NORTHEASTERN SECTION

NEWSLETTER

SPRING 1997

VOLUME 19 NUMBER 1

EXECUTIVE COMMITTEE

CHAIRPERSON
Richard Cleary
Department of Mathematics
St. Michael's College
Colchester VT 05439
(802) 654-2510
rcleary@smcvt.edu

VICE-CHAIRPERSON
Frank Ford
Dept. of Mathematics/Comp. Sci.
Providence College
Providence RI 02918
(401) 865-2635
fpford@providence.edu

PAST CHAIRPERSON
Donna Beers
Department of Mathematics
Simmons College, 300 The Fenway
Boston MA 02115
(617) 521-2389
dbeers@vmsvax.simmons.edu

SECRETARY-TREASURER
Betsey S. Whitman
Department of Mathematics
Framingham State College
Framingham MA 01702-9001
(508) 626-4785
bwhitma@frc.mass.edu

GOVERNOR
Karen J. Schroeder
Mathematical Sciences Dept.
Bentley College, 175 Forest St.
Waltham MA 02154-4705
(617) 891-4705
kschroed@bentley.edu

TWO-YEAR COLLEGE REP.
Philip Mahler
Department of Mathematics
Middlesex Community College
Bedford MA 01730
(617) 280-3861
mahlerp@admin.mcc.mass.edu

NEWSLETTER EDITOR
Frank P. Battles
Department of Basic Sciences
Massachusetts Maritime Academy
Buzzards Bay MA 02532-3400
(508) 830-5000 x2262
fbattles@mma.mass.edu
FAX: (508) 830-5075

FUTURE SECTION MEETINGS

June 6-7, 1997: Merrimack College
Local Arrangements: Dave Finn and Carolyn Labenski
Program Chair: Richard Cleary, St. Michael's College

November 21-22, 1997: Western New England College
Local Arrangements: Anne Kizanis and Richard Pelosi

OTHER SECTION ACTIVITIES

Minicourse: Providence College, May 3, 1997
Using the TI-92 in Teaching Precalculus and Calculus
Mary Ann Connors, University of Massachusetts Amherst
Coordinator: Frank Ford, Providence College
See Page 19

Short Course: Salve Regina University, June 15-19, 1997
Dynamical Systems Across the Curriculum
Robert Devaney, Boston University
Coordinator: William Stout, Salve Regina University
See Pages 17-18

Regional Dinner Meetings: Spring 1997
Coordinator: Larry Braden, St. Paul's School
See Pages 8-9

NOMINATIONS

1998 NES/MAA Award for Distinguished College or University Teaching of Mathematics
Committee Chair: Frank Ford, Providence College
See Page 16

Access our homepage via **HTTP://WWW.MAA.ORG** or directly with **HTTP://SCSU.CTSTATEU.EDU/~MAA_NES/MAIN.HTML** for more information about section activities between issues of the *Newsletter*.

CHAIRPERSON'S MESSAGE

In recent weeks I've heard several variations on a classic joke and I thought I would present a new version here. How many Northeastern Section MAA chairs does it take to change a light bulb? As in so many other cases in which this joke is told, the answer here is, "None. They just call together a committee and it gets done for them." Getting credit for this job on my résumé is almost too easy thanks to the help of so many or our colleagues around the Section.

We are fortunate to have in the Section both members who serve faithfully and a larger core of members who seem to respect and appreciate those who do the most. This was brought home in a great way at the national AMS/MAA meetings in San Diego in January when the Section was well represented at the Joint Prize Session and Reception. There we saw Profs. Laura Kelleher and Frank Battles receive their Certificates for Meritorious Service, richly deserved for their work promoting the Section's activities.

While on the subject of service let me thank some of the many individuals who have been particularly helpful over the last several months. First, I wish to thank our new set of Section Officers: Vice-Chair Frank Ford of Providence College, Secretary-Treasurer Betsey Whitman of Framingham State and the re-elected two year college representative Phil Mahler of Middlesex Community College all deserve our thanks and congratulations. Frank is doing double duty by hosting and coordinating this year's Saturday minicourse on the use of the TI-92 graphing calculator, to be given by Mary Ann Connors of UMass Amherst. Thank you also to Bill Roberts of Plymouth State and Alan Gorfin of Western New England College for agreeing to run for Vice Chair and Secretary-Treasurer, respectively.

Frank and Betsey will be following in the footsteps of some very dedicated Section Officers. Lynne Durkin (Bentley College) has done a tremendous job as Secretary-Treasurer. We wish her well and look forward to calling on her again after a brief respite. Dennis Luciano (Western New England College) and Ed Sandifer (Western Connecticut State University) deserve our thanks for agreeing to run for Governor for the term starting July 1997. I encourage all members to thank outgoing Governor Karen Schroeder (Bentley College) for her hard work on behalf of the Section in her three years at the helm.

As we prepare for our Spring Meeting with its program of "Mathematics: The Next Generation" at Merrimack College, we will be doing our best to show the youngest of our colleagues how rewarding work in the MAA can be. No person is better connected to this next generation than Prof. Jim Tattersall of Providence College. It is my distinct pleasure to announce that Jim is the 1997 winner of the Northeastern Section Award for Distinguished College or University Teaching of Mathematics. I hope you will all come to the Spring Meeting so that we can congratulate Jim in person.

Our Fall 1996 meeting at UMass Boston was another in a long line of first rate meetings. Local arrangements coordinator Jack Lutts did a masterful job winding his way through the mass of state and local regulations to make us feel at home on the harbor. The program committee, chaired by Joe Witkowski of Keene State, did an excellent job of providing a thought provoking day and a half of mathematics. The Saturday morning session of brief research talks by young members of the Section was a highlight that I

hope we will be able to continue as a regular part of the meeting.

No set of thanks will ever be complete but I would be particularly remiss if I did not mention the hard work of Larry Braden (Saint Paul's School) in organizing our Sectional dinner meetings and Will Stout (Salve Regina University) for his work on the June short course as it heads south from Maine to Rhode Island. Statistics distributed at the Section Officers meeting in San Diego shows that our Section is one of the most active in the country, with some of the best attended regional meetings. When one includes the other meetings and courses that the Section provides for members it is easy to conclude that our Section is a powerful force in the mathematical community. It has been, and continues to be, a pleasure to see all of this effort produce some good for the mathematical community.

It's fair to say the Northeastern Section offers its members a choice of activities and so I close by offering the rare member who reads this far a choice of their own...get onto your e-mail account right now and send a message to me at rcleary@smcvt.edu. Include an idea for a program theme, a speaker you think we should line up, or a colleague you think deserves to win a distinguished teaching award. Feel free to be outlandish and whimsical. We'll take it from there.

Thanks again to all of our members and best wishes for a great spring and summer.

Richard Cleary
St. Michael's College
Chairperson NES/MAA

GOVERNOR'S MESSAGE

It seems such a short time ago that I wrote my first message as Governor of the Northeastern Section and now I'm writing my last message. It's been an interesting three years. I've learned what a complex organization the MAA is, have become well acquainted with its committee structure and have seen firsthand the numerous and diverse programs and services which the MAA provides to its members and to the mathematical community, in general.

I've gained a new appreciation for our own Section and the many hard-working people who make our activities possible. While we are not the largest Section in the MAA, I believe we offer more programs to our members than any other Section. I would like to encourage you to participate in our Fall and Spring meetings, dinner meetings, Spring minicourse and Summer short course.

Most of all, I've enjoyed meeting many mathematicians and mathematics educators at both the Section and national levels. I've appreciated your notes, phone calls and e-mail messages and especially your support and encouragement during my three-year term as Governor.

Karen J. Schroeder
Bentley College
Governor NES/MAA

NATIONAL MAA CERTIFICATE OF MERITORIOUS SERVICE

Every five years each section of the MAA may make a nomination for the *National MAA Certificate of Meritorious Service* in recognition of outstanding service at the sectional or national level. The previous recipients of this award were Donald Small (1984, Colby College now at USMA) and James J. Tattersall (1989, Providence College). A committee consisting of Richard Cleary (St. Michael's College, Chair), James J. Tattersall (Providence College), Steve Ingram (Vermont Technical Community College) and Donna Beers (Simmons College) nominated Frank P. Battles and Laura L. Kelleher of Massachusetts Maritime Academy for this award. It was approved by the Board of Governors and presented at the National MAA Meeting at San Diego this past January. A copy of the citation and the official response of the recipients appear below.

FRANK P. BATTLES and LAURA L. KELLEHER, Northeastern Section

"While the geographic center of the Northeastern Section lies somewhere in northern New England, it would be fair to say that the heart of the Section in recent years has been on the coast of Massachusetts, in the town of Buzzards Bay. There, at the Massachusetts Maritime Academy, Professors Frank P. Battles and Laura L. Kelleher have labored to make the Northeastern Section more valuable professionally and more welcoming personally to our 2000-plus members. Arriving together for both regional and national meetings, short courses, dinners, and special events, Frank and Laura make first-time participants feel welcome and veterans feel important. They have become the people whom the Section turns to first for leadership, information, and support.

Their experience and hard work supports the Section's faith in their counsel. Frank has served as the Editor of the *Newsletter* for many years, producing a consistently attractive publication that is prized by readers for its thorough coverage of Section events. Frank is the "conscience of the Section" as he prompts program and local arrangements chairs to complete their tasks in time to get word to the membership. Laura has served as Section officer, including Secretary-Treasurer and Chair, as well as on numerous Section committees.

Most importantly, Frank and Laura are seen by colleagues around the Section not just as willing and able administrators, but as powerful advocates for mathematics and good teaching. Their enthusiasm for programs in mathematics and their willingness to discuss their work in the classroom has made all of us who know them better teachers.

The Northeastern Section is proud to honor Frank P. Battles and Laura L. Kelleher with the Northeastern Section's 1997 Certificate for Meritorious Service."

Response from Professor Battles and Professor Kelleher

"It has been both a privilege and a pleasure to serve the Northeastern Section of the MAA in our various capacities over the past 10-plus years. We have received far more than we have given in that we have come to know many of the dedicated, hard-working members of the Northeastern Section. Without their assistance, our accomplishments would be meaningless. No award belongs only to the recipients. Rather, it belongs to all who make the accomplishments possible. It is with gratitude to our fellow Northeastern Section members that we accept this award."

MINUTES OF THE LAST MEETING

The Fall Meeting of the Northeastern Section was held on November 22-23, 1996 at the University of Massachusetts at Boston. There were 175 in attendance, including 49 students.

Christie Lecture

N.N. Luzin's Notebooks on the Mysteries of Set Theory by Roger Cooke, University of Vermont.

Invited Papers

Explorations in College Algebra: Developing Algebra from Data Based Applications by Linda Kime, UMASS Boston.
Explorations in College Algebra: The Physical/Visual Connection by Meg Hickey, Massachusetts College of Art.
Using Fermi Problems to Teach Informal Model-Building by George Lukas, UMASS Boston.
Homepage Workshop by Bill Campbell, UMASS Boston.
The Descartes-Fermat Feud by Ed Sandifer, Western Connecticut State University.
Solving Linear Systems of Equations and its Relation to Image Reconstruction from Projections by Ed Soares, College of the Holy Cross.
The Algebra of Solving Polynomial Equations by David Cox, Amherst College.

Student Chapter Workshop

Can We Have Proofs Without Axioms in Geometry? by David Henderson, Cornell University.

New Faculty Presentations

Family Groups in the Outback by Sandy Rhoades, Keene State College.
A Few of My Favorite Calc III Things by Tommy Ratliff, Wheaton College.
How I Explain My Research to Undergraduates by Susan Loepp, Willams College.
Higher Codimensional Geometry and Linear Algebra by Thomas Garrity, Williams College.

Invited Short Papers

The Parking Meter Game by Mike Veatch, Gordon College.
On 2-Spheres in 4-Manifolds by Mikhail Chkhenkeli, Williams College.

Student Papers

The Visualization of Mathematical Concepts Through Art: A Look at the Curvature of Russian Avant Garde Art of the 1920's by Kara Jackson, Bates College.
Using Sperner's Lemma to Solve a Queen/Rook Dilemma and Implications for Brouwer's Fixed Point Theorem by Kelly McDonald, Bates College.
Mathematical Modeling of Cardiac Pacemaker Cells by Jamie McDowell, Bates College.
How to Really Count by Lisa Cummings, Bates College.
The Search for Perfect Letters by Melissa Demers and Sherrie Fairbanks, Merrimack College.
Using Non-Linear Coupled Differential Equations to Simulate the Motion of Fish by Sue Generazzo, UMASS Lowell.
The Cubic Polynomials: Interesting Features by Justin E. Hahn, Boston University.
Estimate of Common Mean of Several Normal Distributions by Jian Han, University of Maine, Orono.
What Positive Integers can be Represented as the Sum of Consecutive Integers? by Duane Jones, Fitchburg State College.
Queuing Systems by Rosemary Guillette, Regis College.
Big Circles and Little Circles: A Problem Inspired by Small Restaurant Tables by Jane Gillette, Salem State College.
State-of-Art Cryptography by Dan Bailey, Worcester Polytechnic Institute.

Contributed Papers

Teaching An Old Course New Tricks: A Project Approach to Linear Algebra by John Goulet, WPI.
Calculators Banned After Maths Standards Fall by Domenico Rosa, Teiko Post University.
What Else Do We Teach in Math Classes Besides Math? by Irina Peterburgsky, Suffolk University.
The General Integral Equation for Inflections Surfaces Between Moving Charges by Matthew Cross and Domina Eberle Spencer, University of Connecticut.
Partial Derivatives with Respect to tau and t and the New Gaussian Equation for the Force Between Moving Charges by Domina Eberle Spencer, University of Connecticut, Uma Y. Shama, Bridgewater State College and Philip J. Mann, University of Connecticut.
The Definition of the Gradient of a Scalar and Weber's Equation for the Force Between Moving Charges by Philip J. Mann, Matthew Cross and Domina Eberle Spencer, University of Connecticut.
The Definition of the Divergence and the Curl of a Vector Field and the Gaussian Form of Maxwell's Equations by Domina Eberle Spencer, University of Connecticut, Uma Y. Shama, Bridgewater State College and Philip J. Mann, University of Connecticut.
A Data Oriented Business Calculus Course by Mark H. Turpin, University of Hartford.
Partial Derivatives Made Transparent by Mako E. Haruta, University of Hartford.
Aspects of Reform: Calculus Laboratories at St. Michael's College by George Ashline and Zsuzsanna Kadas, St. Michael's College.

A Critique of the Traditional Proof that the Square Root of Two is Irrational by Herb Nichol, Drexel University (Retired).
Modeling Juror Decay in a High Profile Criminal Trial by Ethan Bolker, UMass/Boston.
Numerical Data for Satellite Altitude Control by Means of Wong's Angles by Po Kee Wong, Adam Wong, Anita Wong, Systems Research Company.

At the business meeting, the election of new Section Officers was held. Our new Vice-Chair will be Frank P. Ford of Providence College; the new Secretary-Treasurer will be Betsey Whitman of Framingham State College; and Philip Mahler was reelected as Two-Year College Representative. Numerous other items were discussed which are covered elsewhere in this *Newsletter*.

Lynne Durkin
Bentley College
Secretary-Treasurer, NES/MAA

PUBLISHERS

We would like to thank each of the below named for exhibiting at the Fall Meeting held at UMass/Boston:

Addison-Wesley
Lori Bittiker
617-391-8208
lorib@smtp4.aw.com

Houghton-Mifflin
Maureen Duffy
617-784-4579
mo_duffy@hmco.com

ITP
Diane Leon
603-890-1075
dleon@wadsworth.com

John Wiley & Sons
Suzanne Conboy
617-965-7960

McGraw Hill Book Co.
Philip Charles
508-525-2100
philip_charles@mcgraw-hill.com

Prentice Hall
James Porter-Hamann
617-721-6910
james_porterhamann@prenhall.com

Texas Instruments
Tina Guerette
617-489-7211
tguerette@ti.com

It is very helpful for faculty to see the latest texts, software and calculators on display and the income from these exhibits is very helpful in defraying expenses associated with the meeting.

REPORT OF THE TWO YEAR COLLEGE REPRESENTATIVE

The New England Mathematics Association of Two Year Colleges (NEMATYC) will hold its annual meeting at the Brockton Campus of

Massasoit Community College on Friday and Saturday, April 11-12, 1997. The theme is "Surfing Towards 2000."

MATYCONN, the Mathematical Association of Two Year Colleges - Connecticut, will hold its Spring meeting at Naugatuck Community Technical College on Friday, April 25.

AMATYC continues to support regional workshops and conferences to help promulgate and institute its Crossroads Standards. The nearest is at Dutchess Community College, Poughkeepsie, NY, "on the beautiful Hudson River"... an "area of great historical interest," June 5 - 7, 1997. It also offers summer institutes. The nearest is at The College of Charleston, Charleston, SC, June 2 - 7. The main topics are precalculus mathematics, statistics, technology, and the internet.

After the untimely death of AMATYC's Northeast Vice President in November, 1966, I was appointed to fill the remainder of that term, which expires in November, 1997. Extensive duties include a one-week directors' meeting in Memphis TN, in March.

Please contact me for more information on anything in this report. See inside the front cover for contact information.

Philip Mahler
Middlesex Community College
Two-Year College Representative

DINNER MEETINGS: SPRING 1997

This spring the sixth annual round of NES/MAA Regional Dinner Meetings is being held. Shown below is a list of those meetings which are scheduled:

Rhode Island Region (4/3): Premjit Singh, Johnson & Wales University, coordinator
Speaker: Dilip K. Datta, University of Rhode Island, *Efforts to Emulate Potsdam.*

Eastern Massachusetts Region (4/9): Melvin C. Tews, College of the Holy Cross, coordinator
Speaker: Peter J. Bushnell, University of Sussex (England), The Leonard C. Sulski Memorial Lecture, *Prime Numbers - The search for a formula giving every prime number. A story with a happy ending?*

Connecticut Region (4/10): Cornelius Nelan, Quinnipiac College, coordinator
Speaker: Michael Nabel, Quinnipiac College, *Mathematical Magic.*

Vermont Region (4/15): Daisy McCoy, Lyndon State College, coordinator
Panel Discussion: *Mathematics Education - The Changing Pre-College Curriculum.*

New Hampshire Region (4/16): Larry Braden, St. Paul's School, coordinator
Speaker: Richard Askey, University of Wisconsin, *T-shirt Mathematics.*

Greater Boston Region (4/24): Donna Beers, Simmons College, coordinator
Speaker: Gian-Carlo Rota, Massachusetts Institute of Technology, *Ten Lessons I Wish I Had Been Taught Before I Started Teaching Differential Equations.*

If you are interested in hosting an NES/MAA Regional Dinner Meeting in the Spring of 1998, please contact Larry Braden of St. Paul's School, Concord NH 03301; (603-225-9104 or lbraden@sps.edu), Coordinator of the Regional Dinner Meetings. We would be especially interested in having Dinner Meetings in regions not represented this Spring: Maine, the Canadian Provinces and Western Massachusetts.

STUDENT CHAPTER NEWS

The Northeastern Section student chapters now have their own homepage at the following URL address:

HTTP://SCSU.CTSTATEU.EDU/~MAA_NES/STUDCHAP.HTML

The homepage has notes about section activities and other information for students, including links to related websites. The site is still evolving, and suggestions about content and interesting websites are welcome. If your MAA student chapter, math club, etc., has a homepage, send us the name and the URL, and we will build a link to your homepage from the Student Chapters homepage. Also, if you have student-related activities that you would like to publicize, send them to us and we will post them on the Student Chapters homepage. Any information to be posted should be sent to Ross Gingrich, the NES Section Student Chapters Coordinator, at **gingrich@scsu.ctstateu.edu**, or by mail to Ross Gingrich, Mathematics Department, Southern Connecticut State University, New Haven CT 06515.

There will be a special poster session on Saturday morning for students at the Spring (June) meeting at Merrimack College. Students are invited to submit posters of their solutions to the two problems of the 1997 Mathematical Contest in Modeling. For those students who participated in the competition, this session will provide the opportunity to see what some of the other teams did and to discuss their solutions with other participants and perhaps some judges or practitioners. Students from schools that did not participate in the competition are also welcome to submit posters; the problems and the original rules for the competition are posted on our Student Chapters homepage. For details on the poster session, check the meeting announcement in this *Newsletter* on Pages 13-14 and the Student Chapters homepage at the URL address given above, or contact Ross Gingrich at one of the addresses given above.

The national MAA office wants to update the e-mail addresses for all MAA Student Chapter Advisors, so that information and bulletins may be sent electronically. If you have not done so already this year, please send your current e-mail address, along with your name and institution, to PROGRAMS@MAA.ORG. For Section purposes, please also send the information to Ross Gingrich at the e-mail address given above.

If your school does not have an MAA student chapter but you are interested in starting one, you can contact Ross Gingrich for information and help in the application process.

NORTHEASTERN SECTION OF THE MAA
SPRING MEETING: JUNE 6-7, 1997
MERRIMACK COLLEGE, NORTH ANDOVER MA
THEME: Mathematics - The Next Generation

Friday, June 6

2:30 - 6:00 pm	Registration
2:30 - 3:30 pm	Executive Committee Meeting
3:45 - 5:15 pm	**Math/Internet Workshop** Premjit Singh, Johnson & Wales University
3:45 - 5:15 pm	Student Papers
5:30 - 7:00 pm	Reception/Dinner
7:25 - 7:30 pm	Welcoming Remarks
7:30 - 8:30 pm	**Mathematics for the 21st Century** Sheldon Gordon, Suffolk Community College

Saturday, June 7

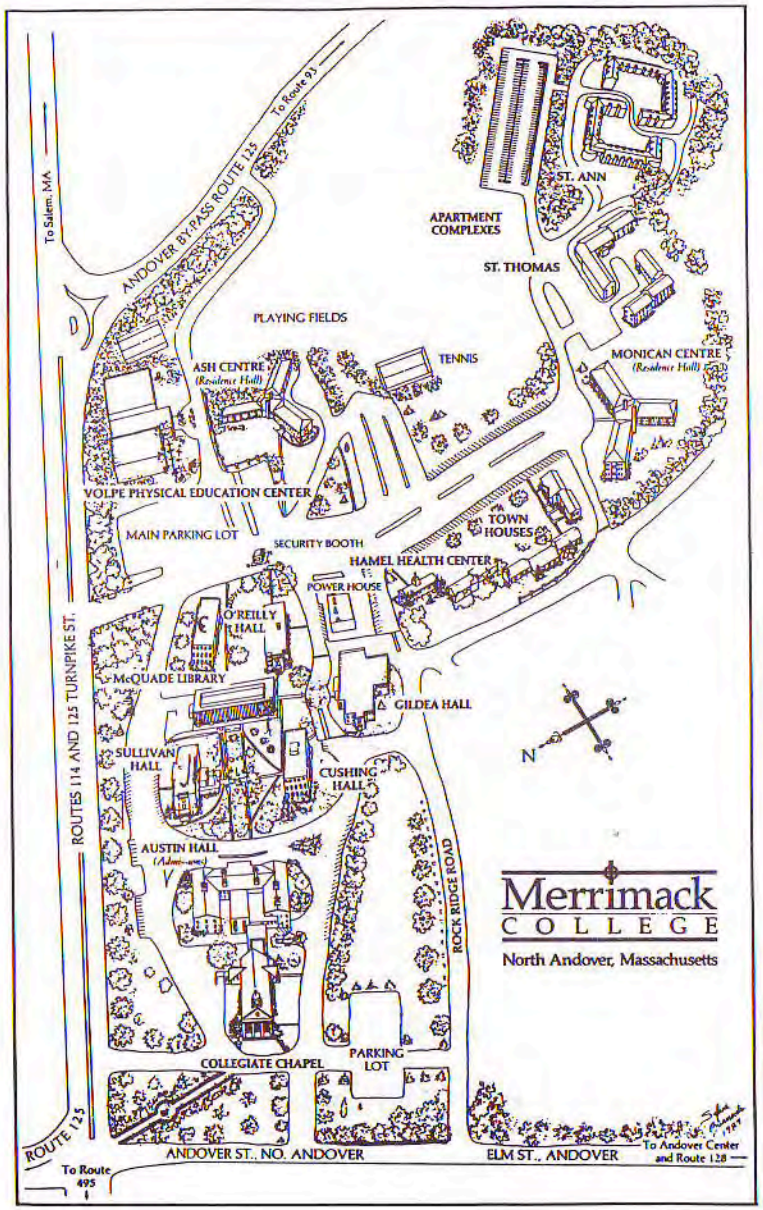
8:00 - Noon	Registration
8:30 - 10:00 am	Student Chapter Poster/Discussion Session
8:30 - 10:00 am	**Future Colleagues: Introductory Talks**
10:00 - 10:30 am	Break
10:35 - 11:30 am	**Challenges and Opportunities for a New Century** James R. C. Leitzel, University of New Hampshire.
11:40 - 12 Noon	Business Meeting
12:00 - 1:00 pm	Lunch
1:15 - 2:05 pm	**Take a Walk on Boardwalk** Steve Abbott
2:15 - 3:05 pm	**Calculus Reform: Where We've Been; Where We're Going** Steven Benson, University of New Hampshire
3:15 - 4:15 pm	Contributed Papers

Program Committee:

Rick Cleary, Saint Michael's College, Chair
Premjit Singh, Johnson & Wales University
Peter Schumer, Middlebury College
Barry Schiller, Rhode Island College
Dave Finn, Merrimack College
Ross Gingrich, Southern Connecticut State University

Local Arrangements:

Dave Finn and Carolyn Labenski, Merrimack College



DIRECTIONS TO MERRIMACK COLLEGE

FROM BOSTON: Route 93 North to exit 41, Route 125 to Andover/ North Andover. Campus is on the left at intersection of Routes 125 and 114. Approximately 25 minutes to campus.
FROM LOGAN AIRPORT: Route 1 North toward Saugus/Peabody to Route 114 West toward Middleton/North Andover. Approximately 40 minutes to campus.
FROM POINTS NORTH: Route 95 South to 495 South (traveling from Maine) or 93 South or 3 South to 495 North (traveling from New Hampshire) exit 42A. Follow route 114 toward Middleton, one mile to campus.
FROM POINTS SOUTH AND WEST: Massachusetts Turnpike (Route 90) to Auburn exit, Route 290 East to 495 North to exit 42A. Follow Route 114 East toward Middleton, one mile to campus.

OFF-CAMPUS ACCOMMODATIONS

For information regarding dormitory lodging, please see the Pre-registration Form. If you wish to stay off - campus, the following are a short drive from the campus: Hampton Inn, (508)-975-4050 or (800)-HAMPTON, Marriot-Andover, (508)-975-3600 and Rolling Green Resort and Conference Center, (508)-475-5400. Please inquire about special rates for Merrimack College guests.

MERRIMACK COLLEGE

Merrimack College is a small comprehensive college founded by the Order of St. Augustine, and is currently celebrating its 50th anniversary. The Department of Mathematics and Computer Science offers programs of study leading to a Bachelor of Arts degree in mathematics, a Bachelor of Science degree in Computer Science, along with several joint major programs with other disciplines. The mathematics major prepares students for graduate study and for employment in actuarial science, teaching and high technology. The computer science degree prepares its majors for graduate work in Computer Science or for entry level jobs as programmers, analysts, and technical support personnel.

At present, there are roughly 85 mathematics and computer science majors, along with a handful of students pursuing joint major programs. There are twelve full-time faculty members in the department who teach both majors and service courses. Service course are either courses designed for college distribution requirements or courses designed to serve the needs of the Division of Business Administration or the Division of Science and Engineering.

ABSTRACTS/SPEAKERS

Math/Internet Workshop
Premjit Singh, Johnson & Wales University

Information technology is changing the way we teach and learn. To be able to guide students through the 21st century, teachers will have to make use of the information available on the Internet. This session assumes no knowledge of the Internet. This session will talk about the Internet, computer system requirements, how to get connected to the Internet, and Instructional Aspects of Mathematics on the Internet using Netscape.

Dr. Premjit Singh has a Master's in Mathematics from New York University, Ph. D. in Mathematics from University of Rajasthan, India, and a Master's in Computer Science from Queens College, CUNY. Dr. Singh has taught for many years at colleges in New England and New York. Currently, she is an Associate Professor of Mathematics at Johnson and Wales University.

Mathematics for the 21st Century
Sheldon Gordon, Suffolk Community College

Mathematics education today appears to be beset from all sides with demands for change: calculus reform, precalculus reform, postcalculus reform, the impact of the NCTM Standards, the changing mathematical needs in the traditional disciplines, the new mathematical needs in non-traditional disciplines, the implications and use of technology, innovative approaches to pedagogy and assessment. How can all of these pressures be reconciled? What mathematics will students have to know if they are to function in the twenty first century? What will the emerging mathematics curriculum look like as we respond to all of these pressures?

Sheldon P. Gordon is professor of mathematics at Suffolk Community College. He is co-project director of the NSF-supported Math Modeling-PreCalculus Reform Project and principal author of the project text, *Functioning in the Real World: A PreCalculus Experience*. The project was recently awarded the top prize in the algebra through precaclulus category of a competition sponsored by the Annenberg Foundation to identity exemplary Innovative Projects Using Technology. Gordon is also a member of the Harvard Calculus Project Consortium. He is the co-editor of the MAA Notes volumes, *Statistics for the Twenty First Century and Calculus: The Dynamics of Change*, the co-author of *Contemporary Statistics: A Computer Approach*, and is the author of over 80 articles on mathematical research and mathematics education.

Student Chapter Poster/Discussion Session

At this poster session, students from the Northeastern Section will be displaying their solutions to the problems of the 1997 Mathematical Contest in Modeling, sponsored by COMAP. In the contest format, all of the student work takes place over a four-day weekend in February. During that time, each team of three students chooses one of two problems, develops a mathematical model for the problem, and produces a solution paper which is submitted for judging. This year Problem A was a predator-prey pursuit problem involving velociraptors chasing a single thescelosaurus; the students were asked to develop strategies for both the predators and the prey. Problem B asked the students to set up small discussion groups for a corporate board of 29 people. Given seven sessions, each broken up into multiple discussion groups, the basic goal was to set up the discussion groups to minimize the common membership of groups for the different sessions. Complete statements of both problems, along with the original rules for the competition, are posted on the Northeastern Section's Student Chapters homepage at http://scsu.ctstateu.edu/~maa_nes/studchap.html and will be posted at the session.

For those students who participated in the competition, this session will provide the opportunity to see what some of the other teams did and to discuss their solutions with other participants and perhaps some judges or practitioners. Students from schools that did not participate in the

competition are also welcome to submit posters. For details on submitting a poster, check the Student Chapters homepage at the URL address given above, or contact Ross Gingrich at one of the addresses given in the Student Chapters notes elsewhere in this newsletter.

Future Colleagues: Introductory Talks

This session is designed to introduce section regulars to some of our future colleagues. Graduate students in the latter stages of their careers will present short expository talks on their research or another mathematical topic of interest. Section members wishing to nominate a student to participate should contact Section Chair Rick Cleary (rcleary@smcvt.edu) by April 15.

Challenges and Opportunities for a New Century
James R. C. Leitzel, University of New Hampshire.

At the International Congress of Mathematicians in 1900, David Hilbert posed 25 questions that helped shape the direction of mathematics during the 20th century. Mathematics education is now in the spotlight and there are interesting challenges and opportunities facing mathematics, mathematicians, and mathematics educators as we move to the 21st century. This session will explore some of these issues.

James R. C. Leitzel is a professor in the Department of Mathematics at the University of New Hampshire. He has held positions previously at The Ohio State University (Columbus, OH), the University of Nebraska (Lincoln, NE), and as Director of Special Projects for the Mathematical Association of America. He has served as chair of MAA's Committee on the Teaching of Undergraduate Mathematics, the Committee on the Undergraduate Program in Mathematics, and the Committee on the Mathematical Education of Teachers (COMET). During his term as chair of COMET, he served as editor of the MAA's publication *A Call for Change*. He is currently a member of MAA's Council on Education, NCTM's Commission on the Future of the Standards, JPBM's Task Force on Enhancing the Educational Activities of Effectiveness of Post-Secondary Mathematics Faculty, and a member of the Executive Committee of the Mathematical Sciences Education Board at the National Research Council. With T. Christine Stevens, Saint Louis University, he co-directs MAA's Project NExT.

Take a Walk on Boardwalk
Steve Abbott

Monopoly, the popular board game, may seem a terribly complex game to model mathematically. It turns out that with some probability, linear algebra and a little help from MAPLE we can answer the questions that we have all wondered about: Which monopolies are best to own? Why do we land on some colors more than others? Is it better to be the shoe or the race car? The talk highlights how the answers to these question are accessible to (and may even be good assignments for) undergraduate mathematics students.

Calculus Reform: Where We've Been; Where We're Going
Steven Benson, University of New Hampshire

The Calculus Reform movement is beginning its second decade and the discussions - both pro and con - are continuing. The phrase "teaching reform Calculus" is loaded with ambiguity in that everyone has their own idea about

what each word in the phrase means. Philosophical disagreements can be useful, since they force us to rethink our position in the light of another's. We must remember that underlying all of the "discussions" are personal philosophies of doing, teaching, and learning mathematics. Recognizing that we are all interested in "doing what's best" (speaking of "loaded" phrases), I hope to provide a context for discussion of this important, yet often divisive issue.

Steve Benson was an undergraduate at the University of Texas and received his Ph. D. in Mathematics from the University of Illinois in 1988. He has been a faculty member in the Mathematics Departments at St. Olaf College, Santa Clara University, and the University of New Hampshire. At each of these institutions, he has had the unique opportunity to observe - and participate in - a variety of Calculus (and other curriculum) reform efforts. Although "trained" in Algebraic Number Theory, his current research interests are in collegiate mathematics education and K-22 teacher education. During his copious free time, he likes to spend time with his wife, Jean, and their 3 year old daughter, Sophie.

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 mathematical periodicals. Prizes will be awarded and the registration fee and cost of meals and dormitory 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 April 4, 1997 to: Dan Carter/Ockle Johnson, 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.

CALL FOR CONTRIBUTED PAPERS

Participants are invited to submit contributed papers for either the Spring or Fall Meeting. We are particularly interested in papers which will appeal to a variety of participants. 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 College, Danbury CT 061810 (203) 837-9351, or via Internet at Sandifer@wcsu.ctstateu.edu. The deadline for the Spring Meeting is May 15 and for the Fall Meeting is October 27.

1998 NES/MAA AWARD FOR DISTINGUISHED COLLEGE OR UNIVERSITY TEACHING OF MATHEMATICS

Nominations are now being accepted for the 1998 NES/MAA Award for Distinguished College or University Teaching of Mathematics. Any member of the Northeastern Section may nominate any other NES/MAA member for this award.

Help us identify who should be considered for this award!

Send for a nomination form

or

Send a one page letter in support of an outstanding teacher

and the Selection Committee will ask the candidate's Department Chairperson to complete the nomination form.

Recipients of the Section Awards are eligible to receive a National MAA Award. As established by the Board of Governors, the awards are to be made to teachers of mathematics at the 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 of the National awards must be members of the MAA teaching in the United States or Canada.

Contact:

Professor Frank Ford
Chair Mathematics/Computer Science
Providence College
Providence RI 02918
(401) 865-2334
fpford@providence.edu

Single page letters of support should be received by June 15, 1997.
Completed nomination forms must be received by October 1, 1997.

NES/MAA SHORT COURSE: TEACHING DYNAMICAL SYSTEMS ACROSS THE CURRICULUM

This course will be held at Salve Regina University on June 15-21, 1997 and will be taught by Robert L. Devaney of Boston University. The goal of this short course is to show mathematics instructors how aspects of dynamical systems theory may be successfully incorporated into courses ranging in level from precalculus to upper division undergraduate. Professor Devaney and collaborators will cover topics including:

1. A description of the Boston University differential equations project. This NSF project has resulted in an updated sophomore level differential equations course that includes more emphasis on qualitative and numerical techniques and less on cookbook solution methods.

2. How to use fractals to teach the geometry of linear transformations.

3. Chaos and fractals in precalculus courses.

4. Newton's method and other iterations in calculus.

5. An overview of a sophomore level dynamical systems course that serves as a bridge from calculus to more rigorous analysis courses.

6. Using dynamic animations to animate dynamical systems.

The course will take a hands-on approach to teaching and learning dynamical systems theory. Participants will have ample opportunity to work on computer experiments during the short course.

Robert L. Devaney received his A.B. from the College of the Holy Cross and his Ph.D. from the University of California at Berkeley in 1973 and came to Boston University in 1980. Since 1989 he has been director of the NSF sponsored Dynamical Systems and Technology project. His main area of research is dynamical systems. He is the author of over 50 research papers in these fields and is the author of three textbooks in dynamical systems theory. Professor Devaney is also involved in the Boston University Ordinary Differential Equations Project with Paul Blanchard and Dick Hall. This NSF project is an attempt to revitalize the lower level ordinary differential equations course by including material from dynamical systems theory in all aspects of the course. A preliminary version of the textbook *Differential Equations* resulting from this project has been published by ITP. In 1994 he received the Award for Distinguished University Teaching from the Northeastern Section of the Mathematical Association of America.

Dormitory housing is available on campus. Nonparticipating family members are welcome with payment of the room/board fee. Room assignments are made by Salve Regina University. Persons with special needs in housing or diet should write or phone in advance so that suitable arrangements can be made. Dormitories will open at 3PM Sunday June 15, 1997. Accommodations are generally not available before Sunday afternoon or after lunch on Thursday. Sunday evening meal will be on your own; the first meal served will be breakfast on Monday, June 16. The last meal will be lunch on Thursday, June 19.

To register for this course, complete the form on the back of this page. For additional information, see the NES/MAA homepage (address on Page 2 of this *Newsletter*) or contact Dr. William Stout (address on next page.)

TEACHING DYNAMICAL SYSTEMS ACROSS THE CURRICULUM

Please mail this form (or a photocopy) early (deadline May 2) as enrollment is limited. Mail to:
Dr. William Stout, Mathematical Sciences Dept., Math Short Course, Salve Regina University, 100 Ochre Point Avenue, Newport, RI 02840-4192, Tel. 401/847-6650 xxt. 3110 Fax 401/847-0372

Acknowledgements will be mailed immediately. Acceptances with full instructions and details will be mailed by May 16. A minimum $50 deposit will be required within 14 days of acceptance. **Do not send money with this application.** You will be billed when you are accepted.

Name:_____

Address:_____

_____

_____

City:_____

State:_____ Zip:_____

Institution:_____

Telephone:_____ e-mail:_____

Registration (for all participants)

$ 100.00 for MAA members $ _____

$ 120.00 for non-members $ _____

Room and Board (includes ALL meals)

$310.00/person (double room)$ _____

$330.00/person (single room) $ _____

Meals Only (for commuters)

$50.00 (includes lunches and reception)$ _____

Total Due $ _____

Participants pay REGISTRATION ($100 or $120) and ROOM AND BOARD or MEALS ($310 or $330 or $50). Non-participating family members each pay ROOM AND BOARD ($310 or $330).

NES/MAA MINICOURSE: USING THE TI-92 IN TEACHING PRECALCULUS AND CALCULUS

This course will be held at Providence College on May 3, 1997 and will be taught by Mary Ann Connors, University of Massachusetts Amherst. Participants in this course will be supplied with loaner TI-92's so that they will have the opportunity to gain "hands on" experience with the hand held computer algebra system that is built into this powerful graphing calculator. Session I will focus on basic key stroking and Session II will allow for laboratory exploration and investigation of the use of this tool in problems involving precalculus and calculus. No previous experience with the TI-92 is necessary. Dave Ullman of Educational Electronics in Weymouth will be available for participants wishing to purchase calculators at the minicourse.

Mary Ann Connors is a Lecturer at the University of Massachusetts Amherst where she teaches a calculus course with a lab component using Mathematica computer software. Dr. Connors has given presentations at the Advanced Placement (AP) Calculus Calculator Workshops as a faculty consultant for the College Board and ETS, at the NSF funded workshops on Calculus Reform using appropriate technology, and for the TI/Ohio State Calculus Short Course using the TI-92. She has also presented workshops on fractals at national and international meetings. Her publications include numerous articles, papers, and a fractal project on the World Wide Web.

To register for this minicourse send, no later than April 24, 1997, the completed registration form below and the registration fee of **$40** (make check payable to **MAA/NES**) to: Frank Ford, Chair, Math/CS, Providence College, Providence RI 02918. Telephone: 401-865-2334; e-mail: fpford@providence.edu

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TI-92 Minicourse Registration Form

Name:_____

Institution:_____

Address:_____

_____

e-mail:_____

Telephone:

(W)_____

(H)_____

Hotel Info Needed (circle one): YES NO

If you have any food restrictions, please indicate:_____

GOVERNOR'S ELECTION

In January, 1997 ballots were mailed to members of the Northeastern Section with the following nominees for the office of Sectional Governor:

Dennis M. Luciano, Western New England College
C. Edward Sandifer, Western Connecticut State University

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, 1997 to June 30, 2000. Congratulations, Dennis!

Professor Luciano has been at Western New England College for the past twenty years where he holds the rank of Professor. He has chaired the Department of Mathematics and Computer Science since 1981. His past experience in the Northeastern Section includes: Local Arrangements Coordinator for our Fall 1984 Meeting, Student Papers Coordinator (1985-87), Vice-Chairperson (1986-1987), Chairperson (1987-1989), and Governor (1991-1994). In 1988, he shared (with Gordon Pritchett of Babson College) the George Pólya Award of the MAA for the paper *Cryptology: From Caesar Ciphers to Public-key Cryptosystems* published in the *College Mathematics Journal*.

The Nominating Committee for the selection of Governor consisted of Richard Cleary, Chairperson (St. Michael's College), Kenneth Bogart (Dartmouth College), Ross Gingrich (Southern Connecticut State University) and Philip Mahler (Middlesex Community College).

EDITOR'S MESSAGE

I attended the National Meeting of the MAA this past January which was held in San Diego. At the awards ceremony, Laura Kelleher and I were presented with the *National MAA Certificate of Meritorious Service* (see Page 4). It was quite an honor for us to be up on the same stage as some very distinguished mathematicians and mathematics educators such as Andrew Wiles and Deborah Tepper Haimo. We were also treated to a wonderful dinner afterwards at the *Bella Luna* in the Gaslamp Quarter of the city.

It is said that "imitation is the highest form of flattery". We in the Northeastern Section have received this form of compliment for our dinner meetings (see Pages 8-9) which we instituted in 1992. Recently both the Southeastern Section and the Ohio Section have also instituted such, having learned of our success at the Section Officers Meetings held in conjunction with the National MAA meeting.

Friday, September 12, 1997 is the date when all information for the *Fall Newsletter* must be received by the editor (address on inside front cover). Thanks to all for their assistance on this issue!

PRE-REGISTRATION FORM

SPRING MEETING OF THE NORTHEASTERN SECTION-MAA

JUNE 6-7, 1997 **MERRIMACK COLLEGE**

Mail Registration Form to: NES/MAA
c. o. David Finn
Dept. of Mathematics/Computer Science
Merrimack College
North Andover MA 01845

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 pre-registration fees. In any case, meals and housing cannot be guaranteed unless reservations are received by Friday, May 23, 1997. **It may not be possible to buy tickets to the banquet or lunch at the meeting.** Spouses and guests are welcome at all meals.

REGISTRATION:

Name:_____

Institution:_____

Address:_____

City, State, Zip:_____

Telephone: ( )_____

E-MAIL:_____

PRE-REGISTRATION FEE:

MAA Member ($20.00)
Non-member ($25.00)
Student or unemployed ($5.00) } $_____

MEALS AND HOUSING:

Reception and Banquet
5:30 p. m. Friday: Number ( ) x $15.00 $_____

Breakfast: Number ( ) x $4.00 $_____

Luncheon Noon Saturday: Number ( ) x $8.00 $_____

On Campus Housing for Friday, June 6: (includes linen)
Single: $32.00 Double: $23.00 (per person) $_____

TOTAL: $_____

Northeastern Section MAA
Department of Basic Science
Massachusetts Maritime Academy
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