department Chairperson was distributed today. I have a week to mark my choices. As I said before, people don't actively campaign to be department chair.

**MARCH 16:** Last weekend's "Storm of the Century" postponed the Computer Conference to a later date. I hope I will be available that day. It was just as well. I have been getting a bit worn out and am looking forward to spring break next week.

Although the Preferential Poll isn't due until Friday, I hear that more than half of the ballots are already in. The committee doesn't count the votes until they are all in.

**MARCH 30:** The results of the Preferential Poll were released last week. The results were interesting. No one candidate received a large amount of votes. Three people each received approximately 25% of the vote, with the other 25% split among everyone else. The Department Personnel Committee has to decide what to do next. Ultimately, the Dean recommends an appointment, which is in turn approved by both the department and the President.

The stress of academic life got to a professor in the Philosophy department last week. He

resigned from his position of Assistant Professor after getting into some legal hot water. Also sad was the fact that he had just been granted tenure.

Speaking of tenure, a member of my department applied for tenure this year and was denied. The teaching of this person was rated "below average" among all of those who applied for tenure this year, prompting another member of my department to comment that the teaching abilities of the Southern faculty must be incredible. (This person is considered one of the best teachers in the department.) Such is life in academia.

One of my students was expelled this week. It is a very curious story that I have been getting through the grapevine. In an English class last semester, this student was given a grade of C+. He protested the grade to the instructor, who told him that, first, the C+ was a gift, and second, that she would be willing to consider changing his grade if he would submit an essay for grading. The essay was terrible and she changed the student's grade to F.

This is where the story gets interesting. Rumor has it that the student, who was a wrestler, then put the instructor in a headlock, and contacted the police, accusing her of assaulting him. I'm not sure what to believe. This has been a strange week.

The third part of my Job Search Diary is out this week, and reading it now really brings home how much pressure I was under a year ago. I was trying really hard not to panic, but it wasn't easy.

The Job Search Diary has led to an exchange of email with a new faculty member at a school in Massachusetts. He has some interesting stories to tell. For one, even though he has a tenure-track position, he has been given the strong impression that it will be impossible for him to get tenure because of quotas set up to limit the number of people who get tenure. He is also struggling with trying to establish a research career. I told him about the Young Scientists' Network, which I joined last year. The Network is actually a daily newsletter, populated more by physicists than any other group. Maybe we need a Young Mathematicians' Network. [Editor's note. Now there is one. Ed helped to set it up. See page 23.]

To be continued . . .

## Young Mathematicians' Network

Charles Yeomans

Since 1990, the Young Scientists' Network (YSN) has served as a forum for voicing the concerns of young (in terms of years after the degree) scientists. Last summer, Mark Winstead, a new Ph.D. from Virginia, floated a suggestion to the YSN that it start specialty networks. While YSN didn't really like the idea, a few people wrote to Winstead to express their agreement. Out of the ensuing exchange of e-mail, the Young Mathematicians' Network was born.

The YMN is:

- (i) a mathematicians' group keeping the mathematical community honest about the job market and its future;
- (ii) a group providing information about job searches from both the inside and the outside;
- (iii) a support group for those in the job market;
- (iv) a group providing information on publishing, grant proposals, obtaining industry jobs, and other services which many of us did not receive in graduate school;
- (v) a group to inform the mathematical community of the interests and concerns of the younger mathematicians.

We publish a weekly newsletter, *Concerns of Young Mathematicians*. The newsletter is devoted to issues of interest to young mathematicians, with the exception of job advertisements, which we have decided not to include. Editorial duties are rotated monthly to anyone who volunteers. Since July 1993, the number of subscribers has risen steadily to over 700, including many department chairs and leaders of various professional organizations. The newsletter is distributed by e-mail (thanks to comput-

ing support supplied by the University of Kentucky Mathematics Department), and it is free. We wish to point out that anyone is welcome to subscribe.

Recent issues have included numerous articles on the job market, both how it currently works and how it might be improved. We have had articles from both sides of the job fence, including articles from people at schools of various sizes which attempt to explain what particular schools look for in applicants. Other topics have included how the NSF awards grants, discussion of the MYTH (that there is a shortage of scientists in the U.S.) and how it continues to reappear in the media, and some firsthand stories from the job front in academia and industry.

YMN has been active in other ways as well. At the winter meeting in Cincinnati, we co-sponsored with the AMS-MAA-SIAM Committee on Employment Opportunities a panel discussion titled "What Can Be Done About Employment of Mathematicians in the 90s and Beyond?" Curtis Bennett sat on that panel. Also, Mark Winstead was invited to serve on a panel discussion of the AWM, titled "Are Women Getting All the Jobs?"

While the job market has been our immediate focus, we hope to address additional issues of long-range importance, including funding for young mathematicians, reform of graduate education to include better preparation for students who intend to go into industry or into teaching, and more involvement of young mathematicians in professional organizations. We are always on the lookout for people interested in editing or who wish to become more actively involved in what we are doing.

For more information on YMN, or subscription requests, send e-mail to me, Charles Yeomans, at: [cyeomans@ms.uky.edu](mailto:cyeomans@ms.uky.edu).

*Charles Yeomans is an Assistant Professor of Mathematics at the University of Kentucky.*

## CALL FOR PROPOSALS

1995 NSF-CBMS Regional Research Conferences in the Mathematical Sciences. Closing date: April 4, 1994.

### Program Description

A. Introduction—To stimulate interest and activity in mathematical research, the National Science Foundation intends to support six NSF-CBMS regional research conferences in 1995. A panel chosen by the Conference Board of the Mathematical Sciences will make the selections from among the submitted proposals. In the twenty-five year history of this NSF-CBMS Regional Research Conference Series, a total of 242 such conferences have been supported.

Each five-day conference features a distinguished lecturer who delivers ten lectures on a topic of important current research in one sharply focused area of the mathematical sciences. The lecturer subsequently prepares an expository monograph based upon these lectures, which is published as a part of a regional conference series. Depending on the conference topic, the monograph is published by the American Mathematical Society, the Society for Industrial and Applied Mathematics, or jointly by the American Statistical Association and the Institute of Mathematical Statistics.

Support is provided for about 30 participants at each conference and the conference organizer invites both established researchers and interested newcomers, including postdoctoral fellows, graduate students, and underrepresented groups, to attend.

Colleges or universities with at least some research competence in the field of the proposal are eligible to apply. Since a major goal of these conferences is to attract new researchers into the field of the conference and to stimulate new research activity, institutions that are interested in upgrading or improving their research efforts are especially encouraged to apply.

Inquiries concerning this conference series or the preparation of proposals for conferences should be directed to:

Conference Board of the Mathematical Sciences, 1529 Eighteenth Street NW, Washington DC 20036, (202) 293-1170.

## Sound familiar?

*I am giving this winter two courses of lectures to three students, of which one is only moderately prepared, the other less than moderately, and the third lacks both preparation and ability. Such are the onera of a mathematical profession.*

—Gauss, in a letter to his colleague Bessel, written in 1810.

# NETWORKS IN FOCUS

## Internet Bibliography

*This article first appeared in Syllabus, Number 27 (March/April 1993), and is reprinted here with permission.*

There are numerous published guides to establishing, maintaining, and using an Internet connection. The following is a list of selected books and other resources that provide information on the Internet.

*Exploring the Internet: A Technical Travelogue*, by Carl Malamud (ISBN 0-13-296898-3). Literally a travelogue, the book covers the author's travels to 21 countries and 56 cities, exploring the Internet as an "emerging global village." Technically sophisticated descriptions of networking efforts in an easy-to-understand and entertaining narrative style. \$26.95. Contact: PTR Prentice Hall, 113 Sylvan Avenue, Route 9W, Englewood Cliffs, NJ 07632; (201) 592-2348.

*The Internet Companion: A Beginner's Guide to Global Networking*, by Tracy LaQuey and Jeanne C. Ryer (ISBN 0-201-62224-6). A concise guide to Internet basics: what the Internet is; how to obtain a connection; e-mail; FTP; telnet; finding information with Archie, WAIS and Gopher; and descriptions of other Internet tools and resources. \$10.95. Contact: Addison-Wesley, One Jacob Way, Reading, MA 01867; (617) 944-3700.

*Internet: Getting Started*, by SRI International (ISBN 0-944604-15-3). Thoroughly covers basic information on what the Internet is, how to get a connection, and how to use the Internet. Clarifies terminology and includes listings of practical information such as service provider contacts. Includes a section on Internet organizations. \$39. Contact SRI at (415) 859-6387.

*Internet: Mailing Lists*, by SRI International (ISBN 0-944604-16-3). How to access Internet, BITNET, and USENET mailing lists; how to start mailing lists; and a compilation of lists. \$39. Contact SRI at (415) 859-6387.

*The Internet Message: Closing the Book With Electronic Mail*, by Marshall T. Rose (ISBN 0-13-092941-7). Presents the basic technol-

ogy of providing electronic mail services on the Internet, protocols, naming and addressing, message formats, mailbox services, privacy-enhanced mail, mail gatewaying, and more. \$44. Contact: PTR Prentice Hall, 113 Sylvan Avenue, Route 9W, Englewood Cliffs, NJ 07632; (201) 592-2348.

*Internet System Handbook*, edited by Dan Lynch (ISBN 0-201-56741-5). Chapters contributed by 22 well-known experts. Covers Internet evolution, infrastructure, protocols, major applications, tools, security, and changing architecture. Includes annotated bibliography. \$59.25. Contact: Addison-Wesley, One Jacob Way, Reading, MA 01867; (617) 944-3700.

*The Matrix: Computer Networks and Conferencing Systems Worldwide*, by John S. Quarterman (ISBN 0-13-565607-9). An in-depth treatment of internetworking on a global scale, with major coverage of the Internet. \$49.95. Contact: Digital Press, P.O. Box CS 2008, Nashua, NH 03061; (603) 884-6660 or (800) 234-2298.

NNSC Tour of the Internet. A HyperCard stack that explains the purpose, history, and practical tips for navigating the Internet and getting help. FTP to nnsf.nsf.net and download the file "Internet-Tour" or contact the NSF Network Service Center, c/o BBN Systems and Technologies, 10 Moulton Street, Cambridge, MA 02138; (617) 873-3400. E-mail nnsf@nnsf.nsf.net.

*The Simple Book: An Introduction to Management of TCP/IP-Based Internets*, by Marshall T. Rose (ISBN 0-13-812611-9). Covers the concepts and mechanisms for managing networks built with the Internet suite of protocols (TCP/IP). Describes the Simple Network Management Protocol (SNMP) and includes sections on networking history and the Internet-standard Network Management Framework. \$54. Contact: PTR Prentice Hall, 113 Sylvan Avenue, Route 9W, Englewood Cliffs, NJ 07632; (201) 592-2348.

*The Whole Internet User's Guide & Catalog*, by Ed Krol (ISBN 1-55558-033-5). Discusses the Internet and its history; how the Internet works; and a guide on how to use the Internet, what's allowed, and how to deal with network problems. Contact:

O'Reilly & Associates, Inc., 103 Morris Street, Ste. A, Sebastopol, CA 95472; (800) 998-9938 or (707) 829-0515.

*Zen and the Art of the Internet: A Beginner's Guide*, by Brendan P. Kehoe (ISBN 0-13-010778-6). An introduction for the novice Internet user. Covers basic Internet features such as electronic mail, FTP, telnet, newsgroups, various tools, and how to find out more. \$22. Contact: PTR Prentice Hall, 113 Sylvan Avenue, Route 9W, Englewood Cliffs, NJ 07632; (201) 592-2348.

## Visiting Mathematician Sought for MAA's Washington, DC Headquarters

Have a sabbatical coming up? About to retire? Interested in national mathematics issues? Then think about spending a semester, a year, or a summer at MAA headquarters in Washington, DC, as a Visiting Mathematician.

Applications for the position of Visiting Mathematician are being accepted. Please write or send an E-mail message describing your background and interests to:

**DR. MARCIA P. SWARD**  
**EXECUTIVE DIRECTOR**  
**MAA**  
**1529 EIGHTEENTH STREET, NW**  
**WASHINGTON, DC 20036**  
**E-MAIL: MSWARD@MAA.ORG**

Appointments will be made on the basis of the match between the needs of the office and the interests and skills of the applicant.



# PROJECT NEX<sub>T</sub>

## (New EXperiences in Teaching)

The Mathematical Association of America (MAA) is pleased to announce an exciting year-long program designed to inform and assist beginning mathematical sciences faculty in their new professional roles. This program is supported by a grant from the Exxon Education Foundation. Sixty new Ph.D.s about to start their first full-time college/university teaching jobs, or faculty just completing their first year of collegiate-level teaching, will be selected as Project NEX<sub>T</sub> Fellows. Fellows will:

- Attend a two-and-a-half day **SUMMER WORKSHOP** at the University of Minnesota, addressing a broad range of issues in undergraduate mathematics and led by outstanding educators and leaders in collegiate mathematics (August 12-14, 1994).
- Participate in the summer **MATHFEST**,

including a special **SHORT COURSE** on the use of technology in the teaching and learning of collegiate level mathematics (August 15-18, 1994).

- **NETWORK** during the academic year with one another and with distinguished teachers of mathematics.
- Participate in specially designed sessions at the **JOINT MATHEMATICS MEETINGS** in San Francisco (January 1995).
- Participate in a final **WORKSHOP** at the 1995 **MATHFEST**, focusing on issues in the first year of teaching, and preparation for the next academic year. Fellows will meet with incoming Project NEX<sub>T</sub> Fellows, and will advise leaders in the mathematics community on the needs of beginning faculty.
- Participate in the 1995 summer **MATHFEST**, including a variety of short course opportunities.

Fellows' home institutions will be expected

to provide the financial support needed for participants to travel to the meetings and participate in the workshops and the Joint Meetings. Funds are available to provide assistance to institutions unable to afford full or partial support.

### FOR APPLICATION INFORMATION CONTACT:

**Professor James R.C. Leitzel**  
Dept. of Mathematics and Statistics  
P.O. Box 880323  
Lincoln, NE 68588-0323  
Phone: (402) 472-7232  
FAX: (402) 472-8466  
E-mail: jimleitz@unlinfo.unl.edu

**Professor T. Christine Stevens**  
Department of Mathematics  
St. Louis University  
221 N. Grand Blvd.  
St. Louis, MO 63103-2097  
Phone: (314) 658-2444  
FAX: (314) 658-3874  
E-mail: stevensc@sluvca.slu.edu

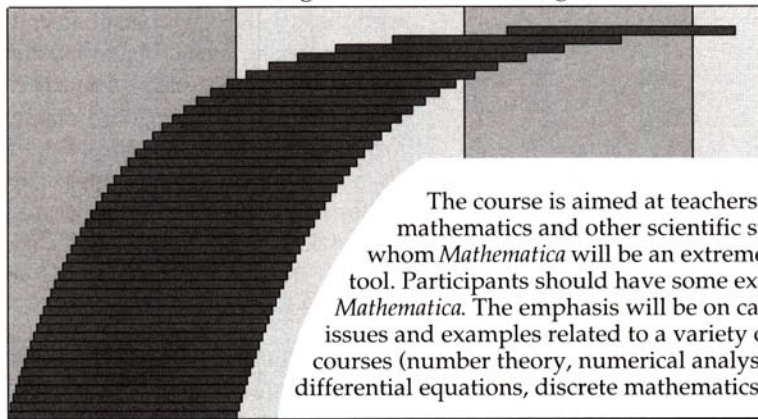
## MATHEMATICA® IN THE MOUNTAINS

July 18-24, 1994

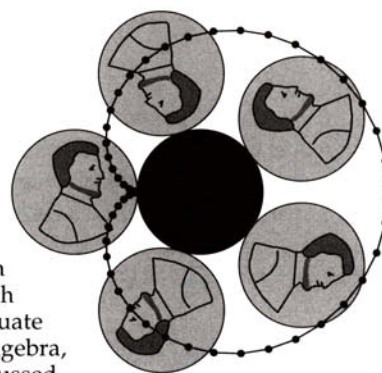
A Residential Course to Develop *Mathematica* Skills at the Intermediate Level

Venue: Colorado Mountain College in scenic Leadville, Colorado, the highest city in the United States

Instructor: Stan Wagon, Macalester College, author of *Mathematica in Action* and *Animating Calculus*



The course is aimed at teachers of mathematics and other scientific subjects, for whom *Mathematica* will be an extremely useful tool. Participants should have some experience with *Mathematica*. The emphasis will be on calculus, though issues and examples related to a variety of undergraduate courses (number theory, numerical analysis, modern algebra, differential equations, discrete mathematics) will be discussed.



Registration fee: \$495 (includes single-occupancy room in apartment for six nights, full board, tuition, use of *Mathematica*, complete course notes, and a copy of *Animating Calculus* by E. Packel & S. Wagon, W. H. Freeman, 1994). Early-bird registration: \$475 (by March 15). Late registration: \$525 (after May 15). Participants are encouraged to bring a computer able to run *Mathematica*; otherwise, a computer lab fee of \$75 will be charged. There will be morning and evening lectures and workshops with free time in the afternoons to enjoy the spectacular high mountain environment. Arrangements are suitable for accompanying family members.

For information about the course, contact: Stan Wagon, 71043.3326@compuserve.com; (303) 468-0977.

For all other matters, including registration, contact Paulene McKeever, 73173.1245@compuserve.com.

Sponsored by Front Range Press, Inc., Copper Mountain, Colorado, and Wolfram Research, Inc.

# WORKSHOPS AND SHORT COURSES

## GREAT THEOREMS OF MATHEMATICS

TENTH ANNUAL ALLEGHENY MOUNTAIN SECTION

SUMMER SHORT COURSE

Allegheny College, June 13-17, 1994

**Presenter: William Dunham, Truman Koehler Professor of Mathematics at Muhlenberg College**

A five-day workshop that examines a collection of significant theorems from a 250-year span in the history of mathematics, including original work of Newton, the Bernoullis, Euler, Weierstrass, Cantor, and other major figures, as they addressed questions from the realms of analysis, number theory, algebra, geometry, and set theory. The theorems—all of which have relevance to the undergraduate classroom—will be amplified by biographical information and placed in historical context, but the primary focus is on the genius of great mathematicians doing great mathematics.

Course registration will be \$120; room and board will be an additional \$120, for a total of \$240.

For further information and an application form, contact:

George Bradley  
Department of Mathematics and Computer Science  
Duquesne University  
Pittsburgh PA 15282  
(412) 396-5115  
BRADLEY@DUQ3.DUQ.EDU

## IMA Summer Program

Mathematical Modeling for Instructors

August 1-19, 1994

*Supported by the National Science Foundation*

The program goal is to provide experience in the use of mathematical modeling to solve problems which come from industry and engineering. This course is limited to 32 college and university instructors of undergraduates. Participants can incorporate their experiences and newly acquired skills in either enrichment of existing math courses or development of new undergraduate courses in math modeling. A team approach is used, with highly experienced tutors.

Mathematicians who teach undergraduates are invited to apply. The deadline is March 15, 1994. Two letters of recommendation are required, one from the department chairperson, as well as the applicant's curriculum vitae and statement of background and interest in employing modeling in the undergraduate math curriculum. Prerequisites: Ph.D. in mathematics or applied mathematics, some ODE and PDE, computational experience, and some physics background. The IMA will cover local living expenses, but not travel. Selection criteria will include background and motivation, as well as geographic and institutional diversity. Women and minorities are especially encouraged to apply.

For more information and to apply, write to Mathematical Modeling, c/o Avner Friedman, Director, Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church Street, SE, Minneapolis, MN 55455.

## Consortium for Ordinary Differential Equations Announces Workshops and Newsletter

The Consortium for Ordinary Differential Equations was founded in 1990 by a group of college and university faculty who design and use computer experiments in their teaching of ordinary differential equations. Stetson University joined the Consortium in 1993. Their support enables the Consortium to run summer faculty workshops and to publish a newsletter.

In the summer of 1993, workshops took place at Washington State University and St. Olaf College. Approximately 25 college and university faculty participated in each of the day workshops. Workshop participants shared their experiences, exchanged ideas, examined a variety of software packages and text materials, and worked together to design and produce new course materials (projects, demonstrations, etc.).

Similar workshops will be held at West Valley College, June 7-11, 1994, and at Rensselaer Polytechnic Institute, June 14-18, 1994. Stetson University in Florida will host a workshop in 1995. Participants in these workshops will receive a small stipend plus room and board. For more information about the 1994 workshops, please contact Professor Wade Ellis, Mathematics Department, West Valley College, Saratoga, CA 95070 (E-mail: wellis@applelink.apple.com) or Professor William Boyce, Department of Math Sciences, Rensselaer Polytechnic Institute, Troy, NY 12180 (E-mail: boycew@rpi.edu).

The Consortium's newsletter, *C\*ODE\*E*, is published quarterly. The specific purpose of the newsletter is to share and facilitate the use of interactive computer-experiment courses involving ordinary differential equations. Anyone interested in receiving the newsletter regularly may send a subscription request to: *C\*ODE\*E*, Mathematics Department, HMC, Claremont, CA 91711 (E-mail: codee@hmc.edu). Subscriptions to the newsletter are free.

## Constructivist Methods in Undergraduate Math Teaching

### 1994 Faculty Workshops at Purdue University

<b>Calculus</b>	<b>Abstract Algebra</b>
<b>June 2-19</b>	<b>June 9-19</b>

#### If you are

- a caring and dedicated undergraduate math instructor
- planning to teach Abstract Algebra or Calculus in 1994-95
- trying to make your course motivating, stimulating, and effective

**BUT... you have been disappointed with past results;**

#### If your students

- feel stuck and frustrated despite your best efforts and excellent explanations
- show poor understanding of the important ideas
- often fail to re-construct the meaning that your words are trying to convey;

WE INVITE YOU TO JOIN OUR INTENSIVE WORKSHOPS ON ABSTRACT ALGEBRA OR CALCULUS

Our approach is based on

- cooperative learning in a computerized environment
- eight years of experience with alternative methods of teaching various undergraduate mathematics topics
- a large research and development international project, funded by the National Science Foundation

#### NO PREVIOUS COMPUTER EXPERIENCE IS REQUIRED

Participants will be provided travel grants up to a limit of \$400, accommodations, and a meal allowance. Take-home software and written materials will be provided at nominal cost.

For information and application forms, contact: Terry Loro, Department of Mathematics, Purdue University, W. Lafayette, IN 47907, (317) 494-1982, FAX: (317) 494-6318.

#### APPLICATION FORMS MUST BE RETURNED BY MARCH 15, 1994.

Ed Dubinsky & Keith Schwingendorf (Purdue University); Uri Leron (Israel Institute of Technology); Rina Zazkis (Simon Fraser University), co-directors.

## Annual Ohio Section Summer Short Course

June 27-29, 1994, at John Carroll University, near Cleveland, Ohio. Professor Hugh L. Montgomery (University of Michigan), will demonstrate CLINT in five two-hour sessions over two and one-half days. Additional laboratory time to experiment with programs will be available.

CLINT stands for "Computational laboratories in Number Theory," an experimental, optional, one-credit micro-laboratory course that Professor Montgomery offers to undergraduates taking his course from *An Introduction to the Theory of Numbers*, by Niven, Zuckerman, and Montgomery [NZM]. CLINT programs and a detailed

laboratory manual for laboratory sessions are free to anyone using NZM or attending this short course. Students explore conjectures and gain more understanding through the numerical insights CLINT provides.

Registration fee is \$90; dormitory room (two nights) is \$70 single, \$65 double; seven meals, \$60. Registration open until thirty \$50 deposits are received, or May 15, whichever is earlier.

For more information or to register, contact Leo Schneider, John Carroll University, University Heights, OH 44118, (216) 397-4481, E-mail: LEO@JCVAXA.JCU.EDU.

## MD-DC-VA MAA Section Workshop

A five-day workshop, sponsored by the MD-DC-VA Section, will be given at Frostburg State University on the Western Shore of Maryland this May. This is the 19th year that the Section has sponsored a workshop.

"Surfaces, soap bubbles and general relativity," May 31 - June 3, 1994, will be given by Dr. Frank Morgan of Williams College. Morgan is an MAA Distinguished Teacher and is widely known for his clear and dynamic lectures on geometry.

The cost for the five-day workshop, including room and board, is \$215. For further information, contact Dr. John Biggs, Department of Mathematics, Frostburg State University, Frostburg, MD 21532, (301) 689-5291, or Dr. Ben Fusaro, Department of Mathematics and Computer Sciences, Salisbury State University, Salisbury, MD 21801, (410) 543-6471.

## Park City/Institute for Advanced Study Mathematics Institute

The Park City/Institute for Advanced Study Mathematics Institute (formerly known as the Regional Geometry Institute), incorporates learning, teaching, research activities, and interaction in a unique, four-level integrated format. Participants include high school teachers, undergraduates, graduate students, postdoctorates, and researchers.

The three-week institute will be held in Park City, Utah, from July 10-30, 1994 (pending funding from the National Science Foundation). High school teachers, in partnership with university mathematicians and students, will explore the evolution of classical geometry to modern geometry on curved spaces, and will discuss issues of geometry education and reform.

Applicants interested in interaction between programs and other participants are encouraged to apply. The Mathematics Institute specifically invites applications from women and members of minority groups.

The deadline to apply is March 1, 1994. For more information, please contact: PC/IAS Mathematics Institute, 18C DeTrobriand Street, Salt Lake City, UT 84113. Phone (801) 585-3488, FAX: (801) 585-5793. E-mail: PCIM@math.utah.edu.

# The Roles of Mathematics Teacher Educators

June 2-4, 1994

University of Nebraska - Lincoln

Regional Workshop

Leading the Way to Systemic Change

This regional workshop will serve as a catalyst to bring together mathematical sciences and mathematics education faculty from nearby states and forge linkages for common approaches to systemic change. The workshop will address three main areas where mathematics teacher educators can play critical roles in effecting change:

- \* Working with teacher preparation programs, both within a given institution and among institutions.
- \* Working with teacher in-service programs.
- \* Working with other state-level stakeholders (state coalitions, state departments of education, statewide systemic initiatives, etc.) and professional associations.

For further information contact:

James R. C. Leitzel  
Department of Mathematics and Statistics  
P.O. Box 880323  
Lincoln, NE 68588-0323  
Phone: (402) 472-7232  
E-mail: jimleitz@unlinfo.unl.edu

## Undergraduate Research Call for Papers

There will be an AMS-MAA special session for undergraduate research papers at the sectional MAA meeting in Eugene, Oregon, June 16-18, 1994. Faculty are encouraged to nominate students who produced quality research results last spring, last summer, or this academic year. Please submit nominations and requests for information to Robby Robson, Department of Mathematics, Oregon State University, Corvallis, Oregon 97331-4605; E-mail: robby@math.orst.edu; (503) 737-5171. Nomination deadline: March 1, 1994.

## Franks' Paradox?

Speaking at an AMS-organized panel discussion on the impact on libraries of electronic publishing at the January Joint Meetings in Cincinnati, John Franks (Northwestern University), recounted an experience with an electronic document he had recently circulated on the Internet. The aim of the document was, he said, to catalogue the many different kinds of electronic publications that librarians and others might have to deal with in the near future. The document drew an unexpectedly large response from librarians. It was during the course of the ensuing electronic exchanges that Franks realized the awful truth. His own electronic publication was of a kind not among the types of electronic documents listed in the document.

## Sixth Annual MAA Undergraduate Student Paper Presentations

The 6th Annual MAA Undergraduate Student Paper Presentations were given at the joint MAA-AMS summer meetings, August 15-19, 1993 at the University of British Columbia in Vancouver, BC, Canada. The MAA student talks included 13 papers given in three sessions, by representatives from the midwest and southwest as well as from the west coast and various Canadian provinces. Also, for the fifth year, students from various NSF-sponsored Research Experiences for Undergraduates programs made presentations.

The MAA Undergraduate Student Paper Committee, consisting of Dick Jarvinen (Winona State University), Mike Kallaher (Washington State University), and Ron Barnes (University of Houston-Downtown), would like to thank the Exxon Education Foundation for travel fund assistance provided to all student speakers through an Exxon Grant to the MAA.

In addition, the Committee would like to acknowledge the generous donation of some outstanding mathematics books by the W.H. Freeman and Co. publishers, which were awarded to the students of outstanding papers.

The outstanding paper awards were given to Jennifer Courter (California Polytechnic University), "Search Procedure: A Strategy for Finding Lost Objects"; Donald Hill (University of Chicago), "Algebraic Numbers and Differentiability"; and Leon Hsu (University of Waterloo), "The Polynomial Time Approximation for Maximum Satisfiability".

## 1994 Statistical Thinking and Teaching Statistics (STATS) Workshops

- Reed College, Portland OR, June 13-20, Johanna Turner, Site Manager
- Rice University, Houston, TX, June 12-19, Dennis Cox, Site Manager
- University of Tennessee, Knoxville, TN, June 13-20, Sharon Neidert, Site Manager.

## 1994 Summer Workshops for Mathematicians Who Teach Statistics

Again this year, the MAA, with support from the NSF, is sponsoring a series of summer workshops for mathematicians who teach statistics but who do not have recent or advanced training in the subject. (See the November, 1993 issue of *UMETrends*.) Last year, we received 160 applications for the 48 places at our two workshops. This year, we have 72 places at three workshops. For 1995, the final year of the project, we expect to run four workshops.

According to a recent survey by the Board of the Mathematical Sciences, introductory statistics courses are much more often taught in departments of mathematics than in departments of statistics. It is a worthy but demanding challenge for a faculty member who is not trained as a statistician to shape such a course to meet the spirit of the various guidelines and recommendations from the MAA and the American Statistical Association. The goal of these workshops is to provide background and resources that will help faculty to meet that challenge more effectively.

Four days of each week-long workshop will be divided between presentations by leading applied statisticians and related computer lab activities. The rest of the time teams of four participants each, with guidance and assistance from the workshop coordinator, will design and carry out projects involving collection and analysis of statistical data or activities suitable for a statistics lab. After the workshop ends, team members will re-

main networked (by E-mail) with each other, with the statistician presenters, and with the workshop coordinator, first during the remainder of the summer as they develop and adapt their projects for use in their own teaching, and then throughout the fall as they try out their projects in the classroom. Each regional workshop will hold a one-day reunion after the tryout period, in connection with a regional or national meeting of the MAA.

Participants or their home institutions are expected to cover the cost of travel to the workshop site. Each workshop will provide room and board for 24 participants. In addition, participants will receive course materials which will include a copy of *Perspectives in Contemporary Statistics*, a personal copy of the Minitab statistical analysis package used at the workshop, and \$100 towards the cost of travel, room, and board for the one-day reunion.

The application deadline for the 1994 workshops is March 5, 1994. Project Directors George Cobb of Mount Holyoke College and Mary Parker of Austin Community College are sending more detailed information and an application form to department chairs. To receive a personal copy, please contact Jane Heckler, STATS Project Registrar, The Mathematical Association of America, 1529 Eighteenth Street NW, Washington DC 20036-1385 (202) 387-5200, FAX: (202) 265-2384. (See the bottom of page 28 for a list of workshop locations and dates.)

## Robert Osserman Chosen as New Pólya Lecturer

Professor Robert Osserman (Mellon Professor of Interdisciplinary Studies at Stanford University and Deputy Director of the Mathematical Sciences Research Institute at Berkeley), has been chosen as the Association's next Pólya Lecturer, serving for the academic years 1994-95 and 1995-96.

Dr. Osserman received his bachelor's degree from New York University, and his M.A. and Ph.D. from Harvard. After Harvard, he spent a year at the University of Colorado, immediately following which he joined the faculty at Stanford. He was chair of the department there from 1973 to 1979. His research interests are complex variables, minimal and Riemann surfaces, and Riemannian geometry. In 1993, he was a Joint AMS-MAA Invited Lecturer at the Joint Meetings in San Antonio.

## NSF-CBMS Regional Research Conferences in the Mathematical Sciences

Contingent upon National Science Foundation funding, it is anticipated that four NSF-CBMS regional research conferences will be held this coming summer. These will bring to 247 the total number of such conferences held in the twenty-six year history of this NSF-CBMS Regional Research Conference Series. These conferences are intended to stimulate interest and activity in mathematical research.

Support for about 30 participants is provided, and the conference organizer invites both established researchers and interested newcomers, including postdoctoral fellows and graduate students, to attend.

Information about an individual conference may be obtained by contacting the conference organizer. Information about the series and guidelines for submitting proposals for future conferences may be obtained by writing or calling the Conference Board of the Mathematical Sciences at: CBMS, 1529 Eighteenth Street NW, Washington DC 20036, (202) 293-1170.

### Controlled Topology and the Characterization of Manifolds

Steven C. Ferry, lecturer  
May 24-28 at the Univ. of Tennessee at Knoxville  
Robert J. Daverman and Jerzy Dydak, organizers  
(615) 974-6577; daverman@utk.vx.utk.edu

### Recent Advances in Spectral Graph Theory

Fan R. K. Chung, lecturer  
June 6-10 at California State Univ. at Fresno  
Rudolph M. Najar, organizer  
(209) 278-2462; rudolphn@csufresno.edu

### Complex Dynamics in Higher Dimensions

John Erik Fornaess, lecturer  
June 12-17 at SUNY at Albany  
R. Michael Range, organizer  
(518) 442-4602; range@math.albany.edu

### Bayesian Methods in Finite Population Sampling Theory and Applications

Malay Ghosh, lecturer  
Dates to be announced; at the Univ. of Connecticut at Storrs  
Alan E. Gelfand and Dipak Dey, organizers  
(203) 486-3416; gelfand@uconnvm.bitnet

# Interactive Mathematics Text Workshops—Summer 1994

The MAA's Interactive Mathematics Text Project (IMTP) has as its goal the improvement of student learning of mathematics through the use of interactive texts. An interactive mathematics text is a computer based text document from which numeric, symbolic, and graphical commands can be executed with the result appearing in the document. The text may be a single lesson or it may be an entire course.

The summer of 1994 will be the third and last summer during which the IMTP will run workshops. Six workshops are intended for participants who have little experience in authoring texts or using the computer environments in which these texts are created. At these workshops participants will be given an overview of interactive texts and their use in instruction, will spend time using a text, receiving instructions on how to author a text, and will work closely with the work-

shop staff and each other on the creation of a short text on a topic of their choice. Three of these workshops will use MathKit for Windows, a new environment developed by James White at the Institute for Academic Technology in Chapel Hill, NC. One workshop will use Mathcad; one, Maple for Windows; and one, Mathematica for Windows.

One workshop will be devoted to the use of Calculus and Mathematica, and another will focus on the use of interactive texts in teaching differential equations. Participants at the first workshop should have some familiarity with Mathematica while participants at the differential equation workshop should have some knowledge of either Maple or Mathematica.

In addition to the one-week workshops, there will be four two-week workshops (one each on MathKit, Mathcad, Maple, and

Mathematica). These workshops are intended for individuals who have previously attended one-week workshops or who, on their own, have created interactive texts. It is the goal of these workshops to provide an environment where individuals can work collaboratively on the authoring of texts.

The workshops are supported by a grant to the MAA from IBM. They begin on Monday and end on Saturday. The National Science Foundation will provide funding for individual room and board during the workshops. Participants will be responsible for travel expenses to the site. Please see the chart below for a schedule of workshops. For an application or further information, contact: Project Director, Gerald Porter, Department of Mathematics, University of Pennsylvania, 209 S. 33rd Street, Philadelphia, PA 19104-6395 (or gjporter@math.upenn.edu).

## Summer 1994 Workshop Schedule Interactive Mathematics Text Project INTRODUCTORY LEVEL WORKSHOPS ON CREATING INTERACTIVE TEXTS

Using <b>Mathematica</b> to Create Interactive Texts June 20–25 Seattle Central Community College Nancy Blachman	Using <b>Maple</b> to Create Interactive Texts July 11–16 Los Angeles Pierce College Carol Scheftic
Using <b>MathKit</b> to Create Interactive Texts June 13–18 Towson State University Ladnor Geissinger	Using <b>MathKit</b> to Create Interactive Texts June 20–25 University of Michigan–Dearborn Jurgen Sladeczek
Using <b>Mathcad</b> to Create Interactive Texts July 18–23 Morehouse College Charles Alexander	Using <b>MathKit</b> to Create Interactive Texts July 18–23 University of Houston–Downtown Charles & Roseanne Hofmann

## WORKSHOPS ON CALCULUS AND DIFFERENTIAL EQUATIONS

Teaching <b>Calculus with Calculus and Mathematics</b> July 25–30 Los Angeles Pierce College Juan Manfredi	Teaching <b>Differential Equations using Interactive Texts</b> July 25–30 Towson State University Dan Schwalbe
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## ADVANCED LEVEL TWO-WEEK WORKSHOPS

These workshops are intended for people who have previously attended an IMTP Summer Workshop, or who have been creating an interactive text.

Using <b>Maple</b> to create Interactive Texts June 27–July 9 University of Houston–Downtown Dan Schwalbe	Using <b>Mathcad</b> to create Interactive Texts July 25–August 5 Towson State University David Royster
Using <b>MathKit</b> to create Interactive Texts July 5–16 Seattle Central Community College Jim Swift	Using <b>Mathematica</b> to Create Interactive Texts July 11–23 University of Michigan–Dearborn Bill Davis

### EMPLOYMENT OPPORTUNITIES

Rates for FOCUS Employment Advertisements are **\$65.00 per column inch**.

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**Advertising Copy Deadlines:** The first of the month, two months prior to publication.

FOCUS is published in February, April, June, August, October, and December.

Advertisers should contact: Amy Stephenson, FOCUS Advertising Coordinator, The Mathematical Association of America, 1529 Eighteenth Street, NW, Washington, DC 20036-1385 (202) 387-5200, fax: (202) 265-2384 E-mail: focus@maa.org

Subject to the availability of funding, one tenure-track teaching position in Mathematics at the Assist. Prof. level, salary dependent upon qualifications. Doctorate in Mathematics or related field and expertise in ordinary, partial, and/or stochastic differential equations and their applications to modeling required. Evidence of potential for excellent teaching and scholarly research also necessary. Closing date 3/30/94; position starting date 9/94. Cal Poly Pomona is actively seeking to maintain its heritage and identity as a comprehensive center of education that serves a dynamic, multicultural region (with 58% ethnic minorities). For additional information or to apply, contact: Search Committee, Mathematics Dept., Calif. State Polytechnic Univ., 3801 W. Temple Ave., Pomona, CA 91768-4033 (909) 869-3467. EOE/AA

## RHODE ISLAND COLLEGE MATH- MATICS FACULTY

Rhode Island College anticipates three tenure-track (and/or 3 year term) faculty positions available at Assistant Professor rank. Duties: Teach undergraduate and graduate courses, participate in college and departmental committee work, curriculum development, student advisement and scholarly work. Requirements: Ph.D. in mathematics, or a doctorate in mathematics education, statistics or computer science with at least a master's level mathematics background; ability and interest in teaching a wide variety of courses. Desirable: College teaching experience and expertise in integrating technology into the college math classroom. Salary competitive; excellent benefits. APPLICATIONS MUST BE RECEIVED BY MARCH 4, 1994. Send letter of application, resume, copies of transcripts, and three letters of reference to Office of Personnel Services, Rhode Island College, Providence, RI 02908. Attention: Math/CS Search. AN AFFIRMATIVE ACTION / EQUAL OPPORTUNITY EMPLOYER.

## DARTMOUTH COLLEGE

### John Wesley Young Research Instructorship in Mathematics

The John Wesley Young Research Instructorship is a two year post-doctoral appointment for promising new or recent Ph.D.s whose research interests overlap a department member's. Current departmental interests include areas in algebra, analysis, combinatorics, computer science, differential geometry, logic and set theory, number theory, probability and topology. Teaching duties of four ten-week courses spread over two or three quarters typically include at least one course in the instructor's specialty and include elementary, advanced and (at instructor's option) graduate courses. Nine-month salary of \$34,000 supplemented by summer (resident) research stipend of \$7,556 (two-ninths). Send letter of application, résumé, graduate transcript, thesis abstract, description of other research activities and interests if appropriate, and 3 or preferably 4 letters of recommendation (at least one should discuss teaching) to Phyllis A. Bellmore, Mathematics and Computer Science, 6188 Bradley Hall, Hanover, NH 03755-3551. Applications received by Jan. 15 receive first consideration; applications will be accepted until position is filled. Dartmouth College is committed to affirmative action and strongly encourages applications from minorities and women.

## Williams College

### Department of Mathematics

Williamstown, Massachusetts 01267

Anticipated visiting position for the 1994-95 year, probably at the rank of assistant professor; in exceptional cases, however, more

advanced appointments may be considered. Excellence in teaching and research and doctorate are expected. Please have a vita and two letters of recommendation on teaching and research sent to Visitor Hiring Committee. Evaluation of applications will begin November 15, and continue until the position is filled. As an EEO/AA employer, Williams especially welcomes applications from women and minority candidates.

## University of Tennessee at Chattanooga Department Head

The University of Tennessee at Chattanooga invites applications for the Head of the Department of Mathematics. A Ph.D. in a Mathematical Science, at least five years of college mathematics teaching experience, and qualifications commensurate with the rank of Associate Professor or higher are required. Applicants should provide evidence of leadership in curriculum development, teaching, public service and research/scholarly activities. In this primarily undergraduate institution, the faculty is expected to exhibit excellence in teaching while maintaining a strong commitment to research and public service. The mathematics department has 23 faculty members including a Chair of Excellence in Applied Mathematics. Located in a very scenic metropolitan area of 400,000, UTC has a student enrollment of 8300. Send applications to Dr. DeWayne S. Nymann; Chair of the Search Committee, Dept. of Mathematics, UTC, Chattanooga, TN 37403-2598. Screening of applicant's credentials will begin on January 3, 1994, and will continue until the position is filled. Women and minorities are encouraged to apply. UTC is an Equal Opportunity Employment/Affirmative Action/Title IX/Section 504/ADA Institution.

## Wake Forest University Department of Mathematics and Computer Science

Applications are invited for a position as Instructor or Visiting Assistant Professor in Mathematics. The term is one year, renewable for up to three years. Rank is dependent upon qualifications, and a Master's degree or PhD degree in Mathematics or Statistics is required. Duties consist only of teaching three courses per semester. A strong interest and preparation for teaching calculus and introductory statistics is desirable. The department has 22 members, offers a BS and MA in mathematics, and a BS and MS in computer science. Send a letter of application and resume to Richard D. Carmichael, Chairman, Department of Mathematics and Computer Science, Wake Forest University, Box 7388, Winston-Salem, NC 27109. AA/EO employer.

**Mathematics:** Georgia College, a senior unit of the University System of Georgia with a current enrollment of 5700 students, is accepting applications for two tenure track positions in mathematics starting September 1, 1994.

Master's degree in mathematics required; Ph.D. in mathematics preferred. Teaching experience is highly desirable. Rank and salary commensurate with qualifications. Submit a letter of application, vita, copies of transcripts, and the names, addresses, and phone numbers of three references to: Search Committee, Department of Mathematics and Computer Science, CBX 017, Georgia College, Milledgeville, GA 31061. Deadline February 15, 1994 or until position is filled. Georgia College is an Affirmative Action/Equal Opportunity Employer. Qualified women, persons of color, and minorities are encouraged to apply.

**NORTHWESTERN COLLEGE (IOWA)** seeks candidates for anticipated faculty position in Mathematics. Subject to budget approval, this tenure track position begins in August 1994. Teaching assignments include a range of undergraduate courses with emphasis in statistics and/or math education. Doctorate preferred, Masters required. NWC is a Christian liberal arts college of 1,075 students and 60 FT faculty. Candidates must have a strong evangelical Christian faith commitment. Apply to Dr. Robert Zwier, Vice President for Academic Affairs, Northwestern College, Orange City, IA 51041. EOE.

## Wright State University

### Department of Mathematics and Statistics Mathematics Education

Tenure-track assistant professorship in mathematics education anticipated for Fall 1994. Applicants should expect to complete all requirements for the Ph.D. or Ed.D. by September 7, 1994. Excellent research record or potential and commitment to quality teaching required. Three or more years of experience successfully teaching mathematics at the secondary-level preferred. Competitive salary and excellent fringe benefits. Two-course teaching load. Department has 35 Ph.D. faculty and offers a master's degree. Please send vita, graduate transcript(s), and three letters of reference to: **Mathematics Education Search Committee, Wright State University, Department of Mathematics and Statistics, Dayton, Ohio 45435.** Closing date: February 15, 1994 then every two weeks thereafter until selection or July 1, 1994. WSU is an AA/EOE.

## Department of Mathematics

Indiana University Northwest, Gary, IN  
The Department of Mathematics invites applications for both a tenure-track assistant

professorship and lecturer.

**Assistant Professor** - A Ph.D. in mathematics and a strong commitment to teaching undergraduates is expected. Applicants with a knowledge of statistics, operations research or ability to teach actuarial sciences courses will be given preference.

**Lecturer** - a Master's in Mathematics and a strong commitment to teaching undergraduates is expected. Applicants showing progress toward a Ph.D. will be given preference.

Send applications with vita, three letters of recommendation and transcripts to: Dr. A. Mizrahi, Department of Mathematics, Indiana University Northwest, Gary, IN 46408. Deadline for applications is March 1, 1994. Indiana University Northwest is an Affirmative Action, Equal Opportunity Employer.

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### URSINUS COLLEGE Dept. of Mathematics and Computer Science

Box 1000, Collegeville, PA 19426-1000

One or two possible positions, starting Fall 1994, at independent co-ed liberal arts college near Philadelphia. Experience in computer science desired. Rank and salary commensurate with qualifications. Ph.D. desired. Three courses per semester teaching load, full range of courses in the mathematical sciences. Standard fringe benefits. Send letter of application, resume, and three letters of recommendation to: John Shuck, Search Committee Chairperson. EOE/AA.

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### Bethany College

Mathematics: One year sabbatical replacement. Ph.D. preferred, Master's acceptable. Teach Calculus I, II, III; Differential Equations; and two of: College Algebra, Discrete Mathematics, Mathematics for Elementary Teachers. Deadline: February 23, 1994 or until position is filled. EOE. Women and minorities encouraged to apply. Send letter of application, resume, transcripts, and three letters of recommendation to: Academic Dean, Bethany College, Lindsborg, Kansas 67456.

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### Meredith College

Computer Science. Assistant/Associate Professor and Director of Computer Science within the Department of Mathematics and Computer Science. Ph.D. in Computer Science (or Computer Information Systems); strong interest in teaching; commitment to undergraduate computer science education and to liberal arts education. Opportunity for curriculum development. Meredith College is a women's college with a stable enrollment of about 2000 students located near the Research Triangle area of North Carolina. Send letter and resume to

Dr. Virginia Knight, Head, Department of Mathematics and Computer Science, Meredith College, 3800 Hillsborough St., Raleigh, NC 27607; knightv@ecsvax.uncecs.edu. An Equal Opportunity Employer; minorities are encouraged to apply.

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### Western New England College Department of Mathematics and Computer Science

Assistant Professor of Mathematics for appointment beginning September 1994. Term and conditions of appointment depend upon candidate's qualifications and experience. The successful candidate will instruct 12 semester credit hours per term. Applicants must have a Ph.D. in Mathematics or the Mathematical Sciences with a record of excellence in and a strong commitment to teaching. Scholarly activity is encouraged and supported through release time, summer research grants, and professional travel funds.

The Department of Mathematics & Computer Science has 10 full-time faculty members and 60+ majors in degree programs leading to a BA in Mathematics and a BS in Computer Science, and provides courses for the general education program of the college.

Salary is competitive and commensurate with credentials and experience. Western New England College is an independent, non-denominational, private co-educational institution with Schools of Arts and Sciences, Business, Engineering, and Law, with total day/evening enrollments exceeding 5,000.

Send letter of application, curriculum vitae, a statement on teaching, and three letters of recommendation (including comments on the applicant's experience and promise as a teacher and scholar) to: Dennis M. Luciano, c/o Ann Guyotte, School of Arts & Sciences, Western New England College, Springfield, Massachusetts 01119. Applications will be screened on a rolling basis until the position is filled. Western New England College is an Equal Opportunity Employer encouraging applications from women and minority candidates.

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### UNH at Manchester, Assistant Professor of Mathematics

Tenure-track position to begin Fall 1994. UNHM is seeking an individual with an interest in the reform movement in mathematics, especially how students learn mathematics. Candidates should have experience in teaching mathematics education courses and be capable of teaching several of the following: College Algebra, Precalculus, Finite Mathematics, Calculus I & II, Differential Equations, Multidimensional Calculus and mathematics education courses. Additional responsibilities

include working with the Learning Skills Center, especially the peer tutoring program. Minimum qualifications: Doctorate in Mathematics Education or Mathematics (Ph.D. or Ed.D.) required; teaching experience at the post secondary level; commitment to the college's priority of excellent teaching and continuing engagement in scholarship. UNHM is the University's urban, commuter college composed of a diverse student body, in particular adults, located in the population center. Application review begins March 15, 1994.

To apply, send curriculum vitae; a statement of teaching philosophy; evidence of teaching excellence (e.g. teaching evaluations); and three current letters of recommendation to Dr. Peter Haebler, Associate Dean for Academic Affairs, Mathematics Search Committee, University of New Hampshire at Manchester, 220 Hackett Hill Road, Manchester, NH 03102. Women and minorities are encouraged to apply. Hiring is contingent upon eligibility to work in the U.S. UNH is an AA/EEO Employer.

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### WAKE FOREST UNIVERSITY Department of Mathematics and Computer Science

Applications are invited for a position as Instructor or Visiting Assistant Professor in Mathematics. The term is one year, renewable for up to three years. Rank is dependent upon qualifications, and a Master's or Ph.D. degree in Statistics or Mathematics is required with preference being given to holders of a statistics degree for this position. Duties consist only of teaching three courses per semester. A strong interest and preparation for teaching introductory statistics and calculus is desirable. The department has 22 members, offers a B.S. and M.A. in mathematics, and a B.S. and M.S. in computer science. Send a letter of application and resume to Richard D. Carmichael, Chairman, Department of Mathematics and Computer Science, Wake Forest University, Box 7388, Winston-Salem, NC 27109. AA/EO employer.

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### Baylor University

One tenure track position (Asst. Prof.) open Fall, 1994 for a person who will contribute to our bachelors-masters program. Excellence in undergraduate teaching is required and appreciated. Analysis or related areas preferred. Ph.D. required. Baylor is a private university with 12,000 students. Baylor is a Baptist University affiliated with the Baptist General Convention of Texas. As an Affirmative Action/Equal Employment Opportunity employer, Baylor especially encourages minorities, women, and persons with disabilities to apply. Provide a resume, transcript, and three letters of reference to Howard L. Rolf, PO Box 97328, Waco, TX 76798



**Nicholls State University  
Department of Mathematics  
Thibodaux, Louisiana**

The Department of Mathematics is seeking candidates for two tenure-track positions at the assistant professor rank and one position at the rank of instructor beginning August 1994. One tenure-track position is reserved for a qualified candidate in numerical analysis. For the other position preference will be given to a candidate in mathematical computing or computer applications in mathematics. Applicants in other areas of applied mathematics will be considered. Qualifications include a Ph.D. in mathematics or related area, commitment to excellence in teaching, and execution of scholarly activity. Duties include teaching 9 to 12 hours of undergraduate and master's level courses each semester and research or scholarly activity. Qualifications for the instructor's position include a master's degree in mathematics or related field with at least 18 graduate hours of mathematics, and a commitment to teaching. The teaching load is 15 hours per semester.

Applicants should complete an application from Nicholls State University and forward a resume, three letters of recommendation, and transcripts of academic work to:

Donald Bardwell, Head  
Department of Mathematics  
Nicholls State University  
P.O. Box 2026  
Thibodaux, LA 70310

Screening of applicants begins March 1, 1994. Applications from women and minority group members encouraged. Nicholls State University is an affirmative action/equal opportunity employer.

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**Mathematics**

The University of Southern Indiana invites applications for a tenure-track position as Assistant/Associate Professor of Mathematics beginning August 1994. Responsibilities include teaching courses in algebra, precalculus, calculus, probability and statistics. Ph.D. in statistics and/or mathematics or substantial completion of degree required. Candidates with specializations in probability and/or statistics, or applied areas of mathematics will receive favorable consideration. Submit letter of application, resume, graduate transcript(s) and three professional letters of reference by February 25, 1994, to: Dr. David Kinsey, Chair, Mathematics Department, University of Southern Indiana, 8600 University Blvd., Evansville, IN 47712. AA/EOE

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**Department Head  
Department of Mathematics,  
Statistics, and Computer Science  
The University of Illinois at Chicago**

The Department of Mathematics, Statistics, and Computer Science at The University of Illinois at Chicago seeks applicants for the position of Head. The Department enjoys an AMS group I classification, and has 68 faculty and over 200 graduate students. Major research programs include applied mathematics, mathematical computer science, mathematics education, probability and statistics, and pure mathematics. Located in the heart of Chicago, UIC is a research university with 16,000 undergraduate, 5,000 graduate, and 3,000 professional students.

The head is the chief administrative officer of the Department, with responsibility for instructional programs, administrative, budgetary, promotion, and recruitment matters. The head is expected to provide leadership in the further development of research, teaching, and public service. The successful candidate will have an earned doctorate and be eligible for appointment at the rank of full professor. A strong record in research and university teaching, a demonstrated commitment to equality of opportunity and substantial leadership and organizational skills are required. Women and minority candidates are especially encouraged to apply. The desired appointment date is August 21, 1994.

Applications should be received by February 1, 1994 to receive full consideration, although the search will proceed until the position is filled. Materials, including a full curriculum vitae and names and addresses of four references, should be directed to:  
Professor Vera Pless  
Search Committee for Department Head  
c/o College of Liberal Arts and Sciences  
m/c 228  
The University of Illinois at Chicago  
601 South Morgan Street  
Chicago, Illinois 60607-7104

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**Goldey-Beacom College  
Computer Information Systems/  
Mathematics Department**

Goldey-Beacom College is a small private business college emphasizing teaching excellence. A full-time faculty position at the assistant/associate professor level is available for Fall 1994. Requirements for the position include: doctorate required in Computer Information Systems or Mathematics; proven excellence in teaching required; good communication skills essential; ability to teach a variety of undergraduate computer and mathematics courses required; business experience preferred. Salary is negotiable.

Applicants should send a letter of intent, up-to-date resumé, copies of transcripts, three letters of reference, copies of department chair evaluations and copies of student evaluations to Mrs. Denise I. Griffiths, Search Committee Chair, CIS/Mathematics Department, Goldey-

Beacom College, 4701 Limestone Road, Wilmington, DE 19808, (302) 998-8814. Applications should be received by February 28, 1994. Goldey-Beacom College is an equal opportunity employer.

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**SUNY College at Cortland  
Mathematics Department  
Mathematics Faculty Position**

Two tenure-track positions available at the Assistant Professor level, beginning August, 1994. A Doctorate in Mathematics or Mathematics Education is required. Candidates working in areas which can be made accessible to undergraduates and mathematicians in other fields are actively sought. Applicants with specialties in geometry, dynamic systems, and mathematics education (particularly secondary school teacher training) will be given preference. Applicants must have a commitment to teaching a broad range of courses at the undergraduate level. SUNY-Cortland offers bachelor's degrees in mathematics and mathematics education, and master's degrees in mathematics education.

All materials (letter of application, curriculum vitae, unofficial copy of graduate transcripts, and three letters of reference, at least one of which addresses teaching ability) should be sent to:

Prof. Mahdi Rubaii  
Search Committee Chair  
Mathematics Department  
SUNY at Cortland  
Cortland, NY 13045

Review of applications will begin January 15, 1994.

Women and minorities are encouraged to apply. SUNY College at Cortland is an Equal Opportunity/Affirmative Action Employer, and does not discriminate in employment or provision of services on the basis of disability.

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**Baruch College-CUNY  
Department of Mathematics**

Tenure-track position beginning 8/31/94; rank and salary will be commensurate with qualifications and experience. A Ph.D. in mathematics or mathematics education is required, as well as a demonstrated commitment to research in mathematics education. A proven record of excellence in teaching, curriculum development, and scholarly publication is preferable and past successful grant funding is very desirable. Applications must be received by March 31, 1994. Send resumé and the names (no letters!) of three references to: Baruch College, Dept. of Mathematics-Search Committee, Box 509, 17 Lexington Ave., New York, NY 10010. Baruch is an EOE/AA employer; women and minorities are encouraged to apply.

### Northeast Louisiana University

Northeast Louisiana University is seeking applicants for the position of Head of the Department of Mathematics beginning July 1, 1994. Applicants should possess the Ph.D. degree in mathematics and have demonstrated accomplishments in teaching and scholarly activities. Rank and salary will be commensurate with experience and qualifications. Northeast Louisiana University is a four-year state supported university with an enrollment of 11,500 students which offers the BS degree in mathematics. Review of applications will begin on March 1, 1994 and continue until the position is filled. Applications and nominations should be sent to: Mathematics Search Committee  
Office of the Dean  
College of Pure and Applied Sciences  
Northeast Louisiana University  
Monroe, LA 71209-0500  
(318)342-1750, FAX (318)324-1755  
DPASMITH@MERLIN.NLU.EDU

NLU is an equal opportunity employer.

### Mathematics Department United States Naval Academy Annapolis, MD 21402-5002

Applications are invited for one or two anticipated tenure-track appointments at the assistant professor level commencing August 1994. Ten months salary commensurate with experience and qualifications. Research opportunities exist for augmenting salary during summer. Applicants must possess Ph.D., have a commitment to excellence in teaching and be capable of pursuing independent research. Send inquiries and applications to J.M. D'Archangelo. Required of each applicant are a resume, undergraduate and graduate transcripts, and three letters of recommendation discussing applicant's teaching and research. The Naval Academy is an EO/AA employer.

### Northern Kentucky University Department of Mathematics and Computer Science

Tenure-track position in secondary mathematics education beginning August, 1994, pending funding. Ph.D. in mathematics education or a mathematical science required; graduate coursework in mathematics or statistics and mathematics education also required. Responsibilities include teaching a secondary mathematics methods course, introductory statistics courses; and mathematics courses at least through the level of calculus; teaching and advising Master's students in mathematics education; supervising student teachers and interns; liaison and inservice activities with local secondary schools. Normal teaching load is twelve hours per semester. Quality teaching is the Department's highest priority; continued scholarly activity and service re-

quired. Oral and written competence in English is mandatory. Send letter of application, curriculum vitae, transcripts or summary of graduate work, and three letters of recommendation to: Dr. Frank Dietrich, Chair of Search Committee, Department of Mathematics and Computer Science, Northern Kentucky University, Highland Heights, KY 41099-1700. Review of applications will begin March 1, 1994.

Located eight miles southeast of Cincinnati, Ohio, the university enrolls over 12,000 students. The department offers courses in mathematics, computer science, and statistics and has 202 computer science and 95 mathematics majors. NKU is an Equal Opportunity/Affirmative Action Employer and encourages the applications of qualified women and minorities.

### Trinity College Washington, DC

Trinity College invites applications for two anticipated tenure-track positions in mathematics beginning August, 1994. Completion or near completion, of the Ph.D. is required. Successful candidates must demonstrate excellence in undergraduate teaching and a commitment to scholarly activity. Interested candidates should send a letter of application, curriculum vitae, and a statement describing curricular ideas relating to the role of mathematics in a liberal arts college. They should also arrange to have three letters of recommendation sent to: Ms. Carole King, Mathematics Search Coordinator, Office of Human Resources, Trinity College, 125 Michigan Avenue, N.E., Washington, DC 20017. Applications should be received by March 1. Trinity College, one of the nation's oldest Catholic colleges for women, is an EEO employer and welcomes applications from women and minority candidates.

### Saint Mary's College of California

A tenure-track position in mathematics at the Assistant Professor level will be available starting in fall 1994. Applicants must have a Ph.D. in Mathematics, demonstrated commitment to outstanding teaching, and a strong plan/record of scholarly pursuits/research. Preference will be given to candidates in Algebra, Combinatorics and Number Theory, but not to the exclusion of excellent candidates in other fields. Ability to teach some Computer Science is desirable. Normal teaching load is seven courses per year (3-1-3), nine hours per week, plus student advising, committees and independent studies. Benefits include health, dental, vision and long term disability insurance. Saint Mary's College is a Catholic, predominately undergraduate, liberal arts institution located 30 miles from San Francisco and 15 miles from Berkeley. Send letter of application, curriculum vitae, graduate tran-

script and three letters of recommendation, at least two of which address teaching ability, to Lidia Luquet, Mathematics Search Committee, P.O. Box 3517, Moraga, CA 94575. Review of completed applications will begin February 15, 1994, and will continue until the position is filled. We are an Equal Opportunity Employer.

### Denison University

The Department of Mathematical Sciences anticipates a two-year position with the possibility for renewal at the level of Assistant Professor starting in Fall 1994. Eventual conversion to tenure-track is likely. A doctorate (or ABD) in mathematics is required. Ability to teach statistics or "computer literacy" courses a plus, but not required. A commitment to quality undergraduate instruction is essential. Duties include teaching three courses per semester and continued scholarship.

Denison is a liberal arts college of about 1900 students located in a village of about 4000, twenty-five miles east of Columbus. The department offers B.A. and B.S. degrees in mathematics and computer science. The department consists of nine full-time members.

Send resume, transcripts of graduate work and three letters of recommendation (at least one should address your teaching) to Professor Todd Feil, Chair, Department of Mathematical Sciences, Denison University, Granville, Ohio 43023.

Applications should be made by February 1, 1994; applications beyond this date will be considered until the position is filled. Denison is an Affirmative Action/Equal Opportunity Employer; women and minorities are encouraged to apply.

### The University of Wisconsin- Oshkosh

The Department of Mathematics, University of Wisconsin Oshkosh, invites applications for three/four tenure-track assistant professor and two or more one-year-only lecturer positions beginning September 1994. Research, grant writing and advising expected for tenure-track positions.

#### Mathematics Education

Ph.D. in Mathematics Education or Ph.D. in Mathematics with interest in Math Education required; commitment to NCTM Standards desirable. Teach mathematics for secondary, middle and elementary education majors and advise students in M.S. Mathematics Education programs.

#### Applied Mathematics

Ph.D. in Mathematics required; preference given to those with interest in Numerical Analysis, Mathematical Programming or Applied

Classical Analysis. Teach/develop curriculum in Applied Mathematics and general education courses.

#### Statistics

Ph.D. in Statistics required. Teach lower/upper level Statistics courses. Preference given to candidate interested in working with Pre-Actuary students.

Closing date: March 1, 1994. Send application, CV, three letters of recommendation and transcripts to Dr. H.S. Moghadam, Chair, Mathematics Department, University of Wisconsin Oshkosh, Oshkosh, WI 54901-8631. The University of Wisconsin Oshkosh is an affirmative action/equal opportunity employer.

#### Whittier College Whittier, CA 90608

The Department of Mathematics invites applications for an anticipated tenure-track position at the assistant professor level to teach undergraduate mathematics courses beginning Fall of 1994, pending final budgetary approval.

Qualifications: Ph.D. (completed or to be completed by summer of 1994) in Mathematics, evidence of quality teaching, and potential for scholarly growth. Expertise in Applied Mathematics preferred. Most faculty at the college participate in teaching College-wide courses such as Freshman Writing Seminars, and other interdepartmental courses.

Candidates should send a curriculum vitae, a statement of teaching philosophy, and three letters of recommendation to Chairperson, Department of Mathematics, Whittier College, P.O. Box 634, Whittier, California 90608.

Review of completed applications will begin on Feb. 15, 1994.

Whittier College is an Equal Opportunity/Affirmative Action Employer.

#### Strategic Plan from page 9

Determination of priorities among the various initiatives is now the responsibility of the Strategic Planning Committee, the Executive and Finance Committees, the Board of Governors, and the MAA staff. Specific responsibility for developing, refining, and implementing particular initiatives will rest primarily with the councils and committees of the Association.

The strategic planning process began in the spring of 1991, when MAA President Deborah Tepper Haimo appointed a fifteen member Task Force, charged with preparing a planning report for the Board of Governors. The Task Force was chaired by Thomas Tucker, and included all MAA council chairs

## TRENTON STATE COLLEGE

### DEPARTMENT OF MATHEMATICS AND STATISTICS ANTICIPATED FACULTY VACANCIES FOR FALL 1994

**Tenure track positions at the Assistant Professor level:** Required: Doctorate in Mathematics Education, Statistics or Mathematics; demonstrated commitment to quality teaching, strong research potential. All fields will be considered, openings are anticipated in Mathematics Education as well as in Statistics and Mathematics. Send vita and three letters of recommendation to: Aigli Papantonopoulou, Chair, Search Committee, Department of Mathematics and Statistics, Trenton State College, CN-4700, Hillwood Lakes, Trenton, NJ 08650-4700. The review process will begin February 1, 1994 and will continue until all the positions are filled. Non U.S. citizens must include a statement of current visa status. The department currently enrolls over two hundred and fifty majors in Mathematics, Mathematics Education and Statistics. A graduate program offers a master's degree in Mathematics and in Mathematics Education. To enrich education through diversity, TSC is an AA/EEO.

**CONNECTICUT COLLEGE** - Department of Mathematics - Anticipated one or two year visiting position, probably at assistant professor level, beginning Fall 1994. Department has six full-time faculty. Background in applied mathematics and probability preferred. Three courses each semester. Require doctorate, excellence in teaching and research. EEO/AA employer, strongly encouraging applications from women and minority candidates. Send cover letter, curriculum vita, and names of three references to Professor Bridget Baird, Con-

necticut College, Box 5412, New London, CT 06320-4196, bbbai@mvax.cc.conncoll.edu

as well as leaders of AMS, SIAM, and NCTM. The Task Force began its work with a two-day meeting in Orono, Maine, during the summer meeting of the Association. It then met in Washington in September and in Baltimore the following January to reach agreement on general goals and objectives.

To gauge members' priorities, the Task Force held open discussions with the Board of Governors and the Section officers, and undertook a survey of Association members which was published in FOCUS, September 1992, Vol. 12, No. 4.

A draft of the report was prepared during the spring of 1992 and reviewed by members of the Task Force. A revised version was then

#### TRANSYLVANIA UNIVERSITY

The Mathematics Program invites applications for an anticipated tenure-track position commencing in the fall of 1994. Transylvania University is a selective, private, liberal arts college of 1000 students. Applicants must have a Ph.D. in mathematics and a commitment to undergraduate teaching and continuing professional activity. Bingham Awards for Excellence in Teaching may provide substantial salary supplements for exceptional candidates or smaller "start-up" grants for recent Ph.D.s.

Applications will be reviewed on arrival. The search will remain open until the position is filled. Send a letter of application, curriculum vitae, transcripts, and three letters of recommendation to David L. Shannon, Mathematics Program Director, Transylvania University, Lexington, KY 40508. Transylvania University is an Equal Opportunity Employer.

**Tenure-track teaching position in Mathematics Education at the Assist. Prof. level, subject to funding. Doctorate in Mathematics or Mathematics Education;** experience in K-12 teaching or teacher education and potential for related research required. Application, resume, copy of transcripts, and three current reference letters to be postmarked by 3/30/94; position starting date 9/94. Cal Poly Pomona is actively seeking to maintain its heritage and identity as a comprehensive center of education that serves a dynamic, multicultural region (with 58% ethnic minorities). For information or to apply, contact: Math Ed Search Committee, Mathematics Dept., Calif. State Polytechnic Univ., 3801 W. Temple Ave., Pomona, CA 91768-4033 (909) 869-3467 EOE/AA

prepared and discussed by the entire group at a meeting in Washington in late May. Based on this meeting, the document was revised once again, and was submitted to the Board of Governors for a first reading in August 1992.

At the January meeting in San Antonio, the Board approved the mission and goals of the Plan and charged the individual MAA councils and committees to review the relevant initiatives from the plan and to suggest revisions, deletions, and additions. These various reviews, together with comments and straw votes from the August 1992 and January 1993 Board meetings, were then incorporated into the final draft of the Plan, which the Board approved on January 11, 1994.

# Calendar

## National MAA Meetings

**August 15-17, 1994** Sixty-ninth Annual Joint Summer Meeting, Minneapolis – MATHFEST 1994

**January 4-7, 1995** Seventy-eighth Annual Meeting, San Francisco (Board of Governors, January 3, 1995)

## Sectional MAA Meetings

**ALLEGHENY MOUNTAIN.** April 8-9, 1994, West Virginia University, Morgantown, WV

**EASTERN PA & DELAWARE.** March 12, 1994, Harrisburg Area Community College, Harrisburg, PA

**FLORIDA.** Feb 25-26, 1994, Daytona Beach Comm College, Daytona Beach

**ILLINOIS.** April 22-23, 1994, Parkland College, Champaign, IL

**INDIANA.** March 19, 1994, DePauw University, Greencastle, IN

**INTERMOUNTAIN.** April 8-9, 1994, Westminster College, Salt Lake City, UT

**IOWA.** April 15-16, 1994, Grinnell College, Grinnell, IA

**KANSAS.** March 11-12, 1994, University of Kansas, Lawrence, KS

**KENTUCKY.** April 8-9, 1994, Morehead State University, Morehead, KY

**LOUISIANA-MISSISSIPPI.** March 4-5, 1994, Nicholls State University, Thibodaux, LA

**MD-DC-VA.** April 15-16, 1994, St. Mary's College of Maryland, St. Mary's City, MD

**METROPOLITAN NEW YORK.** May 1, 1994, Merchant Marine Academy, Kings Point, NY

**MICHIGAN.** April 29-30, 1994, Alma Col-

lege, Alma, MI

**MISSOURI.** April 1994, Missouri Southern State College, Joplin, MO

**NEBRASKA.** April 22-23, 1994, Nebraska Wesleyan University, Lincoln, NE

**NEW JERSEY.** April 23, 1994, (Joint meeting with the MATYC/NJ) Rutgers University, Busch Campus, Piscataway, NJ

**NORTH CENTRAL.** April 22-23, 1994, Winona State University, Winona, MN

**NORTHEASTERN.** June 3-4, 1994, Salve Regina University, Newport, RI

**NORTHERN CALIFORNIA.** February 12, 1994, San Jose City College, San Jose, CA

**OHIO.** April 8-9, 1994, Miami University, Oxford, OH

**OKLAHOMA-ARKANSAS.** March 25-26, 1994, Harding University, Searcy, AR

**PACIFIC NORTHWEST.** June 16-18, 1994, University of Oregon, Eugene, OR

**ROCKY MOUNTAIN.** April 15-16, 1994, South Dakota School of Mines & Tech., Rapid City, SD

**SEAWAY.** April 22-23, 1994, SUNY at Albany, Albany, NY

**SOUTHEASTERN.** April 8-9, 1994, Carson Newman College, Jefferson City, TN

**SOUTHWESTERN.** April 8-9, 1994, Glendale Community College, Glendale, AZ

**SOUTHERN CALIFORNIA.** March 5, 1994, California Lutheran College, Thousand Oaks, CA

**TEXAS.** April 7-9, 1994, Texas A&M, College Station, TX

**WISCONSIN.** April 22-23, 1994, University of Wisconsin-Eau Claire, Eau Claire, WI

## Other Meetings

**April 13-16, 1994** Seventy-second Annual National Council of Teachers of Mathematics Meeting, Indianapolis. For more information, contact: NCTM, 1906 Association Drive, Reston, VA 22091-1593.

**April 14-15, 1994** Scientists, Educators, and National Standards—Action at the Local Level, a Sigma Xi Forum, Omni Hotel at CNN Center, Atlanta. Scientists, engineers, teachers, and representatives of industry and government will review proposed national K-12 science education standards and define a role for professional researchers in improving science education. Sponsored by Sigma Xi, The Scientific Research Society. For more information, contact: Dee Windley, Sigma Xi, P.O. Box 13975, Research Triangle Park, NC 27709, (800) 243-6534, Fax (919) 549-0090.

**April 18-20, 1994** Conference on Emerging Issues in Mathematics and Computation from the Materials Sciences. Pittsburgh Vista Hotel, Pittsburgh, PA. Organized by the Center for Nonlinear Analysis, Carnegie Mellon University, and SIAM. For more information contact SIAM Conference Coordinator, 3600 University City Science Center, Philadelphia, PA 19104-2688, (215) 382-9800, Fax (215) 386-7999, E-mail: meetings@siam.org.

**July 21-23, 1994** 1994 International Symposium on Mathematics/Science Education and Technology, San Diego, CA. Sponsored by the Association for the Advancement of Computing in Education, and hosted by the University of Edinburgh. For more information, contact: AACE, P.O. Box 2966, Charlottesville, VA 22902 USA; (804) 973-3987; FAX: (804) 978-7449; e-mail: AACE@Virginia.edu.

## FOCUS

The Mathematical Association of America  
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## FEBRUARY 1994

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