FOCUS

THE NEWSLETTER OF THE MATHEMATICAL ASSOCIATION OF AMERICA

October 1997

Volume 17, Number 5

In this Issue

JOINT MATHEMATICS MEETINGS

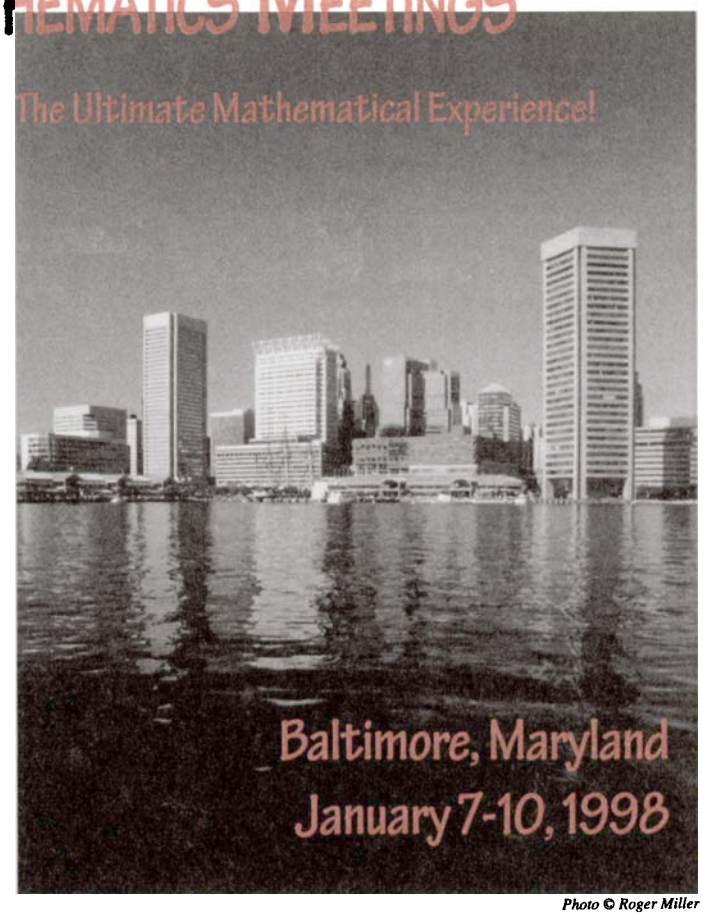

Photo © Roger Miller

Join the MAA and AMS at the winter meeting January 7-10, 1998, in Baltimore, Maryland. This meeting will exceed all your professional and personal expectations with a rich program and a meeting location with great cultural and historic ambience.

Experience the insight and knowledge of one of the world's leading mathematical physicists when Edward Witten, delivers the AMS Josiah Willard Gibbs Lecture. This Fields Medalist played a key role in discovering the "Seiberg-Witten Equations", and is sure to be a popular speaker. More than fifteen additional invited addresses, featuring speakers such as Marjorie Senechal, who has worked extensively on quasicrystal theory, and Herbert Wilf, well-known for his work on combinatorics, will fill your busy schedule.

Attend the invited address on "Some Exceptional Objects and their History" delivered by John Stillwell for a exceptional perspective. Then add to your history lesson with two joint AMS/MAA special paper sessions, two MAA contributed paper sessions, an AMS special session on The History of Mathematical Logic, and two MAA minicourses on the relationships between history and mathematics instruction. If you have an interest in geometry, don't miss Dusa McDuff speaking on symplectic structures and attend the three AMS Colloquium lectures by Gian-Carlo Rota. Of course, these are in addition to the paper sessions and the MAA Student Lecture with a geometric focus.

These activities are just a sampling of what the Joint Mathematics Meetings in Baltimore has to offer. Read through the program to see firsthand the variety of topics and the outstanding speakers participating in invited lectures, paper sessions, panel discussions, minicourses, and more. Remember, register in advance using the forms in this issue to save up to 20% off onsite registration fees, obtain your choice of hotels and a chance to win free hotel accommodations.

See you in Baltimore!

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Washington, DC 20036-1385

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FOCUS

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EDITORIAL

Burning the Flag

One of the things I like about the MAA is that it is very much a grass roots organization. As editor, I have always taken the position that FOCUS should try as much as possible to represent the views of the entire membership of the Association, not just the current leadership. Its most obvious manifestation has been the regular appearance of opinion pieces, letters, and editorials. Many readers have told me they like those features.

Since motherhood and apple pie articles tend to have low news value, the opinion pieces or letters that have appeared have inevitably expressed views not shared by all members. As editor, I always tried to ensure that, over time, all viewpoints were represented. The only major restriction was that I had to be convinced that a particular view was representative of at least a significant proportion of Association members. That was always a judgement call, based on a number of factors, including my regular attendance at as many section meetings as I could get to.

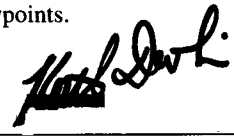
Occasionally the publication of a particular opinion has led to protestations that FOCUS should not have allowed the article or letter in question to appear. "FOCUS is, after all, the newsletter of the MAA," the complainants would argue, "and as such it should represent the MAA's views." My response was always that, in a grass roots organization, there is no such thing as a single organizational view. Of course there was never any doubt as to what were the stated policies and the "official" views of the Association, and they always found their way into FOCUS on a regular basis. The Personal Opinion, Letters, and Editorial sections were introduced to give other views, and opinion pieces were clearly identified as such.

The latest article to provoke a strong reaction from some quarters was the guest editorial from Peter Renz in the June issue. (In earlier times it would have appeared as a Personal Opinion, but because of the reduction of space in FOCUS, I gave up all my editorial space to Renz, himself a former editor of FOCUS.) In the current issue, FOCUS publishes a response to the Renz article, written by Anne E. Brown and David J. DeVries. Since this sandwiches Renz between the response and the original article by John and Annie Selden to which he in turn objected, I have also asked Renz to respond briefly to the new article. (The Seldens, editors themselves, also wrote to me, but asked that their comments not appear in FOCUS.)

A number of people have told me that they think it was wrong to have published Renz's article in FOCUS, and Brown and DeVries say the same in their response. With respect, I disagree. When I first received Renz's article, I knew from first-hand knowledge that the views he expressed were shared by a large number of MAA members. That assessment has been confirmed by many of the letters Renz has received since his article appeared, some of which he has shared with me, and again by comments made to me in person at the recent MathFest in Atlanta. Thus, Renz's piece clearly satisfies my usual criteria for publication. It may not express my view. It may not express yours. It is, however, an articulate expression of a view held by many MAA members. As such, I believe it should be heard and discussed.

As mathematicians we work in a field where things are either right or wrong. Quite rightly we do not knowingly publish mathematics that is wrong. The decisions are usually clean and straightforward. But we should, I think, guard against trying to adopt the same approach to matters of opinion. One person's "right" opinion is another person's "wrong." If you believe Renz really is "wrong," and along with him all those who share his views, then surely the best thing to do is to allow him to air his views and then present your best counter argument—as Brown and DeVries set out to do in this issue.

The strength of American democracy is that it allows a citizen to burn the flag, a right that is strengthened each time it is exercised. While I do not see anything to be gained by MAA members publicly defacing the rules of predicate logic, I do think that our profession is both enriched and advanced by the thoughtful expression of all viewpoints.



The opinions expressed in the FOCUS editorial are those of the editor and do not necessarily represent the official views of the MAA.

Invited Addresses

AMS Invited Address
Tudor Stefan Ratiu, University of California, Santa Cruz
Recent advances in geometric mechanics: Theory and applications
Wednesday, 10:05 a.m.

AMS–MAA Invited Address
Haim Brezis, Universite' de Paris and Rutgers University
How to handle infinite energies
Wednesday, 11:10 a.m.

MAA Invited Address
Marjorie Senechal, Smith College
The Symmetry Mystique
Wednesday, 2:15 p.m.

MAA Invited Address
John Stillwell, Monash University (Australia)
Some Exceptional Objects and Their History
Wednesday, 3:20 p.m.

AMS Josiah Willard Gibbs Lecture
Edward Witten, Institute For Advanced Study
Title to be announced
Wednesday, 8:30 p.m.

AWM Emmy Noether Lecture
Dusa McDuff, SUNY at Stony Brook
Symplectic structures---a new approach to geometry.
Thursday, 9:00 a.m.

MAA Invited Address
Thomas Banchoff, Brown University
Communicating Visual Mathematics: Illuminating Mathematics via the Internet
Thursday, 10:05 a.m.

AMS–NCTM–MAA Invited Address
Gail F. Burrill, President, National Council of Teachers of Mathematics
Title to be announced
Thursday, 11:10 a.m.

AMS Invited Address
Melvin Hochster, University of Michigan, Ann Arbor
Title to be announced
Thursday, 2:15 p.m.

AMS Invited Address
Robert L. Bryant, Duke University
The idea of curvature for differential *equations*
Thursday, 3:20 p.m.

AMS Invited Address
Lai-Sang Young, University of California, Los Angeles
The speed of mixing in chaotic dynamical systems
Friday, 10:05 a.m.

AMS–MAA Invited Address
Jonathan Alperin, University of Chicago
Problems in the representation theory of finite groups
Friday, 11:10 a.m.

MAA Invited Address
Alan H Schoenfeld, University of California, Berkeley
Can We Build a Model of How and Why Teachers Do What They Do? And if so, Why Should We Care?
Friday, 2:15 p.m.

AMS Invited Address
Bradley Lucier, Purdue University, West Lafayette, Indiana
Nonlinear wavelet image processing
Friday, 3:20 p.m.

MAA Student Lecture
Roger E. Howe, Yale University
Coincidences and Connections: Some new and old results in Euclidean Geometry
Friday, 7:30 p.m.

MAA Invited Address
James Propp, Massachusetts Institute of Technology
Tilings, Randomness, and Undergraduate Research
Saturday, 9:00 a.m.

MAA Invited Address
Herbert Wilf, University of Pennsylvania
New Views of the Idea of Mathematical Induction
Saturday, 10:05 a.m.

AMS Invited Address
Prabhakar Raghavan, IBM Almaden Research Center, San Jose, CA,
Randomized algorithms
Saturday, 2:15 p.m.

AMS Colloquium Lectures
Gian-Carlo Rota, Massachusetts Institute of Technology,
Lecture I: Combinatorial snapshots; Lecture II: Introduction to geometric probability; Lecture III: Invariant theory, old and new
Wednesday–Friday, 1:00 p.m.

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Monday

9:00 A.M.-5:00 P.M. AMS Chort Course on Singular Perturbations

9:00 A.M.-5:00 P.M. MAA Short Course on the Mathematics of Imaging

Tuesday

8:30 A.M.-4:00 P.M. MAA Board of Governors

9:00 A.M.-5:00 P.M. AMS Chort Course on Singular Perturbations

9:00 A.M.-5:00 P.M. MAA Short Course on the Mathematics of Imaging

1:00 P.M.-10:00 P.M. AMS Council

3:00 P.M.-7:00 P.M. Joint Meetings Registration

3:00 P.M.-5:00 P.M. MAA Minicourse #3: Part A A dynamical systems approach to the differential equations course.

3:00 P.M.-5:00 P.M. MAA Minicourse #4: Part A Computability and computational complexity: What is this all about?

3:00 P.M.-5:00 P.M. MAA Minicourse #5: Part A Teaching the history of mathematics using the World Wide Web.

6:00 P.M.-9:30 P.M. MATHCHATS

7:00 P.M.-9:00 P.M. MAA Minicourse #3: Part B A dynamical systems approach to the differential equations course.

7:00 P.M.-9:00 P.M. MAA Minicourse #4: Part B Computability and computational complexity: What is this all about?

7:00 P.M.-9:00 P.M. MAA Minicourse #5: Part B Teaching the history of mathematics using the World Wide Web.

Wednesday

7:30 A.M.-4:00 P.M. Joint Meetings Registration

7:30 A.M.-4:00 P.M. Mathematical Sciences Employment Register Registration

8:00 A.M.-10:55 A.M. AMS-MAA-MER Special Session

8:00 A.M.-10:55 A.M. AMS Special Sessions

8:00 A.M.-10:55 A.M. AMS Contributed Papers

8:00 A.M.-10:00 A.M. MAA Minicourse #14: Part A Knot theory and applications in sciences.

8:00 A.M.-10:00 A.M. MAA Minicourse #1: Part A Teaching a course in the history of mathematics.

8:00 A.M.-10:00 A.M. MAA Minicourse #6: Part A Mathematical algorithms, models, and graphic representations using spreadsheets.

8:00 A.M.-10:55 A.M. MAA Contributed Paper Sessions

8:00 A.M.-9:20 A.M. MAA Panel Discussion The impact of new K–12 instructional materials on teacher preparation programs.

8:00 A.M.-9:20 A.M. MAA Panel Discussion Partnerships in undergraduate education, I.

9:35 A.M.-10:55 A.M. MAA Panel Discussion How can an MAA teaching consultant help a department?

9:35 A.M.-10:55 A.M. MAA Panel Discussion Partnerships in undergraduate education, II.

9:45 A.M.-10:45 A.M. AMS Special Presentation Mathematical markup language: Enabling math in HTML documents.

10:05 A.M.-10:55 A.M. AMS Invited Address Recent advances in geometric mechanics: Theory and applications. Tudor Stefan Ratiu

11:10 A.M.-12:00 P.M. AMS-MAA Invited Address How to handle infinite energies. Haim Brezis

12:00 P.M. -5:00 P.M. Book Sales and Exhibits

1:00 P.M.-2:00 P.M. AMS Colloquium Lectures: Lecture I Combinatorial snapshots. Gian-Carlo Rota

2:15 P.M.-3:05 P.M. MAA Invited Address The symmetry mystique. Marjorie Senechal

2:15 P.M.-6:00 P.M. AMS-MAA-MER Special Session Mathematics and Education Reform, II

2:15 P.M.-6:00 p.m AMS Special Sessions

2:15 P.M.-6:00 P.M. AMS Contributed Papers

2:15 P.M.-4:15 P.M. MAA Minicourse #10: Part A Polynomial algebra.

2:15 P.M.-4:15 P.M. MAA Minicourse #16: Part A The Fibonacci and Catalan numbers.

2:15 p.m -4:15 P.M. MAA Minicourse #7: Part A Mathematica laboratories in calculus instruction.

2:15 P.M.-6:00 P.M. MAA Contributed Paper Sessions

3:20 P.M.-4:10 P.M. MAA Invited Address Some exceptional objects and their history. John Stillwell

3:20 P.M.-4:20 P.M. AWM Panel Discussion Mathematicians and families.

4:20 P.M.-4:50 P.M. AWM Business Meeting

4:30 P.M.-6:30 P.M. MAA Minicourse #1: Part B Teaching a course in the history of mathematics.

4:30 P.M.-6:30 P.M. MAA Minicourse #8: Part A Linear algebra using an interactive text.

4:30 P.M.-6:00 P.M. AMS Committee on the Profession Panel Discussion

4:30 P.M.-6:30 P.M. MAA Task Force on Graduate Students Panel Discussion Teaching at a College or University: Advice About Preparing for and Securing Such Positions.

4:30 P.M.-6:30 P.M. MAA Section Officers

6:00 P.M.-7:00 P.M. Reception for First-time Participants

7:15 P.M.-8:15 P.M. Young Mathematicians Network Discussion: Concerns of young mathematicians: A town meeting.

8:30 P.M.-9:30 P.M. AMS Josiah Willard Gibbs Lecture Title to be announced. Edward Witten

9:30 P.M.-11:00 P.M. AWM Reception

Thursday

7:00 A.M.-4:00 P.M. Mathematical Sciences Employment Register

7:30 A.M.-4:00 P.M. Joint Meetings Registration

8:00 A.M.-12:00 P.M. AMS-MAA-MER Special Session Mathematics and Education Reform, III

8:00 A.M.-12:00 P.M. AMS Special Sessions

8:00 A.M.-10:00 A.M. MAA Minicourse #14: Part B Computability and computational complexity: What is this all about?

8:00 A.M.-10:00 A.M. MAA Minicourse #6: Part B Mathematical algorithms, models, and graphic representations using spreadsheets.

8:00 A.M.-12:00 P.M. MAA Contributed Paper Session

8:00 A.M.-11:00 A.M. MAA Poster Session The National Science Foundation's Mathematics Across The Curriculum (MATC) projects.

9:00 A.M.-9:50 A.M. AWM Emmy Noether Lecture Symplectic structures– a new approach to geometry. Dusa McDuff

9:30 A.M.-5:30 P.M. Book Sales and Exhibits

10:05 A.M.-10:55 A.M. MAA Invited Address Communicating visual mathematics: Illuminating mathematics via the Internet. Thomas F. Banchoff

11:10 A.M.-12:00 P.M. AMS-MAA–NCTM Invited Address Title to be announced. Gail F. Burrill

1:00 P.M.-2:00 P.M. AMS Colloquium Lectures: Lecture II Introduction to Geometric Probability. Gian-Carlo Rota

1:00 P.M.-3:30 P.M. ILI Projects Poster Session

2:15 P.M.-3:05 P.M. AMS Invited Address Title to be announced Melvin Hochster

2:15 P.M.-4:10 P.M. AMS-MAA-MER Special Session Mathematics and Education Reform, IV

2:15 P.M.-4:10 P.M. AMS Special Sessions

2:15 P.M.-4:10 P.M. MAA Minicourse #10: Part B Polynomial algebra.

2:15 P.M.-4:10 P.M. MAA Minicourse #15: Part A Developing the ability in beginning college mathematics majors to write proofs.

2:15 P.M.-4:10 P.M. MAA Minicourse #16: Part B The Fibonacci and Catalan numbers.

2:15 P.M.-4:10 P.M. MAA Minicourse #9: Part A Interactive multimedia modeling and differential equation solving.

2:15 P.M.-4:10 P.M. MAA Contributed Paper Sessions

2:15 P.M.-3:15 P.M. AMS Presentation e-MATH on the World Wide Web.

2:15 P.M.-4:10 P.M. MAA Panel Discussion Case studies in curriculum reform.

2:15 P.M.-4:10 P.M. MAA Student Workshop Wheels on wheels.

2:15 P.M.-4:10 P.M. SUMMA Workshop

3:20 P.M.-4:10 P.M. AMS Invited Address The idea of curvature for differential equations. Robert L. Bryant

4:25 P.M.-7:00 P.M. Joint Prize Session and Reception

5:45 P.M.-7:00 P.M. MAA Reception for Two-year Colleges

7:00 P.M.-9:00 P.M. MAA Presentation An evening of poetry.

7:00 P.M.-9:00 P.M. MAA Presentation Reunion for calculus reform workshop.

7:00 P.M.-8:30 P.M. Young Mathematicians Network-Project NExT Panel Discussion: Professional development issues concerning young and future faculty.

FRIDAY

7:00 A.M.-8:00 A.M. Joint Pi Mu Epsilon and MAA Student Chapter Advissors' Breakfast

7:30 A.M.-4:00 P.M. Joint Meetings Registration

8:00 A.M.-10:55 A.M. AMS-MAA Special Sessions

8:00 A.M.-10:55 A.M. Research in Undergraduate Mathematics Education, I

8:00 A.M.-10:55 A.M. AMS Special Sessions

8:00 A.M.-10:55 A.M. AMS Contributed Papers

8:00 A.M.-10:00 A.M. MAA Minicourse #13: Part A Music and mathematics.

8:00 A.M.-10:00 A.M. MAA Minicourse #2: Part A Interdisciplinary lively application projects.

8:00 A.M.-10:00 A.M. MAA Minicourse #8: Part B Linear algebra using an interactive text.

8:00 A.M.-10:55 A.M. MAA Student Chapters Special Paper Session

8:00 A.M.-10:55 A.M. MAA Contributed Paper Sessions

8:00 A.M.-10:55 A.M. ASL Contributed Paper Session

8:00 A.M.-9:20 A.M. MAA Panel Discussion Increasing the participation of minorities in mathematics.

8:00 A.M.-9:20 A.M. MAA Committee on Two-Year Colleges Panel Discussion Successful articulation for innovative mathematics programs.

8:00 A.M.-10:55 A.M. Project NExT and Young Mathematicians Network Poster Session

8:15 A.M.-4:40 P.M. Mathematical Sciences Employment Register Interviews only.

9:30 A.M.-5:30 P.M. Book Sales and Exhibits

9:35 A.M.-10:55 A.M. MAA Panel Discussion Mathematics at the crossroads: The intersection of the two-year and four-year curricula.

9:45 A.M.-10:45 A.M. AMS Presentation AMS-LaTeX for authoring mathematical documents.

9:55 A.M. -10:55 A.M. MAA Committee on Teaching Undergraduate Mathematics and AMS–MAA Committee on Teaching Assistants and Part-time Instructors Panel Discussion Keeping adjunct faculty aware of changes in teaching.

10:05 A.M.-10:55 A.M. AMS Invited Address The speed of mixing in chaotic dynamical systems. Lai-Sang Young

11:10 A.M.-12:00 P.M. AMS-MAA Invited Address Problems in the representation theory of finite groups. Jonathan Alperin

1:00 P.M.-2:00 P.M. AMS Colloquium Lectures: Lecture III Invariant Theory, Old and New. Gian-Carlo Rota

1:00 P.M.-5:00 P.M. AMS-MAA Special Sessions

1:00 P.M.-6:00 P.M. AMS Special Sessions

1:00 P.M.-5:00P.M. AMS Contributed Papers

1:00 P.M.-3:00 P.M. MAA Minicourse #12: Part A The use of hand-held numerical, graphical, and symbolic algebra devices in the teaching and learning of calculus.

1:00 P.M.-3:00 P.M. MAA Minicourse #9: Part B Interactive multimedia modeling and differential equation solving.

1:00 P.M.-3:50 P.M. MAA Contributed Paper Sessions

1:00 P.M.-6:00 P.M. ASL Contributed Paper Session

1:00 P.M.-2:30 P.M. AMS Library Committee Panel Discussion The electronic environment: Changing the relationship between mathematician and librarian.

1:00 P.M.-3:30 P.M. MAA Committee on Mathematics and the Environment Poster Session Environmental mathematics.

2:15 P.M.-3:05 P.M. MAA Invited Address Can we build a model of how and why teachers do what they do? And if so, why should we care? Alan H. Schoenfeld

2:15 P.M.-4:00 P.M. NAM Contributed Paper Session

2:15 P.M.-4:00 P.M. RMMC Board of Directors

3:15 P.M.-5:15 P.M. MAA Minicourse #11: Part A Elementary mathematical models: Order aplenty and a glimpse of chaos.

3:15 P.M.-5:15 P.M. MAA Minicourse #7: Part B Mathematica laboratories in calculus instruction.

3:20 p.m -4:10 P.M. AMS Invited Address Nonlinear wavelet image processing. Bradley Lucier

3:20 P.M.-5:00 P.M. MAA Teaching Award Presentations.

4:00 P.M.-7:00 P.M. MAA CUPM Subcommittee on Research by Undergraduates Poster Session Mathematical research projects of undergraduate students.

4:05 P.M.-6:00 P.M. MAA Contributed Paper Sessions

5:00 P.M.-7:00 P.M. MAA Informal Session Actuarial Education.

6:00 P.M.-8:30 P.M. NAM Banquet

7:30 P.M.-8:20 P.M. MAA Student Lecture: Coincidences and connections: Some new and old results in Euclidean Geometry. Roger E. Howe

SATURDAY

7:30 A.M.-2:00 P.M. Joint Meetings Registration

8:00 A.M.-10:55 A.M. AMS-MAA Special Sessions

8:00 A.M.-10:55 A.M. Research in Undergraduate Mathematics Education, II

8:00 A.M.-10:55 A.M. AMS Special Sessions

8:00 A.M.-10:55 A.M. AMS Contributed Papers

8:00 A.M.-10:55 A.M. MAA Contributed Paper Sessions

8:00 A.M.-10:55 A.M. ASL Contributed Paper Session

8:00 A.M.-9:20 A.M. AMS-MAA Joint Panel Discussion New directions in information technology: Challenges and opportunities.

8:30 A.M.-10:00 A.M. AMS Committee on Education–MAA President's Task Force on the NCTM Standards Forum The future of the NCTM standards.

9:00 A.M.-9:50 A.M. MAA Invited Address Tilings, randomness, and undergraduate research. James Propp

9:00 A.M.-10:00 A.M. NAM Panel Discussion

9:00 A.M.-5:00 P.M. AWM Workshop

9:00 A.M.-12:00 P.M. Book Sales and Exhibits

10:00 A.M.-10:55 A.M. NAM Business Meeting

10:05 A.M.-10:55 A.M. MAA Invited Address New views of the idea of mathematical induction. Herbert S. Wilf

11:10 A.M.-11:40 A.M. MAA Business Meeting

11:45 A.M.-12:15 P.M. AMS Business Meeting

1:00 P.M.-5:00 P.M. AMS-MAA Special Sessions

1:00 P.M.-5:00 P.M. AMS Special Sessions

1:00 P.M.-5:00P.M. AMS Contributed Papers

1:00 P.M.-3:00 P.M. MAA Minicourse #12: Part B The use of hand-held numerical, graphical, and symbolic algebra devices in the teaching and learning of calculus.

1:00 P.M.-3:00 P.M. MAA Minicourse #13: Part B Music and mathematics.

1:00 P.M.-3:00 P.M. MAA Minicourse #15: Part B Developing the ability in beginning college mathematics majors to write proofs.

1:00 P.M.-5:00 P.M. MAA Contributed Paper Sessions

1:00 P.M.-5:00 P.M. ASL Contributed Paper Session

1:00 P.M.-2:20 P.M. MAA Panel Discussion Research methodology/ethics issues.

1:00 p.m -2:20 P.M. MAA Panel Discussion Environmental mathematics at work.

2:15 P.M.-3:05 P.M. AMS Invited Address Randomized algorithms. Prabhakar Raghavan

2:35 P.M.-3:55 P.M. MAA Panel Discussion New models for the preparation of secondary school mathematics.

2:35 P.M.-3:55 P.M. MAA CRAFTY Panel Discussion Research in mathematics education: Its importance for undergraduate education.

3:15 P.M.-5:15 P.M. MAA Minicourse #11: Part B Elementary mathematical models: Order aplenty and a glimpse of chaos.

3:15 p.m -5:15 P.M. MAA Minicourse #2: Part B Interdisciplinary lively application projects.

4:10 P.M.-5:30 P.M. MAA Committee on the Mathematical Education of Teachers Panel Discussion Accreditation of mathematics programs for the preparation of teachers.

4:10 P.M.-5:30 P.M. MAA Panel Discussion Authors, publishers, and contracts: Classical issues and modern problems.

7:30 P.M.-10:00 P.M. AMS Banquet

Social Events

It is strongly recommended that tickets for these events be purchased through advance registration, since only a very limited number of tickets, if any, will be available for sale on site. For a 50% refund, returned tickets must be received by the Mathematics Meetings Service Bureau (MMSB) by December 19. After that date no refunds can be made. Special meals are available at all banquets upon advance request, but this must be indicated on the Advance Registration/Housing Form.

Mathchats and Graduate Student Reception

On Tuesday evening well-known mathematicians representing a wide range of disciplines will join interested graduate students for informal chats; all graduate students are invited. Complimentary food and beverages will be served. NOTE: This event is only for students who sign up on the Advance Registration/Housing (ARH) Form. There is no charge.

Reception for First-Time Participants

The AMS Committee on Membership and the MAA Committee on Membership are cosponsoring a social hour on Wednesday from 6:00 p.m. to 7:00 p.m. All participants (especially first-timers) are encouraged to come and meet some old-timers and pick up a few tips on how to survive the environment of a large meeting. Refreshments will be served.

Joint Prize Session and Reception

In order to showcase the achievements of the recipients of various prizes, the AMS and MAA are cosponsoring this event at 4:25 p.m. on Thursday. A cash bar reception will immediately follow. All participants are invited to attend. The AMS will announce the recipients of the Leroy P. Steele Prizes. The AWM will present the Louise Hay Award for Contributions to Mathematics Education and the Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. The MAA prizes include the Deborah and Franklin Tepper Haimo Awards for Distinguished College of University Teaching of Mathematics, the Chauvenet Prize, the Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathemtaics, Beckenbach Book Prize, and Certificates of Meritorious Service.

AWM Reception

There is an open reception on Wednesday evening at 9:30 p.m. All participants interested in attending a dinner to honor AWM's Noether Lecturer on Wednesday may sign-up at the AWM table in the exhibit area and also at the AWM panel discussion.

MER Banquet

The Mathematicians and Education Reform (MER) Network welcomes all mathematicians who are interested in precollege, undergraduate, and/or graduate educational reform to attend the MER Banquet on Thursday evening. Make or renew contacts with other mathematicians who are involved in educational projects and engage in lively conversation about educational issues at the banquet. The after-diinner discussion is an open forum for participants to voice their impressions, observations, and analyses of the current education scene. Cash bar begins at 6:30 p.m. Dinner will be served at 7:30 p.m. Tickets are $32 each, including tax and gratuity.

NAM Banquet

The National Association of Mathematicians will host a banquet on Friday evening. A cash bar receoption wil be held at 5:30 p.m. and dinner will be served at 6:00 p.m. Tickets are $32 each, including tax and gratuity.

Special Sessions

AMS-MAA Special Session

History of Mathematics

Karen H. Parshall, University of Virginia, and James J. Tattersall, Providence College; Friday and Saturday mornings and afternoons

AMS-MAA-MER Special Session

Mathematics and Education Reform

William Henry Barker, Bowdoin College; Jerry L. Bona, University of Texas at Austin; Naomi Fisher, University of Illinois at Chicago; Harvey B. Keynes, University of Minnesota, Minneapolis; and Kenneth C. Millett, University of California Santa Barbara; Wednesday and Thursday, mornings and afternoons

AMS-MAA Special Session

Research in Undergraduate Mathematics Education

Karen J. Graham, University of New Hampshire, and Michael A. McDonald, Occidental College; Friday and Saturday mornings

AMS-MAA Special Session

The Uses of History in the Teaching of Mathematics

Florence Fasanelli, The Mathematical Association of America; Victor J. Katz, University of the District of Columbia; and V. Frederick Rickey, Bowling Green State University; Thursday morning and afternoon

AMS-MAA Special Session

New Directions in Information Technology: Challenges and Opportunities

Saturday, 8:00 a.m. to 9:20 a.m, organized by James H. Lightbourne, III, NSF, and Lee L. Zia, University of New Hampshire. Rapid advances in information technology are challenging the temporal and spatial boundaries that have traditionally defined the "when and where" of information flow. Traditional roles of faculty and students are also changing in the face of the restructured learning environments that these technologies enable. The panel will discuss some of these new directions and their implications for mathematical sciences education. Sponsored by MAA and the AMS Committee on Education.

AMS-MAA Special Session

The Future of the NCTM Standards

Saturday, 8:30 a.m. to 10:00 a.m., organized by Kenneth A. Ross, University of Oregon and chair of the MAA President's Task Force on the NCTM Standards, and Roger Howe, Yale University and chair of the AMS Advisory Committee for NCTM Standards 2000. The AMS and MAA will sponsor a short panel presentation on activities to date, followed by a substantial session for audience questions and comments. Cosponsored by the AMS Committee on Education and the MAA.

Registration Deadlines

EARLY advance registration ..... **November 7**
(room lottery)

ORDINARY advance registration ..... **November 20**
(hotel reservations, materials mailed, tickets, inclusion in the Winter Lists for the Employment Register)

MAA Minicourse Registration ..... **December 1**

FINAL advance registration ..... **December 19**
(advance registration, Short Courses, Employment Register)

MAA Minicourses

#1 Teaching a Course in the History of Mathematics

V. Frederick Rickey, Bowling Green State University
Victor J. Katz, University of the District of Columbia

Part A: Wednesday, 8:00 a.m. to 10:00 a.m.
Part B: Wednesday, 4:30 p.m. to 6:30 p.m.

Enrollment limit is 60. Cost: $45

Many colleges and universities are introducing courses in the history of mathematics and asking mathematicians without a strong background in history to teach them. This minicourse will assist those teaching history by introducing participants to numerous resources, discussing differing approaches and sample syllabi, providing suggestions for student projects and course assessments, and, in general, giving those teaching such courses for the first time the confidence to master the subject themselves and to present the material to their students.

#2 Interdisciplinary Lively Applications Projects

Frank R. Giordano, COMAP; Marie M.Vanisko, Carroll College; and Laurette B. Foster, Prairie View A&M

Part A: Friday, 8:00 a.m. to 10:00 a.m.
Part B: Saturday, 3:15 p.m. to 5:15 p.m.

Enrollment limit is 40. Cost: $45

Interdisciplinary applications can be used to weld mathematics with other disciplines to provide student growth in modeling and problem-solving. This minicourse will discuss projects that can be used in a wide range of mathematics courses, with applications from problems in chemistry, biology, physics, engineering, economics, or social sciences. Projects are designed to take students about four to five hours and can be done in groups or individually. Participants will work with materials prepared for students and instructors in printed and video formats. Additionally, interdisciplinary curricula that make use of projects will be discussed. The level of mathematics of the projects ranges from pre-calculus to post-calculus subjects.

#3 A Dynamical Systems Approach to the Differential Equations Course

Paul R. Blanchard and Robert L. Devaney, Boston University.

Part A: Tuesday, 3:00 p.m. to 5:00 p.m.

Part B: Tuesday, 7:00 p.m. to 9:00 p.m.
Enrollment is limited to 80. Cost: $45

This course will be useful to college instructors wishing to restructure their ODE course; it is based upon the NSF-sponsored Boston University Differential Equations Project. It includes more emphasis on quantitative and geometric methods as well as the incorporation of technology and numerical methods throughout. Although the minicourse will include technology demonstrations using a Macintosh computer, the BU project is independent of any particular type of technology. Students in a course based upon the BU Project must have some access to computers or graphing calculators, however.

#4 Computability and Computational Complexity: What Is This All About?

William A. Marion, Valparaiso University

Part A: Tuesday, 3:00 p.m. to 5:00 p.m.
Part B: Tuesday, 7:00 p.m. to 9:00 p.m.

Enrollment limit is 80. Cost: $45

NP-complete, Turing Machines, algorithm, tractable and intractable problems, the Halting Problem...these terms appear frequently in today's mathematical literature. They are part of a coherent body of knowledge, known as the theory of computation. This minicourse will provide the participant with an overview of the theory by addressing two questions: "What can be computed?", and "What can be computed in a reasonable amount of time?" Examples and proofs will be illustrated, group exercises will be assigned, a list of readings will be provided, and relevance to undergraduate mathematics will be discussed. Also, some recent results concerning the difficulty of even approximating the solution to "hard" problems will be presented.

#5 Teaching the History of Mathematics Using the World Wide Web

Brian E. Smith, McGill University
Mary Robinson, University of New Mexico

Part A: Tuesday, 3:00 p.m. to 5:00 p.m.
Part B: Tuesday, 7:00 p.m. to 9:00 p.m.

Enrollment limit is 60. Cost: $65. Computers.

This course will focus on finding resources related to the history of mathematics on the World Wide Web, and on incorporating historical material into the curriculum. We find that historical material, including mathematics and the lives of mathematicians, is very motivational for students. Using a web browser gives students a sense of discovery and "ownership" which stimulates their learning of mathematical concepts. A video showing student presentations will be shown and handouts will be provided.

#6 Mathematical Algorithms, Models, and Graphic Representations Using Spreadsheets

Robert S. Smith, Miami University; Deane E. Arganbright, University of Papua New Guinea, and Erich Neuwirth, University of Vienna

Part A: Wednesday, 8:00 a.m. to 10:00 a.m.
Part B: Thursday, 8:00 a.m. to 10:00 a.m.

Enrollment limit is 40. Cost: $65. Computers.

This minicourse will draw on examples from calculus, precalculus, finite mathematics, numerical analysis, statistics, geometry, number theory, and discrete dynamical systems to illustrate a variety of mathematical concepts. In addition to its considerable power to process data, the modern spreadsheet possesses exceptional graphics capabilities. These capabilities will be used creatively to design interactive mathematical

MINICOURSE REGISTRATION FORM ON PAGE 12

Minicourses Cont'd

displays which illustrate algorithms and dynamic models. Additionally, these graphics will be used to create classical curves, tessellations, and elementary fractal patterns.

#7 Mathematica Laboratories in Calculus Instruction

Anita J. Salem, Rockhurst College; William H. Barker, Bowdoin College; and John R. Michel, Marietta College

Part A: Wednesday, 2:15 p.m. to 4:15 p.m.
Part B: Friday, 3:15 p.m. to 5:15 p.m.

Enrollment limit is 40. Cost: $65

A number of NSF-supported projects have produced Mathematica materials for use in reformed calculus courses. This minicourse will explore the issues raised by incorporation of Mathematica laboratories into the calculus curriculum and provide guidance to participants who are considering the use of Mathematica in their own calculus programs. The course will devote significant time to hands-on work with Mathematica laboratories that have been developed for the calculus reform program "Project CALC". These labs can be used in conjuction with other calculus reform programs. Rudimentary familiarity with Mathematica will be assumed.

#8 Linear Algebra Using an Interactive Text

Eugene A. Herman, Grinnell College; Michael D. Pepe, Seattle Central Community College; and Robert T. Moore and James R. King, University of Washington

Part A: Wednesday, 4:30 p.m. to 6:30 p.m.
Part B: Friday, 8:00 a.m. to 10:00 a.m.

Enrollment limit is 40. Cost: $65. Computers.

Participants will use a new interactive linear algebra text (from LAMP, the Linear Algebra Modules Project) written in Maple V, Release 4, and will become acquainted with the types of learning that its use can engender. For example, how can we help students become more independent learners? What uses of visualization can aid the development of strong intuitions about the subject? How can the environment support collaborative learning and writing to learn? Several models for using the text, ranging from an entirely laboratory-based course to a course with labs to a lecture/demonstration course also will be discussed.

#9 Interactive Multimedia Modeling and Differential Equation Solving

Michael Moody, Robert L. Borrelli, and Courtney S. Coleman, Harvey Mudd College; and Beverly H. West, Cornell University

Part A: Thursday: 2:15 p.m. to 4:10 p.m.
Part B: Friday, 1:00 p.m. to 3:00 p.m.

Enrollment limit is 40. Cost: $65.

ODE ARCHITECT (created by CODEE, developed by IntelliPro, Inc., and published by John Wiley & Sons, Inc. with NSF support), is a CD-ROM based teaching, learning, and research tool with companion lab book. This material combines a numerical ODE solver with 13 multimedia modules on ODEs, modeling, and dynamical systems. Users can enter their own systems of ODEs and explore (with 2D or 3D graphics and numerical tables) what happens as data and parameters change. This minicourse will introduce participants to the environment for analysis, discovery, and motivation provided by ODE ARCHITECT.

#10 Polynomial Algebra

David A. Cox, Amherst College; John B. Little, College of the Holy Cross; and Donal B. O'Shea, Mount Holyoke College

Part A: Wednesday, 2:15 p.m. to 4:15 p.m.
Part B: Thursday, 2:15 p.m. to 4:10 p.m.

Enrollment limit is 80. Cost: $45.

New algorithms and computers now allow one to do for systems of polynomial equations what one routinely does for linear equations. This has resulted in minor revolutions in algebra and its applications. The minicourse will cover Groebner basis algorithms and applications to two of the following: solving polynomial systems, integer programming, coding and splines. The material makes a good alternative algebra class for undergraduates. The presentation will use Maple V and materials developed with NSF support from the instructors' two books.

#11 Elementary Mathematical Models: Order Aplenty and a Glimpse of Chaos

Dan Kalman, American University; and Angela Hare, Messiah College

Part A: Friday, 3:15 p.m. to 5:15 p.m.
Part B: Saturday, 3:15 p.m. to 5:15 p.m.

Enrollment limit is 45. Cost: $45

Elementary Mathematical Models (EMM) is a new course that aims to cover many of the same topics as a traditional college algebra course, but with the educational philosophy of a liberal arts mathematics course. It emphasizes the quantitative reasoning required to formulate and apply elementary models, and de-emphasizes algebraic manipulation and notation. The syllabus provides a coherent story line beginning with simple arithmetic growth and climaxing with the chaos that can emerge in logistic growth models. This minicourse will cover EMM's philosophy, content, and organization, as well as teaching methods, technology, and evaluation.

#12 The Use of Hand Held Numerical, Graphical, and Symbolic Algebra Devices in the Teaching and Learning of Calculus

Carl Leinbach, Gettysburg College; Wade Ellis, West Valley College; and Bert Waits, The Ohio State University

Part A: Friday, 1:00 p.m. to 3:00 p.m.
Part B: Saturday, 1:00 p.m. to 3:00 p.m.

Enrollment limit is 45. Cost:$45.

Participants in this minicourse will have the opportunity to gain "hands-on" experience with a hand held computer algebra system that is built into a powerful graphing calculator. The focus of the course will be on how the learning of calculus changes when students have this powerful tool available for classroom and out of class activities. Mathematical topics will include limits, linearity, derivatives, optimization, differential equations, integration, functions defined by integrals, functions of several variables, graphing of surfaces, and related applications. Some (but not extensive) basic "key stroking" instruction will be provided; participants will be provided with appropriate calculators.

#13 Music and Mathematics

Leon Harkleroad, Poughkeepsie, NY

Part A: Friday, 8:00 a.m. to 10:00 a.m.
Part B: Saturday, 1:00 p.m. to 3:00 p.m.

Enrollment limit is 80. Cost: $45.

Over the years, people have used mathematics in various ways to describe, analyze, and create music. This minicourse will explore the application of mathematical areas such as number theory, probability, and group theory to musical topics like tuning systems, bell-ringing, and 20th century compositional technique. Emphasis will be placed on how minicourse participants can incorporate this material in their classes—or even design a service course on music and mathematics.

#14 Knot Theory and Applications in Sciences

Stefanos P. Gialamas, The Illinois Institute of Art

Part A: Wednesday, 8:00 a.m. to 10:00 a.m.
Part B: Thursday, 8:00 a.m. to 10:00 a.m.

Enrollment limit is 80. Cost: $45.

Designed for participants who are unfamiliar with knot theory, this minicourse introduces such concepts as knots, links, equivalence, the writhe and linking numbers, Conway polynomial, Jones polynomial, and Kauffman polynomial. Ribbon knots and their role in DNA research will also be presented. Participants will use strings to create fascinating knots and links, and will work on knot and link puzzles and present their results.

#15 Developing the Ability in Beginning College Mathematics Majors to Write Proofs

Diane Resek and Daniel M. Fendel, San Francisco State University

Part A: Thursday, 2:15 p.m. to 4:10 p.m.
Part B: Saturday, 1:00 p.m. to 3:00 p.m.

Enrollment limit is 40. Cost: $45.

The focus of this minicourse is on ways to help beginning college majors in a transition course develop the ability to write meaningful proofs—that is, convincing arguments. A key element of the approach is to have students work from their own conjectures, gradually attaining greater rigor. Participants will work in groups with activities from the presenters' college and high school texts, will see student work, and will discuss the controversies that arise from this approach.

#16 The Fibonacci and Catalan Numbers

Ralph P. Grimaldi, Rose-Hulman Institute of Technology

Part A: Wednesday, 2:15 p.m. to 4:15 p.m.
Part B: Thursday, 2:15 p.m. to 4:10 p.m.

Enrollment limit is 80. Cost: $45.

In introductory courses in discrete or combinatorial mathematics one encounters the Fibonacci numbers—and sometimes the Catalan numbers. This minicourse will review and then extend this first encounter as it examines some of the properties these numbers exhibit as well as applications where these sequences arise. A survey of applications dealing with chemistry, physics, computer science, linear algebra, set theory, graph theory, and number theory will show why these sequences are of interest and are important.

MAA CONTRIBUTED PAPER SESSIONS

Applied Calculus and Mathematics for Advanced Technical Careers

Janet P. Ray, Seattle Central Community College; Brian E. Smith, McGill University; Yajun Yang, SUNY Farmingdale
Thursday and Friday mornings

Chaotic Dynamics and Fractal Geometry

Jon W. Scott, Montgomery College, and Denny Gulick, University of Maryland, College Park
Wednesday and Friday mornings

Developmental Programs that Work

Catherine M. Murphy, Purdue University Calumet, and Eileen L. Poiani, St. Peter's College
Saturday Afternoon

Establishing and Maintaining Undergraduate Research Programs in Mathematics

Emelie Kenney, Siena College, and Joseph A. Gallian, University of Minnesota at Duluth
Thursday and Saturday afternoons

Innovations in Teaching Linear Algebra

David C. Lay, University of Maryland, and Steven J. Leon, University of Massachusetts at Dartmouth
Wednesday morning and Friday afternoon

Mathematics Across the Disciplines

Brian J. Winkel, United States Military Academy
Friday afternoon and Saturday morning

Mathematics and Sports,

Robert Edward Lewand, Goucher College
Saturday afternoon

Mathematics For Preservice Elementary Teachers

Albert D. Otto, Illinois State University, C. Patrick Collier, University of Wisconsin at Oshkosh; Judith L. Covington, Lousiana State University at Shreveport; and William E. Haver, Virginia Commonwealth University
Wednesday and Friday mornings

Rethinking Upper Level Core Mathematics Courses

Alan C. Tucker, SUNY-Stony Brook
Wednesday and Thursday afternoons

Teaching the Practice of Statistics at All Levels

AnneD. Sevin, Framingham State College, and K.L.D. Gunawardena, University of Wisconsin-Oshkosh
Thursday and Saturday afternoons

Using Real World Data in the Teaching and Learning of Mathematics

Florence S. Gordon, New York Institute of Technology; Iris B. Fetta, Clemson University; and Sheldon P. Gordon, SUNY College of Technology at Farmingdale
Wednesday morning and Friday afternoon

The World Wide Web in Mathematical Instruction

Earl D. Fife, Calvin College; Eugene A. Klotz, Swarthmore College; and Laurence S. Husch, University of Tennessee
Wednesday and Friday afternoons

Student Activities

Student Workshop
Wheels on Wheels
Thomas R. Berger, Colby College.
Thursday, 2:15 p.m. to 4:10 p.m.

Undergraduate Research: Student Poster Session
Organized by Judith Palagallo, University of Akron, and Aparna Higgins, University of Dayton. Posters will describe mathematical research projects of undergraduate students. The posters will be judged on the mathematical content and on the presentation. Prizes will be awarded to all participants, and monetary prizes will be awarded for the best poster presentations by undergraduate students. (Sponsored by the CUPM subcommittee on Research by Undergraduates.)
Friday, 4:00 p.m. to 7:00 p.m.

MAA Student Lecture
Roger E. Howe, Yale University
Coincidences and Connections: Some new and old results in Euclidean Geometry
Friday, 7:30 p.m.
There will be an ice cream social following this lecture.

Short Courses

AMS Short Course
January 5–6

Singular Perturbation Concepts for Differential Equations
Organized by Jane Cronin Scanlon, Rutgers University & Robert E. O'Malley, Jr., University of Washington. Speakers include: Joseph Flaherty, Rensselaer Polytechnic Institute; Mark H. Holmes, Rensselaer Polytechnic Institute; Tasso Kaper, Boston University; Robert O'Malley, University of Washington; Jane Cronin Scanlon, Rutgers University; and Michael Ward, University of British Columbia

MAA Short Course
January 5–6

Introduction to Mathematical Imaging and Image Processing
Organizers: Akram Aldroubi and Dennis Healy

This course will provide a general overview of the exciting challenges and opportunities encountered in modern imaging and image processing as well as some indication of the variety of sophisticated mathematical techniques currently being applied to these problems. Contact Jane Heckler; MAA; (800) 741-9415; jheckler@maa.org, for more information.

Photo © Roger Miller, 1994

MAA Sessions

MAA Sessions cover a variety of topics. Included in the program will be:

- Partnerships in Undergraduate Education
- The Impact of New K-12 Instructional Materials on Teacher Preparation Programs
- Panel Partnerships in Undergraduate Education II
- How Can An MAA Teaching Consultant Help a Department?
- Teaching at a College or University: Advice about Preparing for and Securing such Positions
- Poster Session of the NSF Mathematics Across The Curriculum (MATC) Projects
- Poster Sessions
- Strengthening Underrepresented Minority Mathematics Achievement Workshop
- Case Studies in Curriculum Reform
- Reunion for Calculus Reform Workshop
- An Evening of Poetry
- Professional Development Issues Concerning Young and Future Faculty
- Student Chapters Special Paper Session
- Successful Articulation for Innovative Mathematics Programs
- Increasing the Participation of Minorities in Mathematics
- Mathematics at the Crossroads: The Intersection of the Two Year and Four Year Curricula
- Keeping Adjunct Faculty Aware of Changes in Teaching
- Informal Session on Actuarial Education
- Research Methodology/Ethics Issues
- Environmental Mathematics at Work
- New Models for the Preparation of Secondary School Mathematics
- CRAFTY Panel on Research in Mathematics Education: Its Importance for Undergraduate Education
- Authors, Publishers, and Contracts: Classical Issues and Modern Problems
- Accrediatation of Mathematics Programs for the Preparation of Teachers

Corollary Conference

Conference in honor of Ubi D'Ambrosio: This conference, held on the occasion of D'Ambrosio's 65th birthday and celebrating his role as the originator of ethnomathematics and his influence in mathematics education and in the history of mathematics, will take place on Tuesday, January 6, 1998, in the Omni Inner Harbor Hotel in Baltimore, MD. Confirmed speakers include Marcia Ascher, Paulus Gerdes, John Fauvel, Reuben Hersh, and Dirk Struik. Contributed papers are welcome in any area related to D'Ambrosio's work. Send an abstract no later than October 1 to Victor J. Katz, vkatz@maa.org, or by mail c/o Mathematical Association of America, 1529 18th St. N.W., Washington, DC 20036. To register for the conference, please send a check for $50, along with your name, addresses and phone numbers, to Karen Michalowicz, 5855 Glen Forest Dr., Falls Church, VA 22041. The fee is chiefly to cover the cost of a festive birthday dinner.

Registration and Travel Informtion

Book Sales and Exhibits: Visit the book, education media, and software exhibits from noon to 5:00 p.m. on Wednesday, 9:30 a.m. to 5:30 p.m. on Thursday and Friday, and 9:00 a.m. to noon on Saturday. Books published by the AMS and MAA will be sold at discounted prices, available only to registered participants wearing the official meetings badge. Most major credit cards will be accepted for book sale purchases at the meetings.

Mathematical Sciences Employment Register: Those wishing to participate in the Baltimore Employment Register should contact the AMS at 1-800-321-4AMS.

Free Hotel Room Drawing: Those who register by the early deadline of November 7 will be included in a random drawing to select winners of complimentary hotel rooms in Baltimore. Multiple occupancy is permissible. The location of rooms to be used in this lottery will be based on the number of complimentary rooms available in the various hotels.

Electronic Advance Registration: You may request advance registration and housing forms from meetreg-request@ams.org. Send completed electronic forms to meetreg-submit@ams.org.

The forms are also available on e-math at http://www.ams.org/amsmtgs/2014_registration.html. VISA, MasterCard, Discover, and American Express are the ONLY methods of payment which will be accepted for electronic advance registration, and charges to credit cards will be made in U.S. funds. All advance registrants will receive acknowledgment of payment prior to the meetings.

Those registering by November 20 will receive their badges, programs, and tickets purchased in advance by mail two to three weeks before the meetings, unless they check the appropriate box to the contrary on the Advance Registration/Housing Form. It is suggested that advance registrants from Canada choose to pick up their materials at the meetings. Because of delays that occur in U.S. mail to overseas, materials will not be mailed overseas. There will be a special Registration Assistance Desk at the Joint Meetings to assist participants. A $5 replacement fee will be charged for programs and badges that are mailed but not taken to Baltimore.

Information Distribution: Tables are set up in the exhibit area for dissemination of general information of possible interest to the members and for the dissemination of information of a mathematical nature not promoting a product or program for sale.

If a person or group wants to display information of a mathematical nature promoting a product or program for sale, they may do so in the exhibit area at the Joint Books, Journals, and Promotional Materials exhibit for a fee of $50 per item. Please contact the Exhibits Manager, MMSB, P.O. Box 6887, Providence, RI 02940, for further details. If a person or group would like to display material in the exhibit area separate from the Joint Books table, the proponent must reimburse the AMS and MAA for any extra furnishings requested, in addition to payment of the $50 per item fee. (This latter display is also subject to space availability.)

Local Information

The Baltimore Area Convention and Visitors Association maintains a home page on the WWW. Visit it at http://www.baltconvstr.com/.

Travel Information

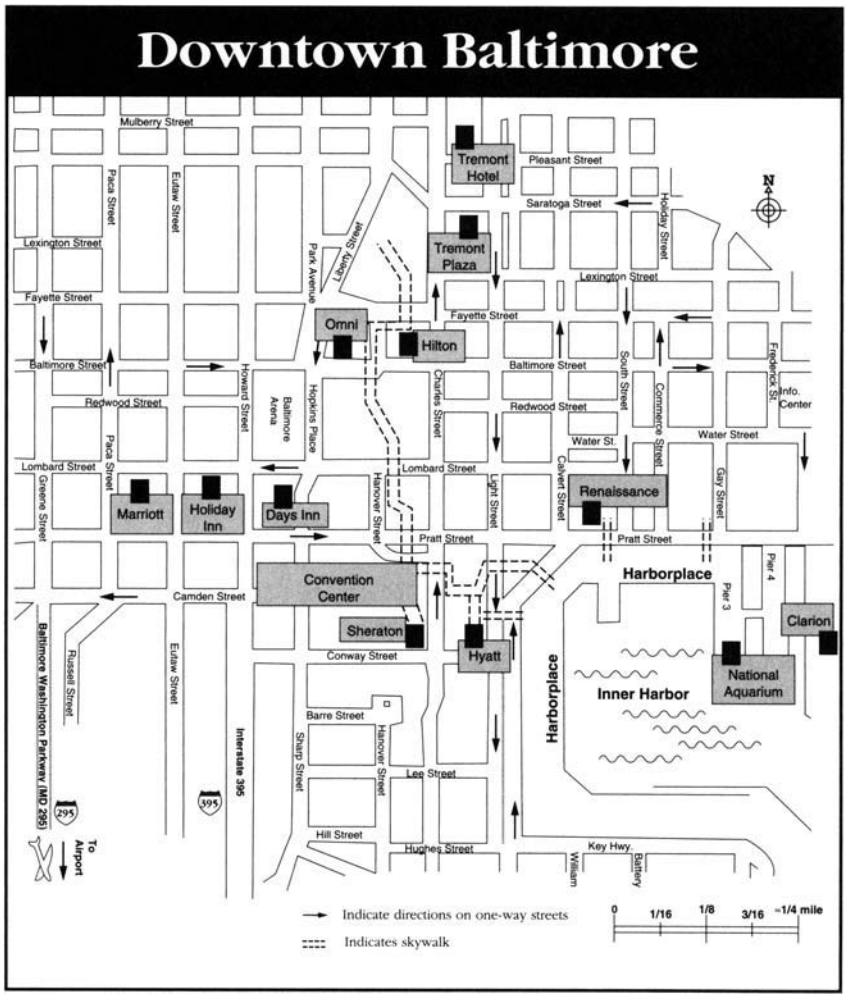
USAirways has been selected as the official airline for these meetings. Given the volatility in airfares because of "fare wars", we cannot guarantee that these will be the lowest fares when you make your arrangements. For additional information, rates, and reservations call 800-334-8644 between 8:00 a.m. and 9:00 p.m. Eastern Standard Time. Refer to Gold File **Number 73670341**.

There are several ways to reach downtown Baltimore from the Baltimore–Washington Airport: taxi, 20 minutes, fare about $20; Super Shuttle van, fare $11 one way ($17 round trip) to major hotels, runs every 30 minutes, 410-859-0800 for information; light rail to downtown (along Howard St.), fare $1.35.

Driving: **From the northeast**: Stay on I-95 South through the Fort McHenry Tunnel (toll). After the tunnel, take Exit 53 to I-395 (Downtown). I-395 ends after 1 mile near the Convention Center and downtown hotels. ***From the north:*** Stay on I-83 all the way to the end, where it becomes President St. At the third light, turn right on Lombard St. to reach downtown, about 1/2 mile. **From the south:** Follow I-95 North and take Exit 53 to I-395, as above. **From the west:** Proceed on I-70 until it ends at I-695 (Baltimore Beltway). Then take the Beltway I-695 South (or Outer Loop) towards Glen Burnie as far as Exit 11A (I-95 North), and continue as from the south.

Railway Transportation: Baltimore's Penn Station is served by Amtrak trains from New York, Philadelphia and Washington. The station is1 1/2 miles north of downtown; take a taxi, bus, or light rail to downtown. For information, call 1-800-872-7245.

Bus: Baltimore is served by Greyhound and Peter Pan Trailways. The preferred destination on Greyhound is the Downtown Bus Terminal on Fayette St.. Peter Pan buses run from New York and Washington to the Baltimore Travel Plaza, four miles east of downtown; to reach downtown, take a taxi or MTA bus. For information, call 1-800-231-2222 (Greyhound) or 1-800-343-9999 (Peter Pan).



JOINT MATHEMATICS MEETINGS
MAA Minicourses

Advance Registration Form
Baltimore, Maryland
January 7–10, 1998

To register for MAA Minicourse(s), please complete THIS FORM or a PHOTOCOPY OF THIS FORM and return it with your payment to:

Minicourse Coordinator
MAA
1529 18th St., NW
Washington, DC 20036
(202) 387-5200
1-800-741-9415
mcallana@maa.org
(202) 483-5450 (fax)

After the deadline potential participants are encouraged to contact the minicourse coordinator to check on availability. The MAA reserves the right to cancel any minicourse which is undersubscribed. Should this occur, those registered in advance will be notified and receive full refunds. MAA minicourses are open only to persons who register for the Joint Mathematics Meetings and pay the regular registration fee.

Each participant must fill out a separate Minicouse Advance Registration Form. Enrollment is limited to two minicourses.

Name: _____

Mailing Address: _____

_____

Telephone: _____ E-mail: _____

Registration

I would like to attend ❑ 1 Minicourse ❑ 2 Minicourses

Please enroll me in MAA Minicourse(s): # ____ and # ____

In order of preference, my alternatives are: # ____ and # ____

Payment

Make checks payable to the MAA. Canadian checks must be marked "US Funds." You may also charge this total to your VISA or MasterCard.

Check enclosed $ ❑ VISA ❑ MasterCard

Card Number _____ Exp. Date _____

Signature _____

Deadlines

MAA Minicourse Advance Registration	December 1, 1997
Cancellation in order to receive a 50% refund	December 31, 1997

❑ I plan on registering for the Joint Mathematics Meetings ONLY in order to attend the MAA Minicourse(s). Should the course(s) of my choice be fully subscribed, a full refund of the Joint Mathematics Meetings advance registration fee will be made.

Minicourses	Fee
1. Teaching a Course in the History of Mathematics	$45
2. Interdisciplinary Lively Applications Projects	$45
3. A Dynamical Systems Approach to the Differential Equations Course	$45
4. Computability and Computational Complexity: What Is this all About?	$45
5. Teaching the History of Mathematics Using the World Wide Web	$65
6. Mathematical Algorithms, Models, and Graphic Representations Using Spreadsheets	$65
7. Mathematica Laboratories in Calculus Instruction	$65
8. Linear Algebra Using an Interactive Text	$65
9. Interactive Multimedia Modeling and Differential Equation Solving	$65
10. Polynomial Algebra	$45
11. Elementary Mathematical Models: Order Aplenty and a Glimpse of Chaos	$45
12. The Use of Hand Held Numerical, Graphical, and Symbolic Algebra Devices ...	$45
13. Music and Mathematics	$45
14. Knot Theory and Applications in Sciences	$45
15. Developing the Ability in Beginning College Mathematics Majors to Write Proofs	$45
16. The Fibonacci and Catalan Numbers	$45

Baltimore Advance Registration/Housing Form

Joint Mathematics Meetings
Baltimore, Maryland
January 7-10, 1998

Please complete this form and return it to:
Mathematics Meetings
Service Bureau (MMSB)
P. O. Box 6887
Providence, RI 02940-6887
FAX: 401-455-4004
Questions/changes call:
401-455-4143 or
1-800-321-4267 x4143

Name _____

Mailing Address _____

_____

Telephone _____ Fax _____

Email Address _____

Badge Information:
Name to appear on badge _____
Affiliation for badge _____
Nonmathematician Guest Badge _____
(please note charge below)

Membership
✓ all that apply

- AMS ☐
- ASL ☐
- AWM ☐
- CMS ☐
- MAA ☐
- NAM ☐
- SMM ☐

If you do not wish your program and badge to be mailed to you on 12/10/97, check this box. ☐

Registration Fees

Joint Meetings	**by Dec 19**	**at mtg**
☐ Member AMS, ASL, CMS, MAA	$155	$202
☐ Nonmember	$240	$312
☐ Graduate Student	$ 35	$ 45
☐ Undergraduate	$ 20	$ 26
☐ High School Student	$ 2	$ 5
☐ Unemployed	$ 35	$ 45
☐ Temporarily Employed	$105	$125
☐ Developing Countries Special Rate	$ 35	$ 45
☐ Emeritus Member of AMS or MAA	$ 35	$ 45
☐ High School Teacher	$ 35	$ 45
☐ Librarian	$ 35	$ 45
☐ Nonmathematician Guest	$ 5	$ 5
☐ One-day Member	—	$121
☐ One-day Nonmember	—	$172

AMS Short Course on *Singular Perturbation Concepts for Differential Equations.*
Registration for the Joint Meetings is not required for the Short Course.

☐ Member, Nonmember	$75	$ 90
☐ Student, Unemployed, Emeritus	$35	$ 45

Employment Register
Registration for the Joint Meetings is required for participation. Applicant résumé forms and employer job listing forms will be on e-MATH in September and in the October issues of *Notices* and *Focus*.

☐ Employer—First Table ☐ Regular ☐ Self-scheduled	$200	$250
☐ Employer—Second Table ☐ Regular ☐ Self-scheduled	$ 50	$ 75
☐ Employer—Posting Only	$ 50	$ 50
☐ Applicant	$ 40	$ 75

Events

Events with Tickets				**Price Per**	**Total**
AMS Banquet	#___Regular	#___Veg	#___Kosher	$32	_____
MER Banquet	#___Regular	#___Veg	#___Kosher	$32	_____
NAM Banquet	#___Regular	#___Veg	#___Kosher	$32	_____
				Total	_____

Student Activities
☐ Mathchats (no charge)
☐ MAA Student Workshop (no charge)

Statistical/Other Information

Mathematical Reviews field of interest # _____
☐ I am a mathematics department chair.
How did you hear about this meeting? Check one:
☐ *Notices* ☐ *Focus* ☐ WWW ☐ Colleague(s) ☐ Special Mailing
☐ Please do not include my name on any mailing list used for promotional purposes.
☐ Please ✓ this box if you have a disability that requires special services.

Deadlines

Room lottery	**November 7, 1997**
Housing reservations, listing of résumés/job descriptions in the Winter Lists	**November 20, 1997**
Housing reservation changes/cancellations through MMSB	**December 8, 1997**
Advance registration, Employment Register, Short Course, banquets	**December 19, 1997**
50% Refund on banquets	**December 19, 1997***
50% Refund on advance registration	**January 2, 1998***

***no refunds after this date**

Payment

Category	**Total**
Joint Meetings fee(s)	_____
AMS Short Course	_____
Employment Register	_____
Event tickets	_____
Hotel deposit (only if paying by check)	_____
Total amount paid	**$** _____

(Please note that a $5 processing fee will be charged for each returned check or invalid credit card.)

Method of Payment
☐ Check. Make checks payable to the AMS. Checks drawn on foreign banks must be in equivalent foreign currency at current exchange rates.
☐ Credit Card. VISA, MasterCard, AMEX, Discover. (no others accepted)

Card Number: _____

Exp. Date: _____ Zipcode of credit card billing address: _____

Signature: _____

Name on card: _____

☐ Purchase Order # _____ (please enclose copy)

Hotel Reservations

To ensure accurate assignments, please rank hotels in order of preference by writing 1, 2, 3, etc., in the spaces at the left of the form and by circling the requested room type and rate. If the rate or the hotel requested is no longer available, you will be assigned a room at a ranked or unranked hotel at a comparable rate. Participants are urged to call the hotels directly for details on suite configurations, sizes, etc. Reservations at the following hotels must be made through the MMSB to receive the convention rates listed. All rates are subject to a 12.5% sales occupancy tax. **Guarantee requirements: First night deposit by check (add to payment on reverse of form) or a credit card guarantee.**

☐ Deposit enclosed ☐ Hold with my credit card Card Number_____ Exp. Date _____ Signature _____

Date and Time of Arrival _____ **Date and Time of Departure** _____

Name of Other Room Occupant _____ **Arrival Date**_____ **Departure Date**_____**Spouse** ☐ **Child** ____ **(give age)**

Order of choice	Hotel	Single	Double 1 bed	Double 2 beds	Triple 2 beds	Triple 2 beds w/cot	Quad 2 beds	Quad 2 beds w/cot	Suites Starting rates
	Renaissance Harborplace (hdqtrs)	$102	$112	$112	$125	$125	$135	$135	$150
	Students	$82	$92	$92	$105	$105	$115	$115	N/A
	Hyatt Regency Baltimore	$102	$112	$112	$137	$137	$162	$162	$225
	Students	$95	$95	$95	$115	$140	$115	$140	N/A
	Marriott Inner Harbor	$96	$106	$106	$116	$136	$126	$146	$209
	Students	$86	$86	$86	$96	$116	$106	$126	N/A
	Sheraton Inner Harbor	$95	$95	$95	$110	$110*	$125	$125*	$425
	Students	$85	$85	$85	$100	$100	$100	$100	N/A
	Omni Inner Harbor Hotel	$92	$92	$92	$112	$132	$112	$132	$325
	Students	$86	$86	$86	$106	$126	$106	$126	N/A
	Baltimore Hilton & Towers	$86	$86	$86	$106	$116	$126	$136	$275
	Students	$77	$77	$77	$77	$87	$77	$87	N/A
	Clarion Hotel (Mt. Vernon Square)	$82	$82	$82*	$92	$92	$102	$102	N/A
	Students	$72	$72	$72	$82	$82	$92	$92	N/A
	Days Inn Inner Harbor	$80	$80*	$80	$90	$90	$100	$100	$100
	Students	$70	$70	$70	$70	$70	$70	$70	N/A
	Holiday Inn Inner Harbor	$79	$79	$79	$79	$94	$79	$94	$250
	Tremont Plaza (all suites)	$75	$75	$75	$95	$115	$95	$115	$155
	Students	$65	$65	$65	$85	$105	$85	$105	N/A
	Tremont Hotel (all suites)	$65	$65	$65	$85	$105	$85	$105	$155

*** Limited Availability**

Special Housing Requests:.

☐ I have disabilities as defined by the ADA that require a sleeping room that is handicap accessible.

My needs are: _____

If you are a member of a hotel frequent-travel club and would like to receive appropriate credit, please include the hotel chain and card number here: _____

Other requests: _____

If you are not making a reservation, please check off one of the following:

☐ I plan to make a reservation at a later date.

☐ I will be making my own reservations at a hotel not listed. Name of hotel: _____

☐ I live in the area or will be staying privately with family or friends.

☐ I plan to share a room with _____, who is making reservations.

How to Obtain Hotel Accommodations

Room Lottery: (See the *How to Register in Advance* section to learn how to qualify for this year's lottery.) Here are last year's winners:

Efraim Armendariz, Jennifer Becker, Brian Birgen, Richard Carmichael, Francis Carroll, Elwyn Davis, Matt Dempsey, Alan Durfee, Gelca Gazvan, Judy Green, Jeff Hakin, Theodore Hatcher, Mary Hesselgrave, Michelle Homp, Guy Jacobsohn, David Kaminski, Cathy Liebars, Bernadette Mullins, Wayne Proctor, Cora Sadosky, Roger Teller, Aaron Trautwein, Thomas Weisgran, David Wilson

General Instructions: Participants must register in advance in order to obtain hotel accommodations through the Mathematics Meetings Service Bureau (MMSB). Special meeting rates at the hotels listed below can be obtained only by making reservations through the MMSB. Reservations mistakenly taken by hotels directly may be subject to an increased rate. Participants interested in suites are urged to call the hotels directly for details on configurations, prices, etc.; however, all hotel reservations can only be made by completing the Housing section of the **Advance Registration/Housing (ARH) Form** by November 20. Reservations, based on availability, will be accepted by hotels directly after December 19.

$ Rates:

- subject to 12.5% sales/occupancy tax
- only certified students or unemployed mathematicians qualify for student rates
- see ARH Form for detailed rate structure of each property

$ Room Payments/Cancellations:

- all major credit cards
- personal checks with personal ID and/or credit card backup
- 72-hour cancellation policy for all hotels except Renaissance and Days Inn (48 hours), Hilton (24 hours), and Marriott (6 pm on day of arrival)

$ Guarantee Requirements:

- one night deposit by check or
- credit card: VISA, MC, AMEX (cards may be charged one night deposit)

Hotel Information:

- children free, where appropriate, in existing beds only
- check-in: 3 or 4 p.m. / check-out: 11 a.m. or noon
- distances to Baltimore Convention Center (BCC) indicated under each caption
- parking rates listed below are daily and include in/out privileges
- windows do not open in most hotels unless otherwise indicated below

Special Services:

- all hotels, with the exception of historical hotels, are working toward being in compliance with the Americans with Disabilities Act (ADA); historic properties indicated below where applicable
- special needs should be clearly indicated on the ARH form
- nonsmoking rooms available at all properties

Deadlines:

- room lottery qualification: **November 7**
- reservations through MMSB: **November 20**
- changes/cancellations through MMSB: **December 8**
- convention rates **based on availability only** after December 19

Renaissance Harborplace (headquarters)	**Hyatt Regency Baltimore**	**Marriott Inner Harbor**	**Sheraton Inner Harbor**	**Omni Inner Harbor**
(.25 mile to BCC)	(.10 mile to BCC/connected by walkway)	(.25 mile to BCC)	(.10 mile to BCC/connected by walkway)	(.35 mile to BCC/connected by walkway)
202 East Pratt Street Baltimore, MD 21202 (410) 547-1200 single - $102, double - $112 student single - $82, student double - $92	300 Light Street Baltimore, MD 21202 (410) 605-2857 single - $102, double - $112 student single/double - $ 95	Pratt & Eutaw Streets Baltimore, MD 21201 (410) 962-0202 single - $96, double - $106 student single/double - $86	300 South Charles Street Baltimore, MD 21201 (410) 962-8300 single/double - $95 student single/double - $85	101 West Fayette Street Baltimore, MD 21201 (410) 752-1100 single/double - $92 student single/double - $86
restaurant; lounges; indoor pool; health club; business center; parking - $10 (self) & $14 (valet); in all rooms - coffee maker, hair dryer, iron/ironing board, king or queen beds, desk, 2 telephone lines, dataport; windows open in most rooms; children under 18 years free	restaurants; lounges; glass elevators with atrium; outdoor pool; exercise facility; tennis courts; jogging path; parking - $12 (self) & $15 (valet); in all rooms - coffee maker, hair dryer, iron/ironing board, king or double beds, desk, 2 telephones (not 2 lines); children under 18 years free	restaurant; lounge; indoor pool; health club; business center; parking - $8 (self) & $12 (valet); in all rooms - iron/ironing board, hair dryer, king or double beds, desk, dataport; children under 18 years free	restaurant; bar; indoor pool; workout room; parking - $12 (guest - self) & $15 (visitor - self); in all rooms - hair dryer, coffee maker, servi bar, iron/ironing board, 2 telephone lines (no dataport), desk, king or double beds; children under 18 years free	restaurant; lounge; 2 towers; outdoor pool; health club; business center; parking - $12 (self) & $14 (valet); in all rooms - 2 telephone lines (no dataport), desk, king or queen or double beds; children under 18 years free

(Continued on next page)

How to Obtain Hotel Accommodations (Continued)

Baltimore Hilton & Towers

(.20 mile to BCC/connected by walkway)

20 West Baltimore Street
Baltimore, MD 21201
(410) 539-8400
single/double - $86
student single/double - $77

historic property; restaurant; lounge; fitness room; whirlpool; business center; parking - $15 (valet); in all rooms - coffee maker, iron/ironing board, desk, 2 telephone lines, dataport, king or double beds; children under 18 years free

Clarion Hotel at Mt. Vernon Square

(.80 mile to BCC)

612 Cathedral Street
Baltimore, MD 21201
(410) 727-7101, (800) 292-5500
single/double - $82
student single/double - $72

small historic property; food court; parking - $12 (valet); in all rooms - hair dryer, coffee maker, 2 telephone lines, dataport, windows open, mini bar (sink only), king or queen or double beds; children under 16 years free; free inner harbor shuttle

Days Inn Inner Harbor

(.10 mile to BCC)

100 Hopkins Place
Baltimore, MD 21201
(410) 576-1000
single/double - $80
student single/double - $70

restaurant; lounge; health club; parking - $8.50 (self); in all rooms - safe, double or queen (limited) beds, refrigerator upon request, dataport upon request; children under 18 years free

Holiday Inn Inner Harbor

(.20 mile to BCC)

301 West Lombard Street
Baltimore, MD 21201
(410) 685-3500
single/double - $79

restaurant; lounge; indoor pool; exercise room; parking - $6 (self); in all rooms - coffee maker, dataport, king (some have recliner and some have sofa bed) or double beds; children under 19 years free

Tremont Plaza

(.50 mile to BCC)

222 St. Paul Place
Baltimore, MD 21202
(410) 727-2222
single/double - $75
student single/double - $65

all suites hotel; restaurant; deli; fitness center; outdoor pool; parking - $11 (valet); in all suites - fully equipped kitchen, windows open, 1 telephone line, dataport, 1 or 2 queen beds; some suites with separate living room; children under 16 years free; **limited number of rooms for physically challenged persons**

Tremont Hotel

(.52 mile to BCC)

8 East Pleasant Street
Baltimore, MD 21202
(410) 576-1200
single/double - $65

all suites hotel; restaurant (dinner only); lounge; passes to Baltimore Sports Club at a nominal fee; parking - $11 (valet); in all suites - fully equipped kitchen, 1 telephone line, windows open, 1 or 2 queen beds; some suites with dataport and separate living room; children under 16 years free; **limited number of rooms for physically challenged persons**

Alternative Housing

As an alternative to hotel/motel accommodations, we list the following bed & breakfast reservation service:

Amada's Bed & Breakfast Reservation Service
1428 Park Avenue
Baltimore, MD 21217
(410) 225-0001, (800) 899-7533

For your convenience, we also list the following inexpensive properties that can be called directly for reservations:

Mt. Vernon Hotel & Washington Café
(1 mile from BCC)
24 W. Franklin Street
Baltimore, MD 21201
(410) 727-2000

Quality Inn Inner Harbor
(1.25 miles from BCC)
1701 Russell Street
Baltimore, MD 21230
(410) 727-3400

Attention Students!

As another alternative to housing choices listed above and for your convenience, we list a student hostel located in Baltimore:

Baltimore International AYH-Hostel
(.5 mile, 5 blocks to BCC)
17 Mulberry Street
Baltimore, MD 21201
(410) 576-8880

Rates range from $13 to $16 per person, based on hostel membership. Please call the number listed above for further information.

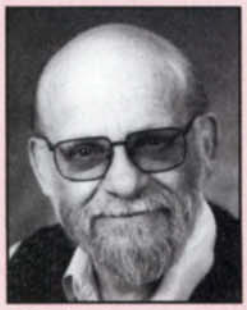
Banchoff Elected Next MAA President

Geometer Tom Banchoff of Brown University is to be the next president of the MAA. Banchoff will officially become president-elect at the end of the Joint Mathematics Meetings to be held in Baltimore, Maryland, in January 1998, and will start a two-year term as president a year later.

To serve along with Banchoff, Anita Solow of DePauw University is to be the next first vice-president and Ed Dubinsky of Georgia State University will be second vice-president.

Tom Banchoff

Anita Solow



Ed Dubinsky

Available Now on a Screen in Your Office: Visual Mathematics

August saw the appearance of a new on-line mathematics journal, the first completely electronic journal published by the MAA. *Communications in Visual Mathematics* was conceived two years ago at the summer MathFest in Burlington, Vermont, when Brown University geometer Tom Banchoff (recent MAA president-elect) was discussing with some colleagues the need for an outlet for the electronic research and expository articles that are now starting to appear. These "electronic papers" (to coin a seemingly oxymoronic term) often make essential use of interactive graphics and animations that make them highly unsuitable for publication in standard print form.

After much work by Banchoff and his former student Davide Cervone, the new journal went on line the opening day of the 1997 MathFest. Accessible from *MAA Online*, this first edition consists largely of material prepared by Banchoff and Cervone. Editor Banchoff hopes that others will use the articles in this first issue as general guidelines for the preparation of further electronic articles dealing with highly visual mathematical topics.

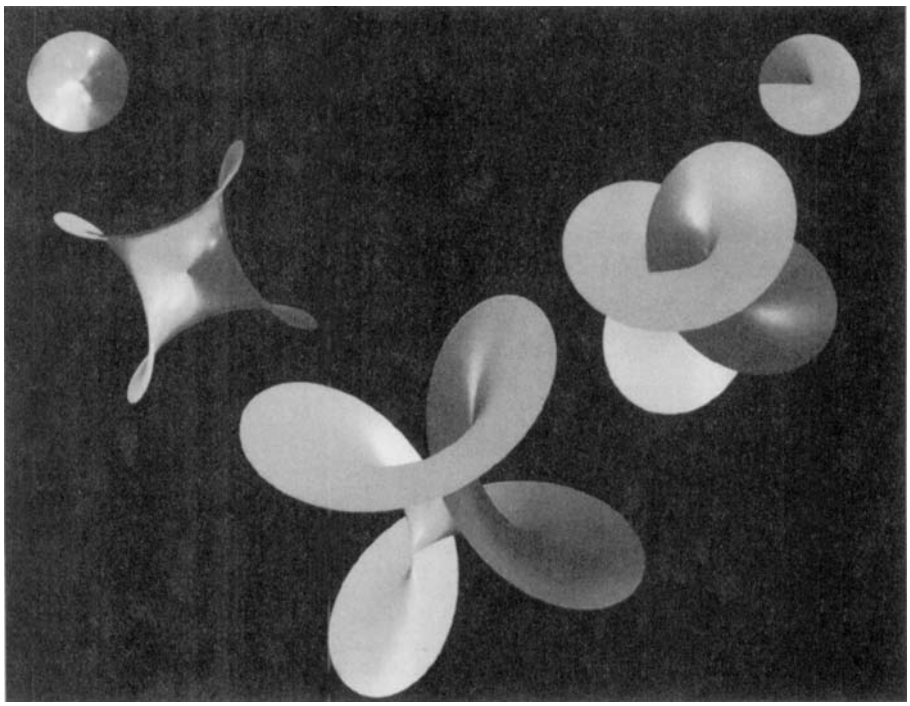
Other New Attractions

The appearance of the new *CML* is just one of a number of new developments in the provision of electronic services for MAA members. As reported to the MAA Board of Governors in August, present electronic resources enable members to access

- news of recent developments
- feature articles of interest to the mathematical community
- long distance learning courses
- electronic discussion groups
- electronically stored databases, documents, and archives
- links to electronic services offered by other organizations or individuals
- various official MAA documents
- and many of the features previously provided by FOCUS and *UME Trends*.

In addition, a recently introduced search engine allows users to access all of the above resources in a fast, efficient fashion.

Finally, looking into the future, among the plans for forthcoming features is the introduction of an electronic MAA bookstore.



PERSONAL OPINION

Renz Editorial Off Target

Anne E. Brown and David J. DeVries

We would like to respond to the June 1997 FOCUS editorial by Peter Renz, which related in part to a February 1997 article by Annie and John Selden concerning the Research Conference on Collegiate Mathematics Education. We regret that the pages of FOCUS were used to disseminate Renz's misconceptions about the nature and promise of the field of research in mathematics education, particularly when his comments were based on surmises about a conference that he did not attend, and about a field of which he appears to have little direct knowledge.

Renz suggests that current mathematics education research is of little help to the "average classroom teacher." The fact is that the vast majority of the participants at the conference to which Renz refers are classroom teachers of mathematics who are also interested in what research on teaching and learning has to offer. Those participants included the members of the sponsoring organization RUMEC (Research in Undergraduate Mathematics Education Community). This group of college mathematics teachers has chosen to conduct research in collegiate mathematics education using a framework that includes the design, implementation, and assessment of theory-based instruction. Moreover, the opening panel at the conference was devoted to the problems of connecting research with practice, a fact present in the Seldens' article but absent in Renz's critique. While pointing out the obvious deep interest in connecting research to practice, we also maintain that every field of research must be free to define its own problems, goals, and methods, and that inquiries within the field not be shaped by persistent concerns about the immediate applicability of the research to practice.

Given the complexities of teaching and learning mathematics, no one would seriously suggest that mathematics education research will ever provide all the answers to learning problems. Few results of educational research are directly applicable to situations other than the original ones investigated. Nonetheless, as Renz points out, teachers do need to find out what works for their students. If the teacher expects quick fixes from research in mathematics education, feelings of frustration like Renz revealed in his editorial will inevitably result. Instead, the teacher might more profitably look to the science of mathematics education to provide an interpretive context and knowledge base for practicing the art of teaching mathematics. For example, research provides theoretical models of learning and analyzed data that can inform the teacher about how students might be thinking when struggling to learn a concept, what kinds of mistakes students are making and why, and what knowledge and intuitions students bring to the study of a new topic. The insights offered by research thus can yield a new lens through which to view the teaching and learning process, provided that teachers understand and accept the realities of what research has to offer and not expect the simple answers we might all prefer, in an ideal world.

To gain this advantage, the practitioner will have to learn some of the technical language of the field, as one would when delving into any field of scientific inquiry. That is, "jargon" comes with the territory. The issues of mathematical learning are not easy or superficial. We argue that progress can be made only when these issues are examined systematically within a clearly identified theoretical framework. Precise technical language is required to describe such a framework, but it can be a barrier to communication with those outside of the field. We also acknowledge that the tendency of each researcher to invent his or her own technical language is an impediment to progress within the field. We agree that educational researchers need to find effective ways to communicate the essence of their field to all teachers; efforts to do this are underway, and would benefit greatly from more cross-community collaboration.

Detailed information about the variety of models and theories is difficult to provide in brief reports for general audiences. Those who seek to inform their practice through an understanding of research are encouraged to attend conferences like the one on which the Seldens reported, and the sessions on research in mathematics education that are held at the Joint Mathematics Meetings. Many college mathematics teachers do attend these sessions; what they find must be worthwhile, for the sessions always have large audiences. Their demonstrated interest in the field makes us feel optimistic that more practitioners will become involved in the field of research in mathematics education. Perhaps Peter Renz himself will be interested in pursuing in a serious fashion some of the important issues he raised in the second part of his editorial.

Anne E. Brown is at Indiana University South Bend, South Bend, Indiana (abrown@iusb.edu). David J. DeVries is at Georgia College and State University, Milledgeville, GA (ddevries@mail.gac.peachnet.edu). *The above article was written with the support of the members of RUMEC.*

Peter Renz Replies

Keith Devlin has asked whether I would make a brief comment on the Brown–DeVries article, and I am happy to do so. The Association's consistent and constructive involvement with mathematics education makes its newsletter, FOCUS, the natural forum for an exchange of ideas in this area. Therefore I am pleased that a response to my June editorial appears here. With the authors of this response, I urge you to consider these issues and draw your own conclusions. There is a wealth of material and a sea of differing opinions on these matters. I will be content if you sift these for yourselves and make use of whatever you can.

Though I began by looking at the Selden's report of the conference at Central Michigan University on research in mathematics education, the bulk of my editorial concerned how we present our subject. These broader issues should not be lost in a narrow controversy about the nature and efficacy of mathematical education research. In various ways, these issues touch your lives and livelihoods.

Peter Renz's e-mail address is plrenz@aol.com.

USA Team Comes Fourth at International Mathematical Olympiad

Competing against teams representing a record eighty-two countries, the American team won six medals at the thirty-eighth International Mathematical Olympiad held in Mar del Plata, Argentina, July 18–31, 1997. The team tied for fourth place.

The top ten teams and their scores (out of a possible 252 points) are China (223), Hungary (219), Iran (217), U.S.A. (202), Russia (202), Ukraine (195), Bulgaria (191), Romania (191), Australia (187), and Vietnam (183).

Head coach and team leader Titu Andreescu, from the Illinois Mathematics and Science Academy in Aurora, says, "We are very pleased with the performance of our students. Carl Bosley was among only four students out of 460 participants who scored a perfect paper. All other team members performed very well, achieving gold or silver medals. We ran a very intense four-week training program preceding the competition and the hard work paid off. We are very happy that our team maintained its high ranking in the world competition this year."

The team was also accompanied by Professor Elgin Johnston from Iowa State University, who is deputy of the leader, and Professor Walter E. Mientka from the University of Nebraska–Lincoln, as the official U.S.A. leader observer.

The U.S. team was chosen on the basis of performance in the twenty-sixth annual U.S.A. Mathematical Olympiad held in May of this year. A report on the USAMO appears in the August FOCUS.

The 1997 IMO team members were Gold Medalists Carl J. Bosley (Washburn Rural High School, Topeka, Kansas) and Nathan G. Curtis (Thomas Jefferson High School for Science and Technology, Alexandria, Virginia); and Silver Medalists Li-chung Chen (Monta Vista High School, Cupertino, California), John J. Clyde (New Plymouth High School, New Plymouth, Idaho), Josh P. Nichols-Barrer (Newton South High School, Newton Center, Massachusetts), and Daniel A. Stronger (Stuyvesant High School, New York, New York).

Math Lessons on the Hill

This past summer, the Coalition for National Science Funding (CNSF) held its Third Annual Exhibition on Capitol Hill. The event allowed dozens of NSF-funded researchers and educators to set up displays about their work and interact with more than a hundred congressional members and staff. The Joint Policy Board for Mathematics, along with the AMS, MAA, and SIAM, sponsored three exhibits by mathematical scientists: Jonathan Simon of the University of Iowa and Gregory Buck of Saint Anselm College on the energy of knots; Dennis DeTurck and Larry Gladney of the University of Pennsylvania on mathematics and its applications throughout the curriculum; and Todd Torgersen of Wake Forest University on mathematical techniques for restoring atmospherically blurred images.

The CNSF is a collaboration of scientific societies, professional associations, and universities that has been lobbying on behalf of the NSF for nearly ten years. This year the coalition called for a 7% budget increase for the NSF and undertook a variety of activities to generate congressional support. Given the constraints under which Congress is operating, CNSF members said they were more than pleased with the 6.6% increase recommended by House appropriators in July.

As it transpired, the version of the FY1998 VA, HUD, and Independent Agencies Appropriations Bill subsequently passed by the Senate provided only a 3.3% increase for the NSF, $110 million less than the amount approved by the House.

Atlanta MathFest Declared Big Success

Over 850 mathematicians attended the MAA MathFest in Atlanta, Georgia, in early August. Despite the fears that some had expressed in advance about the heat and humidity that can greet the summer visitor to Atlanta, participants enjoyed glorious and mostly sunny weather for the entire five days of the meeting.

The meeting was preceded by an MAA two-day short course on Epidemiology Modeling, co-sponsored by the Centers for Disease Control. "Music and Mathematics" was the title of one of four minicourses members could choose from. The Hedrick Lectures were given by Elliott Lieb of Princeton University, who took his audience on a tour of some of the mathematics of the physical universe. Former AMS President Ronald Graham of AT&T Laboratories gave two presentations titled "Paul Erdös' Favorite Problems." The Pi Mu Epsilon J. Sutherland Frame Lecture was given by Philip Straffin, Jr. of Beloit College, who spoke on the geometry of voting. University of Dayton mathematician Aparna Higgins gave the MAA Student Lecture, taking as her topic "Demonic Graphs and Undergraduate Research."

Among the many other lectures, presentations, banquets, receptions, and special sessions, a two-hour open session on "Mathematics Instruction and the World Wide Web" provided the audience a snapshot of how the educational world of tomorrow is already here at some institutions. The increasing incursion of computer technology into the mathematics classroom was further reflected in the vendor display, where, as usual these days, electronic products were almost as much in evidence as books.

It was, in the words of one younger attendee, "a cool event." For a summer MathFest in Atlanta, that is surely the highest possible praise.

Prizes and Awards at the Atlanta MathFest

The awards ceremony at the summer MathFest in Atlanta took place on August 2. The **Carl B. Allendoerfer Awards** went to Colm Mulcahy of Spelman College and Lin Tan of West Chester University. Established in 1976 and named after the MAA president for the period 1959–60, these awards are given in recognition of expository writing in *Mathematics Magazine*. Mulcahy, a native of Ireland, received the award for his article "Plotting and Scheming with Wavelets," which appeared in December 1996. Tan, who hails from China, was recognized for his article "Group of Rational Points on the Unit Circle," which the magazine published in June 1996.

The **Trevor Evans Awards** were established in 1992 and are given to authors of expository articles published in *Math Horizons*. Named after a distinguished mathematics teacher and writer at Emory University, the awards for 1996 went to William Dunham of Muhlenberg College, for his article "1996—A Triple Anniversary" (September 1996), and to Dan Kalman of American University, for "A Perfectly Odd Encounter in a Reno Cafe" (April 1996).

Three expository articles published in the *American Mathematical Monthly* earned **Lester R. Ford Awards** for their authors. Robert Bartle (Eastern Michigan University) was recognized for his article "Return to the Riemann Integral" (October 1996). Alan Beardon (University of Cambridge) was given the award for "Sums of Powers of Integers" (March 1996). The third award went to John Brillhart (University of Arizona) and Patrick Morton (Wellesley College) for their article "A Case Study in Mathematical Research: The Golay-Rudin-Shapiro Sequence" (December 1996). The Lester R. Ford Award was established in 1964 and named in honor of the Association's president for 1947–48.

The **Merten M. Hasse Prize** was established in 1986 to encourage younger mathematicians to write good expository articles. The award is made for expository papers published by the Association for which one or more of the authors is younger than forty at the time the article was accepted. The prize for 1996 went to Jonathan King of the University of Florida for his article "Three Problems in Search of a Measure," which appeared in the August–September 1994 issue of *American Mathematical Monthly*.

The **George Pólya Award**, established in 1976 and named after the famous Stanford mathematician and writer, are made to authors of expository articles published in *The College Mathematics Journal*. The award for 1996 went to Chris Christensen for his article "Newton's Method for Resolving Affected Equations," published in November 1996.

Highlights from the Governors Meeting

With the Board of Governors meeting in Atlanta lasting all day (the agenda book had 148 pages, not counting last minute additions), it is impossible for a single article to cover everything that transpired, or even to mention everything that might justifiably be called a "highlight." What follows are just a few of the highlights.

• It was announced that President Alexanderson (who unfortunately was unable to attend the MathFest due to ill health) has appointed a task force to review the 1993 *MAA Guidelines for Programs and Departments in the Mathematical Sciences*. The task force members will be Donald Bentley, Sylvia Bozeman, John Fulton (chair), Wanda Gardner, Nancy Hagelgans, James Leitzel, Dale Mugler, Barbara Osofsky, and Jimmy Solomon.

• Don Albers, director of publications, reported that the MAA plans to publish a total of twenty books in 1997, the largest number ever in a single year.

• Marcia Sward, executive director, announced that the National Security Agency has made an additional grant of $32,000 to continue their support of SUMMA (Strengthening Underrepresented Minority Mathematics Achievement). Another long-time sponsor, The Carnegie Corporation of New York, has given a further $25,000.

• Director of Marketing Caroline Fuchs reported that the current membership of the Association stands at 25,200, comprising 24,676 individuals, 520 institutions, and 4 corporate members. The additional projected membership for 1997 is 2860, which would bring the grand total to just over 28,000.

• Underwood Dudley of DePauw University was elected as the new editor of *The College Mathematics Journal*. He will succeed Bart Braden whose term expires in December 1998.

• James Tattersall of Providence College was elected associate secretary of the Association to succeed Donovan van Osdol when his term comes to an end after the January 1998 meeting.

• Gerald Porter of the University of Pennsylvania was re-elected to a second five-year term as MAA treasurer, his second full-term commencing in January 1998.

Joint Meetings: What's in it for Students?

Now is the time to register for the 1998 Joint Mathematics Meetings, just three months away. Faculty may be asking themselves what benefit can be had by taking along a group of undergraduate students. That is exactly what Sonoma State University Professor ***Jean Bee Chan*** *did when she attended the 1997 meetings. Here is her report.*

Jean Bee Chan (center row, fourth from left) and her Sonoma State students in San Diego

With the support of the MAA Committee on Student Chapters and Sonoma State University, some thirty California undergraduates, including twenty-three minority students, attended the January 1997 Joint Mathematics Meetings in San Diego.

The fun began Wednesday morning at the Oakland airport where my small group (ten Sonoma State students, my husband, and I) assembled to board the plane for San Diego. Funding a student expedition to the San Diego meetings was financially difficult. Everyone agreed to be frugal, and one of the students brought an overstuffed bag containing breakfasts for her entire trip so she wouldn't have to buy them in San Diego.

To our surprise Constance Reid joined the party on the same flight. She graciously invited us to the evening reception where she would be discussing her new book *Julia*, a story of her sister Julia Bowman Robinson. The students were intrigued, especially after learning that Constance had been to a Sonoma State party to autograph her *Hilbert* for each mathematics graduate and that her sister had visited our campus some years ago.

At the San Diego airport, we met two CSU Chico students and others from Occidental College. Arriving at the San Diego Convention Center, we rushed to the Student Hospitality Center. Thanks to Professor and Mrs. Richard Neal, the center featured free drinks, candy, interesting videos, puzzles, and problem solving tables. Some of the students immediately became involved in a puzzle. Meanwhile, Professor David Barsky of CSU San Marcos spotted us. He told us he would bring his students to the MAA workshop on Thursday.

Noting the conflict of the Reid reception and the MAA First-time Participants Reception, one of my students asked if we could go to both receptions, leaving one early and arriving at the other late. This became the plan, and my star-struck students left the Reid reception early, the book *Julia* bought with their dinner money. Fortunately they didn't go completely hungry as there were hors d'oeuvres at both receptions. Besides, an autographed *Julia* is worth much more than a full stomach.

At the MAA First-time Participants Reception, Brent Morris amazed the crowd with flawless magic tricks. When the show was over, he came to visit our circle of students sitting on the floor and he mesmerized our party with more

tricks. Thank you, Brent, for a very special time.

Sonoma State students were specially asked to attend the AMS Invited Address on "Dynamics, Symmetry, and Pattern-forming Instabilities in Physical Systems," given by Professor Mary Silber of Northwestern University, who is a Sonoma alumna. After the talk, she pleased my students by mentioning getting together to reminisce about our campus.

The Thursday afternoon MAA Student Workshop "Linking Geometry and Number Theory," led by Professor Jean Pedersen, was a big hit. The workshop was packed to capacity by sixty students and five faculty from a variety of schools from all parts of the U.S. and Canada. Student Hospitality Center leader Richard Neal helped make extra copies of workshop handouts for the unexpected crowd, and Professor Dick Jarvinen, the next Student Chapters Committee chair, came to make sure everything was going well. All the students actively participated in the hands-on colorful workshop for two full hours.

Next we attended the Joint Prize Session and yet another reception. The students, familiar with Fermat's Last Theorem, rushed to meet Professor Andrew Wiles and ask for his autograph. Several group pictures were taken in a hurry. One of us remarked that these extra activities cost dearly because we missed being at the head of the food line! So that evening we decided to splurge on a dinner out. A dozen students from Sonoma, Chico, and Occidental dined family style. Everyone listened approvingly when a student from Occidental declared her determination to work toward a Ph.D. in mathematics.

Friday was *the* big day for students. In a paper session organized by Professor Karen Schroeder, Sonoma State MAA Student Chapter current and former presidents Amy Polos and Amy Joell, respectively, delivered a joint talk on "Student Chapter Won Outstanding Club of the Year Award." Our friend Professor Barbara Beechler came to talk to our students, adopting them as her mathematical grandchildren. She asked how we could afford to bring so many students along. (Hasn't she heard about the famous Body Packing Problem of fitting four students in one small hotel room with a fifth on a cot?)

That evening we attended the Morgan Prize Lecture, the added two-hour program "A Tribute to Paul Erdos," and the MAA Student Lecture, "When is an Integer the Product of Two and Three Consecutive Integers?" delivered by Professor Ed Schaefer, which the students rated as first-class. His presentation, unfolding the solution through elliptic curves, prompted exclaimations and nods of understanding from the students.

At the Ice Cream Social following the lecture, the students surrounded Professor Schaefer for more questions and stories. We all posed for group pictures with him as well as with Aparna Higgins, the committee chair and the one who inspired and led the Committee on Student Chapters to create the MAA Student Events for the past nine years.

Our group stayed even after the ice cream servers had left. My husband and I walked to our hotel after eleven o'clock, with our students' laughter echoing through the empty convention center, and we overheard them talking excitedly about raising enough money to attend the next national meetings in Atlanta. Had the fire of curiosity been kindled and a long relationship with the MAA just begun?

Jean Bee Chan serves on the MAA Student Chapters Committee and teaches at Sonoma State University in Rohnert Park, California. Her e-mail address is jean.chan @sonoma.edu.

Authors Needed for NCTM 2000 Yearbook

Help us close out the century with thoughtful reflections of where we have been in school mathematics and ruminations on where we will go next. The Educational Materials Committee is calling all interested writers to submit articles for the 2000 National Council of Teachers of Mathematics yearbook, *Learning Mathematics for a New Century*.

NCTM yearbooks annually explore the range of thinking and discussion on a particular mathematics topic. For 2000, the dialogue will focus on the content of school mathematics needed to launch us into the new century. The yearbook editorial panel is particularly interested in papers that reflect on our past, examine current curricula, and look to the future. Maurice Burke, associate professor of mathematics education at Montana State University, will edit this volume.

Author guidelines are now available and include a complete description of topics to be addressed and instructions for preparing manuscripts. For a copy of the guidelines, write to General Editor Frances R. Curcio, Dept. of Teaching and Learning, School of Education, New York University, 239 Greene St., Washington Square, New York, NY 10003; curcio@is2.nyu.edu. You can also find the guidelines on NCTM's website, www.nctm.org, under "Educational Materials/2000 Yearbook." The deadline for receiving manuscripts is March 1, 1998.

Undergraduate Paper Competition

Cryptologia

The scholarly journal *Cryptologia* sponsors the Annual Undergraduate Paper Competition in Cryptology to encourage the study of all aspects of cryptology in the undergraduate curricula. We encourage you to consider this competition yourself if eligible or to encourage young people in your crypto purview to consider the competition. The prize is $300 and publication of the paper in the journal. The topic may be in any area of cryptology—technical, historical, and literary subjects. For inquiries, submission, and subscription information, contact *Cryptologia*, Dept. of Math Sciences, United States Military Academy, West Point, NY 10996; (914) 938-3200; fax: (914) 938-2409; ab3646@usma2.usma.edu; WWW: http://www.dean.usma.edu/math/resource/pubs/cryptolo/index.htm

12th Annual Department Chairs Colloquium

Board on Mathematical Sciences, National Research Council

"Being More Resourceful and Winning More Resources"

November 7–8, 1997, Bethesda, MD

Each mathematical sciences department is unique, with no two departments having exactly the same needs. A department's mission, priorities, and the expectations it must meet vary with its local academic and geographic community, and also over time. However, certain themes are consistently of concern to most departments. In light of today's "interesting" times, this year's colloquium focuses on case studies, "how-they-did-it" examples, and what makes for stronger research and education programs, while preparing for tomorrow's opportunities.

The colloquium will be held at the Bethesda Marriott Hotel in Bethesda. The registration fee is $175. For additional information or to register for the colloquium, contact the Board on Mathematical Sciences at (202) 334-2421; bms@nas.edu.

DIMACS Workshops

Massive Data Sets in Telecommunications

DIMACS Center, Rutgers University, Piscataway, NJ, October 13–15, 1997

For further information, contact Joan Feigenbaum, AT&T Labs; (973) 360-8442; jf@research.att.com.

End-to-End Network Modeling and Simulations

Computer Science Department, Princeton University, Princeton, NJ, October 23–25, 1997

This workshop will focus on current developments in network modeling, simulation, and algorithmic techniques which take into account the observed and measured behavior of networks. An intense program of invited talks is anticipated. For further information, contact Andy T. Ogielski, DIMACS and WINLAB, Rutgers University; ato@winlab.rutgers.edu. For local arrangements, contact Sandy Barbu, Princeton University; (609) 609-1771; barbu@cs.princeton.edu.

Randomization Methods in Algorithm Design

Computer Science Department, Princeton University, Princeton, NJ, December 12–14, 1997

The last decade has witnessed a tremendous growth in the area of randomized algorithms. Major topics to be covered in the workshop include randomization techniques for linear and integer programming problems, randomization in the design of approximate algorithms for combinatorial problems, randomization in parallel and distributed algorithms, practical implementation of randomized algorithms, derandomization issues, and pseudo-random generators. For further information, contact Panos Pardalos, University of Florida; pardalos@ufl.edu. For local arrangements, contact Sandy Barbu, Princeton University; (609) 609-1771; barbu@cs.princeton.edu.

Discrete Mathematical Chemistry

DIMACS Center, Rutgers University, Piscataway, NJ, March 23–25, 1998

Discrete mathematics have been used in chemistry for well over a century. Graph theory is a tool of choice to represent molecules (the name graph appears to have been coined by A. Cayley in the context of such studies), clusters, or reaction paths. Group theory is much used for the study of molecular symmetries. Coding theory is basic in systematizing the enormous amount of chemical data available, in problems of enumeration of molecules, isomers, and families having various properties. Graph invariants are much used in structure-activity and structure-property relationship studies. All these techniques are increasingly used by industry in the rapidly expanding fields of computer-assisted molecular design and combinatorial chemistry. For further information, contact Pierre Hansen; pierreh@crt.umontreal.ca. For local arrangements, contact Pat Pravato, DIMACS Center; (732) 445-5929; pravato@dimacs.rutgers.edu.

Astrophysics and Algorithms: A DIMACS Workshop on Massive Astronomical Data Sets

Computer Science Department, Princeton University, Princeton, NJ, May 6–8, 1998

For further information on this workshop, contact the e-mail address dimacs@astro.princeton.edu. For local arrangements, contact Sandy Barbu, Princeton University; (609) 609-1771; barbu@cs. princeton.edu.

Large Scale Discrete Optimization

DIMACS Center, Rutgers University, Piscataway, NJ, May 27–29, 1998

This workshop on very large problems in a variety of areas ranging from telecommunications to airline scheduling map to questions in discrete optimization is sponsored jointly by DIMACS, Carnegie Mellon University, and Georgia Tech. . The aim is to bring practitioners and theoreticians with insight into specific areas where large scale discrete optimization methods are used and to talk about central issues as well as outstanding open questions in their respective areas. For further information, contact R. Ravi, Carnegie Mellon; ravi@cmu.edu. For local arrangements, contact Pat Pravato, DIMACS Center; (732) 445-5929; pravato@dimacs.rutgers.edu

For more information on these DIMACS workshops, see http://dimacs.rutgers.edu/Workshops/index.html

Student Poster Session

Undergraduate Research

The CUPM subcommittee on Undergraduate Research in Mathematics is sponsoring a student poster session at the January 1998 joint AMS–MAA meetings in Baltimore. The posters will be judged and prizes awarded.

A title and a brief abstract (limit half a page) of the poster should be mailed to Dr. Judith Palagallo, Dept. of Math Sciences, University of Akron, Akron, OH 44325-4002; palagallo@uakron.edu. The deadline for submission is December 1, 1997.

1997 Tensor Foundation grants

Twelve awards, ranging from $2400 to $5000, were made in the third year of the Tensor Foundation's support of programs designed by universities, colleges, and school systems to increase the participation of women in mathematics and science. The grants program is administered by the MAA on behalf of the foundation.

Winners represented a variety of institutions: three state universities, a historically Black university, a private university, two small colleges, one joint college-state university effort, two two-year colleges, one high school, and one joint college and school system proposal. The 1997 winners are:

Pushpa Agashe and Barbara Hatfield, University of Rio Grande/Rio Grande Community College, Ohio

Dorothy Anway and Ann Sigford, The College of St. Scholastica, Minnesota

John August, Mount Saint Mary's College and Bonnie Ward, Frederick County Public Schools, Maryland

Jo-Ann Cohen, North Carolina State University and Virginia Knight, Meredith College, North Carolina

Richard Gillman and Mary Treanor, Valparaiso University, Indiana

Kalpana Godbole, Tamara Olson and Allan Struthers, Michigan Technological University

Gwendolyn Hines and Judy Walker, University of Nebraska

Lou Ann Mahaney, Tarrant County Junior College, Texas

Sharon Quick, Clara Barton High School, New York

Charles Slavin, University of Maine

Laura Smith, North Carolina Central University

Margaret Wiener, Marymount Manhattan College, New York

The winning projects include a mentoring program; semester-long programs featuring Saturday classes and associated activities; summer programs ranging in length between two days and four weeks; a career day featuring hands-on activities; and an intervention program for freshman community college women. Six of the programs are based in rural areas, two in inner-city areas, and four in mid-size cities. Two of the awards were continuation grants.

The grantees were selected from among thirty-eight submitted proposals by a committee consisting of members of the MAA staff, a trustee of the Tensor Foundation, and a member of the Committee on the Participation of Women after recommendations from reviewers including members of the MAA's Committee on the Participation of Women as well as some awardees from the first two Tensor Foundation competitions who did not submit this year.

Tensor Foundation Program for Women and Girls

Call for Proposals

The Tensor Foundation will continue the program, started in 1995, to make funds available for programs that encourage women and girls in mathematics. Ten grants of up to $5000 each will be awarded in April 1998 for student-centered projects conducted by high school, college, or university mathematics faculty, to begin in the academic year 1998-99. The deadline for proposals is February 20, 1998.

An announcement containing information about the objectives, evaluation criteria, and submission procedures is available on *MAA Online* (http://www.maa.org) or from the Member Services and Programs Department, MAA, 1529 18th St. NW, Washington DC 20036; (202)387-5200 or (800) 741-9415.

Employment Opportunities

ARIZONA

UNIVERSITY OF ARIZONA

Department of Mathematics

Three Year Teaching Post-Docs

Overview: The Department of Mathematics at the University of Arizona has openings for three year, non-tenure track, teaching positions of professional training beginning in Fall 1998. These positions are similar to post doctorate positions in research except here the emphasis is on teaching and scholarly activities pertaining to teaching. The candidate must provide documentation of interest and accomplishments that show evidence or potential of quality instruction and creativity in the classroom. Applicants must have a recent Ph.D. in mathematics, mathematics education or statistics. These positions are intended for individuals with a teaching career in mind. They are meant to provide an excellent opportunity for those planning to teach in a community college, four year college or masters institution.

Responsibilities: Teaching up to nine credit hours per semester, involvement in departmental activities, participation in the weekly Mathematics Instruction Colloquium, involvement in departmental activities such as curriculum reform, projects with undergraduates, outreach, research seminars and teacher training. We suggest that candidates check out our web page at http://www.math.arizona.edu for a complete list of departmental activities.

Departmental Commitment: Opportunity to teach a full spectrum of lower division courses as well as upper division courses in the individual's specialty, assistance with the creation of a teaching portfolio under the guidance of a faculty mentor, opportunity to serve in teaching leadership roles, a small travel stipend to attend professional meetings, a small moving allowance, a computer for the individual's use, and an opportunity to teach summer school for additional compensation.

Salary: $30,000 to $35,000 per academic year.

We encourage early application including a letter of interest, a resume, transcripts, statement of goals, and names of references (you must include Job #9698 in your letter). Review of applications begins November 10, 1997 with application being accepted until January 10, 1998. Correspondence regarding job description, qualifications and application procedures should be sent to:

Entry Level Committee
Department of Mathematics
617 N. Santa Rita Avenue
University of Arizona
Tucson, Arizona 85721, USA

The University of Arizona is an Affirmative Action/Equal Opportunity/M/W/D/V/ Employer

CALIFORNIA

CALIFORNIA POLYTECHNIC STATE UNIVERSITY

Assistant Professor

Tenure-track in Mathematics, beginning Fall '98. Assistant Professor ($37,140 to $46,812). Duties include teaching (normal load, 12 hours per quarter), scholarship, advising and committee service. Doctorate in mathematics is required. Applicants are expected to present evidence of excellent teaching and an active research program. **Computational Mathematics (Recruitment Codes: 83001):** Areas of interest include dynamical systems, numerical analysis, topology, applied mathematics or more generally any area that uses computational mathematics in a significant way. **Operator Theory (Recruitment Code: 83002):** Areas of interest include applications of operator theory to control theory, mathematical physics, and traditional topics in operator theory. **Combinatorial Mathematics (Recruitment Code: 83003):** Areas of interest include enumerative and algebraic combinatorics, Polya theory, theory of partitions, formal series, q-series, permutations statistics, and symmetric polynomials. Send letter of application, resume, brief statement of professional goals, three letters of reference (at least one of which discusses teaching ability), and transcripts (unofficial okay initially) to: Chair, Screening Committee, Mathematics Department, Cal Poly, San Luis Obispo, CA 93407. Indicate specific recruitment code on all correspondence. Closing date: 11/1/97. Cal Poly is strongly committed to achieving excellence through cultural diversity. The university actively encourages applications and nominations of women, persons of color, applicants with disabilities, and members of other under-represented groups. AA/EEO.

STANFORD UNIVERSITY

SCHOOL OF EDUCATION

Faculty Position - Mathematics Education

The School of Education at Stanford University seeks nominations and applications for a faculty member specializing in mathematics education.

The successful candidate will have a doctorate in mathematics education, a potentially powerful program of research at least in its initial stages, and teaching experience, preferably at the level of middle school or high school. As a faculty member, this person will teach graduate-level courses for both prospective researchers and secondary school teachers; he or she will also guide doctoral research in mathematics education and related fields. Candidates will be especially attractive if, in addition to the requirements stated above, they have research interest in teacher education, equity (including gender issues), technology, and/or curriculum.

There is a strong preference for an appointment at the assistant professor level, but the appointment could be made at the associate or full professor level, subject to administrative and fiscal approval. Salary will be determined on the basis of qualifications, including experience. Applicants must have completed the doctorate before the date of appointment. They should provide a cover letter, curriculum vitae, and a list of three references (complete with addresses and phone numbers). We will request letters of recommendation to be sent directly to Stanford for a small number of finalists.

Nominations and applications will be reviewed beginning November 15, 1997, but the position will remain open until it is filled.

Please direct correspondence to:
Professor James Greeno, Chair
Mathematics Education Search Committee
c/o Annie Craft-Kincheon
School of Education
Stanford University
Stanford, CA 94305-3096
Please direct inquiries to:
Annie Craft-Kincheon
Phone: 415-725-4491
FAX: 415-725-7412
e-mail: annie.craft@forsythe.stanford.edu

Stanford University is an equal opportunity employer. The School of Education is committed to increasing the representation of women and members of historically underrepresented minority groups on its faculty and encourages applications from such candidates.

ILLINOIS

UNIVERSITY OF ILLNOIS AT CHICAGO

Dept. of Mathematics, Statistics, and Computer Science

The Department has active research programs in all areas of pure mathematics, computational and applied mathematics, combinatorics and computer science, statistics, and mathematics education. See **http://www.math.uic.edu** for more information. Applications are invited for the following positions, effective August 21, 1998.

First, a tenure track or tenured position. Candidates in all areas of interest to the Department will be considered. The position is initially budgeted at the Assistant Professor level, but candidates with a sufficiently outstanding research record may be considered at higher levels. Applicants must have a Ph.D. or equivalent degree in mathematics, computer science, statistics, mathematics education or related field, an outstanding research record, and evidence of strong teaching ability. Salary negotiable.

Second, a Research Assistant Professorship. This is a non-tenure track position normally renewable annually to a maximum of three years. The position carries a teaching load of one course per semester, with the requirement that the in-

cumbent play a significant role in the research life of the department. The salary for AY 98-99 for this position is expected to be $40,000. Applicants must have a Ph.D. or equivalent degree in mathematics, computer science, statistics, mathematics education or related field, and evidence of outstanding research potential.

We encourage applicants to submit an electronic cover sheet. The electronic cover sheet may be filled out on the web at **www.phds.org** or may be obtained by sending an e-mail to the address **coversheet@phds.org**. However, for this search we still require that an original paper application must also be submitted. Send vita and direct 3 letters of recommendation, indicating the position being applied for, to Henri Gillet, Head; Dept. of Mathematics, Statistics, and Computer Science; University of Illinois at Chicago; 851 S. Morgan (M/C 249); Chicago, IL 60607. To ensure full consideration, materials must be received by December 22, 1997. Minorities, persons with disabilities, and women are particularly encouraged to apply. UIC is an AA/EEO employer.

INDIANA

FRANKLIN COLLEGE

A private four-year liberal arts college, invites applications for a tenure-track assistant professor of mathematical sciences anticipated for August 1998. Position requires teaching a variety of courses at all levels. PHD or ABD required. Computing background and/or experience highly desirable. For details see our web page at http://www.franklincoll.edu/matweb/position.htm

IOWA

AAUW EDUCATIONAL FOUNDATION

We're Changing the World
One Woman at a Time

If you are a woman student pursuing a master's degree in mathematics or statistics, you may be eligible for funds from The American Association of University Women Educational Foundation. Dedicated to education and equity for women, the Foundation's Selected Professions Fellowships Program seeks to increase women's participation in and access to fields where their participation has traditionally been low.

U.S. citizens or permanent residents who will be entering their final year of full-time study in the Fall of 1998 for a master's degree are encouraged to apply. Award ranges from $5,000 to $12,000.

If you are interested in applying, please call or write the AAUW Educational Foundation before December 20, 1997, c/o American College Testing, P.O. Box 4030, Dept. 113, Iowa City, IA 52243-4030, 319/337-1716 ext. 113.

Applications are available through December 20, 1997. Completed applications must be postmarked by January 6, 1998.

MASSACHUSETTS

WILLIAMS COLLEGE
Department of Mathematics
Williamstown, Massachusetts 01267

Anticipated tenure-eligible position in statistics, beginning Fall, 1998, probably at the rank of assistant professor, in exceptional cases, however, more advanced appointments may be considered. Excellence in teaching and statistics, including scholarship and consulting, and Ph.D. required.

Please have a vita and three letters of recommendation on teaching and research sent to Hiring Committee. Evaluation of applications will begin November 15 and continue until the position is filled. As an EEO/AA employer, Williams especially welcomes applications from women and minority candidates.

WILLIAMS COLLEGE
Department of Mathematics
Williamstown, Massachusetts 01267

Anticipated visiting positions(s) in mathematics or statistics for the 1998-99 year, probably full-time, probably at the rank of assistant professor; in exceptional cases, however, more advanced appointments may be considered. Excellence in teaching and research, and Ph.D. required.

Please have a vita and three letters of recommendation on teaching and research sent to Visitor Hiring Committee. Evaluation of applications will begin November 15 and continue until the position is filled. As an EEO/AA employer, Williams especially welcomes applications from women and minority candidates.

MICHIGAN

GRAND VALLEY STATE UNIVERSITY

An institution committed to teaching excellence, solicits applications for a tenure track assistant professorship to begin August, 1998. Responsibilities include teaching mathematics courses at all levels, maintaining an active program of professional development, advising students, and engaging in departmental service.

The successful candidate will have: a Ph.D. in mathematics; demonstrated excellence in undergraduate teaching and strong teaching recommendations; commitment to continued scholarly and professional growth; demonstrated scholar-ly interest in an area of mathematics amenable to undergraduate research; demonstrated interest in teaching mathematics courses including calculus and in at least one of the following areas: precalculus mathematics, mathematics education, or introductory statistics.

A complete application must include a cover letter and vita, a copy of graduate transcripts, and at least three letters of recommendation At least two letters must attest to the applicant's teaching ability and potential. The application must also include a personal statement that addresses the applicant's qualifications for the position (as listed above) and teaching philosophy and methodology. Send these materials to:

Mathematics Search Committee
Department of Mathematics and Statistics Grand Valley State University
Allendale, MI 49401

Completed applications must be received by December 1, 1997.

KALAMAZOO COLLEGE
Assistant Professor of Mathematics

Kalamazoo College invites applications for a tenure-track position at the Assistant Professor level beginning September, 1998. A Ph.D. in mathematics, statistics, or operations research is required, with preference given to candidates of broader experience in mathematics, science or the liberal arts. Teaching load is two courses per quarter, three quarters per year. Salary is competitive and consistent with level of experience. For more information about the college, visit our web home page at www.kzoo.edu.

Experience with and interest in the application of statistics to problems in the life or social sciences is essential. The ideal candidate will also have an interest in developing an active research program that involves undergraduate student participation. Candidates are expected to have high aptitude and interest in undergraduate teaching and a commitment to the liberal arts.

Completed applications received by December 31, 1997 will receive full consideration, with later applications reviewed as needed until the position is filled. Send curriculum vitae, undergraduate and graduate transcripts (unofficial acceptable), a two-to-three page statement of teaching philosophy and research plans, and three letters of recommendation to

Prof. John Fink
Chair, Department of Mathematics
Kalamazoo College, 1200 Academy Street
Kalamazoo, MI 49006-3295
fink@cc.kzoo.edu

Kalamazoo College encourages candidates who will contribute to the cultural diversity of the College to apply and to identify themselves if they wish. Equal Opportunity Employer.

NEW JERSEY

MONTCLAIR STATE UNIVERSITY
Department of Mathematics and Computer Science (Two Position)

Applications are invited for a tenure-track position in Mathematics Education (V#-2) starting Fall 1998. Rank and salary at the Assistant or Associate level will be commensurate with qualifications and experience. Candidates are required to have a doctorate in Mathematics or Mathematics Education with a demonstrated commitment to research in Mathematics Education. A strong

background in mathematics through the Master's level and some experience with grades K-12 are also required. Preference will be given to candidates whose primary research involves the training or education of mathematics teachers.

Candidates should be capable of directing doctoral students and contributing leadership to the Department's active graduate program in Mathematics Education. Responsibilities will include involvement with undergraduate and master's courses in mathematics and undergraduate, master's and a developing Ed.D. program in mathematics education.

Applications are also invited for a tenure-track position in Discrete Applied Mathematics (V#-1) starting Fall 1998 at the rank of Assistant Professor. Candidates are required to have a Ph.D. in Mathematics with expertise in operations research required together with one or more of the following areas preferred; Graph Theory, Game Theory, or Combinatorial Mathematics.

Faculty are expected to be professionally active, have an active research program, and be committed to quality teaching and the pursuit of grants. Teaching load is 12 credits per semester but may be reduced to 9 credits per semester if actively engaged in research.

The Department of Mathematics and Computer Science at Montclair State University includes undergraduate programs in Mathematics, Mathematics Education, Computer Science and Physics; Master's programs in Mathematics, Mathematics Education, Computer Science and Statistics. Currently, there are thirty-nine full-time faculty in the department. Faculty are cooperating with the University's College of Education and Human Services in the development of an Ed.D. with a Specialization in Mathematics Education designed for the classroom teacher.

Applicants should send a vita, a statement of professional goals, research interests and teaching philosophy, and three letters of recommendation of either:

Mathematics Education Search
Committee (V#-2) or
Applied Mathematics Search Committee (V#-1)
c/o Dr. George Santiago
Assistant Dean, CSAM
Montclair State University
Upper Montclair, NJ 07043

Screening begins immediately and continues until the position is filled. Montclair State University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply. Subject to available funding.

OREGON

OREGON STATE UNIVERSITY
Assistant Professor of Financial Mathematics

The Department of Mathematics at Oregon State University invites applications for a tenure-track position at the assistant professor level in the area of financial mathematics. The department has a particular interest in such applications as actuarial mathematics, natural resource valuation, and banking and corporate finance. The position is a full-time appointment based on an academic year (September 16 thru June 15). Salary commensurate with experience.

Appointment begins September 16, 1998. For full consideration, apply by January 15, 1997. Applications will be accepted until the position is filled. If an appropriate candidate cannot be found, the position will be filled with a visitor. For complete job description, list of faculty research areas, statement of selection criteria, and application materials, write to:

Dr. Donald C. Solmon
Staff Selection Committee
Department of Mathematics
Oregon State University
Corvallis, Oregon 97331-4605

Contact can also be made through Lois Brittin, Graduate Secretary, at (541) 737-5134 or e-mail lois@math.orst.edu.

PENNSYLVANIA

SHIPPENSBURG UNIVERSITY
Assistant Professor of
Mathematics Education for August 1998

Qualifications: Doctorate in Mathematics Education with a masters degree (or equivalent) in mathematics education, or Doctorate in Mathematics with a masters degree (or equivalent) in mathematics education. Candidates who will be completing their doctorate within one year will be considered on a contingent contract basis. The position requires excellence in teaching, as well as experience or potential in research and academic service. The successful candidates will be expected to teach secondary mathematics education courses, graduate mathematics education courses and supervise student teachers. A demonstration of teaching effectiveness will be required as part of the interview.

The primary responsibilities are to teach undergraduate mathematics and mathematics education courses, teach graduate mathematics education courses, advise students, conduct research and contribute to the academic climate of the department through writing grants, reviewing the curriculum, serving on committees, and interfacing with regional, secondary-level mathematics teachers.

The Department: The Department of Mathematics and Computer Science includes 25 full-time faculty members. There are currently 137 computer science majors, 111 mathematics and mathematics education majors, and 100 graduate majors in the department. The department offers graduate programs in computer science, information systems, mathematics and mathematics education. The university computer equipment includes a Unisys 2200/500 mainframe and an Alpha 2100 5/250

server computer. Departmental facilities include a microcomputer lab, two microcomputer equipped classrooms and a mathematics education technology center limited by Eisenhower and Whitaker foundation grants.

Application: Candidates must submit copies of graduate and undergraduate transcripts, publications (if any), three letters of recommendation from persons familiar with candidate's professional competence and other appropriate information which demonstrate judged on potential for teaching, research and university service. Review of applications will commence on January 1, 1998, and will continue until the positions are filled.

Apply To: Mathematics Education Selection Committee, Department of Mathematics and Computer Science, Shippensburg University, Shippensburg, PA 17257. The telephone number is 717-532-1431.

Shippensburg University is committed to equal employment opportunity. Women, persons of color, veterans, and the disabled are encouraged to apply.

TEXAS

ST. MARK'S SCHOOL OF TEXAS

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1-12, seek a Mathematics Department Chair beginning with 1998-99 academic year. The ideal candidate will have experience teaching Algebra I through Calculus and, perhaps, Middle School mathematics as well. Master's degree, thorough knowledge of NRSM standards, and vision of how to integrate technology into the mathematics classroom are essential. Candidates should send resumes to Arnold E. Holtberg, Headmaster, St. Mark's School of Texas, 10600 Preston Road, Dallas, Texas 75230.

St. Mark's School of Texas is an equal opportunity employer.

VIRGINIA

MATHEMATICS DEPARTMENT CHAIR
WOODBERRY FOREST SCHOOL
Woodberry Forest, Virginia

Applications are invited for the position of Chair of Mathematics at Woodberry Forest School, an independent residential secondary school for 370 boys located on a 1400 acre campus in the rolling foothills of Virginia. Founded in 1889, Woodberry Forest offers a rigorous values-based program of academics, arts, athletics and community service. The mathematics department offers courses from Algebra I through Abstract Algebra and Number Theory and includes all Advanced Placement mathematics courses. All students take a mathematics course every term. The mathematics department encourages students to use graphing calculators and spread sheets, and to write journals and formal mathematics papers. Each year about 35 students submit research papers to a mathematics research competition.

The school seeks a highly skilled mathematics educator with substantial teaching experience, preferably in independent schools, to become department chair on September 1, 1998. The successful candidate must be capable of leading a faculty of nine superior teachers, most of whom have advanced degrees including one Ph.D. The department chair must be an energetic teacher who enjoys working with motivated high school students. ABD or completed doctorate is preferred. Applicants must be eager to mentor student research papers and to supervise the research paper program. Candidates should also enjoy working in the boarding school environment, which includes dormitory supervision and coaching at an appropriate level. Enrolment is quite competitive. Prospective candidates should submit a cover letter, a resume and addresses and telephone numbers of five references to: Mr. Frederick Jordan, Dean of Faculty, Woodberry Forest School, Woodberry Forest, VA 22989.

MEETINGS

National MAA Meetings

January 7–10, 1998 Eighty-first Annual Meeting, Baltimore, MD; Board of Governors Meeting January 6, 1998

January 13–16, 1999 Eighty-second Annual Meeting, San Antonio, TX; Board of Governors Meeting January 12, 1999

January 19–22, 2000 Eighty-third Annual Meeting, Washington, DC; Board of Governors Meeting January 18, 2000

January 10–13, 2001 Eighty-fourth Annual Meeting, New Orleans, LA; Board of Governors Meeting January 9, 2001

Section Meetings

ALLEGHENY MOUNTAIN – March 27-28 1998, Clarion University of PA, Clarion, PA

EASTERN PA & DELAWARE – November 1, 1997, University of Pennsylvania, Philadelphia, PA

– Spring 1998, Shippensburg University, Shippensburg, PA

FLORIDA – March 6-7, 1998, Florida Atlantic University, Boca Raton, FL

– March 5-6, 1999, Florida Gulf Coast Comm College, Panama City, FL

ILLINOIS – March 27-28, 1998, McKendree College, Lebanon, IL

INDIANA – October 18, 1997, Wabash College, Crawfordsville, IN

– March 20-21, 1998, Ball State University, Muncie, IN

– November 7, 1998, St. Mary's College, Notre Dame, IN

INTERMOUNTAIN – April 10-11, 1998, Brigham Young University, Provo, UT

IOWA– April 1998, Luther College, Decorah, IA

KENTUCKY – March 27-28, 1998, Morehead State University, Morehead, KY

LOUISIANA-MISSISSIPPI – March 6-7, 1998, University of New Orleans, LA

– March 5-6, 1999, Jackson State University, Jackson, MS

MD-DC-VA – November 21-22, 1997, Mount St. Mary's, Emmitsburg, MD

– April 17-18, 1998, Virginia State University, Petersburg, VA

– Fall 1999, Towson State University, Towson, MD

MICHIGAN – October 3, 1997, Northern Michigan Univ, Marquette, MI

– May 1-2, 1998, Western Michigan University, Kalamazoo, MI

– May 1999, Eastern Michigan University, Ypsilanti, MI

MISSOURI – April 17-18, 1998, Southwest Missouri State University, Springfield, MO

– Spring 1999, Rockhurst College, Kansas City, MO

NEBRASKA-SOUTHEAST

SOUTH DAKOTA – April 1998, Wayne State College, Wayne, NE

NEW JERSEY – November 8, 1997, Montclair St. College, Montclair, NJ

NORTHEASTERN – Nov 21-22, 1997, Western New England College, Springfield, MA

NORTHERN CALIFORNIA – Feb-March, 1998, Stanford University, Stanford, CA

OHIO– October 24–25, 1997, Shawnee State University, Portsmouth, OH

– April 17–18, 1997, John Carroll University, Cleveland, OH

OKLAHOMA-ARKANSAS – March 27-28, 1998, University of Arkansas-Little Rock, AR

– March 26-27, 1999, Southern Nazarene University, Bethany OK

ROCKY MOUNTAIN – April 17-18, 1998, Araphoe Community College, Littleton, CO

– April 1999, Adams State College, Alamosa, CO

– April 2000 Colorado State University, Ft. Collins, CO

SOUTHEASTERN – March 13-14, 1998, College of Charleston, SC

SOUTHERN CALIFORNIA – Oct 4, 1997, Claremont McKenna College, Claremont, CA

– March 7, 1998, University of Redlands, Redlands, CA

– October 17, 1998, Pepperdine University, Malibu, CA

SOUTHWESTERN – April 3–4, 1998, Pima Community College, Tucson, AZ

SEAWAY – November 7-8, 1997, Siena College, Loudonville, NY

– April 1998, York University, No. York, Ontario, Canada

– November 1998, Nazareth College, Rochester, NY

TEXAS – Spring 1998, Southern Methodist University, Dallas, TX

– Spring 1999, Southwest Texas State University, San Marcos, TX

– Spring 2000, University of Texas at Austin, Austin, TX

WISCONSIN – April 24-25, 1998, University of Wisconsin-Stevens Point, Stevens Point, WI

– April, 1999, Concordia University, Mequon, WI

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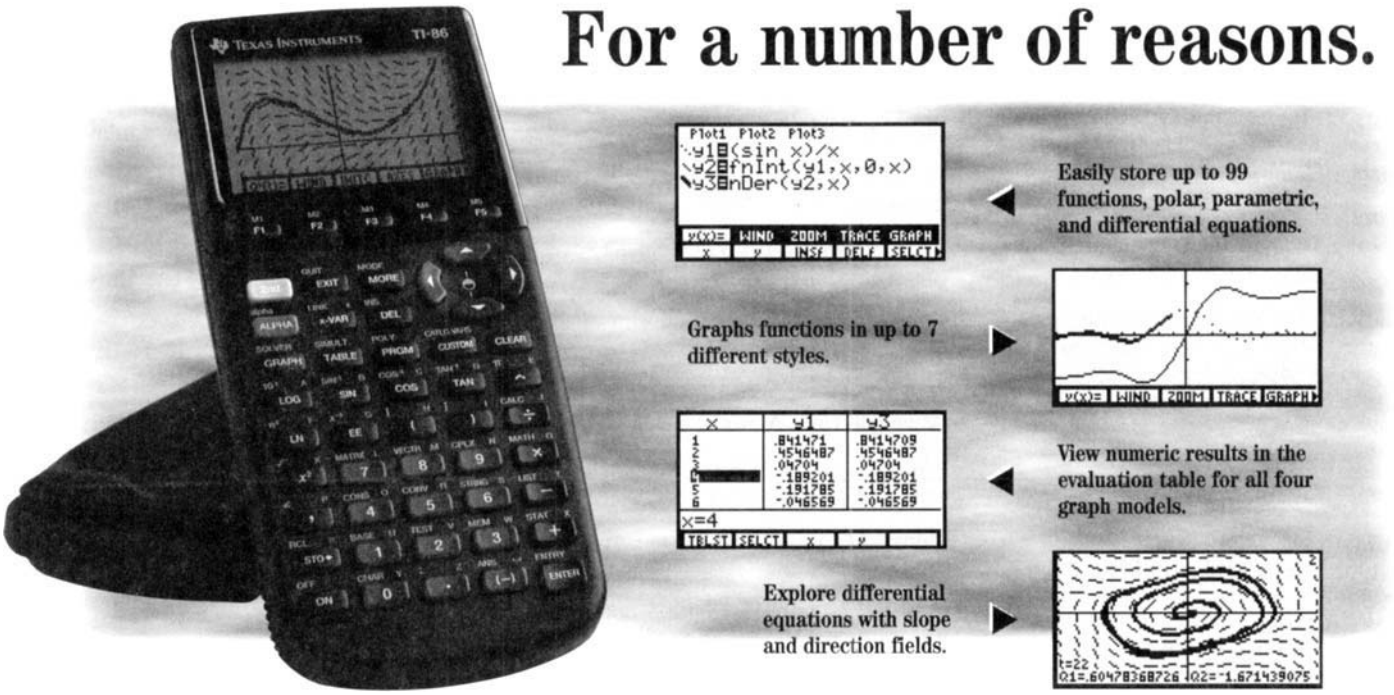

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