FOCUS is published by the Mathematical Association of America in January, February, March, April, May/June, August/September, October, November, and December.

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Periodicals postage paid at Washington, DC and additional mailing offices. **Postmaster:** Send address changes to FOCUS, Mathematical Association of America, P.O. Box 90973, Washington, DC 20090-0973.

ISSN: 0731-2040; Printed in the United States of America.

FOCUS

January 2003

Volume 23, Number 1

On the cover: Lake Fibonacci is a recently created reservoir at the Maryland Science and Technology Center, located in Bowie, MD. The lake's remarkable centerpiece is a massive, yet elegant fountain that spurts water as high as 36 feet into the air. Created as a mathematical sculpture by artist and mathematician Helaman Ferguson, the fountain is made up of more than 45 tons of Texas granite, layered in alternating colors and rising to a height of 18 feet. It is supported by a concrete and steel platform atop pilings pounded 40 feet into the lake floor. For more on Lake Fibonnaci see Ivars Peterson's Oct. 21, 2002 MathTrek column on MAA Online at http://www.maa.org/mathland/mathtrek_10_21_02.html. Photograph courtesy of Helaman Ferguson.

FOCUS Deadlines

	May/June	August/September	October
Editorial Copy	March 15	July 8	
Display Ads	March 25	July 10	August 20
Employment Ads	March 11	June 11	August 13

Arthur Benjamin and Jennifer Quinn Named New Editors of *Math Horizons*

Arthur Benjamin, of Harvey Mudd College, and Jennifer Quinn, of Occidental College, have been selected as the new editors of *Math Horizons*, beginning with the September 2003 issue. Their term will last five years.

Jennifer Quinn

Arthur Benjamin

Professor Benjamin earned his B.S. in Applied Mathematics from Carnegie Mellon and his PhD in Math-ematical Sciences from Johns Hopkins. Since 1989, he has taught at Harvey Mudd College, where he is currently Chair and Professor of Mathematics. He has served as Editor of the *Spectrum* book series for MAA, and currently serves on the editorial boards of *Mathematics Magazine* and the *UMAP Journal*. In 2000, he received the MAA's Haimo Award for Distinguished College and University Teaching. His research interests include game theory and combinatorics, with a special fondness for Fibonacci numbers. In addition to spending time with his wife and two daughers, he enjoys tournament backgammon, racing calculators, and performing magic.

Jennifer Quinn truly feels as if she has led a charmed life. She had the privilege of earning a B.A. from Williams College, an M.S. from the University of Illinois, Chicago, and a Ph.D. from the University of Wisconsin, Madison. She cannot imagine a professional career that doesn't include doing mathematics and teaching students. In 1993, she joined the faculty at Occidental College in Los Angeles where she currently chairs the mathematics department.

Quinn has served as Newsletter Editor for the Southern California Section of the MAA, is an Associate Editor for *Mathematics Magazine*, and is completing her sixth and final year on the board of the *Spectrum* book series. In 2001, she was honored to receive the Distinguished Teaching Award for the Southern California section of the MAA. Her research interests include combinatorial proof, graph theory, and combinatorial matrix theory. Other pursuits include too much committee work, home renovations, and raising a beautiful millennium baby boy. ■

CBMS Announces 2003 Regional Research Conferences

Every year, the Conference Board of the Mathematical Sciences (CBMS) and the National Science Foundation (NSF) sponsor Regional Research Conferences in various areas of mathematics. The conferences are intended to stimulate interest and activity in mathematical research. Each lasts five days. About 30 funded participants are invited to each conference, ranging from established researchers to graduate students and other newcomers to the field. Five conferences will be offered this year:

Expansion Methods in Combinatorics
May 13–17
University of Memphis
http://troy.msci.memphis.edu/cbms

Free Boundary Problems in Partial Differential Equations and Applications
May 18–22
Wayne State University
http://www.math.wayne.edu/~gzlu/cbms/cbms.html

Stochastic Partial Differential Equations and their Applications
May 19–23
Illinois Institute of Technology
http://www.iit.edu/~duan/SPDE.html

The Web of Modularity
June 3–7
University of Illinois at Urbana-Champaign
http://www.math.uiuc.edu/cbms/

Fully Nonlinear Equations in Geometry
June 23–27
University of Notre Dame
http://www.nd.edu/~cbms/

See http://www.cbmsweb.org/NSF/2003_conf.htm for more information. CBMS is also calling for proposals for conferences for next year; see http://www.cbmsweb.org/NSF/2004_call.htm.

Remembering Henry L. Alder (1922-2002)

By G. L. Alexanderson

If one were asked, " Who would be best described as representing the MAA?", the name that would leap to mind is, "Henry Alder,." From 1956, when he was elected Chair of the Northern California Section, until his death, Henry was given one significant responsibility after another in the Section and at the national level. He performed these tasks splendidly, always conscientiously and carefully, with meticulous attention to detail, and showing wisdom, diplomacy, and tact. He truly believed in the importance of the work of the Association. Through his many years of tireless service and his inviting others into the profession through his collegiality and mentoring, Henry Alder personified the spirit of the MAA. Sadly for the MAA, his family, colleagues, and friends, Henry died of cancer on November 6, 2002, at the age of 80, at his home in Davis, California.

Henry L. Alder

Between 1960 and 1975, he was the national Secretary of the MAA, and in recognition of that outstanding service, he was designated Secretary Emeritus, the only person in MAA history to be so honored. A few years later he was elected national President for 1977-78. In 1960 he had been approached by Carl Allendoerfer, then President of the MAA, about being nominated for Secretary. He asked what the principal responsibilities would be. Allendoerfer told him that it was largely the care and feeding of Presidents. Henry took that admonition seriously, but at the same time he realized that the Secretary has the potential for moving an organization along. The Secretary can hold the office for a significant period of time and provides the institutional memory of the organization. Presidents come and go, but the Secretary often stays on.

Secretary and President were only the most visible offices that Henry Alder held in the MAA. He served on innumerable MAA committees over the years, and when he was chair of a committee, things happened. He chaired the Committee on the Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics and is largely responsible for the successful implementation of that important program, funded through an endowment from another former MAA President Deborah Tepper Haimo. He chaired the first committee on the Sliffe Awards and was largely responsible for the formulation of that program by which we reward teachers of the most successful teams participating in the American Mathematics Competitions. Other committees Henry chaired most effectively include the Gung-Hu Committee (the group that each year nominates the winner of the Distinguished Service Award), the Council on Awards, and the Committee on the 25-Year Member Banquet.

There is scarcely any aspect of MAA activities that has not been touched by Henry's sage counsel and good judgement. In 1980 he received the Association's most prestigious prize, the Award for Distinguished Service to Mathematics. Earlier he had received the Lester R. Ford Award for Expository Writing for his beautiful article, "Partition Identities—from Euler to the Present," that appeared in the *American Mathematical Monthly* in 1969. This work described a broad range of ideas in partition theory, and "Present" in the title included work from some of his own research papers in the *Bulletin of the American Mathematical Society* and the *Pacific Journal of Mathematics*. Certain generalizations of the Rogers-Ramanujan identities involve what are now called Alder polynomials. When he published that paper in the *Monthly* the editor, Harley Flanders, wrote that Henry has probably contributed more than anyone else to the present vitality of this Association." The same could be said today.

Henry Ludwig Alder was born in Duisburg, Germany on March 26, 1922, but with Swiss citizenship. He and his family moved to Zürich in 1933 where he finished school and started his college education at the Eidgenössische Technische Hochschule. In 1941 he transferred to the University of California, Berkeley, where he received his B.A. in mathematics and chemistry in 1942. He remained at Berkeley, with the exception of service in the U.S. Army Air Corps in 1944-45, and wrote a dissertation under the direction of the eminent number theorist, D.H. Lehmer, competinlg his Ph.D. in 1947. After one year as an instructor at Berkeley, he moved to the University of California, where he remained until his retirement, except for a sabbatical in Zurich. At Davis he was a renowned teacher, both in his own field of number theory but also in statistics, an area in which he and his colleague, Edward B. Roessler, wrote a successful textbook that ran through six editions. On his own campus he served as department chair, and chair of various committees, including one on minority undergraduate research participation, another on culturally disadvantaged students. Statewide, he chaired the Board of Ad-

missions and Relations with Schools of the University of California system, among others.

Professor Alder served mathematics across a wide range, from school mathematics through research. For the *Pacific Journal of Mathematics,* he served on its Board of Governors from 1960 to 2002 and, from 1970 on he was Chair of its Investment Committee. His interest in school mathematics resulted in his appointment to the California State Board of Education, the first mathematician and first UC faculty member to receive such an appointment. Another indication of the great range of his interests was his service as chair of the Council of Scientific Society Presidents in 1980, and from 1956 to 1959 he was the first national president of Mu Alpha Theta, the national high school and junior college mathematics club. I could give more examples of his many areas of service to mathematics and to education; the list is long.

Those who knew Henry Alder well always marveled at how organized he was. With an incredible memory he could call up precedents and procedures like few others. Subsequent MAA secretaries came to rely on Henry for advice on the handling of bylaws changes, responding to legal questions on incorporation, and such. He was a master of Robert's Rules of Order. If someone was planning to take a proposal to the MAA's Board of Governors, it was wise to be prepared for Henry's analysis. If he approved of the proposal he would come up with a set of arguments (numbered of course) as to why he favored the proposal. On the other hand, one had to be prepared for a comparable list, seemingly thought out after considerable study, of all the reasons this same proposal was a bad idea.

In the Northern California Section he was responsible for procedural guidelines enunciated early on but still used by the officers today—for example, the "Alder Rule", now extended to our national meetings, that says, "Don't invite a speaker for a meeting program unless someone on the program committee has heard the speaker and can vouch for the quality of his or her exposition." He himself was an exceptionally able speaker, and according to reports from his students, an inspiring teacher. A colleague of mine, as an undergraduate at Davis, took four courses in number theory from Henry and says of his teaching, "Henry had the ability both to awe students and put them at ease at the same time. His presence would fill the room and his humor, historical anecdotes and charming phrases kept all of us at the edge of our seats. He had an uncanny knack for teaching students how to write good proofs, both by his beautiful examples as well as by his clear hints that made proof-writing seem easy. Henry inspired me to become a number theorist and I strive to live up to his example today." In 1976 he won the UC Davis Award for Distinguished Teaching. In 1999 he endowed a fund in the UC Davis Mathematics Department that will support a $2000 prize each year to the mathematics graduate student deemed to be the best teacher. Additional revenue from the fund will be used to enhance undergraduate teaching.

Henry Alder served as president of the MAA from 1977-78. This photograph hangs in the stairwell of the MAA headquarters. It is part of a gallery of portraits of MAA presidents.

When asked why the Northern California Section of the MAA has been so successful, he immediately responded that there are four reasons (as usual, the response was spontaneous, but still the arguments were numbered): (1) a strong Secretary-Treasurer; (2) a good representation of different kinds of schools—a rotating system for choosing meeting sites and officers, through research universities, comprehensive state universities, liberal arts colleges, two-year colleges, and industry [a practice probably due to Henry's influence]; (3) high quality speakers, chosen for their ability to reach an audience; and (4) an executive board where past officers stay on after their terms of office and continue to contribute, thus assuring continuity. He always reminded his colleagues that at an MAA meeting, a lecture should be given for the benefit of the audience, not the benefit of the speaker. Up to the last year or so, Henry attended almost every Section Executive Board meeting, and when the Section's annual meeting was held in Davis last March, Henry was the person in charge of local arrangements. It was an enormously successful meeting, a tribute to Henry's planning and conscientious attention to detail. In 1998 the Sectional Certificate of Meritorious Service was given to Henry at the Baltimore meetings. It was appropriate that he was recognized in this way for his contributions to the Section, even well after he had received the Award for Distinguished Service at the national level.

Henry was a person of absolute probity, always fair to his colleagues and generous with his time. In all my years of working with him on many committees and boards, I never heard him speak harshly of a colleague. On a proposed course of action he could be forceful in putting forth his arguments, but they were never *ad hominem*. He never spoke in a mean-spirited way. He was serious, always sincerely promoting what he was convinced was good for the organization, but he was not without humor. Ken Ross reports that when he was elected Secretary of the MAA in 1983, Henry was "the first person to congratulate [him]" and then went on to emphasize that "as Secretary, [Ken]

would have a great deal of power and pointed out that Lenin was Secretary of the Communist Party, never President."

Henry's manner of dealing with people set the tone for relations between MAA officers, board members, and Washington office staff that, I think, still prevails—one of civility and of concern for the feelings of one's colleagues. He has left a lasting mark on the quality of this great organization. When he received the Distinguished Service Award in 1980, the citation included the following: "He has had tremendous and profound influence on all of mathematics, and more than any other person, he has charted the course of the Mathematical Association of America for the past twenty years." There are mathematicians who have added greatly to mathematics through their research activities. Still others have contributed through their teaching. Finally, some mathematicians are willing and energetic workers on behalf of the professional organizations. But there are few among us who fill all three of these roles. Thus it is appropriate that we today honor Professor Henry L. Alder, an able researcher, an honored teacher, and a man who has made unparalleled contributions of time and energy to the professional activities of mathematicians."

Henry Alder served as secretary to the MAA from 1960-1975. This photograph is displayed on the second floor of the MAA headquarters building, together with portraits of other MAA secretaries and treasurers.

We can say the same today after more than forty years. We shall miss him.

Let me close on a very personal note. Henry was responsible for my becoming involved deeply in the activities of the MAA. I always thought of him as a mentor. When I became MAA Secretary and later President, when faced with a problem I always thought, "What would Henry do?" I felt I was attempting to carry on, in some small way, the work that he had done so well.

He is survived by his wife Benne, who is a professional actress; a son and daughter-in-law, Lawrence and Janice Alder; two granddaughters, Allison and Catherine; two brothers and other family members. ■

Gerald L. Alexanderson has been both Secretary and President of the MAA.

Lowell W. Beineke Named to Be Editor of the *College Mathematics Journal*

Lowell Beineke, Schrey Professor of Mathematics at Indiana University-Purdue University, Fort Wayne, Indiana, has been selected as the new editor of the *College Mathematics Journal*, beginning with the January 2004 issue. He will serve for five years.

Beineke joined the MAA when he was awarded a membership as a student at Purdue in the early 60s. Following graduation, he attended the University of Michigan, from which he received his doctorate in 1965. He then joined the faculty of Purdue at the Fort Wayne campus (now IPFW), where he has spent his entire professional career, moving through the ranks and being awarded the Schrey Professorship in 1986. Five years of that have been spent in England, including one on a Fulbright Exchange at the (then) Polytechnic of North London and three sabbaticals at the Oxford University Mathematical Institute.

Beineke's research has been in graph theory. His thesis was on the thickness of graphs and was written under the supervision of Frank Harary. He is author of just over a hundred papers in the field; some of his favorite areas are topological graph theory, connectivity, tournaments, line graphs, and multi-dimensional trees. He and Robin Wilson of the Open University have written and edited five books on graph theory, the most recent being Graph Connections, a collection of chapters relating graph theory to various other areas of mathematics. He referees numerous papers every year and serves on the Editorial Board of the *Journal of Graph Theory*.

Although IPFW does not award doctorates, he has supervised four theses, three at Purdue West Lafayette and one at Western Michigan University. These opportunities have provided one of the links between his teaching and research. While complementing one another, the two activities also compete for time. Beineke says that if forced to give up one or the other, he's not sure which it would be, although the day-to-day teaching would probably win out. His favorite courses to teach are graph theory (of course), geometry (including non-Euclidean), foundations of higher math, math history, and calculus (definitely!).

Lowell W. Beineke

Throughout his career, Beineke has participated in many MAA activities, regularly attending national and section meetings. He has served as both President and Governor of the Indiana Section, and is currently the liaison for his department and Advisor to the IPFW Student Chapter (one of the Charter Chapters). Among his honors, he is proud to have received both the Distinguished Teaching and Distinguished Service Awards from the Indiana Section.

He is pleased to have this opportunity to edit the *College Mathematics Journal* and will try his best to maintain its excellence as a vehicle for the dissemination of mathematics for college educators.

"I am excited," he said, "by the challenge of the position, but also recognize that if the MAA goals for the CMJ are to be met, it will require the assistance and cooperation of many, many others. So, along with the other editors, I ask you to please submit not only appropriate articles, but also ideas and suggestions for articles and authors. With your cooperation, the excellence of the MAA journals will continue without interruption."

In addition to his mathematical and university lives, Beineke's interests include gardening, reading, running, cryptic crosswords, and travel. He and his English wife Judith have two children: the older, Jennifer, is an Assistant Professor of Mathematics at Western New England College, while her younger brother, Philip, is a graduate student in statistics at Stanford. ■

A Year in the Life of the MAA: The Statistics

By Ann Watkins

A Year of Publications

American Mathematical Monthy
Total number of pages: 945
Number of manuscripts submitted: 719
Number published: 103
Number of people who refereed manuscripts: ~ 300

Mathematics Magazine
Number of manuscripts submitted: 282
Number published: 60
Number of referee reports requested: 321
Percentage received: 88%

The College Mathematics Journal
Number of *CMJ* authors: 77
Number of *CMJ* referees who, on being asked what was happening with the paper they had been sent ten weeks ago, replied that they had not looked at it, were not planning on looking at it, and didn't know that they needed to tell anyone about that: 1

Number of new books published by the MAA: 23
Number of those that are all-electronic: 1
Average number of MAA books sold per month on amazon.com: 385

Average number of visits to MAA Online per day: 4,637
Average number of pages hit per visit: 12

Number of articles published last year in MAA journals by MAA president: 1
Number of expository writing awards received by MAA president: 0

A Year of Membership

Number of full-time and part-time two-year college, four-year college, and university mathematics professors: 48,015
Total MAA membership: 32,558

Number of individuals who contributed to the MAA: 1,391
Average contribution: $123.89

Number of MAA staff members: 35
Ratio of members to staff: ~q 930/1
Ratio for the AMS: ~ 180/1
Ratio for SIAM: ~ 148/1

Number of full-time graduate students in mathematics: 26,168
Number of graduate students who are MAA members: 2,419

A Year of Programs for Members

Number of new SIGMAAs approved: 3

Number of members of largest SIGMAA (RUME): 1264

Number of new outside grants funded: 14
Total value of funded grants: $2,330,832

Number of professional development workshops: 8
Number attending: 224

Number of U.S. citizens receiving Ph.D.s in mathematics: 532
Number of new Project NExT Fellows: 71
Number of Fellows so far: 626

A Year of Programs for Undergraduates

Number of junior and senior mathematics majors: 58,900
Number of undergraduates who are MAA members: 1,199
Number of undergraduates who receive *Math Horizons*: 17,000
Number taking the Putnam exam: 2,954
Number of active Student Chapters: 173

Number of students attending MathFest: 193
Number of papers they presented: 107
Number of mathematicians attending MathFest: 908
Number of papers they presented: 116

A Year of the American Mathematics Competitions

Number of 8th grade and below students participating in the AMC 8: 169,654
Number of 12th grade and below students participating in the AMC 12: 136,714
Number of students participating in the USA Mathematical Olympiad: 325
Number who came to Cambridge to take the USAMO: 202
Number of students participating in the Mathematical Olympiad Summer Program: 178

Rank of the U.S in the International Mathematical Olympiad.: 3 out of 84
Number of gold medals presented at the IMO: 39
Percentage won by U.S. team: 10%

A Year of Governance

Number of pages in nine issues of FOCUS*:* 280
Number of pages in agendas for two Board of Governor's meetings: 241

Number of members in largest MAA section (Southeastern): 2065
Number of members in smallest MAA section (Intermountain): 164
Number of governors representing Southeastern Section: 1
Number of governors representing Intermountain Section: 1

Number of e-mails sent by the MAA president: 2817

A Year of Section Meetings

Number of section meetings: 38
Average attendance per meeting: 144
Average number of students per meeting: 41
Average number of two-year college faculty per meeting: 10
Largest attendance at a section meeting (Texas): 301
Largest percentage of members attending a section meeting (Mississippi-Louisiana): 51%
Largest number of student papers at a section meeting (Ohio): 38
Number of times Pólya lecturer Ed Burger spoke at section meetings: 6
Number of chicken dinners eaten by MAA president at section meetings: 7
Number of blue-grass bands heard by MAA president at section meetings: 1

A Year of National Meetings

Total attendance at winter meeting in San Diego: 4665
Number who were students: 717
Number of panel discussions: 50

Total attendance at MathFest in Burlington: 1239
Number of states represented: 47
Number of foreign countries represented: 10
Percentage change in MathFest attendance in six years: +62%
Percentage change in NASDAQ over same period: -22%

A Year of Complaints to the MAA President

Complaints about the letter from the MAA president asking people to give money to the MAA in their will: 2
Complaints about the letter asking people to give money before they die: 0

Number of e-mails complaining that the MAA president didn't respond to a previous e-mail that requested no further communications from the MAA: 1

Most common complaint (having to speak on the same program as Pólya lecturer Ed Burger): 4

A Year of Thank-Yous

I receive many letters and emails thanking me for the work that the MAA does. Often these come from high school students grateful for their experience with the American Mathematics Competitions or from retired members who enjoy their journals even more now that they actually have time to read them. I would like to add my thank-you to all of you for your dedication and hard work towards advancing the mathematical sciences and for making the two years I've served as president productive ones for the MAA.

Number of minutes the MAA president enjoyed her job in the last year: 525,600. ■

Ann Watkins' term as MAA President ends after the January 2003 Joint Mathematics Meetings.

Corrections

1) The article in our December issue on Manjul Bhargava's appearing in the *Popular Science* list contained two unfortunate errors. First, Bhargava's thesis was not about the "Fifteen Theorem." Second, the article's title suggests that the "Fifteen Theorem" was the major reason for Bhargava's selection as one of the "Brilliant Ten." That is, of course, incorrect: the selection was based on all of Bhargava's work so far.

2) In the article on Fibonacci's *Liber Abbaci* in the November issue, a typesetting error introduced extra plus signs and ellipses into two of the formulas on page 7. They should read

$$5 \cdot 17 \cdot 10 \cdot 5 + 5 \cdot 4 \cdot 10 \cdot 5 + 5 \cdot 4 \cdot 3 \cdot 5 + 5 \cdot 4 \cdot 3 \cdot 2$$

and

$$4 \cdot 10 \cdot 5 \cdot 26 + 4 \cdot 3 \cdot 5 \cdot 26 + 4 \cdot 3 \cdot 2 \cdot 26 + 4 \cdot 3 \cdot 2 \cdot 5,$$

respectively.

3) In the article on Heron's formula in the November issue, the volume of the tetrahedron with base 1, 1, 1 and slant heights $\sqrt{2}, \sqrt{2}, \sqrt{2}$ should be $\sqrt{5}/12$ not $\sqrt{5}/6$. (Corrected by the author and Peter Ross.)

We regret the errors.

NSF's Advanced Technological Education Program

By Victor J. Katz

Which NSF educational program is the main source of outside funding for projects developed by community colleges, supports improved education for the high-technology industries that are so crucial to our nation's economy, and helps fund the creation of math curricula for at least half of the nation's prospective elementary school teachers? The answer is the Advanced Technological Education Program (ATE). This program, established in 1992, has made grants that have had an enormous effect in increasing the technical competencies of thousands of students in community colleges all around the country.

The ninth annual National ATE Principal Investigators Conference was held in Washington on October 24-26, 2002. Entitled "Assessing the Impact," the conference's goals were to demonstrate how these grants have succeeded in their mission over the years. Many of the current projects had booths in the exhibit hall where they displayed some of their work and had a chance to share their ideas with others. We will report here on some of the projects, and suggest that you contact the Principal Investigators or check the web sites of the projects of most interest to find out how you can either join with them or begin to replicate some of their ideas. Alternatively, if some of the ideas here spark some new ideas of your own, you should take the opportunity to submit proposals to the ATE program yourselves.

Project TEACH, centered at Green River Community College in Auburn, Washington (Their website address: http://www.projectteach.org; email address: projectteach@grcc.ctc.edu), is a collaborative effort with Central Washington University and six nearby school districts. Not only has the project developed new course materials for prospective K-8 teachers, materials which emphasize problem solving and the use of technology, but it is also working hard to recruit talented students into teaching and to provide practical and diverse early field experiences. Furthermore, prospective teachers at Green River spend many hours on Saturdays and in the summer working with local 4th grade students in mathematics, thus gaining valuable experience. One of the reasons that students attend community college is location near the student's home and the low cost. Since these reasons often still apply after a student has completed two years, Green River has arranged with Central Washington University for the latter to conduct junior and senior level courses on its campus to make it as convenient as possible for students to complete their teaching degrees. And since the students' field experiences are at nearby schools, the project has found that once students have completed their degrees, they tend to get jobs in the immediate area, helping these schools to get high quality teachers with a strong mathematics and science background.

Prince George's Community College (PGCC), in Maryland, is leading a similar effort to develop and implement science and mathematics courses for preservice elementary teachers in Maryland's community colleges. In particular, the college is working with Maryland's four-year colleges to insure that students with the new Associate of Arts degree in teaching will be able to transfer easily to any of those colleges to complete their degree. The courses at PGCC, like those at Green River, have a constructivist and inquiry-based flavor, based on materials developed through the Maryland Collaborative for Teacher Preparation and consistent with NCTM and NCATE Standards. The faculty at PGCC is also working with local high schools to recruit students into the program. Interestingly enough, given that the need for math and science-trained teachers is expected to be larger over the next decade than the capacity of Maryland's four-year colleges, plans are underway to develop four-year teaching programs at some of the community colleges themselves. (Contact: Patricia Basili, basilipa@pg.cc.md.us).

The Community College of Philadelphia (CCP), which has a strong program in elementary mathematics, is using ATE funds to develop a new degree option for students planning to be secondary mathematics teachers. As part of this process, CCP is expanding its articulation agreements with many Philadelphia-area four-year colleges, so that students can seamlessly transfer into a Baccalaureate program. Two basic courses being developed for the program are Teaching with Technology and Problem Solving in Math and Science. CCP graduates in this program will thus be expected to be experts in the use of teaching technologies and also have a large repertoire of problem solving strategies. In order to recruit and retain students in the teaching program, CCP is developing an innovative marketing strategy with the School District of Philadelphia in order to promote the program at college fairs. It also is creating customized systems of advising and mentoring to help insure that students complete the program. (Contact: Marcia Epstein, mepstein@ccp.cc.pa.us).

Although the projects above have limited components dealing with the training of community college faculty to prepare prospective schoolteachers, two national organizations have ATE grants specifically designed for this purpose. The American Mathematical Association of Two-Year Colleges (AMATYC) is conducting a project entitled Teacher Preparation, Mathematics and Technology: A National Dialogue. One major component of this project has been a series of regional conferences addressing the mathematics and technological preparation of prospective K-8 teachers at two-year colleges as well as the broader issue of two-year college involvement in teacher preparation. These conferences addressed current research results in mathematics pedagogy, held dialogues on the mathematics that prospective teachers should know, and discussed issues of course creation and articulation with four-year institutions. But AMATYC also conducted two very successful workshops in the summer of

2002 designed to help teachers at two-year colleges work with prospective elementary and middle school teachers. These workshops will be repeated at other locations in the summer of 2003. In addition, with the experience gained in these workshops, AMATYC will begin in March, 2003 to conduct Traveling Workshops in Teacher Preparation. Thus, you can ask AMATYC to come to your campus to help your faculty deal with issues in preparing teachers. For more information, check the website http://amatyc.dtcc.edu.

Another national project is being conducted by Phi Theta Kappa, the honor society for community colleges. The project, Preparing Tomorrow's Science and Math Teachers: The Community College Response, involves teams from seven community colleges with exemplary teacher preparation programs mentoring colleagues at an additional eighteen colleges. The mentoring teams, consisting of a community college educator and a four-year college faculty member, are helping these eighteen colleges replicate or adapt the knowledge, experience, and materials already developed via site visits, conferences, and interactive technologies. They will soon be able to disseminate these activities nationally. Interestingly, among the seven "exemplary" programs are the three community colleges whose projects are discussed above. (Contact: Diane Eisenberg, nsf@ptk.org).

Among the most enthusiastic ATE awardees is the group of faculty from South Carolina involved in the South Carolina ATE Center of Excellence, mainly from Piedmont Technical College and Florence-Darlington Technical College (http://scate.org). The goal of the center has been to increase the quality, quantity, and diversity of South Carolina engineering technology graduates, and it is succeeding in its goals. The emphasis in the new courses developed for the program is problem-solving, and the initial evaluation of the program shows that students graduating in it are far more confident in their problem-solving skills than students coming out of the regular program. The mathematics teachers in this program have had to adjust their own styles to meet the program's goals. Thus their teaching of technical mathematics is far different from what it used to be. They are working more closely with the technology teachers, and teaching the necessary mathematical skills when and as they are needed for solving important technology problems. With some flexible scheduling, so that more mathematics can be taught one week if needed and less another week, the students are more engaged in the mathematics when it is taught and are becoming more capable of using it at the appropriate time. The teachers too are more enthusiastic. One told me that she had been virtually burned out by teaching for several years in a traditional style with indifferent results. Now, she is energized. Her students are succeeding at a much higher rate, and she is very pleased with the outcomes. She has seen numerous students whose initial reaction to mathematics was "avoidance" being turned on by the subject, and she has also seen students with low self-esteem have their horizons raised to the point that they are finding excellent technical jobs with their hard-won skills. One of the goals of the program is to spread the teaching philosophy throughout the South Carolina community college system. So the lead math teachers in the project are serving as mentors throughout the system, to improve technical education all over the state. They welcome inquiries from other states as well. (Contact: Lynn Mack, mack.L@ptc.edu).

Another highly successful ATE Center is the New Jersey Center for Advanced Technological Education, whose main office is at Middlesex County College, (http://www.njcate.org). A key to their success has been the partnerships they forged with corporations in New Jersey. These partnerships allowed them to develop new programs that insured the employability of their graduates. Just as in South Carolina, they used an integrated curriculum model, in which the teaching of mathematics, among other subjects, was project centered. In particular, they developed "just-in-time" methods of delivery, so that students learned the mathematics necessary to solve important problems, many coming out of genuine industry needs. Although the mathematics courses for the various technical programs cover the standard topics of technical mathematics over a two-year period, the topics are all taught in relation to relevant problems. NJCATE is also working with a local school system to help them develop integrated technical high school curriculum units based on their own model.

Many other ATE projects are developing new curricular materials to go along with the project-centered approach to teaching mathematics, whether in mathematics courses themselves or in interdisciplinary programs. For example, Capital Community College in Hartford, CT, in cooperation with the Kennedy Space Center and AMATYC, produced two volumes of Mathematical Explorations, all based on NASA space activities, to be used in various mathematics courses. For example, the first Laboratory Technical Activity in the first volume is entitled "Spare Parts of the Space Shuttle." There are 250,000 parts on a shuttle, some of which are repairable and some of which are replaced once they wear out. Decisions must be made as to how many spares should be on hand, either on the ground or on the shuttle, and when to order replacements, especially of very expensive parts, based on a probability of sufficiency equation. The activity, designed to be worked on by a team, requires algebra and precalculus skills, some of which will probably be developed as the activity is being used. Capital College is also producing a new series of books entitled *Mathematical Journeys*, which consist of Laboratory Activities designed to be used either in an interdisciplinary course or an interdisciplinary club. For example, there is a lab entitled "I've Got Your Number," which explores several aspects of the cellular phone industry. The mathematics in this laboratory includes geometry of circles and polygons, graphing techniques, introductory statistics, and piecewise functions. *Mathematical Journeys* contains detailed instructions on how to create a course out of the materials, with guides as the types of mathematical skills necessary for each unit and how those should be introduced. There is even material on marketing such an interdiscipli-

continued on page 12

continued from page 11

nary course both to administrators, colleagues, and students. (Web site: http://www.ccc.commnet.edu/MWP)

Other community colleges have also developed mathematics course materials which meet their own needs, but which will probably also meet the needs of others. For example, Wake Technical Community College created and tested classroom activities for integrating mathematics and algebra-based physics (http://www.wake.tec.nc.us/math). In order to help students further in determining what skills they will need in the workplace, Wake also developed a project of Workplace Research. Community college and high school instructors visited industries throughout central North Carolina, where they interviewed and videotaped technicians to determine and demonstrate what mathematical skills were being used. Mathematical activities based on these visits were then developed. All of these industry "snapshots," including video clips, warm-up quizzes relevant to the industry, and worksheets for further exploration are now available on a CD. Wake will be hosting an AMATYC workshop in summer, 2003 dealing with Workplace Research.

Another project involving cooperation with industry is the Middle School Advanced Technology Education Project at Cleveland State University, Cuyahoga Community College, and Lorain County Community College, all in Ohio. This project pairs middle school mathematics, science and technology teachers with engineering and technology professionals. The teachers participate in various workshops and engage in project-based learning activities. In addition, they work with their own students during the school year on engineering challenges, where students working in teams with professors and engineers attempt to find innovative solutions to real world problems.. This project has been helping teachers learn better ways to integrate science and technology into the classroom, and has directly helped numerous students through such additional activities as a middle school discovery camp and work-study programs in local industries. (Contact: Terri Byrnes,m.byrnes@csuohio.edu)

For further information, go to the ATE website: http://www.nst.gov/ATE. ■

NSF Beat: Opportunities at the National Science Foundation

By Sharon Cutler Ross

Scientists, engineers, and educators who fill rotational assignments at the NSF are a key element in providing "the talent and resources that are critical to meeting the NSF's mission." The Foundation contracts with rotators principally through two programs: Visiting Scientists, Engineers, and Educators (VSEE) and the Intergovernmental Personnel Act (IPA). Briefly, a VSEE rotator takes a non-paid leave of absence from his or her home institution and receives a salary from NSF. Appointments are for up to one year with the possibility of another year. Under the IPA, a rotator is on loan from her or his home institution for up to two years as intermittent, part-time, or full-time staff. Again, an extension is possible. Both programs have a mechanism, Independent Research/Development, to arrange for time during the work year at the home institution for continuing work with graduate students or other ongoing projects.

Mathematicians and mathematics educators are most likely to serve in the Directorate of Human Resources in areas such as the Mathematical and Physical Sciences, Undergraduate Education (DUE), and Elementary, Secondary, and Informal Education (ESIS). But the lines between areas are frequently crossed and a rotator can expect to wear many hats. "It's perhaps as close as you can come to a functioning interdisciplinary department," says Lee Zia, a Program Director in DUE. Zia, who presently has a permanent position at the Foundation, has served as a rotator. He cites the opportunities to see the workings of the NSF from the inside, to see the national picture in science and mathematics education, and to help shape projects as his reason for applying to be a rotator. Spud Bradley, ESIS Section Head for Instructional Materials Development, gives similar reasons for his work at the Foundation. "Seeing things from a national perspective, working with national leaders, and helping to shape programs" are important factors for Bradley.

Many of the same qualities that make for success in academia or industry are also useful in working at the NSF—good communication skills, especially writing; interest in new things; ease in dealing with people; willingness to speak one's mind. The pace at the Foundation is much faster than at a university, a different bureaucratic style prevails, and thus there are additional qualities that are helpful in making for a good experience as a rotator—a flexible mindset, a willingness to deal with interruptions, the ability to work under tight time constraints, and an ego that can relinquish ownership of projects and writing.

Washington, DC, obviously has much to offer as a place to live. As NSF staffers, rotators have additional resources for professional development such as Congressional hearings and workshops and talks sponsored by the National Research Council as well as those sponsored by the Foundation itself. The collegial atmosphere at the Foundation often leads people from their original interest in coming to the NSF into exploring and working in other areas. A tour at the NSF has the potential for career renewal or redirection as well as providing a venue for contributing to mathematics and science education in the nation. ■

Report: 14th General Assembly of the International Mathematical Union

By Harry Waldman, based on a report by Donald G. Saari

The 14th General Assembly of the International Mathematical Union (IMU) was held on August 17-18, 2002, in Shanghai, China. The American delegation consisted of Salah Baouendi (Dept. of Math, University of California at San Diego), Jennifer Chayes (Microsoft Corp., Seattle), David Eisenbud (Director, MSRI, University of California, Berkeley), Yum-Tong Siu (Dept. of Math., Harvard University), and Donald Saari, (Chair, Dept. of Math, University of California at Irvine). Much of the General Assembly business was carried out by four committees, and the US was represented on each of them: Chayes served on the Finance and Dues committee, Eisenbud on the nominating committee, Saari on the resolution committee, and Siu on the teller and credentials committee.

Several resolutions were passed.

Resolution. *The General Assembly recommends continuing the tradition of the 1994, 1998, 2002 ICMs by holding an Emmy Noether lecture at the next two ICMs (2006 and 2010) with the selection of the speakers to be made by an IMU appointed committee.*

Background: This is the first of the three resolutions proposed by the US NCM and introduced by the US delegation. For several meetings of the GA, the US delegation has consistently but unsuccessfully proposed resolutions to ensure the selection of more women and minorities as major ICM speakers.

Resolution. *The General Assembly of the IMU expects the Executive Committee to develop a proposed mechanism to involve members from the National Committees for Mathematics, not on the Executive Committee, to assist in the selection of slates. This Proposal should be put forth to the 2006 General Assembly.*

Background: It was felt during the meeting that people beyond those on the Executive Committee should be involved in the selection of slates of names for the next Executive Committee.

Resolution. *The General Assembly recommends the guidelines for receiving Colloquia support from the IMU be further developed and made available on the IMU website. These scarce funds should go primarily to supporting mathematicians from developing countries and high quality international conferences that take place in developing countries.*

Background: The issue here was to make more precise procedures for IMU sponsored conferences.

Resolution. *The General Assembly of the IMU endorses the "Best Practices" document of the Committee on Electronic Information and Communication, also endorsed by the IMU Executive Committee at its April 13, 2002, meeting. In particular the Assembly endorses the provisions designed to ensure access by mathematicians of the developing world to current mathematical literature: the posting of the articles on personal homepages and servers and the practice now beginning with several publishers of making journal articles in electronic form freely accessible five years after they have been published, or even sooner.*

Background:This was the second resolution proposed by the US delegation.

Resolution. *Notwithstanding these times of heightened tension and security concerns, we urge a continuation of scientific exchange and publication. The IMU opposes efforts either by governments, organizations, or individuals to restrict contacts and interactions in the world mathematical community. Specifically we oppose holding individual mathematicians liable for the actions of their governments. The IMU endorses the principles expressed in the International Council for Science (ICSU) ARTICLE 5 of STATUTES.*

Background: This was the third resolution proposed by the US NCM and introduced by the US delegation. This resolution reflects a worry that travel and other restrictions which have been imposed, or suggested that they will be imposed, on the free flow of responsible scientists and mathematicians will have an adverse effect on mathematics both here in the US and abroad. As an illustration, this includes concern about a May, 2002, ad which was placed in an European newspaper urging a boycott, it includes concern about visa problems and other possible restrictions imposed on mathematicians wishing to work with colleagues in the US.

In addition, two relevant items of legislation passed involved a a 10% dues increase and the selection of Spain for the site of the 2006 International Congress of Mathematicians.

Finally, new officers of the IMU were elected during the general assembly . They are:

President: John Ball (UK)
Vice Presidents: Jean-Michel Bismut (France) and
Masaki Kashiwara (Japan)
Secretary: Phillip Griffiths (USA)

The newly elected Executive Council consist of: Andrey Bolibruch (Russia), Martin Grotschel (Germany), Zhi-Ming Ma (China), Ragni Piene (Norway) (the first woman ever elected to the Executive Council), Madabusi Raghunathan (India). ■

Short Takes

That's Wrong!

While we make every effort to get things right, it's inevitable that every once in a while FOCUS and MAA Online will contain mistakes. When that happens, we are always willing to run corrections (see page 9, for example), so please let us know when we've messed up. The quickest way is to email focus@maa.org. Thanks!

New Officers for NCTM

The National Council of Teachers of Mathematics has announced the results of the 2002 election. Cathy L. Seeley of Cedar Park, TX will be President-elect for 2003-2004, and will serve as NCTM President in 2004-2006. New members of the NCTM Board of Directors were also elected: Cynthia Bryant of Salem, MO, M. Kathleen Heid of State College, PA, Mari Muri of Cromwell, CT, and Anthony A. Scott of Elmwood Park, IL. Their term will start on April 2003 and they will serve for three years. Kathy Heid, who is currently a member of the MAA Board of Governors, will move from one board to the other with hardly a break.

Fewer Math and Science Ph.D.s

According to an article in the *Chronicle of Higher Education* (Monday, November 11, 2002; online, for subscribers only, at http://chronicle.com/daily/2002/11/2002111101n.htm), the total number of Ph.D's awarded in the United States has declined sharply over the last few years. In fact, the 2001 number is the same as the 1993 number. The decrease is mostly due to fewer Math, Science and Engineering degrees (down 6.5% since 1998). Doctorates in other fields decreased by only 0.9% during the same period.On the other hand, the *Chronicle* points out that the percentage of doctorates awarded to women has increased. The survey was produced by the University of Chicago's National Opinion Research Center; check out their website at http://www.norc.uchicago.edu for more information.

DIMACS Reconnect '03 Conferences

DIMACS, the Center for Discrete Mathematics and Theoretical Computer Science at Rutgers University, sponsors Reconnect Conferences every year. They are intended to expose faculty to current research topics that are relevant to the classroom, to create the opportunity to write classroom materials based on such topics, and to "reconnect faculty to the mathematical sciences enterprise by exposing them to new research directions and questions." There will be three conferences in 2003: "Some Current Problems in Coding Theory" will be held at Salem State College, June 15 -21, 2003; "Centrality in Graphs with Applications to the Theory of Location of Facilities" at the Illinois Institute of Technology, July 16-13, 2003; and "Internet Algorithms: Modeling the Web as a Graph, with Applications to Information Gathering and Search" at DIMACS/Rutgers University, August 10-16, 2003. Funding for lodging and meals is available through a grant from NSF. Visit http://dimacs.rutgers.edu or email reconnect@dimacs.rutgers.edu for more information.

Improving College and University Teaching

A recent report from the National Research Council focuses on *Evaluating and Improving Undergraduate Teaching in Science, Technology, Engineering, and Mathematics.* It argues that while the quality of the research of scientists and mathematicians is carefully evaluated, "the evaluation of teaching in these fields has been haphazard and less exacting." In addition "professors who excel in the classroom are sometimes given little recognition on their own campuses, let alone in the wider academic community." Finally, "faculty members and administrators often believe that it is nearly impossible to objectively gauge the effectiveness of teaching skills." The NRC report argues that the tools for correctly evaluating teaching effectiveness and the impact of curricula do exist and should be used by colleges and universities. The report recommends that colleges and universities help faculty improve their teaching. It also suggests that "university leaders or governing boards should create endowments to recognize faculty members who, over time, have made significant contributions to teaching." The full report is online at http://www.nap.edu/catalog/10024.html.

Summer Mathematics Program for Women at Carleton

The Department of Mathematics at Carleton College plans to offer again this year their month-long summer mathematics program for eighteen mathematically-talented first- and second-year undergraduate women. By introducing them to new and exciting areas of mathematics that they would not see in a standard undergraduate curriculum, and by honing their skills in writing and speaking mathematics, the program leaders endeavor to encourage these women to pursue advanced degrees in the mathematical sciences, and, more importantly, to increase each woman's confidence in her own abilities and connect them all into a supportive network to carry them through their undergraduate and graduate education.

At the heart of the program are two demanding, intense courses under the supervision of female faculty who are active in research and renowned for their teaching. Besides the coursework, participants take part in a variety of mathematical events: panel discussions on graduate schools and careers, colloquia on a variety of topics, recreational problem-solving, and visits from at least one REU organizer and the organizer of the Budapest Semester. The mathematical part of the program is balanced with optional weekend events including canoeing, hiking, picnics, and tubing.

Please refer students who you feel would benefit from this program to the web page at http://www.mathcs.carleton.edu/smp or have them contact Deanna Haunsperger at Dept. of Math/CS, Carleton College, Northfield, MN 55057 (e-mail: dhaunspe@mathcs.carleton.edu). The application deadline is February 21, 2003.

Letters to the Editor

Another Article on Heron's Formula

I enjoyed reading Reuben Hersh's "A Nifty Derivation of Heron's Area Formula" in the November 2002 issue of FOCUS. Hersch's derivation, like other clever results in elementary mathematics, is one which is often rediscovered. I last encountered it (essentially the same derivation, but with a different proof) in Roger C. Alperin's "Heron's Area Formula" in the March 1987 issue (v. 18, no. 2) of *The College Mathematics Journal*, pp. 137–8.

Roger B. Nelsen
Lewis & Clark College

Generalizing Heron's Formula

There actually is a nice "formula for the volume of a tetrahedron as a function of the lengths of the six edges," but it's just not symmetric in all six edges, only in each of two subsets of three edges (which is consistent with the last paragraph in Hersh's article). It's given on p. 13 of Pólya's *Patterns of Plausible Inference* (Volume II of *Mathematics and Plausible Reasoning*, 1954). With edges a, b, and c meeting in the same vertex and edge e opposite to a, f opposite to b, and g opposite to c, the formula is

$$144V^2 = 4a^2b^2c^2 + \left(b^2 + c^2 - e^2\right)\left(c^2 + a^2 - f^2\right)$$
$$\left(a^2 + b^2 - g^2\right) - a^2\left(b^2 + c^2 - e^2\right)^2 - b^2\left(c^2 + a^2 - f^2\right)^2$$
$$-c^2\left(a^2 + b^2 - g^2\right)^2$$

(In standard notation the formula doesn't look as ugly as the above, especially taking into account the partial symmetry.) On p. 45 of Pólya's *Mathematical Discovery*, Volume I, 1981, he gives two special cases of the formula (a trirectangular tetrahedron and a tetrahedron with $e = a$, $f = b$, $g = c$) where the formula simplifies, and each he refers to as an "analogue to Heron's theorem". (Jerry Alexanderson suggested this last reference.)

Peter Ross
Santa Clara University

Letters commenting on material published in FOCUS (or responding to other letters) are always welcome. Send them by email to fqgouvea@colby.edu or by snail mail to Fernando Gouvêa, Department of Mathematics, Colby College, Waterville, ME 04901. Letters will be edited for publication

In Memoriam: René Thom, 1923–2002

René Thom, one of the most important mathematicians of the century and winner of the Fields Medal, died on October 25 in his home in Bures-sur-Yvette, France. He was 79 years old.

Born in Montbéliard, Thom attended the École Normale Superieure between 1943 and 1946 and then quickly established himself as an important mathematician. His work on cobordism and characteristic classes led to his being awarded the Fields Medal in 1958. In 1963 he was made a permanent professor at the Institut des Hautes Études Scientifiques (IHES) and remained there until his retirement in 1988.

Thom made many contributions to mathematics, philosophy of mathematics, and mathematics education, but since the 1970s his name has been most closely attached to "Catastrophe Theory", an attempt to use the theory of singularities as a tool to understand discontinuous phenomena in the real world. Thom argued for the wide applicability of this theory. Unfortunately, the projected applications failed to arise or were not quite convincing. Nevertheless, catastrophe theory is considered a significant precursor of the more recent work in "chaos theory."

Thom was a critic of what he felt was sometimes an excessive fascination with proof. He argued that sometimes imprecise and unrigorous work contained fundamental insights. On the other hand, he once asserted that "it is unethical for a mathematical researcher to use a result the proof of which he does not 'understand' (except for the specific case where he wants to disprove the result)," a very high standard indeed.

Several important newspapers (including the *New York Times*, the *Washington Post*, the *Guardian*, and *Le Monde*) published major obituaries of Thom, several of which can still be found online. A biography can be found at http://www-groups.dcs.st-and.ac.uk/history/Mathematicians/Thom.html. ■

Have You Moved?

The MAA makes it easy to change your address. Please inform the MAA Service Center about your change of address by using the electronic combined membership list at MAA Online (www.maa.org) or call (800) 331-1622, fax (301) 206-9789, email: maaservice@maa.org, or mail to the MAA, PO Box 90973, Washington, DC 20090.

2002 Clay Research Award Winners Announced

The Clay Mathematics Institute (CMI) presented the 2002 Clay Research Awards at its Annual Meeting, held on October 30, 2002, at the American Academy of Arts & Sciences in Cambridge, Massachusetts. The Awards, presented by CMI President Arthur Jaffe and Directors Landon Clay and Lavinia Clay, went to Oded Schramm, for his work on the Loewner equation, and to Manindra Agrawal, for his work on primality testing. Each winner was made a Clay Institute Prize Fellow, and received a bronze model of the CMI logo, which is an elegant sculpture "Figureight Knot Complement vii/ CMI" by sculptor Helaman Ferguson.

Agrawal, who was born in May 1966, has since 2001 been a full professor at the Indian Institute of Technology in Kanpur, India. He has been active over the past ten years in the field of decision theory, complexity, and the relation between the geometry of sets and their information content. For some years he has been interested in finding a polynomial time algorithm to test whether a given number is prime. Although random algorithms can solve this problem with high certainty in polynomial time it remained a long-standing challenge to find a method that works in every case. Agrawal solved this problem in August 2002, working with two undergraduate students: Neeraj Kayal and Nitin Saxena. Their proof establishes the correctness of a conjecture made in 1999 by Agrawal and Somenath Biswas. (See the November issue of FOCUS for an expository account of the Agrawal-Kayal-Saxena result.)

Oded Schramm came to the United States in 1987 as a graduate student in topology under William Thurston. After this, his work evolved into the frontiers of problems in combinatorics and analysis. Schramm is an example of a person using training in one field to elucidate another one. Currently, Schramm works as a Senior Researcher in the extraordinary mathematics group at Microsoft in Redmond, Washington. Schramm's groundbreaking study of the stochastic Loewner equation led to the solution of many problems, by him, by his collaborators, and by others. It led to major progress in probability theory, in the theory of percolation and of random walks, as well as in related topics of conformal field theory.

For more information on the Clay Research Award and the winners, visit their site at http://www.claymath.org. ■

Memories of Arnold Ross

By Glenn Stevens

Arnold Ross entered my life in the form of a personal letter that came to my home in the central valley of California in the winter of 1969, when I was just a sophomore in high school. The hand-typed letter, which was addressed personally to me, and signed personally by Professor Ross, offered a warm invitation to join the *community of mathematicians* by attending an eight week summer program at the Ohio State University in Columbus, Ohio. My decision to accept that invitation proved to be a defining moment in my life. It was not only the beginning of a life devoted to mathematics. It was also the beginnings of a friendship with Arnold that would continue until his recent death on September 25, 2002 at the age of 96.

Over almost five decades, countless young people with early promise for creative research in mathematics and science received such invitations from Arnold to join his program. Those of us who accepted were treated to an unforgettable experience of mathematical exploration. The program was built around a delightful collection of handwritten and mimeographed problem sets designed by Arnold himself. Through our work on these problems we honed our powers of independent exploration and learned the art of skeptical conjecture, proof and disproof. Professor Ross's famous exhortation "to think deeply of simple things" has been deeply etched in the psyches of all who passed through his program. We all benefited from his gentle reminders that rich concrete experience precedes significant discovery, that "language is our friend," and that good abstraction amounts to condensation of diverse experience united by a few fundamental ideas. Arnold often said that "no one leaves the program unchanged." Indeed, at the end of the eight weeks we were mentally exhausted and, as I can say from personal experience, many of us swore never to return. However, once back in the traditional school environment, the need for more intellectual challenge became intense and we felt a yearning to go back.

Arnold Ross

Another personal letter from Arnold arrived in January of the following year inviting us back for more advanced investigations and asking us to "help" the new first-year students in the program. Arnold's invitation was irresistible. He had a remarkable way of making each of us feel special and he never failed to remind us of our responsibility to the rest of the community. Altogether, I joined Arnold's program for a total of five summers, three times as a student and twice as a counselor. Many of my peers were involved even longer. Together we interacted not just with Professor Ross, but also with his colleagues, including such memorable personalities as Kurt Mahler, Hans Zassenhaus, and Ivo Thomas. The OSU mathematics department, which Arnold chaired for many years, welcomed us warmly into graduate seminars offered in the summertime. I am especially grateful for an invitation from Professor John Hsia to join his seminar on quadratic forms one summer. Through these interactions, the "children of the Ross Program" came to see research mathematics as the work of a community of individuals and we came to see ourselves as members of that community.

It has been said that Arnold Ross influenced American mathematics of the 20th century more than any other single individual. Such statements can be neither proved nor disproved, but there is no doubt that Arnold's influence has been profound. A steady stream of outstanding scholars has flowed out of Arnold's program since the very beginning. Many of these individuals now hold research positions at many of the nation's most prestigious institutions—not just in mathematics, but also in a variety of fields ranging from astrophysics to economics.

It is significant, I think, that Arnold made his contribution to American mathematics not through his own research contributions, but through the development of high quality programs of mathematics education. Indeed, Arnold's devotion to mathematics education ran much deeper than the creation of the Ross Program for which he is best known. Arnold repeatedly emphasized that the principles of his program were relevant not just for the education of highly talented young people. The basic principles that Arnold repeated so often and so consistently—that knowledge comes of experience, that language is a basic tool of mathematics, and that "the opposite of boredom is not fun," are applicable to a broad spectrum of students. His insistence on this point was just one of many ways that his deep respect for the potential of learners at all levels manifested itself. Arnold himself ran a very successful program in the 60's for minority students in Columbus, Ohio that he provocatively named *Horizons Unlimited*. Moreover, his work deeply influenced many others in mathematics education who have developed their own programs for young people from a wide range of backgrounds.

Arnold Ross was a deeply compassionate man whose energy and optimism seemed inexhaustible. He ran his summer program every summer from 1957 through 2000, when he finally retired from the program at the age of 94. Until the very end of his life, Arnold bore a mischievous gleam in the eye that reflected his untiring efforts to enrich the talents of young people and to introduce them to the joys of a life of inquisitive exploration. ■

*Glenn Stevens is Professor of Mathematics at Boston University and is the director of the PROMYS program (*http://www.promys.org*), a program for high school students inspired by the Ross Program.*

Being a Mathematics Educator in a Department of Mathematics

By Eileen Fernandez

When I first accepted a position in Montclair State University's Department of Mathematical Sciences, people asked, "Why are you working in a "*mathematics* department when your degree is in *education*?" My response then, which remains true today, was simple: in order to be a *mathematics educator*, one must maintain a solid footing in the classroom and in one's area of education research. I was all too familiar with the dangers of losing this footing. One foot out of the classroom generates research that fails to serve education's stakeholders (among them teachers, students, principals, administrators or parents). And a foot out of education research fails to spread ideas about how to enhance the teaching and learning of mathematics.

I have known since high school that I wanted to be a mathematics educator (although I didn't know at the time that such a profession existed). I tried to balance both disciplines through my education (a Masters in mathematics and a Doctorate in mathematics education). When I com-pleted my studies, I discovered that I qualified for positions in both education and mathematics departments. It was not an easy choice: I wanted to teach mathematics but knew that some mathematicians were prejudiced against mathematics educators. I worried about being able to do *genuine* research in mathematics education and about how my research would be viewed and whether it would be valued. It has taken some work, but I feel I've found a good place for myself. Since others are in my position, I wanted to share some of the strategies I've had that have helped me maintain the delicate footing required to be a contented educator in a department of mathematics.

Use your classrooms as a forum for research

With opportunities to teach either mathematics or mathematics education courses, mathematics educators have a rich forum for doing research, complete with students and their genuine obstacles. I have successfully used this strategy to generate papers on how to enhance the teaching of certain calculus topics, how to tweak certain instructional formats to improve problem solving in geometry amongst prospective teachers, and how to address students' misunderstandings of functions in pre-calculus. Remember to get your students' written permission before you collect data from them and be careful in writing up results in which you are *both* researcher and teacher.

Work with mathematicians and educators

I've had to work hard to achieve this, but the payoff has been enormous. I have served on committees and done professional conference work with professors in our university's education department. I have also collaborated on research projects with mathematicians in my department. As a result, I've met colleagues who are not only valuable resources, but also good friends. Of course, you do not have to stay within your university. I am collaborating on a book for middle school teachers, and have applied for a grant, with two colleagues from my graduate school days (in education) and one new colleague (in mathematics) who are from three different universities.

Seek out the mathematics community's outreach to education efforts

It is not unusual these days to see mathematics projects dedicated to improving education. One of my more rewarding experiences was with the MAA's Project NExT. One of this project's many objectives is the initiation of young faculty into mathematics academic life. Not only did NExT provide me with forums for sharing work I had done in the classroom, but it also exposed me to numerous resources for enhancing my teaching, giving presentations, applying for grants, and maintaining balance between work and personal life. It is still reassuring to find fellow NexTers (and their numerously colored dots) at meetings of the MAA or AMS and to know that I can use the NExT listserv to share ideas and ask for advice on matters of teaching and research.

Go to conferences in both disciplines

This is a tough one, mainly for financial reasons. Balance is the key. I take into account where the meetings are and to what extent what I have to offer matches the topics for paper session. Sharing rooms with friends will help you and your department pay for this effort.

Talk about your work

Recently, I was talking to a statistician in my department who described her initial skepticism and wariness at qualitative research. (Most of my research in mathematics education is qualitative.) She told me that by hearing me (and others) talk about our work and its theoretical underpinnings, she has come to value the role that this methodology can play in generating research and enhancing statistical methods. I've also had colleagues tell me that they didn't know (until they met me and saw my work) what research in mathematics education was like. They confessed to conceptualizing math-ematics education as just mathematics teaching. They now realize it is a social science complete with a wide variety of theoretical frameworks and methodologies that can be used to generate new education theories or inform practice at a wide variety of levels. So talk about your work, not just in departmental seminars, but also at lunch or in the departmental lounge.

There is no choice that works for everyone. Some mathematics educators will end up in departments of education. These strategies have helped make the option of working in a mathematics department work well for me. ■

Eileen Fernandez is in her fourth year as an assistant professor of mathematics and mathematics education at Montclair State University in Upper Montclair, NJ.

Read This!

By Fernando Q. Gouvéa

The MAA Online book review column, *Read This!*, continues to actively review books that are of interest to a wide audience of mathematicians. Between the *Briefly Noted* section and the full-length reviews, we have covered more than 300 books, with many more to come. All those reviews are still available on MAA Online.

What have we reviewed recently? Here's a partial list:

Chance, Luck and Statistics
By Horace C. Levinson.
Review by Charles Ashbacher.

The Math Life
A film by Wendy Conquest, Bob Drake, and Dan Rockmore.
Review by Henry Cohn.

Fractals, Graphics, and Mathematics Education
By M. L. Frame and B. B. Mandelbrot.
Review by George Ashline.

Proofs Without Words II,
By Roger B. Nelsen.
Review by Robert C. Stolz.

The Education of a Mathematician
By Philip J. Davis.
Review by P. N. Ruane.

Mathematical Olympiads: Problems and Solutions From Around the World, 1999-2000
Edited by Titu Andreescu and Zuming Feng.
Review by Mihaela Poplicher.

How to Ace the Rest of Calculus
By Colin Adams, Abigail Thompson, and Joel Hass.
Review by Kevin Anderson.

All the Mathematics You Missed [But Need to Know for Graduate School],
By Thomas A. Garrity.
Review by Mariah E. Hamel.

Mathematics Awareness Week 2003

The theme for this year's mathematics Awareness Week has just been announced. It will be Mathematics and Art. FOCUS will have more detailed information in a future issue; for now, visit http://www.d.umn.edu/~jgallian/art.html for essays, links, references, possible speakers, and the MAM2003 poster.

Employment Opportunities

CALIFORNIA

CAL STATE POLYTECH. UNIV., POMONA
Department of Mathematics
Four tenure-track positions
Mathematics Education (Two positions: Assistant Professor and Associate/Assistant Professor). Teach undergraduate courses in math education, collaborate with others on campus involved in math education. Opportunity to teach lower and upper division math courses, provide in-service programs for local schools, help to develop master's in mathteaching, advise students seeking secondary teaching credential. Minimum qualifications: Doctorate in math education with master's degree in mathematics (or equivalent) or Ph.D. in mathematics, with strong background in math education. ABD's will be considered. Must know about trends in math education, uses of technology in math education. Preference to those able to supervise student teaching. Mathematics (Two positions: Asst Prof) Teach undergraduate, graduate, and service courses in math, participate in curriculum development, and advise undergraduate and graduate students. Preference to those with expertise in one or more of: algebra, control theory, differential equations, estimation theory, geometry, number theory, stochastic differential equations, topology. Minimum qualifications: Ph.D. in Mathematics or Statistics. Completion of terminal degree by 9/03. All positions: Expected to serve on department and university committees, engage in scholarly activities. Required: Evidence of, or potential for, teaching excellence, directing master's theses, engaging in scholarly activities, working with diverse student body. Salary dependent on qualifications. Initial review of applications 1/8/03. Review will continue until position is filled or closed. Submit application form indicating position area (forms are available at http://www.csupomona.edu/~academic/faculty/open_faculty_positions.htm), curriculum vitae, transcripts, and minimum of three reference letters to Faculty Search Committee, Mathematics Department., CSPU Pomona, 3801 W. Temple Ave., Pomona, CA 91768-4007; lmborchert@csupomona.edu; 909-869-4008; Fax: 909-869-4904; http://www.csupomona.edu/~math. AA/EEO.

GEORGIA

GEORGIA COLLEGE AND STATE UNIVERSITY
Department Chair, Department of Mathematics and Computer Science
Applications are invited for Department Chair. Department of Mathematics and Computer Science. At least five years of teaching experience is required and administrative experience is desirable. Applicants must have a doctorate in mathematics, computer science or related field. The department offers undergraduate degrees in mathematics and computer science and minors in mathematics, computer science, actuarial science and quantitative analysis and has excellent teaching and laboratory facilities. There are twenty-one faculty positions in the department distributed as follows: five computer science, two mathematics education, thirteen matheamtics, and one chair. As the University System of Georgia's designated public liberal arts university and a member of the Council of Public Liberal Arts Colleges (COPLAC), GC&SU is committed to combining the educational experiences typical of esteemed private liberal arts colleges with the affordability of public higher education. GC&SU is an Equal Opportunity/Affirmative Action Employer. Review of applications will begin December 6, 2002 and continue until the position is filled. For additional information and the application procedure, go to: http://www.gcsu.edu/facultyjobs.

FLORIDA

BROWARD COMMUNITY COLLEGE
Broward Community College (BCC) is a large, three-campus, three-center urban institution serving approximately 50,000 credit and non-credit students in Southeast Florida. BCC is the principal provider of undergraduate higher education for the residents of Broward County. Through a wide variety of degree and certificate programs and continuing education courses, the college attracts a great diversity of students. The college is also a source of cultural enrichment; a resource for community development, business, and industry; and an avenue for continued skill upgrading and enhancement and retraining.
A completed employment application, copies of graduate transcripts & letter of intent must be received by January 31, 2003 to be considered for employment.

Mathematics Faculty, FOUR Positions Available Master's degree with 18 graduate semester hours in Mathematics required. Three positions at Central Campus (#247): Dedication and enthusiasm for teaching a must. Applicant should be willing to teach the entire span of Math courses from Pre-Algebra to Calculus III. Applicant will contribute time and effort to academic endeavors at the department, campus and college levels. Willing and able to incorporate technology in the classroom and must be open to new teaching strategies to enhance student success.

One position at North Campus (#117): Experience teaching both college preparatory and college level Mathematics courses with an understanding of the needs and concerns of community college students. Must have experience using appropriate technology and must be willing to work with varying instructional modalities.

Upon selection, official transcripts will be required.
Salary ranges (based on degree & years of experience) are: Master's (18 grad semester hrs in discipline), $31,963-$41,552; Doctorate (24 grad semester hrs in discipline), $37,716- $47,305.

Applications available: http//:www.broward.edu/jobs/bccjobs.jsp or 800-682-3646 or 954-201-7338. Submit application packages to: Broward Community College/ HR, 225 E. Las Olas Blvd., Ft. Lauderdale, FL 33301. BCC is committed to the principle of diversity. We are interested in receiving applications from a broad spectrum of people including women, minorities, veterans, & disabled individuals.

UNIVERSITY OF SOUTH FLORIDA

The Department has two non-tenure-earning, nine-month (teaching) Instructorship positions available on our main (Tampa) campus. These positions are annually renewable. Minimum qualifications include Ph.D. (or equivalent) in Mathematics or a closely-related field earned by August 25, 2003, and documented interest and ability in undergraduate teaching. Applicants with three years of experience teaching undergraduate students are preferred. Further details of these positions include:

Equivalent of 12-hour teaching load.Course-release time may be earned for course supervision and/or course development. Instructors will be primarily teaching general-education mathematics courses to Freshmen and Sophomores.

By February 15, 2003, send application materials (including AMS Cover Sheet and curriculum vitae) and have three letters of reference, at least two of which address teaching, sent to:

Instructor Search Committee
Department of Mathematics
University of South Florida
4202 East Fowler Avenue, PHY114
Tampa, FL 33620-5700

Inquiries about these positions may be sent to mathsearch@math.usf.edu.
Note: Members of the Search Committee will be attending the joint meetings in January in Baltimore. The University of South Florida is an affirmative action, equal opportunity, equal access employer. Applications from women and minorities are encouraged. According to Florida law, applications and meetings regarding them are open to the public. For disability accommodations, please contact the department at (813) 974-2643 at least five days in advance.

MASSACHUSETTS

WILLIAMS COLLEGE
The Williams College Department of Mathematics and Statistics invites applications for two positions in mathematics and one position in statistics, beginning fall 2003, all at the rank of assistant professor (in exceptional cases, more advanced appointments may be considered). We are seeking highly qualified candidates who have demonstrated excellence in teaching and research, and who will have a Ph.D. by the time of appointment.

Williams College is a private, residential, highly selective liberal arts college with an undergraduate enrollment of approximately 2,000 students. The teaching load is two courses per 12-week semester and a winter term course every other January. In addition to excellence in teaching, an active and successful research program is expected.

To apply, please send a vita and have three letters of recommendation on teaching and research sent to the Hiring Committee, Department of Mathematics and Statistics, Williams College, Williamstown, MA 01267. Teaching and research statements are also welcome. Evaluations of applications will begin on or after November 25 and will continue until the positions are filled. Williams College is dedicated to providing awelcoming intellectual environment for all of its faculty, staff and students; as an EEO/AA employer, Williams especially encouragesapplications from women and underrepresented minorities. For moreinformation on the Department of Mathematics and Statistics, visit http://www.williams.edu/Mathematics.

MICHIGAN

GRAND VALLEY STATE UNIVERSITY
Grand Valley State University, in Allendale, Michigan, is accepting applications for the position of Postdoctoral Teaching Fellow, with employment to begin in August 2003. Candidates must have a doctorate in the Mathematical Sciences or Mathematics Education by August 2003 (completed not earlier than May 2000).

The fellowship is a two-year visiting position with a renewal option for a third year. This position is designed to offer candidates the opportunity to develop broad instructional and scholarly potential in a department committed to excellence in the teaching and learning of undergraduate mathematics. Fellows will have the opportunity to teach undergraduate courses and work in close mentoring relationships with department faculty. In addition to structured mentoring centered on instruction, fellows will explore avenues for scholarship through interactions with current faculty, and present a monthly seminar in their area of professional expertise.

For more information, including responsibilities of the position, and important details on how to apply, see our position description at http://www.gvsu.edu/math/jobs.html. Review of completed applications will begin February 17, 2003.

NORTHERN MICHIGAN UNIVERSITY
The Department of Mathematics and Computer Science invites applications for two tenure-track positions in mathematics at the rank of assistant professor beginning with the 2003-2004 academic year. Successful candidates must have a Ph.D. in an area of the mathematical sciences by August, 2003. For more information, visit our web site at http://math.nmu.edu/career/position.html. EEO/AA

MONTANA

ROCKY MOUNTAIN COLLEGE
The Department of Mathematics at Rocky Mountain College invites applications for a tenure-track position beginning fall, 2003. The successful candidate will need a strong background in analysis, and demonstrate obvious enthusiasm and talent for undergraduate teaching both at the introductory and upper levels. Classes taught will include, but are not limited to, differential equations, vector analysis, advanced calculus, complex variables and topology. The candidate will also be expected to teach part of the traditional four-semester calculus sequence. The successful candidate must be committed to undergraduate teaching with a demonstrated ability to teach effectively to students of varied interests and backgrounds. A Ph.D. or ABD in mathematics is required, and the successful candidate will play a large role in shaping the future direction of the program. In their applications, applicants should address their interests in teaching in an undergraduate, liberal-arts environment that emphasizes close faculty-student interaction. Applications will be screened beginning February 15, 2003. Send letter of application, statement of teaching philosophy, curriculum vitae, and three letters of recommendation which address the candidates interest in and commitment to excellent teaching, to: Bob Robertson, Director of Personnel, Rocky Mountain College, 1511 Poly Drive, Billings, MT 59102. E-mail inquiries to wiensd@rocky.edu. AA/EOE

NEW JERSEY

RUTGERS UNIVERSITY
DIMACS Reconnect '03 Conferences: Current Research Relevant to the Classroom
The Reconnect '03 Conferences sponsored by DIMACS (the Center for Discrete Mathematics and Theoretical Computer Science) are geared towards exposing faculty teaching undergraduates to current research topics relevant to the classroom, involving them in writing materials useful in the classroom and reconnecting them to the mathematical sciences enterprise by exposing them to new research directions and questions. The three programs: "Some Current Problems in Coding Theory" at Salem State College, June 15 21, 2003; "Centrality in Graphs with Applications to the Theory of Location of Facilities" at Illinois Institute of Technology, July 16 13, 2003; "Internet Algorithms: Modeling the Web as a Graph, with Applications to Information Gathering and Search" at DIMACS / Rutgers University, August 10 16, 2003. Applicants accepted to participate will receive lodging and meals through NSF funding. For more information or an application form, visit our web site at http://dimacs.rutgers.edu/reconnect/. Or, contact the Reconnect Program Coordinator, at reconnect@dimacs.rutgers.edu or (732) 445-5928.

NEW YORK

PACE UNIVERSITY
Dyson College of Arts and Sciences
Department of Mathematics
The Department of Mathematics, Dyson College of Arts and Sciences, Pace University invites applications for a full-time, tenure-track position at the Assistant Professor level to begin September 2003. Applicants should have a Doctorate degree in Mathematics, Applied Mathematics, or
Statistics. All fields of research will be considered. Responsibilities include teaching undergraduate courses in mathematics, developing curriculum, maintaining an active research program and sustaining scholarly activities. The successful candidate must have a strong commitment to undergraduate education, and present evidence of excellence in teaching and research. The position will be located at campuses in both New York City and Westchester County, a northern suburb.

Founded in 1906, Pace University is a private comprehensive university that offers more than 300 majors and 3,000 courses within six undergraduate and graduate colleges/schools. Its diverse student population is comprised of 9,000 undergraduates and 5,000 graduate students. Located in New York City and Westchester County, Pace draws its strength from being a unified institution that offers students a choice of several campus locations, each with its own distinctive atmosphere. For more information, visit our websites at: http://webpage.pace.edu/mathny/ and http://www.pace.edu/dyson/academics/mathwest/

Candidates for the position should submit a letter of application, a curriculum vitae, an AMS Standard Cover Sheet, a teaching statement, research statement, and three letters of recommendation sent separately to: Prof. G. Taiani, Chair, Search Committee, Dept. of Mathematics, Pace University, 1 Pace Plaza, New York, NY 10038. Review of applicants began November 30th and will continue until the position is filled.

Pace University is an Equal Employment and Affirmative Action Employer, M/F/H/V, committed to ensuring a diverse learning and working environment. Women and minorities are encouraged to apply.

NORTH CAROLINA

GUILFORD COLLEGE
Position Description – Mathematics—For Fall, 2003
Guilford College, a private liberal arts college affiliated with the Society of Friends, invites applications for a tenure-track position in mathematics beginning in August of 2003. Completion or imminent completion of a Ph.D. in mathematics is required. Interest in and ability to teach creatively in lower-level courses such as pre-calculus, elementary statistics, mathematics for teachers, and mathematics for the liberal arts through upper-level courses for mathematics majors is required. The Mathematics Department teaches courses that service science, business, education, and computer studies students among others, and all candidates must be committed to

working effectively with the broad range of student interests and abilities this encompasses. Preference will be given to candidates with interests in computer studies, interdisciplinary teaching, and directing independent studies of various sorts (including undergraduate research). Responsibilities include teaching a minimum of 12 credit hours per semester, continuing scholarly activity (broadly interpreted), advising students, college committee service, and teaching as needed in the evening continuing education program.

A complete application includes a letter of interest, a personal statement on teaching, a vita, graduate transcripts, and three letters of recommendation (at least two of which explicitly support teaching excellence or its potential). All materials should be sent to Search Committee, Department of Mathematics, Guilford College, 5800 W. Friendly Ave., Greensboro, NC 27410. Application materials should arrive by February 21, 2003 for first consideration.

Guilford College seeks applications from people representative of diversity based on age, race, gender, sexual orientation, disabilities, ethnicity, religion, national origin, career and life experiences, socio-economic background, geographic roots, as well as members of the Society of Friends. EOE/AA

PENNSYLVANIA

CALIFORNIA UNIVERSITY OF PENNSYLVANIA
Mathematics Education: Department of Mathematics and Computer Science. Duties will include teaching introductory and upper level undergraduate and graduate courses in mathematics and an applications-based elementary education mathematics sequence (MAT 120/130); seeking external funding to support research interests, facility upgrades, and/or outreach programs; serving as a liaison with the College of Education to ensure course compatibility of content and teaching methodology with elementary and secondary education certification programs; and developing collaborative partnerships with educational and/or commercial entities. An earned doctorate in mathematics education is required; a master's degree in mathematics, teaching experience at the elementary or secondary level, and experience with university programs that provide collaborative college credit at the high school level is preferred. Teaching assignments may involve travel to regional sites and/or distance learning formats. See our website at'www.cup.edu/employment for application information. Cal U is AA/EEO.

TENNESSEE

TENNESSEE TECHNOLOGICAL UNIVERSITY
Department of Mathematics
One tenure-track instructor position starting 8/03.

Minimum master's in mathematics required. College mathematics teaching experience preferred. Evidence of excellent teaching required.

Duties: Teaching lower division courses, advising, outreach, scholarly activity and/or service.

Initial screening January 22, 2003, open until filled.

For complete job description and application procedure, see www.math.tntech.edu or contact

Brian O'Connor
Search Committee Chairperson
Box 5054 TTU
Cookeville, TN 38505

AA/EEO

TEXAS

TEXAS LUTHERAN UNIVERSITY
Department of Mathematics invites applications for a tenure-track assistant professorship beginning August 2003. Requirements include Ph.D. in mathematics by appointment date, ability to teach a wide range of introductory and advanced undergraduate courses, and a commitment to establish a research program for undergraduate students. Submit letter of application, cv, statement of teaching philosophy, and five references (names, addresses including email, telephone) to: Dean John T. Sieben - College of Natural Science and Mathematics, Texas Lutheran University, 1000 W. Court St., Seguin, TX 78155; fax (830) 372-6095, phone (830) 372-6007, e-mail jsieben@tlu.edu. Review of applications will begin January 15, 2003 and continue until the position is filled. Texas Lutheran University is an equal opportunity employer and encourages women and minorities to apply. Web page: www.tlu.edu.