

NORTHEASTERN SECTION



NEWSLETTER

FALL 1999

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NORTHEASTERN SECTION MATHEMATICAL ASSOCIATION OF AMERICA

FUTURE SECTION MEETINGS

November 19-20, 1999: Bradford College, Haverhill, MA

Local Arrangements:

Martha Boles (Bradford College)

Judeth Cobb (Bradford College)

Program Committee:

William Stout (Salve Regina College)

Paul Estes (Plymouth State College)

June 16-17, 2000: St Paul's School, Concord, New Hampshire

Local Arrangements:

Larry Braden (St. Paul's School)

OTHER SECTION ACTIVITIES

Regional Dinner Meetings: Spring 2000

Co-ordinator:

Larry Braden, St Paul's School(603)225-9104

lbraden@sps.edu

Summer Short Course: June 25-30, 2000

University of New Hampshire Durham

Director: Kelly Black

See announcement on pages 11

Awards: NES/MAA Award for Distinguished Teaching: See page 2.

Web page: access it via <http://www.maa.org> or directly with

http://scsu.ctstateu.edu/~maa_nes/main.html

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Ross Gingrich, Southern Connecticut State University

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Chair's Message

This is my last message as Section Chair. I've enjoyed the past two years and recommend running for this office to anybody. The best part of the job is all the people who work so hard for the section. I'll acknowledge some of them who have official duties later and I apologize for not being able to list all the other members who do so much.

Now, I'd like to talk of things past and things future. First, the Spring meeting at Colby was a success thanks to Sarah Mubrouk, Phil Blau, Kathy Bevelas, Ed Sandifer, Barry Schiller, and Fernando Gouvea. We all had a wonderful time. Second, I'm happy to report that the MathFest in Providence in August was a rollicking success. We proved once again that the Northeastern Section is the place to hold national meetings! We had the largest attendance at a Summer meeting since the last time we met in Providence. We have to thank two of our section's people for much of this success. Jim Tattersall organized it, handled the behind-the-scenes details including enough e-mails to choke an internet service provider, and was everywhere during the event making sure it went well. Tom Banchoff was the perfect host. Seldom have I seen a President who was so affable and sincere in his welcome to the association's members. They knew they were in Tom's hometown and that Tom would do anything to make sure they had a good time. I also want to thank the AMS for the social hour before the opening banquet. They were lavish hosts and we appreciate their effort. I can't even begin to list all our section members who spoke or were participants. Thank you all.

Now for things future. The next meeting is at Bradford. The details of the program and the local arrangements start on page 12. There will be an optional plant tour this time. I hope that you will participate in this meeting. See page 15 for ways to participate besides attending the meeting.

We also need nominations for the distinguished Teacher Award. The information for this is on page 2.

Finally, I want to thank all the officers- Kathy Bevelas, Dennis Luciano, Ed Sandifer, Barry Schiller, Betsey Whitman - for the tremendous job they have done. Each of them has served the Section in numerous capacities for too many years to remember. I also want to thank Ross Gingrich for the web site, Ockle Johnson for the student papers' organization, and Larry Braden for the Spring dinners. They bring a joy to their work. And, of course, what would our section be without Frank Battles and Linda Kelleher. They come to every executive meeting and they are there at the national section officers' meetings. Thank you all. Come up to Bradford in November.

Distinguished Teaching Award Nominations Due

Ed Sandifer (sandifer@wvsub.ctstateu.edu), chair of the committee to choose the Section's award winner, asks that any remaining nominations be sent to him by November 5, 1999. Nominators will receive a packet and be asked for additional information by November 15. Candidates should be known as outstanding teachers on their own campuses and their influence should extend to the broader mathematical community. The files of nominated candidates remain open in future years.

Governor's Message

The MATHFEST this past summer in Providence was an immense success. The last national mathematics meeting in this city was eleven years ago when Providence hosted the AMS Centennial Meeting. Although the program at the time was a stellar one, that meeting did not receive rave reviews. There was very little to criticize this year. The city is a far cry from what it was like in the 1980s. Of course, Brown is still there and Atwells Avenue remains the area to visit for fine Italian food. But now there is a lot more to Providence, such as a grand convention center with an adjoining hotel and the soon to be completed Providence Place Mall. Yes, it is huge! It was clear to me that Providence has been receiving a face lift over the past few years (and not just for the tv show), and I am confident that our fellow colleagues were impressed with the city and what it has to offer. So Providence was a great choice for the MATHFEST and the program committee truly did a remarkable job. Our section's own Colin Adams was the emcee for the opening banquet; the Hedrick Lecture Series on "Numbers, Numbers, Numbers" was given by Carl Pomerance; Thomas Banchoff gave the inaugural James R.C. Leitzel Lecture; and we also heard from Robert Devaney, V. Frederick Rickey, and other notable mathematicians. Lots of hard working people from our section are responsible for making this event the success that it was, and I pay tribute to all who helped.

The major concern of the MAA is still membership, which I reported in my last governor's message. The MAA will soon be making decisions concerning a comprehensive strategy of addressing this concern. Our professional organization is currently considering a new, more general, publication. More information on that is forthcoming. The Board of Governors

and the AMS Secretariat has approved the following Joint Mathematics Meetings:

Washington, D.C., January 19-22, 2000

New Orleans, LA, January 10-13, 2001

San Diego, CA, January 6-9, 2002

Baltimore and Charlotte are potential sites for 2003, while Honolulu is under consideration for 2004. MATHFEST 2000 will be held in Los Angeles, CA, August 3-5. Under consideration for MATHFEST 2001 (August 9-11) are the University of Michigan at Ann Arbor, University of Wisconsin at Madison, and Saint Mary's College, Notre Dame, Indiana; for 2002 (August 8-10), they are San Jose State University, the University of Colorado at Boulder, and the University of Maine at Orono.

Late in August I transported my daughter to Connecticut College for her freshman year. After moving her belongings into her room, we went to the typical forum of important speakers for the first year students and their parents. The lead off speaker was the Director of Admissions who early on won over the crowd and could have easily held our devout attention for as long as he wanted. I may just go back every year to hear him! At one point, he offered a characterization of the typical Connecticut College student in the class of 2003. He mentioned that such a student during his/her senior year of high school was taking AP Biology, AP History, and AP English. A little later, he mentioned that even after the accepted students receive their "fat" letters from Connecticut College in April, he still keeps track of their academic successes and failures. In fact, when he was reviewing their final senior grade reports and AP scores, it was quite clear to him that yes, the typical student in the class of 2003 did take AP Calculus, and yes, it was clear from those reports and scores that Calculus was the course that they disliked the most! At that time, I slid a little further down in my comfortable chair for fear that people had already identified me as a calculus teacher. So here we have a fairly elite group of students whose collective high school calculus experience was dismal. My own daughter, who in the first quarter of her senior year, while taking AP Calculus using a reform text, told me she hated mathematics and hoped that she could avoid taking mathematics in college. The President of the college was the last speaker of the forum. She spoke for a fairly long time, as we would all expect, but indeed I will give her credit for incorporating calculus into her speech as well. She alluded to the earlier comments from the Director of Admissions, and went on to say that calculus experiences are different at Connecticut College, because

here students will be introduced to calculus from different perspectives. They will view it conceptually, graphically, and computationally. She even mentioned how Mathematica colors in the area under a curve! She almost guaranteed promising outcomes for calculus students at her college, and I hope she is correct, since my daughter is taking calculus this semester. Even more amazing is that it was my daughter's decision.

So here we are 10+ years after the beginning of the calculus reform movement and I am not quite clear on really how much of a difference it has made. I have heard compelling arguments that support the movement as being successful as well as compelling arguments that support just the opposite. What I fear the most is my suspicion that the vehicle that we use to teach calculus is far less important than the teacher who drives it. The discovery method has been with us much longer than the calculus reform movement. But I know from experience that not all mathematics teachers can successfully use that method. Some instructors see discovery as: read the text, try doing some problems, then we will discuss them in class. While others face up to the fact that to use it correctly requires far more effort than the traditional methods. I suspect the same is occurring in the teaching of reform calculus. Several years ago, while sharing a room with Rick Cleary at a national meeting, he suggested that what is really needed is a way to reform the reform movement. We comically thought up names of special MAA sessions on such a topic: contributed papers on reforming the reform movement or contributed papers on unreformed reform calculus or contributed papers on?oh well, you get the idea.

I will probably regret this later, but I would like to do a very informal, unscientific poll of section members' thoughts on reform calculus. Who believes, through experience, that the reform movement has created environments where student learning and understanding have been significantly improved? Similarly, who believes there has been little, if any, improvement? Is there, as I expect, only one successful reform calculus text (Harvard Project) currently on the market? Respondents are urged to offer factual and as well as anecdotal information on this topic. I shall read all correspondences that I receive (send to dluciano@wnec.edu) and somehow summarize the material so that I will be able to report back to our section membership in my next Governor's message.

The Program Committee has again done a wonderful job in developing the program for the Fall Meeting at Bradford College. I hope to see many, many of you there. And for those that are unable to attend, perhaps our paths will cross in Washington D.C. in January at the Joint AMS-MAA Meetings.

Respectfully,

Dennis M. Luciano
Governor, NES-MAA

From the Co-Editors

HIGHLIGHTS OF SPRING MEETING NES-MAA

Our section held another successful spring meeting, this time at Colby College on June 11, 12 1999. 61 people attended including 5 students. We appreciate Prentice-Hall and Texas Instruments for exhibiting at the meeting, indeed TI's John Good made actually made a detailed presentation which summarized the current TI calculator products and let us know what we should anticipate is coming. Thanks John.

Another program highlight was the second Frank Battles memorial lecture, this time given by Boston University's Robert Devaney on "Chaos, Fractals and the Internet." Even those of us who had heard Bob's lectures before learned something new! Thanks again Bob.

There were a total of 16 presentations. They included 3 student talks and 4 contributed papers that were not listed in the Spring 1999 newsletter so they are included below. A complete program is available from the editors. Much deserved thanks goes to the Program Committee (Sarah Mabrouk and Phil Blau of Boston University co-chairs, Kathy Bevelas of Manchester Community College, Fernando Gouvea of Colby, and Ed Sandifer of Western Connecticut. Fernando also chaired the local arrangements committee - he suggested the wonderful lobster dinners most banqueters wanted. Thanks Fernando.

As usual at the Executive Committee meeting they discussed finances - the Section is solvent! We have \$8841.99 on account, thanks Betsey! Betsey Whitman, Treasurer, also reported that the national MAA asked what help the sections most wanted. Besides higher dues subventions, some help providing speakers and up-to-date department liaison lists were noted. The MAA also asked about the interest in setting up special interest groups, for example, in undergraduate math education, statistics, humanistic math, and history of math. Extended discussions are anticipated. Kelly Black of UNH came to explain an NSF grant for a summer 2000 short-course at UNH on a combined calculus/physics curriculum. He asked for NES/MAA cosponsorship, which was approved unanimously with a recommendation for a \$50 fee for the entire course. Thanks Kelly. The Exec Committee also worried about future meetings, especially the fall 1999 meeting at Bradford that still needed a Program Chair. (Later William Stout of Salve Regina University accepted this, thanks Bill.) Also noted was the desirability of a New Hampshire site for the spring 2000 meeting, and the lack of recent dinner meetings in the Boston area.

Not listed in the Colby program in the spring Newsletter are the following student papers presented:

- "Fun with the Tribonacci Numbers"
by Brendan LeFebvre, Providence College
- "Summing Factorials"
by Chuck Garofalo, Providence College
- "Post Enumerative Survey for the 2000 Census"
by Catherine Bloniarz, Bates College

The following Contributed Papers were also presented:

- "Lewis Carroll, Faculty Legislation, and Voting Theory"
by Tommy Ratliff, Wheaton College
- "Platonic Forms, "Banking" Education and the Teaching of Mathematics" by Philip Blau, Boston University
- "Student Reaction to the Use of Group Work in a General Education Mathematics Course" by Sarah L Mabrouk, Boston University
- "Writing in a General Education Mathematics Course - What do Students Learn" by Sarah L Mabrouk, Boston University

We are also grateful to John Good of Texas Instruments who presented "A Demonstration of New TI Technology" summarizing the features, (and some limitations!) of TI calculators present and in the near future.

TWELVE BAGS OF GOLD

No, we were not given twelve bags of gold, but another highlight of the meeting that had people talking was the "Twelve Bags of Gold" problem which amounts to this: If there are 11 identical bags of gold and one counterfeit bag whose weight is different, then can the counterfeit bag be identified, and whether it is heavier or lighter than the rest, in just three uses of a balance? The Editors promise to print the neatest explanation we receive for the answer and the most interesting variation of the problem anyone submits to us!

Frank Ford and Barry Schiller

From the Two-Year Colleges

The fall MATYCONN dinner meeting will be held at Mitchell College in New London on October 22.

Tunxis Community - Technical College welcomes new faculty member Alain D'Amour, formerly of Denison University in Ohio. Alice Grandgeorge and Kathy Bavelas are state delegates to the annual AMATYC conference in Pittsburg, PA November 18 - 21. AMATYC is celebrating its Silver Anniversary this year. MATYCONN co-sponsored a Chaos workshop on June 24 - 30. Participants are looking forward to a follow-up session being planned for March, 2000. Plans are proceeding to invite Denny Gulick of the University of Maryland and Jon Scott of Montgomery College to return this summer for a week long fractal workshop. Central Connecticut State University is offering 3 new on-line courses in statistics.

Kathy Bevelas

From the Colleges

Betsy Whitman from Framingham State College reports that they are trying to survive without two faculty who are on leaves this year. Sonja Sandberg was awarded an American Association for the Advancement of Science (AAAS) fellowship to engage in risk assessment at the United States Department of Agriculture. She is spending her entire sabbatical year in

Washington D.C. John Lewis is on a leave of absence for the 1999-2000 year with a Lectureship in the Mathematics Department at Massachusetts Institute of Technology followed by up to four months of support at the Max Planck Institute for Mathematics in Bonn, Germany. John is continuing to pursue research in the theory of modular forms.

Barry Schiller, in his new role as Chair at Rhode Island College, reports three new hires in term positions: Raimundo Kovac (PhD Indiana), Steve Martin (PhD Connecticut), and Kate Sanders (PhD Brown.) He adds that the department again had a successful "Math Awareness" program in April 1999, highlighted by a talk by Larry Liebovitch on "Fractals and Chaos in Biology and Medicine." He is happy to report that thanks to a grant awarded to a colleague, Dr Mary Sullivan, the Department will be working with in-service and pre-service teachers to improve the teaching of discrete mathematics in secondary education.

Frank Ford reports from Providence College that Ed Sandifer delivered the Pi Mu Epsilon induction speech to an appreciative audience in April. Ed introduced a friend of his, Merlin, who came from the 12th century to explain how to think.

Ross Gingrich from Southern Connecticut State University informs us that Joseph Fields has joined the Mathematics Department at Southern in a tenure-track position. Last summer Joe received his PhD degree in Mathematics from the University of Illinois at Chicago; his advisor was Vera Pless and his areas are error-correcting codes and combinatorics. Richard DeCesare, Cynthia Gubitose, and Rachael Schettenhelm have also joined the SCSU Mathematics Department for one-year positions. Rich received his doctorate last year from Teachers College in New York. His thesis was on the Mathematics of Native Americans!

Dennis Luciano of Western New England College tells us that they have three new faculty members. David Mazur is a 1999 Ph.D. recipient from Johns Hopkins University and has research interests in operations research, integer programming, polyhedral combinatorics, and computation. Len Brin is a 1998 Ph.D. recipient from Indiana University works in PDE's and Numerical Analysis with particular attention given to Stability of Viscous Shock Waves. He was at SUNY-Stony Brook last year. Jay Alan Jackson is a 1985 Ph.D. recipient from Florida State University and his current scholarly activities are the development of interactive educational courseware (e.g. Mathematica notebooks), and the combined use of graphics and sound for visualization. He spent nine years of teaching and research at the University of Southwestern

Louisiana, after appointments at Duke University and Michigan Technological University and work in industry as a EE/CAD programmer, and as a scientist at Los Alamos National Labs and NCSA. Associate Professor Alan Gorfin has assumed the position of Interim Dean of the School of Arts and Sciences. After having endured numerous annual reviews by Chair Dennis Luciano, Dean Gorfin will finally have the opportunity to review Chair Luciano!

Ron DeGray of St. Joseph's College (West Hartford, Ct.) announces the appointment of Ekaterina Lioutikova as an assistant professor. She got her Ph.D. in combinatorial group theory from McGill University last May and did her undergraduate work at Omsk State University in Russia.

Kathy Bevelas reports that Manchester Community-Technical College sponsored a lecture by Jill Zimmermann on the mathematical legacy of Lewis Carroll. She also reports that Tunxis Community-Technical College welcomes Alain D'Amour, a new faculty member who has taught at Denison University.

Finally, Larry Braden, of St. Paul's School, co-ordinator of our Spring dinner meetings and local arrangements chair for our June 2000 meeting spent part of his summer jumping out of an airplane over Mongolia! Can anybody top that for "what I did on my Summer vacation?"

In Search of Newton
A Combined Calculus and Physics Curriculum
University of New Hampshire, Durham NH
25 June - 30 June 2000
A MAA/Northeastern Section Short Course

The mathematics and physics departments at the University of New Hampshire will host a short course on our combined calculus and physics curriculum developed as part of an NSF funded program, NSF-DUE-9752485. The short course will focus on the following aspects of the program now in place:

- * updates and changes to the Physics curriculum,
- * updates and changes to the Calculus curriculum,
- * class format including a detailed examination of the studio format pioneered at Rensselaer Polytechnic Institute,
- * class materials.

The total number of participants in the workshop will be limited, and the cost per participant is \$50. Preference will be given first to pairs of people from institutions (preferably one person teaching mathematics and one person from another discipline).

The short course will be held on the campus of the University of New Hampshire in Durham, New Hampshire. Durham is a small community situated close to the Great Bay and is located close to Portsmouth, New Hampshire. If you would like to know more about the short course or are interested in registering, please contact Kelly Black, (kelly.black@unh.edu), or see our web page at <http://www.math.unh.edu/~black/newton/pre-registration.html>

NORTHEASTERN SECTION OF THE MAA
FALL MEETING: November 19-20, 1999
BRADFORD COLLEGE, HAVERHILL, MA
THEME: Mathematics in Biology and the Environment

<p>Program committee William Stout (Salve Regina University), Chair Paul Estes (Plymouth State College)</p> <p>Local Arrangements Martha Boles (Bradford College), Chair Judeth Cobb (Bradford College)</p>

Friday, November 19, 1999

2:00-6:00 pm	Registration
2:00-3:00 pm	Executive Committee Meeting
3:00-3:50 pm	Student Papers
4:00-4:50 pm	Contingency Constrained Optimal Power Flow for Deregulated Electricity Markets Lucy Kimball, Bentley College
5:00-5:50 pm	Ten Equations that Changed Biology and that Should Change Biology Education John Jungck, Beloit College
6:00-6:40 pm	Reception
6:45-8:00 pm	Banquet
8:00-8:10 pm	Opening Remarks
8:10-9:00 pm	The Challenges and Benefits for Mathematics in Interdisciplinary Courses and Programs, Paula Russo, Trinity College

Saturday, November 20, 1999

8:00-10:30 am	Registration
8:00- 8:50 am	New Faculty Talks
9:00- 9:50 am	Contributed Papers
9:00- 9:50 am	Stella/StarLogo Workshop Linda Grisham, Leslie College
9:00- 2:00 pm	Book Exhibit
10:00-10:30 am	Break
10:30-11:20 am	Christie Lecture: Looking at Classical Mathematics Through Smoke and Haze Charles Hadlock, Bentley College
11:30-12:00 pm	Business Meeting
12:00- 1:00 pm	Lunch
1:00- 1:50 pm	NES/MAA Teaching Award Lecture: Are Mathematicians Good Problem Solvers? Charles Vinsonhaler, University of Connecticut
2:00-2:50 pm	Mathematics and an Ice Core Time Machine David Meeker, University of New Hampshire
3:15-4:30 pm	Power Plant Tour Charles Hadlock, Bentley College

Calls for Participation

Please note there are three parts of the Spring 1999 Program where participation is being requested below. Ockle Johnson is calling for student papers, Frank Ford for new faculty talks, and Tommy Ratliff is for contributed papers.

Student Paper Call

Undergraduate students are invited to present papers at the Spring Meeting on topics in mathematics, statistics, or computer science. The presentations will be 15 minutes long. Interested students should send abstracts by Nov. 12th by e-mail to ojohnson@keene.edu or by regular mail to Ockle E. Johnson; Department of Mathematics; Keene State College; Keene, NH 03435-2001. E-mail is preferred. Abstracts should include current address, phone number, e-mail address, and name of a faculty sponsor. Those that are accepted will receive prizes and one presenter for each paper will receive free meals and registration at the meeting.

New Faculty Call

New faculty at Northeastern Section colleges are invited to present 15-minute talks on their professional interest at the Spring Meeting. Those who are interested should register with Frank Ford at fpford@providence.edu by Nov. 12th.

Contributed Papers Call

Participants are invited to submit contributed papers for the Spring Meeting. We particularly seek papers appealing to a wide variety of participants. Your presentation should be approximately 15 minutes long. Please send an abstract (indicate any special equipment needed) to Tommy Ratliff, Math/CS by e-mail to <http://acunix.wheatoncollege.edu/tratliff>. The deadline is Nov. 12th.

About Bradford: An Introduction

The History of the College

Founded in 1803, Bradford College began as Bradford Academy, one of the earliest New England coeducational academies. Thirty prominent citizens of the parish of Bradford met in the spring of that year to establish a school "for the purpose of promoting piety, religion and morality, and for the education of youth in such languages and in such of the liberal arts and sciences as the Trustees hereinafter named shall direct...." Kimball Tavern, where they gathered, still stands.

Life was changing in 19th century America. Educational opportunities became more plentiful with the rise of the common school. But these opportunities were not equally distributed among all the nation's youth. Accordingly, in 1836, Bradford chose to devote itself exclusively to the education of women - one of the earliest American secondary schools to do so.

By 1932, Bradford had grown from a secondary school to a college. In that year, Bradford Academy became Bradford Junior College, the first such institution to be accredited by the New England Association of Schools and Colleges. Once again, Bradford pioneered in a significant educational

development.

Bradford Junior College quickly became one of the leading exponents of women's post-secondary education. Under the leadership of such educators as Katharine Denworth and Dorothy M. Bell, Bradford Junior College grew into an institution of international distinction. As the school's reputation grew, its educational program, enrollment, and physical plant expanded accordingly.

In the spring of 1971, Bradford Junior College once again opened its enrollment to male students. Later that year, Bradford received authorization from the Commonwealth of Massachusetts to grant the bachelor's degree and change its name to Bradford College. In its transformation from an academy to a four-year institution, the College always retained its special character. Bradford College never lost sight of its roots or its essential purpose.

In 1983, the College introduced the Bradford Plan for a Practical liberal Arts Education, a program that combines Bradford's historic tradition of quality liberal arts education with a desire to prepare students practically for life after college. The Bradford Plan, now in its second decade, has led private colleges in connecting a rigorous liberal arts education with practical professional preparation. The success of the Bradford Plan is reflected both in the numbers of institutions which have since adopted similar approaches and in the success of its graduates.

In 1998, Dr. Jean A. Scott was named president of Bradford College. In preparation for the next century, the college community has built on the foundations of the Bradford Plan, a curriculum which will prepare its students to be agents of change in a changing world, able to approach problems in a multidisciplinary manner and to solve them creatively. The curriculum offers multiple, diverse and individualized credit-bearing opportunities for students to integrate their academic studies with experiential learning in four focus areas: professional development experience, personal development experience, cross/multi-cultural understanding, and community service learning. These areas represent the core values of its liberal arts education, and actualize its belief that development within them must happen both in and beyond the classroom.

For this reason, experiential learning is the primary vehicle by which the

integrated curriculum operates. At Bradford, experiential learning is, first and foremost, an academic activity, bearing academic credit and requiring students to combine the reading, reflection, and writing that are at the heart of liberal arts education with out-of-classroom, problem-oriented experiences in a wide range of contexts. When Bradford College students participate in study-away programs, internships, community service projects, campus leadership activities, specialized seminars, or faculty-designed experiential learning companion modules to existing courses, they engage in problem solving activities that connect directly and purposefully with their studies, infusing and contextualizing them with meaning.

Accommodations For Fall Meeting

Comfort Suites Haverhill

106 Bank Road Haverhill, MA. 01832
Ph: 978-374-7755 Fx: 978-521-1894

Take Exit 49 off 495, and turn toward Haverhill. Bank Road is on the right.

Special room rate - \$65.00 (one or two persons). Cutoff for special rate reservations - 11/4/99 - Mention NESMAA conference.

Best Western Merrimack Valley

401 Lowell Ave. Haverhill, MA. 01832
Ph: 978-373-1511 Fx: 978-373-1517

Take Exit 49 off 495, and turn toward Haverhill. Lowell Ave. is on the left.

Special room rate - \$59.90 (one or two persons). Cutoff for special rate reservations - 11/4/99 - Mention NESMAA conference

Directions to Bradford College

From Maine and points north:

Take 95 South to 495 South
Take 495 South to Exit 48
Follow Campus Directions at end

From New Hampshire, Vermont and points north:

Take 93 South to 495 North
Take 495 North to Exit 48
Follow Campus Directions at end

From Boston and Logan Airport

Take 93 North to 495 North
Take 495 North to Exit 48
Follow Campus Directions at end

From Rhode Island and points south:

Take 95 North to 93 North to 495 North
Take 495 North to Exit 48
Follow Campus Directions at end

From Connecticut and points west:

Take 84 East to 90 East to 495 North
Take 495 North to Exit 48
Follow Campus Directions at end

Campus Directions:

At Exit 48, follow the Rt. 125 connector to the second set of lights. Turn left onto 125 North. Follow 125 for 1.8 miles to Bradford College (on your right) Take a right on South Park immediately after passing by the campus. Turn right into the College parking lot. Note: parking is extremely limited at Bradford. Please carpool if at all possible. On street parking is available in the surrounding neighborhood. Registration will take place in the reception lobby of Academy Hall.

Descriptions of talks

Friday, June 11, 1999

Contingency Constrained Optimal Power Flow for Deregulated Electricity Markets Lucy Kimball, Bentley College

Optimal power flow (OPF) is a tool used for both operation and planning of electric power systems. In the classical OPF formulation, certain controls such as generator outputs are adjusted in order to optimize an objective function subject to physical and operational constraints at a certain point in time. Common objective functions include generation cost, network losses and total transfer

capacity between sets of generation and loads. The classical OPF is a static problem that does not allow for inter-temporal constraints, requiring heuristic adjustments that may increase costs unnecessarily. A dynamic OPF includes inter-temporal constraints to produce an optimal solution with significantly increased dimensionality; therefore requiring specially tailored solution methods.

In addition to economic considerations, the power system operating state must be secure with respect to a defined list of contingencies, such as generator or line outages. Since the number of possible contingencies in a typical power system is extremely large, the contingency constrained OPF also has extremely large dimensionality. An OPF that accounts for contingencies and indicates the optimal, secure operating state is essential. Efficient algorithms for the dynamic OPF as well as the contingency constrained OPF will be presented.

Ten Equations that Changed Biology and that Should Change Biology Education

John R. Jungck, Beloit College

Mathematics has played exceptionally important roles throughout the history of biology. More biology students take Calculus than any other single constituency. Too frequently, textbook authors have unappreciated mathematics in biology curricula because they assume that biology students have an inadequate mathematical preparation. This practice: (1) deskills many biology students, (2) is inconsistent with our requirements, (3) misrepresents contemporary biological research, and, (4) underprepares students to read many articles or to contribute to many areas of biology. However, the recent calculus and biology reform movements have empowered students to actively investigate the behavior of many famous mathematical models in biology. While numerous recent publications are replete with numerous models, there is a need to identify a succinct list of achievements that represent the power of mathematics in biology. Hence, "ten equations that changed biology" and a brief description of their historical importance are presented here with BioQUEST software instantiations in order to: first, draw attention to a variety of mathematical models that have been intrinsic to significant discoveries in biology and, second, to illustrate that the tools are currently available for engaging students in active investigation of biological phenomena and the development of systematic strategies for biological problem solving.

The Challenges and Benefits for Mathematics in Interdisciplinary Courses and Programs

Paula Russo, Trinity College

Many scientists have predicted that the next century will be the century for biology and the life sciences much as physics was the pre-eminent scientific discipline for much of the twentieth century. Given the complexity of living systems compared to physical ones, it is likely that the much of the new research will be highly interdisciplinary in nature. What will be the role of mathematics in this setting? Will it be possible or advantageous to bring some of this interdisciplinary spirit into our own classrooms and courses?

Saturday, November 20, 1999

Looking at Classical Mathematics Through Smoke and Haze,

Charles Hadlock, Bentley College

This is going to be a trashy presentation. Whoops! I mean I'm going to talk trash, lots of trash. In fact, for those who are game, I'm going to show you more trash than you ever wanted to see. Wait, let me try again. I want to show you that buried in that old dumpster of rotting trash is an exciting path to central concepts in classical mathematics, beginning at the pre-calculus level and leading as far as you want into upper-division courses or seminars. More important, that dumpster can lead us and our students to an engaging, if somewhat unusual, rationale for studying mathematical modeling and applying it to important societal problems, often in our own communities. And I hope to show you all this through smoke and haze.

An optional field trip to a trash-to-energy incineration plant in Haverhill and relatively near Bradford College will be available in the afternoon for those who still want to see more trash, more smoke, more haze, and some other interesting environmental issues as they are encountered in the real world of practice.

Are Mathematicians Good Problem Solvers?

Charles Vinsonhaler, University of Connecticut

Some evidence indicates that we mathematicians could improve our understanding and practice of problem solving. This in turn could improve our teaching of problem solving in particular, and mathematics in general. I will present the evidence along with a number of questions, such as: Can we teach problem solving? Should we?

Mathematics and an Ice Core Time Machine

David Meeker, University of New Hampshire

In 1993 scientists of the Greenland Ice Sheet Project 2 (GISP2) finished drilling a 3053-meter ice core (to bedrock) at Summit, Greenland. The GISP2 ice core contains a record of atmospheric chemistry deposited year-by-year in annual precipitation for over 200,000 years. The upper 2900 meters provides a well-dated and high resolution view of climate for the last 110,000 years. Glaciochemical time series from ice cores are both non-stationary and non-uniformly sampled. These features, in addition to the basic nonlinearity of the underlying climate system, complicate their analysis and interpretation. Some of the mathematical tools and techniques developed and adapted for the analysis of the GISP2 series — and the surprising view of climates of the past they reveal — will be discussed in this talk.

Pre-Registration Form

Fall Meeting of the Northeastern Section- MAA

November 19-20, 1999

Bradford College

Mail this form to :

Professor Martha Boles

Bradford College

320 South Main St.

Bradford, MA. 01835

e-mail: mboles@bnet.bradford.edu

Check should be made to: **NES/MAA**

Please Pre-register! 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 cannot be guaranteed unless reservations are received by Friday, November 5, 1999. **It may not be possible to buy tickets to the banquet or lunch at the meeting.** Spouses and guests are welcome at all meals.

PRE-REGISTRATION (please type or print):

Name: _____

Institution: _____

Address: _____

Telephone () _____

E-mail: _____

Pre-registration Fee:

MAA Member (\$20.00)

Non-member (\$25.00)

Student or unemployed (\$5.00) \$ _____

Meals

Reception and Banquet Friday (\$22.00) \$ _____

Luncheon Saturday (\$12.00) \$ _____

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