

NORTHEASTERN SECTION



NEWSLETTER

SPRING 1991

VOLUME 13

NUMBER 1

SECTION OFFICERS

GOVERNOR

Donald Small
Department of Mathematics
Colby College
Waterville ME 04091
(207)-872-3255

CHAIRPERSON

Karen J. Schroeder
Mathematical Sciences Dept.
Bentley College, 175 Forest St.
Waltham MA 02154-4705
(617)-891-2267

VICE-CHAIRPERSON

Laura L. Kelleher
Department of Basic Sciences
Massachusetts Maritime Academy
Buzzards Bay MA 02532-1803
(508)-759-5761 x268

SECRETARY-TREASURER

Premjit Singh
Department of Mathematics
Fitchburg State College
Fitchburg MA 01420
(508)-345-2151

TWO-YEAR COLLEGE REP.

Helene S. Savicki
Mathematics/Science Department
Dean Junior College
Franklin MA 02038
(508)-528-9100 x275

NEWSLETTER EDITOR

Frank P. Battles
Department of Basic Sciences
Massachusetts Maritime Academy
Buzzards Bay MA 02532-1803
(508)-759-5761 x264

FUTURE SECTION MEETINGS

Vermont Technical College

June 7-8, 1991

Local Arrangements Chair: Paul Calter

Program Chair: Steven Ingram, Vermont Technical College

See this bulletin for details

Providence College

November 22-23, 1991

Local Arrangements Chair: Frank Ford

Program Co-Chairs: Alan Gorfin and Richard Pelosi,

Western New England College

At the 1991 Winter Meeting in San Francisco, the MAA Board of Governors approved a proposal on MAA Awards for Distinguished College or University Teaching. Each Section will honor its awardee during the 1991-92 academic year. The Northeastern Section has established a committee, chaired by Vice Chairperson Laura Kelleher, to select our award winner. I invite faculty to nominate a colleague and student chapters to nominate a distinguished faculty member at their school. Criteria and the deadline for nominations for this award can be found in this Newsletter on page 7. Our awardee will be honored at our Fall Meeting at Providence College and his/her name and credentials will be forwarded to the National Office for consideration for one of three national awards to be given at the 1993 Winter Meeting.

The Northeastern Section has received another grant from the Exxon Education Foundation for student activities at our Section Meetings. This year's grant of \$500, which must be supplemented by our Section, will be used for an extensive program for Student Chapter members at our Fall Meeting. Details on this program will be available in the Fall Newsletter.

Our efforts to bring a national minicourse to our Section have been successful. On April 27, Professor V. Frederick Rickey of Bowling Green State University will present his much acclaimed minicourse, *Using History in Teaching Calculus*, at Bentley College, Waltham, Massachusetts. You should have received a separate mailing on this course. We hope to continue this program and to bring other outstanding national minicourses to the Section in the future.

Congratulations to our new Section officers who were elected at the Fall Meeting. They are:

Vice Chairperson, Laura L. Kelleher (Massachusetts Maritime Academy)

Secretary/Treasurer, Premjit Singh (Fitchburg State College)

Two-Year College Representative, Helene S. Savicki (Dean Junior College).

I look forward to working with them.

My thanks to Tom Moore of Bridgewater State College and Ken Preskenis of Framingham State College and their program committee for their hard work in formulating such an outstanding program for our Fall Meeting and to Tom Koshy for extending the hospitality of Framingham State College to the members of the Section. This was the best attended meeting in Section history.

Our Spring Meeting will be held at Vermont Technical College. Steve Ingram and his committee have planned a diverse and interesting program. I look forward to seeing you at the Meeting on June 7-8.

Karen J. Schroeder
Bentley College
Chairperson NES/MAA

THE NEW ORONO MATH FEST

at the University of Maine
August 8-10, 1991
The Joint AMS-MAA Summer Mathematics Meetings

Featuring a new three-day program, instead of four, the AMS-MAA summer meetings will take on a new look this year. Only major addresses will occur in the mornings. Special sessions, contributed papers, panel discussions, and minicourses will all be in the afternoons.

An opening banquet with a concurrent special children's program, a lobster feast, and a contradance are some of the special features planned. See the April 1991 issues of MAA FOCUS and AMS NOTICES for full details and preregistration and housing forms.

GOVERNOR'S ELECTION

In January, 1991 ballots were mailed to the members of the Northeastern Section with the following nominees for the office of Sectional Governor:

Dennis M. Luciano, Western New England College

James J. Tattersall, Providence College

All votes received by the National Office by March 1 were counted independently by two members of the headquarters staff and verified by the Executive Director. As a result of this election, Dennis M. Luciano has been elected Governor for the period July 1, 1991 to June 30, 1994. Congratulations, Dennis!

The Nominating Committee for the selection of Governor consisted of Karen J. Schroeder of Bentley College (Chairperson), Frank P. Battles and Laura L. Kelleher of Massachusetts Maritime Academy and Walter Brady of Connecticut College.

HOWARD EVES AWARD FOR MERITORIOUS SERVICE

The NES/MAA has recently established the Howard Eves Award for Meritorious Service to recognize outstanding contributions and service to the Section. Most appropriately, the first recipient of this award was Howard Eves, the founder of our Section. This award was presented at the November 1990 meeting held at Framingham State College. Due to a recent car accident, Howard was unable to attend. The award was accepted on his behalf by Clayton Dodge of the University of Maine. He read the following letter from Howard:

"I cannot find words sufficient to express the honor I feel at having my name attached to the Northeastern Section's award for outstanding service. Though I know I scarcely merit such an honor, I do deeply appreciate the more than gracious gesture."

It is anticipated that this award will be given every 5 years. The selection committee for this award consists of the elected Section Officers.

GOVERNOR'S MESSAGE

Greetings. Our MAA continues to grow in terms of programs and members. The membership at the end of 1990 was 31,647, which represents approximately 50% increase during the past 6 years. An indication of the extent of the Association's activities is that a recent report listing all of the Association's educational activities ran 13 pages. Many of these activities are directly concerned with the leadership that the Association is providing in the mathematics reform movement. A central issue in the reform movement involves technology in teaching and learning mathematics. Here is my "pitch" for you to become an active player in this issue.

Today's citizens live and work in environments that are already highly dependent on computer technology and that will become more so. The users of mathematics from the store clerk to the space engineer abandoned pencil and paper computing years ago, particularly for any important and complicated analysis. It is time for those in the mathematics classroom to follow suit. Technology has provided student and teacher with powerful tools such as computer algebra systems, sophisticated graphics packages, spreadsheets, mathematical programming, etc. for studying and doing mathematics.

The use of technology both requires and provides opportunities for making changes in not only what we teach, but more importantly in *how we teach*. The role of the instructor is changing from that of a dispenser of facts and techniques to one of guide leading students into exploring relations and searching for patterns. Technology by itself will not turn students into mathematical explorers, but technology can provide an inviting environment for engaging students in doing mathematics. Indeed, the fact that technology helps students to construct and work with abstract mathematical entities on a computer allows both the student and instructor to focus on conceptual understanding rather than on the accuracy of hand computations as is often the case today.

A great deal of work needs to be done on the questions of how best to use technology in teaching and how to decide what may be happening with student learning in technologically enhanced courses. This work needs to be carried out over the entire spectrum of mathematics education and to involve users as well as teachers of mathematics. Furthermore this work needs to be done now (if not yesterday), in that we do not have the luxury of sitting back and waiting for someone else to "fix all of the bugs."

This is my final report as Governor. The past three years have been active ones in the growth of our Association. I have appreciated the opportunity of representing our Section during this period.

Don Small
Colby College
Governor NES/MAA

MINUTES OF THE LAST MEETING

The Fall Meeting of the Northeastern Section was held on November 16-17, 1990 at Framingham State College in Framingham, Massachusetts. There were 258 registrants.

Invited Addresses

The Mathematics of Fair Representation by Alan Tucker, SUNY at Stony Brook.

Self-dual Polyhedra by Dan Archdeacon, University of Vermont.

Christie Lecture: Mathematics and Games by John Conway, Princeton University.

Disorderly Patterns by Marjorie Senechal, Smith College.

Student Chapter Session: The Twin Circles of Archimedes, Are They Really Twins? by Clayton Dodge, University of Maine.

Computer Workshops and Demonstrations

Integrating MATHEMATICA into Calculus by Alan Shuchat and Fred Schultz, Wellesley College.

On C^{++} by Peter Rosenbaum, Framingham State College.

Software for Calculus by Barbara C. Nevils, Bentley College.

Computer Algebra Systems by Donald Small, Colby College.

Invited Short Talks

A Look at Geometric Probability by Martin Badoian, Canton High School.

Mathematics, Computers and the Human Condition by Robert Oberg, Wang Laboratories, Inc.

Humanistic Mathematics and Its Impact on High Schools by Mary Sapienza, Newton North High School.

Mathematics Education: International Perspectives by Carol R. Findell, Boston University.

MSL (Mathematics as a Second Language) by Herb Gross, Bunker Hill Community College.

Modeling AIDS for College Classroom Use by Sonja Sandberg, Framingham State College.

Contributed Papers

Projective Transformations in Nutrition Space by Domina E. Spencer, Terri Mascardo and Irene N. K. Tan, University of Connecticut.

The H-vector Representation of the Ornish Food Groups by Domina E. Spencer, Terri Mascardo and Irene N. K. Tan, University of Connecticut.

A Look at the Isoperimetric Inequality with Calculus by Edwin Wolf, Keene State College.

A Programmer's Approach to Analysis by Robert Gray, Prime Computer, Inc.

Excursions in Mathematics - Problems for a Liberal Arts Mathematics Course by Joyce Anderson and Mary Platt, Salem State College.

The Role of Women in Mathematics, 1960-1990 by Gail Broome, Providence College.

Student Papers

Exceptional Lines and Curvature of Algebraic Surfaces in C^3 by Rebecca Runnels, College of the Holy Cross.

The Geometry of Space-time by Stephen D. Norton, Bridgewater State College.

The Distribution of Primes in an Arithmetic Progression by Jonathan Dearing, University of Maine.

The Graph of $y = \sin kx$ by Freda Sanborn, University of Maine.

Numerous items were discussed at the business meeting, most of which are reported elsewhere in this Newsletter. Election of new Section officers was conducted by the Nominating Committee. The Treasurer's report was presented indicating a healthy financial status for the Section. The presenters of student papers were recognized with a certificate, a one year membership in the MAA and book award donated by Addison-Wesley or Prentice Hall. The Section Chair gave thanks to members of the Program and Local Arrangements Committees as well as to Peter Rosenbaum of Framingham State College for his assistance with computer hardware. In addition, the coordinators for the Student Paper and Contributed Paper Sessions, the Publisher's Liaison, Student Chapters Coordinator and the Nominating Committee were thanked.

Laura L. Kelleher
Massachusetts Maritime Academy
Secretary-Treasurer NES/MAA

UPCOMING MEETINGS

In addition to those listed on the inside front cover, the following meeting dates and locations are tentatively scheduled:

Merrimack College
June 5-6, 1992

Local Arrangements: John Royal

Trinity College
November 20-21, 1992

Local Arrangements: David Robbins

Westfield State College
November 5-6, 1993

Local Arrangements: Dianne Haber and Maureen Bardwell

Please note the date of the Fall 1993 Meeting! This meeting will be held several weeks earlier than usual to avoid conflict with the national meeting of AMATYC which will be held in Boston at a time that overlaps our usual meeting dates.

We are in need of people to serve on program committees for these meetings. If you are interested in serving on such please contact the Chairperson whose address appears on the inside front cover. Get involved!

EXPLORATORY DATA ANALYSIS

NES-UM Short Course

June 17-21, 1991

Professor Peter Bloomfield of North Carolina State University will present this year's annual short course at the University of Maine. Exploratory data analysis (EDA) is a phase in the study of a body of numerical data. It is the first phase, when the data is viewed with no preconceptions, in which we look for tendencies, patterns, and associations. It is the phase in which we look for hypotheses about what might be causing these patterns.

EDA has also come to describe some techniques of data analysis that are especially appropriate to the exploratory phase. These techniques typically seek to display the behavior of the bulk of the data, without undue influence from the small proportion of data that may show quite different behavior.

Peter Bloomfield received his BSc and PhD from the University of London. Previously he taught statistics at Princeton and at Imperial College, University of London. He is author of a book on Fourier series of time studies, and coauthor of another on least absolute deviation methods.

For more information contact Clayton Dodge, Mathematics Department, University of Maine, Orono ME 04473. Telephone (207)-581-3908.

CAS SUMMER WORKSHOPS

Four Computer Algebra Systems (CAS) workshops, each a week long and funded by the National Science Foundation, will be offered during the summer of 1991. These workshops are designed to prepare persons to use a CAS as a teaching tool in calculus. The programs contain three parts: the first part provides participants with "hands-on" experience using one or two CASs; the second focuses on pedagogical issues; the third involves participants in developing a CAS based curriculum topic. Participants are expected to have some experience with a CAS before attending a workshop.

Participants provide their own travel. All other expenses are paid by the National Science Foundation. The dates and location of workshops as well as the instructors and the primary CASs used are listed below. Further information and application forms may be obtained from the contact person for each workshop.

June 17-21, 1991: West Valley College, Saratoga CA 95070
Contact Person: Denny Burzynski (West Valley College)
Instructors: Wade Ellis Jr. and Joe Fielder
CASs: Derive, Maple

July 14-19, 1991: Colby College, Waterville ME 04901
Contact Person: Don Small (Colby College)
Instructor: Doug Child (Rollins College)
CASs: Calculus T/L, Maple, Derive

July 21-26, 1991: St. Olaf College, Northfield MN 55057
Contact Person: Arnold Ostebee (St. Olaf College)
Instructors: Paul Zorn (St. Olaf College) and Michael Henle (Oberlin College)
CASs: Maple, Mathematica

July 21-26, 1991: Clemson Univ., Clemson SC 29634
Contact Person: John Kenelly (Clemson Univ.)
Instructors: Donald LaTorre and Gil Proctor (Clemson Univ.)
CAS: HP 48S calculator

MAA AWARDS FOR DISTINGUISHED COLLEGE OR UNIVERSITY TEACHING

At their meeting in January, the Board of Governors approved the proposal for MAA Awards for Distinguished College or University Teaching which had been submitted by the Committee on Awards. Each section is to select a recipient of the Section Award; each of these recipients is then eligible to receive a National Award. The first Section Awards are to be given during the 1991-1992 academic year and the first National Award winners will be recognized at the annual meeting in January of 1993. Thereafter the Awards will be given annually.

As established by the Board of Governors, these Awards are to be made to teachers of mathematics at any post-secondary level who have been widely recognized as extraordinarily successful. Their teaching effectiveness must be documented and must have had influence beyond their own institutions. Recipients must be members of the MAA teaching in the United States or Canada.

At this time nominations are being sought for the first NES/MAA Award for Distinguished College or University Teaching. Any member of the NES/MAA, including Student Chapters or student members, may nominate any other member of the Section for this Award. Letters of nomination must include specific evidence that the candidate meets each of the criteria described above as well as a description of how the candidate has shown active professional involvement, including participation in the NES/MAA. The nomination must be accompanied by a letter of recommendation from the appropriate Department Chairperson and/or Academic Dean. The nominator also must send information for obtaining additional documentation and statements of support for the candidate.

Six (6) copies of all materials of nomination should be sent to:

Laura L. Kelleher
Department of Basic Sciences
Massachusetts Maritime Academy
Buzzards Bay MA 02532-1803

Nominations must be received by **June 1, 1991** in order to be considered for the Award to be given for the 1991-1992 academic year.

THE NES/MAA IN THE 70'S

The NES/MAA was in very capable hands throughout the 70's. The three Governors who served during the period as liaisons with the Association were Dan Christie (Bowdoin College), Phil Davis (Brown University) and Don Kreider (Dartmouth College.) The Section was chaired successively by Michael Gemignani (Smith College), Richard Schafer (Massachusetts Institute of Technology), Don Kreider (Dartmouth College), John Fraleigh (University of Rhode Island), Eileen Hostinsky (Connecticut College), Anne O'Neill (Wheaton College), Grattan Murphy (University of Maine), Ernest Schlesinger (Connecticut College) and Don Small (Colby College.)

George Best (Phillips Academy) served during the 70's as Secretary-Treasurer and as chief factotum. Under his able leadership the organization remained financially stable. The Section started the decade with a few hundred dollars in the bank and ended it with about the same. At one point in the decade the treasury had \$4.56. Undoubtedly, the generosity and hard work of the officers, local arrangement chairs, and the speakers, together with the institution of a \$1 registration fee helped the Section fend off financial disaster and at the same time kept the quality of the meetings at a high level.

The officers and local arrangements chair were instrumental in keeping the costs for the meetings as low as possible. Perhaps the deal of the decade occurred at the Colby College meeting in 1971 where for \$20 one received a clambake on the Belgrade Lakes and lodging Friday evening and breakfast and lunch on Saturday. Throughout the decade lunch on Saturday was about \$3.50.

The program for each meeting remained the responsibility of the Section Chair throughout the 70's. In an effort to involve more of the membership in the operation of the organization, the responsibilities at the host institution moved from the Vice-Chair to a local arrangements committee. The annual fall meetings were held from 1970-1979 at Merrimack College (Ray Ozimkoski), Wellesley College (Torsten Norvig), Connecticut College (Eileen Hostinsky), Boston University (Don Blackett), the University of Lowell (Art Talkington), Simmons College (Margaret Menzin), Rhode Island College (Dick Howland), Merrimack College (John Royal), Bunker Hill Community College (Nancy Myers) and the University of Hartford (R. McGivney), where the local arrangements committee chairs are given in parentheses. The summer meetings were held in 1971 at Colby College (Lucille Zukowski) and in 1973 at Bowdoin College (Dan Christie). From 1975 to 1979 they were held at the University of Connecticut (John Ryff), the University of New Hampshire (Gordon Raisbeck), Middlebury College (John Emerson), Southern Maine Vocational Technical Institute (Robert Bourque) and the University of Maine (Clayton Dodge).

The list of invited speakers included many very prominent mathematicians: Henry Alder, President of the Association (1977-78), David Roselle, Secretary of the Association (1975-79 and 1980-84), Andrew Gleason, President of the AMS (1981-82), Garrett Birkhoff of Harvard University, Thomas Banchoff and Charles Strauss of Brown University, Donna Beers of Wellesley College, Dan Kleitman, James Munkres and J. R. Zacharias of MIT, Sue Whitesides of Dartmouth College, R. A. Rosenbaum and W. W. Comfort of Wesleyan College, Mary K. Bennett of the University of Massachusetts, Bruce Peterson of Middlebury College and Stanley Bezuska, S. J.

of Boston College. A. B. Willcox, Executive Director of the Association and Howard Eves of the University of Maine were invited lecturers twice in the decade. Panel discussion on topics ranging from applied mathematics to the improvement of college mathematics teaching were prevalent throughout the meetings of the 70's.

During the 70's the world of mathematics lost Richard Courant, L. J. Mordell, C. B. Allendoerfer, Marsden Morse, K. O. May, Richard Brauer and E. G. Begel. The Section lost some instrumental members too. Albert A. Bennett of Brown University, one of the charter members of the NES/MAA, died in 1971. J. R. K. Stauffer of the University of Rhode Island, Regional Chair for the High School Mathematics Examination died in 1975. Torsten Norvig, local arrangements chair for the 1971 meeting at Wellesley College, died in 1976. In 1976 the Section lost the able services of Dan Christie of Bowdoin College who had served in a myriad of capacities for the Section. See the Spring 1989 issue of this Newsletter for a detailed description of Dan's many contributions to this Section. The 1978 meeting at Bunker Hill Community College was dedicated to his memory. In a fitting tribute to Dan, the Section instituted a lectureship in his behalf. The first Christie Lecture was given by John Milnor of Princeton University at the Hartford meeting in 1979.

At the June 1979 meeting several changes in the Section By-Laws were approved. The Executive Committee was expanded to include the Section Governor, the Immediate Past Chairperson, and the Two-Year College Representative. The election of the Section Chairperson in odd numbered years and the Vice-Chairperson, Secretary-Treasurer and the Two-Year College Representative in even numbered years, all elections taking place at the annual fall meeting, was approved. As a further harbinger of changes to come in the 80's, the Section initiated its Newsletter in the spring of 1979 under the editorship of Dorothy T. Meserve. This initial issue was mailed to the approximately 1400 members of the NES/MAA.

J. J. Tattersall
Providence College
Historian-Archivist NES/MAA

SECTION DINNER MEETINGS

Plans are underway to begin the new program of having dinner meetings on a regional basis. These meetings will provide opportunities for people interested in mathematics and mathematics education to meet locally to hear a lively speaker on a topic of general mathematical interest and to share ideas and fellowship. It is hoped that the first set of dinner meetings will be held in March or April of 1992. The members of the Section Dinner Meetings Committee are Thomas Koshy of Framingham State College (Chairperson), Donna Beers of Simmons College, Laura Kelleher of Massachusetts Maritime Academy, Karen Schroeder of Bentley College and Premjit Singh of Fitchburg State College. The Committee is preparing guidelines to aid local coordinators in implementing this program. If you are interested in volunteering as a local coordinator or assisting a local coordinator, please contact Thomas Koshy, Mathematics Department, Framingham State College, Framingham MA 01701-9101. Telephone (508)-626-4727.

THE HOWARD EVES ROOM

There is still time to help the Northeastern Section honor Howard Eves, the founder of our Section, by naming a room for him in the Dolciani Mathematical Center in Washington. If you have not already done, we urge you to send a contribution to the MAA for the Howard Eves Room fund. (Repeated contributions will be gladly accepted.) Our goal is to raise \$20,000 to name this room for him in the MAA's Washington headquarters building. We are presently more than halfway to our goal. In fact, 9 donations of \$1000 each or 90 donations of \$100 each would send us over our goal. Pledges can be made over a two year period. Whether you are a contributor or not, plan to join us next August during the Summer Meetings in Orono when we present an official room plaque (or door knob) to Howard.

Gifts and pledges should be sent to the Washington Office of the MAA and clearly marked for the Howard Eves Room Fund: MAA, 1529 Eighteenth Street, NW, Washington DC 20036.

PUBLISHERS

The following text book publishers and software distributors exhibited their latest offerings in mathematics and computer science at the fall of 1990 meeting held at Framingham State College:

Addison-Wesley Publishing Company
Wm. C. Brown Publishing
D.C. Heath
Harper Brace Jovanovitch
Harper Collins Publishers
Houghton Mifflin Company
McGraw Hill, Inc.
PWS-Kent Publishers
Prentice Hall
The MathWorks, Inc.
Wadsworth Publishing Co., Brooks/Cole

It is very helpful in terms of text and software selection to see so many recent titles on display and the income to the Section goes a long way toward defraying expenses associated with the meeting.

This year, door prizes were donated by two companies. A special thanks goes to SYSTAT for providing a copy of FASTAT and to PWS-Kent for providing a collection of Howard Eves books. The drawing was held during the Business Meeting on Saturday.

Two companies, Addison-Wesley and Prentice Hall, kindly donated books that were awarded to the student presenters.

We of the NES/MAA would like to express our thanks to all of the above mentioned companies for their contributions to the success of the Fall Meeting.

Sonja Sandburg
Framingham State College
Publisher's Liaison NES/MAA

STUDENT CHAPTERS: NES/MAA

Amherst College
Professor Gregory Call
Mathematics and Computer Science
Amherst MA 01002

Centre University de Moncton
Professor Paul DeGuire
de Math-Physique et Infor
Moncton New Brunswick Canada E1A 3E9

Fairfield University
Professor Matt Coleman
Mathematics and Computer Science
Fairfield CT 06430-7524

Holy Cross College
Professor John T. Anderson
Mathematics Department
Worcester MA 01610

Norwich University
Professor Cathy Frey
Mathematics Department
Northfield VT 05663

Roger Williams College
Professor Rocco Colagiovanni
Mathematics Department
Bristol RI 02809

St. Michael's College
Dr. Sue Kadas
Mathematics Department
Winooski VT 05404

University of Lowell
Professor Steve Pennell
Mathematics Department
Lowell MA 01854

University of New Haven
Professor Thurmon Whitley
Mathematics Department
West Haven CT 06516

University of Vermont
Professor Jan Johansson
Mathematics Department
Burlington VT 05405

Bentley College
Professor Karen Schroeder
Mathematics Department
Waltham MA 02154-4705

Colby College
Professor Don Small
Mathematics Department
Waterville ME 04901

Framingham State College
Professor John Lewis
Mathematics Department
Framingham MA 01701

Mass. Institute of Technology
Professor David Jerison
Mathematics Department
Cambridge MA 02139

Providence College
Professor Jeffrey Hoag
Mathematics Department
Providence RI 02918

St. Anselm's College
Professor Peter Lindstrom
Mathematics Department
Manchester NH 03102

Suffolk University
Professor Edith Cook
Mathematics Department
Boston MA 02114

University of Massachusetts
Professor Edward Connors
Mathematics Department
Amherst MA 01003

Univ. of Prince Edward Island
Professor G. W. Pineay
Mathematics/Computers
Charlottetown PEI Canada
C1A 4P3

Western New England College
Professor Richard Pelosi
Mathematics Department
Springfield MA 01119

NORTHEASTERN SECTION OF THE MAA
SPRING MEETING: JUNE 7-8, 1991
VERMONT TECHNICAL COLLEGE,
RANDOLPH CENTER, VERMONT

PROGRAM THEME: *MATHEMATICS IN THE GREEN MOUNTAINS*

Friday, June 7

- 3:00-6:00 Registration-Conant Hall
2:45-3:45 Executive Committee Meeting
4:00-6:00 Computer Workshops
EPIC-James W. Burgmeier, University of Vermont
MATHEMATICA-David Dummit, University of Vermont
ISETL-Chuck Gambler, Norwich University
5:00-6:00 **The Shape of Space**
Jeff Weeks, Middlebury College
6:00-7:00 Social Hour
7:00 Banquet
8:15 VTC Welcome
8:30 **Keynote Address-**
Symmetry: From Euclid to Quantum Physics
and Relativity
Ken Gross, University of Vermont
9:30-10:30 Relax, Refresh, Renew

Saturday, June 8

- 7:45-11:00 Registration
8:00-4:00 **Poster Session - A Favorite Calculus Problem**
7:30-8:30 Breakfast
8:00 Student Papers
9:00-10:00 **Writing to Teach Mathematics**
Priscilla Bremser, Middlebury College
Ray Coughlin, Temple University
Ted Marsden, Norwich University
Frank Morgan, Castleton State College
Mike Olinick, Middlebury College

- 10:00-10:30 Break
10:30-12:15 **Applications to Teach Mathematics**
10:30-11:15 William D. Lakin, University of Vermont
11:30-12:15 Frederic D. Powell, The MITRE Corporation
12:15-1:30 Lunch
1:30-2:30 **Applications: The Buck Stops Here**
Ray Coughlin, Temple University
2:30-2:45 Business Meeting and Poster Session Awards
2:45-3:00 Break
3:00-4:00 **Student Chapter Session-**
Studying Mathematics in an African University:
Anecdotes and Observations
James E. Ward, Bowdoin College
3:00-4:00 Contributed Papers
4:00 VTC's One-for-the-road. Don't leave for home without it!

Program Committee:

Steve Ingram, Vermont Technical College, Chair
Dan Archdeacon, University of Vermont
Priscilla Bremser, Middlebury College
James Burgmeier, University of Vermont
Roger Cooke, University of Vermont
Gerry Davis, Johnson State College
Anthony Julianello, St. Michael's College
Ted Marsden, Norwich University
Frank Morgan, Castleton State College

Local Arrangements Coordinator:

Paul Calter, Vermont Technical College

Directions to VTC and a campus map may be found on page 14.

LOCATION

VERMONT TECHNICAL COLLEGE LOCATED IN THE HILLTOP VILLAGE OF RANDOLPH CENTER NEAR THE HEART OF THE GREEN MOUNTAINS.

For day-to-day needs and activities, the villages of Randolph Center and Randolph offer a variety of shops, restaurants, recreational activities, and the Chandler Music Hall and Cultural Center.

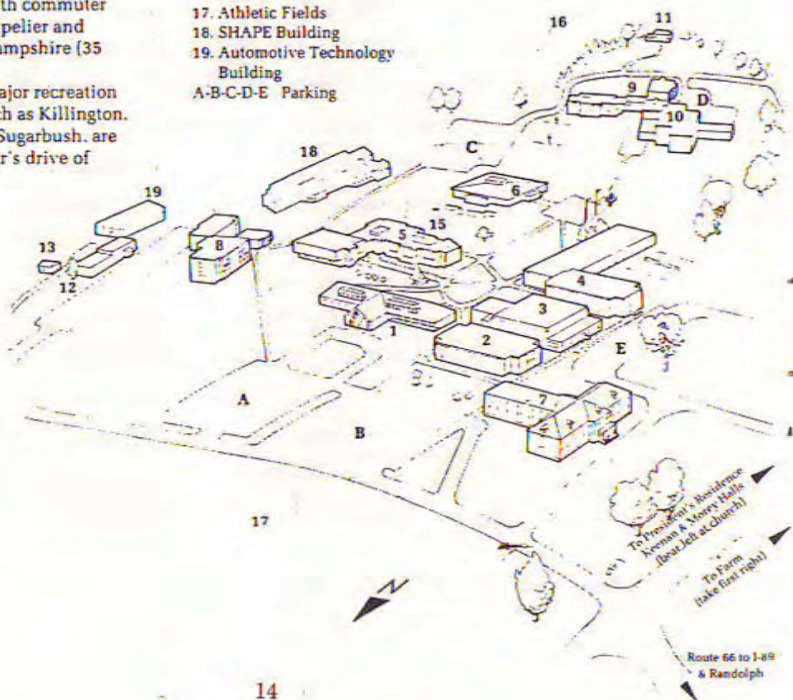
The College's location is rural but far from isolated. With Exit 4 of Interstate 89 just a mile from campus, there's easy access to urban centers such as Boston and Montreal (about 3 hours);

Vermont's largest city, Burlington (1 hour); and Montpelier and Hanover, New Hampshire (35 minutes). There's also Vermont Transit bus service to Randolph Center; Amtrak rail service to White River Junction (35 minutes); and major air service available from Burlington International Airport, with commuter flights from Montpelier and Lebanon, New Hampshire (35 minutes).

In addition, major recreation and ski areas, such as Killington, Pico, Stowe and Sugarbush, are all within an hour's drive of campus.

Map Legend—

1. Administrative Center
2. Conant Hall
3. Judd Gymnasium
4. Morrill Hall
5. Green Hall
6. Hartness Library
7. Old Dorm
8. Nutting Residence Hall
9. Keenan Residence Hall
10. Morey Residence Hall & Dining Room
11. President's Residence
12. Maintenance Building
13. Student Garage
14. Farm
 - a. dairy barn
 - b. milking parlor
 - c. haybarn
 - d. silos
 - e. feeding facility
 - f. heifer barn
 - g. livestock barn
 - h. equipment shed
 - i. sugarhouse
 - j. berry patches
 - k. manure storage
 - l. calf hutches
15. Greenhouse
16. Orchard
17. Athletic Fields
18. SHAPE Building
19. Automotive Technology Building
- A-B-C-D-E Parking



POSTER SESSION: A FAVORITE CALCULUS PROBLEM INVITATION TO PARTICIPATE

We all have a favorite calculus problem - a problem that motivates, illustrates, instructs; a problem that provides critical insight as it raises further questions; a problem that illustrates the *good* in "What good is this stuff?" and knocks out the stuffing.

We all wish we had more such problems to use in our teaching. To provide an opportunity to share these problems, the Program Committee has established a poster session for the June meeting. You are asked to submit your favorite problem on one or two pages of camera-ready copy. Your submissions will be prepared as a poster and displayed throughout the meeting. A selection committee will choose one or more problems for special recognition and the authors will receive a special prize and the opportunity to present their problem, if they wish, after the session. **Applications: The Buck Stops Here** on Saturday afternoon. We hope to compile all the problems into a *Transactions* for distribution to all registrants at the meeting.

We need your submission! Send your favorite problem to Steve Ingram at Vermont Technical College, Randolph Center VT 05061 by May 15. Our students will appreciate it!

ABSTRACTS/SPEAKERS

EPIC

James W. Burgmeier, University of Vermont

EPIC is a graphics-oriented software package designed for use in the classroom, mathematics laboratory or office. It is extremely easy to use, very versatile and invaluable for homework or class preparation. This presentation will introduce participants to the use of EPIC, how to utilize its features for classroom demonstrations and how to devise investigative projects whose purpose is to encourage students to formulate mathematical conjectures and gain insight into their proof. With EPIC, a computer and some guidance, students can discover many important mathematical results, such as the Second Derivative Test, the Mean Value Theorem or the dependence of functions on parameters.

James Burgmeier received his BS degree in 1965 with a double major in Mathematics and Physics. He received his Master's degree in Mathematics in 1967 from the University of Colorado and his PhD in Mathematics in 1969 from the University of New Mexico. His areas of research are numerical analysis and software development -- especially for mathematics education. Dr. Burgmeier has taught mathematics at the University of Vermont for 20 years and has involved the computer in his classes for most of these years. Dr. Burgmeier has been writing software for 30 years. EPIC is a joint project with his colleague Larry Kost (also at the University of Vermont) and has been undergoing continuous development since 1984.

MATHEMATICA

David Dummit, University of Vermont

I shall present a short demonstration of some of the things I have asked my calculus class to do in the IRIS computer lab we have here at UVM (such machinery is not necessary, of course). This includes the usual Riemann sum approximations of integrals, 3-dimensional graphing of surfaces of revolution, plotting of functions with vaguely "pathological" behavior, symbolic integrations and differentiations (with some examples to show the limitations of such software) and general questions regarding numerical approximations in Calculus. There are also a few slightly less standard demonstrations, such as "throwing needles on the screen" to compute an approximation to π (Buffon's needle problem). I shall also include a few examples from my research to show the computational power of such symbolic packages.

Dr. Dummit did his undergraduate work at California Institute of Technology and his graduate work at Princeton. He was an NSF Postdoctoral Fellow at Harvard University in 1981-82 and came to UVM in 1984. His research interests are algebraic number theory, arithmetic algebraic geometry and computational number theory.

ISETL - Using ISETL to Teach Mathematics

Chuck Gambler, Norwich University

ISETL is an interactive high level computer language specifically designed to handle mathematical concepts. Using a computer, mathematics becomes a "hands on" as well as a "minds on" experience. The presentation is a "typical" lecture taken from discrete mathematics course with ISETL. You may take a copy of ISETL with you. No experience necessary!

Chuck Gambler is Chair of the Department of Mathematics at Norwich University. He received his BS from Adrian College, MA from Oakland University and PhD from SUNY at Stony Brook. His interest in mathematics education has made him a popular speaker in the schools, at inservice days, at summer institutes and wherever colleagues congregate to discuss mathematics and its teaching.

The Shape of Space

Jeff Weeks, Middlebury College

What does one mean by the phrase "the shape of space"? What are some possible shapes for our own 3-dimensional universe? In what sense is space expanding? What is the connection between the curvature of space, the density of matter and the eventual fate of the universe? This talk is rated G. No specific mathematical background is required and students are encouraged to attend.

Dr. Weeks is a graduate of Dartmouth College with graduate degrees from Princeton. He has taught at Princeton, Stockton, Ithaca and is now at Middlebury College. His research interests are in the geometry and topology of three-manifolds. His book, *The Shape of Space*, was published in 1985 by Marcel Dekker and is the result of his interest in cosmology, teaching and exposition.

Symmetry: From Euclid to Quantum Physics and Relativity

Ken Gross, University of Vermont

Something old, something new, many things borrowed, nothing blue. We will explore, in a potpourri of examples, the inspiration from Euclidian Geometry for a wide range of mathematical ideas and physical applications that have come to fruition in this century.

Ken came to Vermont as Chair of the Department of Mathematics and Statistics at the University of Vermont after a tour of duty at NSF. He is a research mathematician by reputation and has an active interest in mathematics education and teaching. He has been a guiding force behind the Vermont Mathematics Coalition, a cooperative effort of mathematics teachers from all levels, business and industry representatives and governmental agencies to create a synergism for significant and lasting improvements in mathematics education in Vermont.

Writing to Teach Mathematics

A panel discussion

The use of writing in the mathematics classroom involves learning and using certain skills that are not a part of traditional mathematics instruction. These skills may include the development of study guides for use with course journals, the framing of study questions that lead students to interact with ideas independently from the instructor's presentations, the development of writing assignments along with standards of quality for the assignments, the ability to evaluate written material, the ability to coach students in the use of mathematical forms in writing, speaking and videos, the ability to direct beginning students to interesting problems that can be researched for course projects and how to integrate such activities into a course without taking time away from essential content.

Who Polluted Lynnhaven Inlet?: The Power of Mathematical Modeling in Physical Problems

William D. Lakin, University of Vermont

Lynnhaven Inlet in Tidewater, Virginia is one of many tidal estuaries along the Atlantic Coast from Maryland through the Carolinas. The inlet is known for its recreational facilities and contains beds which produce Lynnhaven Oysters. In the Summer of 1978, a routine analysis of water samples revealed high levels of bacteria associated with raw sewage. Swimming, fishing and commercial oyster harvesting in the Inlet were abruptly curtailed. The most obvious possible source of the pollution was a small, private sewage treatment plant located on one branch of the Inlet. Despite an excellent safety record and a lack of hard evidence, this plant was blamed for the pollution by the State Water Control Board and ordered closed at its owner's expense. A second possible source, the area's major public sewage treatment plant located north of the Inlet on the coast, was deemed by the State to be an unlikely source of the pollution because of its distance and the narrow opening of the Inlet. This talk will describe the mathematical modeling to determine the most likely source of the Lynnhaven pollution. Results of the mathematical analysis were cited by the court as decisive in a case which eventually assigned responsibility for pollution in the Inlet.

Dr. Lakin received his BS in applied mathematics from MIT in 1964 and his PhD in applied mathematics from the University of Chicago in 1968. He is currently Professor of Mathematics and Statistics at the University of Vermont. Prior to coming to Vermont in 1989, he was Eminent Professor of Mathematical Sciences at Old Dominion University in Virginia. He has held faculty positions at UCLA, the University of Chicago and the University of Toronto. He has also served as the Director of the Applied Mathematics Program at the National Science Foundation.

Dr. Lakin's research interests involve the application of mathematics to problems in the physical, biological and biomedical sciences. He has worked with NASA on problems in fluid dynamics associated with aerodynamics and vibration problems which arise in the design of helicopter rotor blades. He has also discussed the effect of disparate time scales in population ecology and is currently part of an interdisciplinary group which is developing models of intracranial pressure dynamics in the human brain. As a member of the Vermont Mathematics Coalition, Dr. Lakin is committed to excellence in teaching and curriculum development. He has been involved in designing a PhD program at the University of Vermont based on a blended concept of mathematics which combines mathematical theory, applications and computation.

Aircraft Position Reconstruction Algorithms for the Microwave Landing System Avionics: A Systems Engineering Viewpoint

Frederic D. Powell, The MITRE Corporation

The characteristics of the Microwave Landing System (MLS) are described and are compared to the aircraft instrument landing system (ILS) now in service. The MLS consists of the avionics, plus three ground units: azimuth and elevation angle antennas, and distance measuring equipment (DME) transponder which is used to determine the aircraft slant range. The avionics perform the functions of range and angle detection, and in a position reconstruction algorithm (PRA) determine the aircraft location in Cartesian coordinates. Position reconstruction is required in a variety of procedures, including air operations such as initial, intermediate, and final approach, straight, curved, multi-segment and path-stretching maneuvers; these are generally subsumed as area navigation (RNAV). In addition, the MLS may be used in ground operations such as takeoff, deceleration, turnoff and taxiing. When the azimuth antenna and the DME are not collocated the PRA must use iterative procedures to determine the aircraft position exactly. A variety of algorithms can be proposed for this function. The systems engineer/algorithm designer looks for methods of solution and also potential problems of each method. Various PRAs based on the Newton-Raphson and Gauss-Seidel principles are considered from this viewpoint.

Mr. Powell received the AB degree in mathematics at Harvard, and the MA degree at the SUNY at Buffalo, in applied mathematics. He first served in the Navy as a meteorological officer for several years, and was involved in research on the use of seismological techniques for detection and tracking of hurricanes. He then joined Bell Aerospace Co. where he worked on theoretical problems in helicopter rotary-system dynamics, automatic landing systems, adaptive systems and surface-effect vehicle dynamics. In 1977 he joined Simmons Precision and worked on optimization of aircraft precision fuel-mass measurement systems. He then worked briefly at ITEK Optical Co., concentrating on manufacturing technology for very large

mirrors, including an X-ray telescope.

In 1986 he joined MITRE Corp., and after some studies in software cost-estimating techniques, he joined the Military Air Traffic Control activity where he has been devising and analyzing the performance of air navigation algorithms. Overall, Mr. Powell has published 27 articles, of which eleven relate to various aspects of automatic landing.

The Buck Stops Here

Ray Coughlin, Temple University

We all use applications to motivate our students, but how effective are they? Do the applications convince your students that mathematics is actually used in business, industry and the social sciences? This talk will explore various ways you can use to improve your presentation of applications in the classroom. These techniques can be applied to virtually any mathematics course. The techniques take little more than a few minutes of class several times per week, and they involve assigning several short and some longer research papers on them. A recent article in a national mathematics journal stated that "there are no real applications of calculus". This is bunk! Not only are there plenty of applications, but your students can discover them in the library and do research papers on them. It takes a little work, but that is what research is all about and the rewards are great.

The benefits of this experience are threefold: (1) the mathematics that you teach comes alive, probably for the first time for most of your students, (2) your students will get valuable experience at writing across the curriculum, and (3) your students' library skills will improve as well as their confidence at doing research.

Dr. Coughlin is the author of nine textbooks. The most recent, coauthored with David E. Zitarelli, published by Saunders College Publishing, are *Finite Mathematics*, *Finite Mathematics with Calculus*, *Calculus with Applications* and *Brief Calculus with Applications*.

Studying Mathematics in an African University- Anecdotes and Observations

James E. Ward, Bowdoin College

Dr. Ward spent the 1989-90 academic year as a Fulbright Lecturer in Mathematics at the National University of Lesotho, a country completely surrounded by South Africa. He will report on that experience and discuss the teaching and learning of mathematics in southern Africa.

James E. Ward is Professor of Mathematics at Bowdoin College where he has been since 1968. His research interests are in non-associative algebras and finite groups, and he is the co-author of *The Calculus Companion*. He has served as Chairperson of the Northeastern Section of the MAA and as its Governor.

**NES/MAA AT VERMONT TECHNICAL COLLEGE:
A MATHEMATICAL VACATION**

Vermont Technical College is a public, co-educational, two-year technical institute with a rural residential campus located in Randolph Center, Vermont. VTC is a part of the Vermont State Colleges system and offers programs leading to the Associate Degree in Applied Science, the Associate Degree in Applied Technology and to a certificate of advanced study in Building Construction Trade.

VTC focuses on technical education with an emphasis on fundamental preparation in mathematics and the sciences and on practical application using state-of-the-art equipment and facilities. A significant number of VTC graduates enter baccalaureate programs immediately after graduation. The majority of graduates, however, go directly to work and the college has enjoyed a 99% placement success over the past five years.

VTC is located on 644 acres in the rural village of Randolph Center, near the geographical center of Vermont. Come spend a weekend vacation with us. VTC dorms will be available Friday and Saturday evening. Lake Champagne Campground is just off-campus. Lake Champlain is just one hour away, as are Stowe, Killington, St. Johnsbury and Hanover, N. H. The Shelburne Museum is one hour to the west on Lake Champlain and the Montshire Museum is one hour to the east on the Connecticut River. Vermont offers recreational opportunities for all interests, but the greatest charm is often just getting from one place to another, encountering gracious people, beautiful countryside and spectacular vistas.

Come join us in Vermont for an early summer vacation!

CALL FOR CONTRIBUTED PAPERS

Participants are invited to submit contributed papers for either the Spring or Fall Meeting. We are particularly interested in papers pertaining to teaching, new courses, new techniques and in research you or your students have done relating to classroom material. We encourage you to share your experiences with our colleagues. Your presentation should be approximately 15 minutes in length. Please send a typed abstract, together with a list of any special equipment you may need to: Ed Sandifer, Department of Mathematics and Computer Science, Western Connecticut State University, Danbury CT 06810. Telephone (203)-797-4310 or BitNet at SANDIFER@CTSTATEU. The deadline for the Spring Meeting is May 24 and for the Fall Meeting is October 31.

CALL FOR STUDENT PAPERS

Students (and recent graduates) from the Northeastern Section are invited to present papers at the Spring Meeting on topics in mathematics, statistics, or computer science. The presentations will be 15 to 20 minutes in length, on either expository work, research projects, employment experiences, or problems from math periodicals. Prizes will be awarded and the

registration fee and the cost of meals and room will be waived for one student presenter per paper at the Spring Meeting.

Almost every college/university has students working on projects, problems, and mathematical research. The success of a student paper session depends primarily on faculty members identifying prospective papers, encouraging their students and arranging departmental financial support when possible. If there are no potential student papers on your campus for the Spring Meeting, we urge you to initiate student projects now for presentation at the Fall Meeting.

Interested students should send an abstract and current address, with phone number, by Friday, May 17 to: Joseph C. Witkowski, Department of Mathematics and Computer Science, Keene State College, Keene NH 03431. Telephone (603)-358-2555. All proposals will be reviewed by department faculty members.

STUDENT CHAPTER PROGRAM

At the Spring 1991 meeting, students will have a very special treat. Prof. James E. Ward of Bowdoin College will give the Student Chapter talk. The title of his talk will be **Studying Mathematics in an African University: Anecdotes and Observations**. Prof. Ward spent the 1989-1990 academic year at the National University of Lesotho. (Lesotho is a country entirely surrounded by South Africa.) The talk will be based on his experiences there. Prof. Ward is a wonderful speaker and teacher. All students are encouraged to attend this talk. His talk will be given at 3 pm on Saturday, June 8; consult your program for its location.

Swap Session: The regular Student Chapter Swap Session will be held during lunch on Saturday, June 8. Go through the line to get your lunch and bring it to the designated area. Also, be sure to bring your ideas and experiences, good and bad, to share with other Student Chapters.

Special Note: Two representatives per Student Chapter will be given free registration and Saturday lunch for this meeting. Please note on your registration form if you are one of your chapter's designated representatives.

Student Chapters Directory: On page 11 of this Newsletter, you will find a listing of all Student MAA Chapters in the Northeastern Section, along with the name of the Faculty Advisor. If your chapter is not listed or listed incorrectly, please contact Thurmon Whitley, Department of Mathematics, University of New Haven, West Haven, CT 06516. Telephone (203)-932-7296.

ALLEGHENY MOUNTAIN SECTION SHORT COURSE

The Seventh Annual Allegheny Mountain Section Summer Short Course, "Theory and Applications of Discrete Dynamical Systems" will be offered at Allegheny College on June 24-28, 1991. The course presenter will be James Sandefur, Professor of Mathematics at Georgetown University.

Professor Sandefur is the author of an undergraduate level textbook, *Discrete Dynamical Systems*, which was published recently by Oxford University Press. The present course is an expanded version of an MAA minicourse which he has presented at four MAA Winter Meetings.

The focus of the course is to show how the theory of discrete dynamical systems has traditionally been applied in the sciences and social sciences. Solution techniques for linear discrete dynamical systems are developed using linear algebra. The stability of non-linear equations is studied using calculus (linearization) and graphing. Chaos is discussed as one possibility when stability fails. The results are applied to areas such as genetics, economics, Markov chains, harvesting and medicine. The TI-81 graphing calculator is used to enhance the material. Costs for the course will be \$115 for tuition and \$95 for room and board. For further information contact either Richard McDermot, Department of Mathematics, Allegheny College, Meadville PA 16235, Telephone (814)-332-3393 or Dave Wells, Department of Mathematics, Penn State University, New Kensington PA 15068, Telephone (412)-339-6049.

A CONFERENCE ON HISTORY, GEOMETRY AND PEDAGOGY

At the University of Central Florida
May 9-11, 1991
in honor of the 80th birthday of Howard Eves

Howard Eves' career interests in teaching, history, and geometry provide an ideal setting within which mathematics teachers and university professors can discuss their experiences and research. It is a fitting tribute in the year which marks the 80th birthday of Howard Eves that a conference be organized which brings together representatives of these diverse groups to discuss their common interest so that each can learn from the perspectives of the others. Major speakers will include Professors Clayton Dodge, Peter Hilton, Murray Klamkin, Bruce Meserve, Fred Rickey, Marjorie Senechal and, of course, Howard Eves. There will also be parallel sessions for contributed papers and workshops.

For more information concerning the conference address all inquiries to the Conference Director: Professor Joby Anthony, Department of Mathematics, University of Central Florida, Orlando, FL 32816-6990. Telephone (407)-823-2700 or FAX (407)-281-5156.

NEWS FROM NEMATYC

The annual meeting of the New England Mathematics Association of Two-Year Colleges was held at Massasoit Community College on March 9, 1990 with about 140 registrants. There were 20 one hour presentations, a two hour workshop and a luncheon talk. With so many interesting parallel sessions, some difficult choices had to be made!

At the business meeting, the following slate of officers was elected: President-Jack Keating of Massasoit Community College; Vice-President-Richard Eells of Roxbury Community College; Jean Burr Smith of Middlesex Community College (CT) continues as Treasurer. Helene Savicki of Dean Junior College reported on planning activities for November 1993 national meeting of the American Mathematics Association of Two-Year Colleges (AMATYC) which will be held in Boston. Next year's NEMATYC meeting is tentatively scheduled to be held at Roxbury Community College in March.

WANTED: NEW MAA MEMBERS

As part of a national membership drive, the MAA has instituted a section Membership Incentive Program (MIP). Under this program, an MAA section can earn \$10 for each new member. The Executive Committee of the Northeastern Section believes that MAA membership is valuable to a wide variety of mathematics professionals and that the MIP offers an opportunity to raise some additional funds for the Section. We need your help. Please give the membership form which appears below (or a photocopy thereof) to any of your friends or colleagues who are not now MAA members, but who might like to join. Not applicable for renewals or student membership.

JOIN MAA TODAY!

Send this application to: MAA Membership Department
1529 18th West Street N. W.
Washington D. C. 20036
Northeastern Section
FRANK P. BATTLE, MIP Coordinator

Name _____
Mailing Address _____ Zip _____
Employer/School _____
Position/Rank _____
Employer's City/State _____
Highest Degree Earned _____ Year Degree Earned _____
Institution Awarding Degree _____
Month/Year of Birth _____

Have you been a member of the MAA before? Yes No
You may elect to receive any of the listed combinations of the three MAA journals. All members receive, *Focus*, the MAA Newsletter. Please circle the appropriate box corresponding to your selection of journals. (Rates are guaranteed for the indicated period only.) Regular Membership I is for those whose professional income is under \$45,000 annually; Regular Membership II is for those whose annual income exceeds this figure. Subscription prices are included with dues.

- THE AMERICAN MATHEMATICAL MONTHLY (M)
MATHEMATICS MAGAZINE (G)
THE COLLEGE MATHEMATICS JOURNAL (J)

	M	G	J	M&G	M&J	G&J	M&G&J
Regular Membership I	\$76	\$63	\$67	\$89	\$93	\$80	\$106
Regular Membership II	\$96	\$80	\$84	\$112	\$116	\$100	\$132

Rates are from January 1-December 31, 1991.

Method of Payment Check Enclosed* Visa MasterCard Bill me
Card Number _____ Expiration Date _____
(month/year)

Interbank Number [] [] [] [] (Master Card only-located above name on card)
Signature _____

*U. S. funds only. Make check payable to the Mathematical Association of America

FALL MEETING: PROVIDENCE COLLEGE

November 22-23, 1991 are the dates for our annual Fall Meeting which will be hosted by Providence College under the direction of Frank Ford. The program co-chairs for this meeting are Alan Gorfin and Richard Pelosi of Western New England College. Other members of the Program Committee include Barry Schiller of Rhode Island College and Premjit Singh of Fitchburg State College. Tentatively scheduled to speak are Gerald Alexanderson of the University of Santa Clara who is co-editor of **Mathematical People**, Gilbert Strang of Massachusetts Institute of Technology, William Dunham of Hanover College and author of **Journey Through Genius** and Claudia Henrion of Middlebury College. Mark these dates on your calendar!!

EDITOR'S MESSAGE

Thursday, September 12, 1991 is the date by which all materials for inclusion in the FALL 1991 issue of the Newsletter must be in the hands of the editor; see the inside front cover for the address.

This marks the start of my fourth year as editor of this Newsletter, a task I have enjoyed immensely. I would like to thank some people who have assisted me in these efforts. First, I thank the folks at **Dickens Press of Wareham** (508-295-0505) who do the printing of the Newsletter. They do an excellent job at a most reasonable price. I highly recommend them to you. Joseph Cleary of the Buzzards Bay Post Office has been of great assistance in the area of bulk mailing. He is a credit to the Postal Service. Laura Kelleher, our recently elected Vice Chairperson and past Secretary/Treasurer, has been of much help in the areas of proof reading, content suggestions and in the preparation for bulk mailing. We mailed over 2700 copies last spring! Lastly, let me thank the many contributors to the Newsletter for their timely and well written input.

I have been asked on several occasions what word processing package I use. All the text of this Newsletter, as well as the previous six, was typed using EXP, a scientific word processor distributed by Brooks/Cole Publishing Company. The primary use of this package is for typing mathematical equations like

$$\theta = \begin{cases} \mu/(\mu - 1) & \text{if } \delta y \ll |\Delta| \\ \mu/(2 - \mu) & \text{if } \delta y \gg |\Delta| \end{cases}$$

with relative ease. Having gotten used to EXP for typing tests and other mathematical material, I found that it also does a fine and splendid job with straight forward text as is found in this Newsletter. By the way, it is possible to import an ASCII file into EXP so that if you can send your contributions on a floppy disk as an ASCII file (as well as a hard copy) it would be much appreciated. Clayton Dodge has been sending his information regarding the University of Maine Short Course in this format and it sure makes retyping easier and more error free for me!

PRE-REGISTRATION FORM

SPRING MEETING OF THE NORTHEASTERN SECTION-MAA

JUNE 7-8, 1991

VERMONT TECHNICAL COLLEGE

Mail Registration Form to: Paul Calter
Vermont Technical College
Randolph Center VT 05061

Checks should be made out to: NES/MAA

You may register at the meeting if you wish; however, it would facilitate the organization of the meeting if you pre-register by mail and it will save you money in that on site registration fees are five dollars more than preregistration fees. In any case, meals and housing cannot be guaranteed unless reservations are received by Friday, May 24, 1991. Spouses and guests are welcome at all meals and in the dormitories.

REGISTRATION:

Name _____
Institution _____
Address _____
City, State, Zip _____
Telephone (O) () _____ (H) () _____

PRE-REGISTRATION FEE:

MAA Member (\$10.00)
Non-member (\$15.00)
Student or unemployed (\$5.00) } \$ _____

MEALS:

Banquet 7:00 p.m. Friday
Number () x \$15.00 \$ _____

Breakfast 7:30 a.m. Saturday
Number () x \$4.00 \$ _____

Luncheon 12:15 p.m. Saturday
Number () x \$8.00 \$ _____

HOUSING:

Friday, June 7 \$ _____
Saturday, June 8 \$ _____
Rate : \$25, for single; \$15/person, for double

TOTAL \$ _____

Northeastern Section MAA

Department of Basic Sciences
Massachusetts Maritime Academy
P.O. Box D, Buzzards Bay, MA 02532-1803



NON-PROFIT
ORGANIZATION
U.S. POSTAGE
PAID
BUZZARDS BAY, MA
02532
PERMIT NO. 2