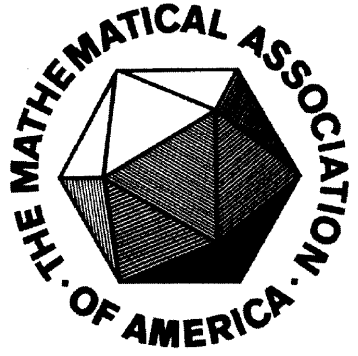
NORTHEASTERN SECTION



NEWSLETTER

Fall 2011

Volume 33 **Number 2**

Web Page: **http:/www.maa.org/northeastern**
Webmaster: **Frank Ford, Providence College**

EXECUTIVE COMMITTEE

UPCOMING SECTION MEETING

November 18 and 19, 2011 — Fall Section Meeting
Connecticut College New London, CT
Program Committee: Joe Fields, Southern Conn. State Univ.
Local Arrangements: Kathy McKeon, Connecticut College

FUTURE SECTION MEETING

Spring, 2012 — Spring Section Meeting
Central Connecticut State University, New Britain, CT.
Local Arrangements: Rachel Schwell, CCSU

Fall, 2012 — Fall Section Meeting
Bridgewater State University Bridgewater, MA.

Spring, 2013 — Spring Section Meeting
U.S. Coast Guard Academy Groton, CT.

Fall, 2013 — Fall Section Meeting
Wheaton College Norton, MA.

OTHER ACTIVITIES

November 18, 2011 — Section NExT Meeting
Conncecticut College New London CT

COORDINATORS

Dinner Meetings:	Lucy Kimball lkimball@LNMTA.bentley.edu
NES/MAA Distinguished Teaching Award:	Jason Moliterno, Sacred Heart University molitiernoJ@sacredheart.edu
Section Project NExT:	Karen Stanish, Keene State College kstanish@keene.edu
New Colleagues Talks:	Chris Aubuchon, Johnson State College aubuchoc @ badger.jsc.vsc.edu Phil Hotchkiss, Western New England College PHOTCHKISS@wsc.ma.edu
Undergraduate Papers:	Raimundo Kovac, Rhode Island College rkovac@ric.edu Karen Stanish. Keene State College kstanish@keene.edu
Graduate Papers:	Sarah Mabrouk, Framingham State College smabrouk@frc.mass.edu
Contributed Papers:	Eric Johnson, US Coast Guard Academey Eric.C.Johnson@uscga.edu
Problem Competition:	Jason Molitierno, Sacred Heart University MolitiernoJ@sacredheart.edu Rob Poodiack, Norwich University rpoodiac@norwich.edu

Message from the Chair…….Rob Poodiack

Hello everyone from increasingly chilly Vermont. We have made it through one of the wettest years on record here. From melting snow to torrential rains to Tropical Storm Irene, it's rarely been dry since April. Not that we're the only folks getting wet: as I write this, many of you in eastern and southern New England are bracing for a Nor'easter type snowstorm … in late October! I hope you all have been able to get through this weather as well as possible.

It's hard to believe that two years have passed, but this is my final Message from the Chair. My term as Section Chair ends at the conclusion of the Fall Meeting on November 19th. Then and there, a permutation of executive committee happens. Vice Chair and Section NExT coordinator Karen Stanish of Keene State will become Chair, Past Chair Jason Molitierno will become Section NExT coordinator, and I will become Past Chair. (Don't worry, we'll give out scorecards at the Fall meeting …)

I'm appreciative of everyone who came north to our place, Norwich University, for the fantastic Spring meeting. Big thanks to Ernie True and Sandy Hyde at Norwich for their work putting together the excellent program, and to Darlene Olsen of Norwich for her help on local arrangements. Thanks also and congratulations to Joseph Silverman of Brown University, our 2011 award winner for Distinguished College or University Teaching, for adjusting his busy schedule to give the Battles Lecture at the meeting.

Joe Fields of Southern Connecticut State University and his program committee have a tough act to follow in setting up the upcoming meeting at Connecticut College, but they're doing a great job! Among the highlights will be William Dunham delivering the Christie Lecture on two results of Euler; Steve Abbott, Editor of Math Horizons, talking about mathematics in theater; and Fred Rickey lecturing on the history of Fundamental Theorem of Calculus. Jason Molitierno will use graph theory to review linear algebra concepts. Jennifer Beineke and her father Lowell Beineke (former editor of the College Mathematics Journal) will talk about graph theory. Rick Cleary will give the Section NeXT lecture on transitions throughout academic careers.

There will also be paper sessions galore, theatrical presentations, and short talks on various software packages by faculty who use them. The Collegiate Math Competition for undergraduate teams and a poster session on pedagogy round out a very full weekend.

As my term concludes, I wanted to take a minute and thank some people who have contributed mightily to the ongoing vitality of the Northeastern Section. All of these folks have organized meetings, welcomed us at their colleges or universities, served on committees, reminded me to get things done, and generally did things when asked to.

Thanks to Ockle Johnson, Frank Ford, Karen Stanish, Jason Molitierno, Ann Kizanis, Phil Mahler, Ed Sandifer, Rick Cleary, Donna Beers, Eric Johnson, Tommy Ratliff, Sarah Mabrouk, Frank Battles, Laura Kelleher, Lois Martin, Ross Gingrich, Joe Fields, Jennifer Berg, Rachel Schwell, Chuck Rocca, Lynette Boos, Kathy McKeon, Raimondo Kovac, Chris Aubuchon, Phil Hotchkiss, Lisa Humphreys, Ann Moskol, Will Stout, Ernie Rothman, Ken Gross, Susan Loepp, Sol Friedberg, Jim Langan, Lynne DeMasi, Stacey Lion. Thanks also to the mathematics departments at Salve Regina University, Providence College, Norwich University, and Connecticut College for hosting us for section meetings. Thanks to all the folks who accepted invitations to speak at our section meetings. Thanks to all of you for coming to meetings, contributing talks or demonstrations, promoting the section and the MAA, nominating distinguished teachers, and just plain showing interest.

I also wanted to thank again Ed Sandifer. I've known him since 1990 when I signed up for his number theory class at Western Connecticut State University. He was my masters' advisor, and kept tabs on me while I worked on my PhD in Vermont. He drew me into the MAA and was always a great help and inspiration through his work as chair and governor. Most anything I've accidentally done right as chair, I learned how to do from Ed. (The rest came from Ockle, Jason, Tommy, Frank, …) I join all of you in wishing Ed continued success in his recovery, and in looking forward to seeing him again at section meetings.

Thanks, Ed. I hope to see the rest of you in New London on November 18th and 19th!

Message from the Acting Governor ..... Ockle Johnson

This summer the Governors met before Mathfest in Lexington, Kentucky. It was Paul Zorn's first Governor's meeting as President of the MAA meeting and he ably led a smooth and productive meeting.
Financial concerns continue to be an important topic for the MAA. John Kenelly, our MAA Treasurer, very forcefully reassured us that the MAA is in very good financial shape overall. While the MAA has not been immune to Wall Street's perturbations, we have generally met our financial targets. Our finances are on a good solid footing, despite recent operating budget deficits. The staff worked hard to trim the budget for 2012, delaying some projects, such as the re-design of our web presence, cutting some staff and allowing some vacancies to remain open, and trimming some expenditures, such lunches at Governor's meetings and the travel reimbursement for governors. The expectation is that we will have a balanced budget again in 2012.
The MAA is currently undergoing a major change in leadership. Tina Straley, who has done an excellent job as Executive Director of the MAA since January, 2000, is stepping down in January, 2012. The governors approved Michael Pearson as the next Executive Director, ensuring that the MAA will continue to have strong leadership. Michael is currently the Associative Executive Director and Director of Programs and Services. In addition, John Kenelly has stepped down as the MAA treasurer. Our new Treasurer is Jim Daniels, who has previously served on the Budget and Audit Committees, as well as other roles in the MAA.
Over the past several years, the MAA has been reviewing and assessing its activities and operations through a series of Strategic

Working Groups focused on major areas, such as Meetings, Publications, Membership, and Students. With the final reports of the last groups, we will take a hiatus from this process. At this point it is time to step back, take stock, and look at the big picture. So in 2012 we will engage in an overarching general review of the MAA. We will consider new opportunities and challenges and try to determine appropriate services and benefits. Ultimately we will decide what to continue, what to stop and what to start doing.
The Committee on the Undergraduate Mathematics Program is in the process of revising its curriculum guide—the current guide was published in 2004. We spent some time during our meeting in small groups providing input to the committee.
Finally, one of the pleasures of being a governor is voting on awards for Section members. At this meeting we approved Frank Ford's Meritorious Service Award and Susan Loepp's Haimo Award for Distinguished College or University Teaching. Congratulations to Frank and Susan.

Message from the Secretary-Treasurer ..... Ann Kizanis

In the spring newsletter, I reported a balance of $24,702.49. Since that time, the expenses from the successful spring meeting at Norwich University were $4,595.90. The revenue from meeting registrations was $4,398.74, and we received $13.78 from the spring MAA book sale. The expenses for the printing and postage of the spring newsletter totaled $749.92. Moreover, we earned $58.17 in interest from money placed into a money market account and from money that was transferred to an 18 month CD. We also received our subvention check in the amount of $2,665.00 from the national office this fall. Our present balance is $26,492.36.

The expenses for our spring 2011 meeting were $647.96 less than our fall 2010 meeting expenses, and the revenue from spring meeting registrations was $2,170.33 less than the revenue from fall meeting registrations. The expenses for the postage and printing of our newsletter last spring decreased from last fall. We spent $1,196.02 for the printing and postage of the fall 2010 newsletter and $749.92 for the printing and postage of the spring 2011 newsletter.

In the spring, I wrote and submitted the yearly Financial Report of the Northeastern Section of the MAA. I also wrote our section's Annual Report at the beginning of the summer.

That is my update for now! We are all looking forward to the Fall MAA meeting at Connecticut College, on November 18-19, where I will update you further on our finances.
I wish you all a very enjoyable fall semester!

Two-year College Representative's Report.....Phil Mahler

The annual meeting of the American Mathematical Society of Two-Year Colleges (AMATYC) is November 10-13 in Austin, Texas. Being a history buff, including of course the history of mathematics, and having just read a good book on the Indians of the Great Plains, and then a history of the Mexican-American War, both of which deeply involve Texas, I am especially looking forward to seeing Austin for the first time. What's "hot" at the meeting, and at two-year colleges, is a movement called "course redesign" or something to that effect. It seems to mean teaching remedial mathematics with technology, and breaking the material into modules instead of the traditional courses. Its purpose is to hopefully get students through the mediation process more quickly and with better mastery. The mastery part is because some level of "mastery", often 85%, is required to move to the next module. Thus, a student with a low C average will not move along, as they do now. the "quickly" part is because there are pre-tests for modules, and students who demonstrate they do not need that particular remediation can skip it. A second "hot" movement is Mathway and Statway, which parallels an AMATYC initiative called "New Life". This recognizes that the attrition rate in remedial courses is around 50%, and there are often 3 or more remedial courses between a student and a "college level" math course, and that 0.5^3 means a small number of successful students. This second movement endeavors to give a remedial student just the mathematical skills needed to do a math modelling course, or a statistics course, in one semester, and then the course itself in the second. This has the potential to dramatically increase the number of developmental students not held back by mathematics, if it proves feasible. (google Statway if you want to read more).

The recent meeting of the New England AMATYC affiliate, NEMATYC, was held in April at Cape Cod Community College. Its luncheon speaker was Ian Winokur, the Rubik's cube speed solver that was featured at a recent section meeting. Housing was in Dennisport, on the waters of Cape Cod. The spring 2012 meeting will be March 30 - 31 at NHTI-Concord's Community College, Concord, NH.

MATYCONN, the other regional AMATYC affiliate, met on October 21 and featured Herb Gross, who taught at Corning Community College, MIT, and finally Bunker Hill Community College. (google herb gross mit video). Herb was the first AMATYC president and was instrumental in founding NYSMATYC (NY) and NEMATYC. Herb is a superb speaker, very entertaining and with a wonderful message (among others) of "Teacher as Coach".

From the Newsletter Editor ..... Frank Ford

First, I am honored and humbled to be selected for the Distinguished Service Award this year. I thank the committee and all the other members of the Section. The executive Committee and the volunteers who do so much work for the Section make life working in this Section very easy. I also am fortunate to have an administrative assistant, Lynne DeMasi, who can work with all the offices that are needed to run a conference and can find anybody I need to locate in the conference. Together, we have harassed many people into sending us what we need.

Second, my college did a drastic overhaul of our web site and it has caused trouble for the Section's website. It is still there and is accessible but its look has changed and some of it may be missing. Rob and I will be collaborating on moving the site to National's web server. He'll do most of the work. After that, we will turn over the site to a volunteer from the Section. If you know a web-savvy person who needs service for tenure or who wants to become active in the Section, let Rob know.

Finally, the meeting in Lexington was great. I met many people from the Section and shared meals with many of them. All of us are excited to have the Joint Meetings in Boston starting on January 4th. I don't remember ever having a Joint meeting in the Section before. Don't miss

Student **Presentations at the Spring 2011 Meeting**

Daniel J. Radil, Southern Connecticut State Univerisy
The Hockey Stick Principle for Multinomial Coefficients
Thomas Dickerson, Saint Michael's College
Generating Crystal Lattices with the Octahedral Symmetry Group
Jessica Adams, Saint Michael's College
Knotted Crystals

Contributed Papers Presented at the Fall 2010 Meeting

A Developmental Math Experience with Online Homework
Elizabeth Mathai, Norwich University
An Introduction to Mathematical Visualization
Jacob A. Gagnon, Worcester Polytechnic Institute

Northeastern Section Fall MAA meeting , Project NExT
Fall 2011
Newsletter at http://www.providence.edu/mcs/fpf/maa/

Program Committee

Joseph Fields (chair), Southern Connecticut State University
Ross Gingrich, Southern Connecticut State University
James Langan, New Haven (CT) Public Schools
Kathleen McKeon (local arrangements liaison), Connecticut College

Local Arrangements Committee

Kathleen McKeon (chair), Connecticut College
Eric Johnson, U.S. Coast Guard Academy

Friday, November 18, 2011: NES/MAA Project NExT Program (all full-time untenured faculty are welcome)

12:00 - 1:00 p.m.	**Lunch in Hood Dining Room**
1:00 - 2:00 p.m.	**Moving from Job to Career: Next Steps for the NExT generation** **Rick Cleary, Bentley University** **Hood Dining Room**

56th Fall Meeting pf the Northeastern Section of the MAA

Friday, November 18, 2011	
11:30 - 5:00 p.m.	**Registration Lobby of** **Blaustein Humanities Center**
1:00 – 3:00 p.m.	**Executive Committee Meeting** **Blaustein 207**
2:00 – 4:00 p.m.	**Student Problem Solving Contest** **1941 Room, Williams Student Center**
3:00 – 4:00 p.m.	**Let's Review Undergraduate Linear Algebra by Using Graph Theory** **Jason Moliterno, Sacred Heart University**

4:00 -- 6:00 p.m.	**Student Presentations** **Blaustein**
6:00 – 8:00 p.m.	**Reception and Banquet** **1941 Room, Williams Student Center**
	The Fundamental Theorem of Calculus: History, Intuition, Pedagogy, Proof
8:00 – 9:00 p.m.	**V. Frederick Rickey, USMA, West Point**

Saturday, November 19, 2011

8:00 – noon	**Registration** **Lobby Blaustein Center**
8:00 – 9:00 a.m.	**New Colleagues Talks and Graduate Papers** **Blaustein**
9:00 – 10:00 a.m.	**Editor Lecture: The Dramatic Life of Mathematics** **Steve Abbott**
10:00 – 10:30 a.m.	**Break**
10:30 – 11:30 a.m.	**Christie Lecture: Two (More) Morsels from Euler** **William Dunham**
11:30 – noon	**Business Meeting** **Olin Science Center**
noon – 1:00 p.m.	**Lunch** **1941 Room, Williams Student Center**
1:00 – 5:00 p.m.	**Pedagogy Poster Session** **Ernst Common Room**
1:00 – 2:00 p.m.	**Splendor in the Graphs** **Jennifer Beineke, WNEC, and Lowell Beineke** **Olin Science Center**
2:00 pm – 5:00 pm	**Software Demos** **2:00 GeoGebra (Marie EL-Nabbout)** **2:00 R (Ray Mugno)** **3:00 Mathbuntu (Len Brin)** **3:00 SAGE (Karl Crisman)** **4:00 GAP (Joe Fields)** **4:00 Moodle (Rob Poodiack)**

2:00 pm – 5:00 pm	**History of Math Plays** **Blaustein**
2:00 pm – 3:00 pm	**Contributed Papers** **Blaustein**

Moving from Job to Career: Next Steps for the NExT generation

Abstract: Undergraduate students seeking advice from college career offices are often reminded that they will have the best chance for career success if they can be life long learners. They are told that they should be ready to adapt to new jobs and new careers in response to economic and technological changes. Their faculty, especially in the mathematical sciences, would be well served to follow the same advice. In this presentation we discuss several directions in which faculty careers can move. These include academic leadership and administration, developing new areas of scholarship, consulting, and outreach. We will use some audience participation exercises to expand these areas. Our goal will be to help those present consider how to alter their careers even if they never change jobs.

Let's Review Undergraduate Linear Algebra by Using Graph Theory

Abstract: In an undergraduate linear algebra course, students study the fundamental concepts of basic linear algebra such as determinants, matrix inverses, the cofactor expansion, and eigenvalues. In this talk, we use these notions from undergraduate linear algebra to explore the combinatorial aspects of graph theory. Our goal is to prove the classical Matrix-Tree Theorem. We then apply this theorem to calculate the inverses of certain matrices strictly using combinatorics and counting methods.

The Fundamental Theorem of Calculus: History, Intuition, Pedagogy, Proof

Abstract: The Fundamental Theorem of Calculus (FTC) was a theorem with Newton and Leibniz, a triviality with Bernoulli and Euler, and took on the concept of "fundamental" when Cauchy and Riemann defined the integral. FTC became part of academic mathematics in the 19th century, but waited until the 20th century to take hold in classroom mathematics. We will discuss the transition from clear intuition to rigorous proof that occurred over three centuries.

Editor Lecture: The Dramatic Life of Mathematics

Abstract: Up until the mid 1990s, it was generally assumed that mathematics was off-limits as subject matter for playwrights interested in writing for a popular audience. The critical success of Tom Stoppard's Arcadia, first performed in 1993, changed everything. Since Arcadia, we have witnessed the emergence of a host of successful plays that deal with mathematics and mathematicians in thoughtful and creative ways. Some of the most well-known examples include Proof, by David Auburn, winner of the Pulitzer Prize in 2000, and Copenhagen, by Michael Frayn, which won the 2001 Tony Award for best play.

Beyond these highly celebrated scripts, one can find a rich array of plays that are perhaps even more authentically mathematical. Set at a fictional mathematics conference on the bitter English coastline in the winter of 1911, The Five Hysterical Girls Theorem, by Rinne Groff is a dark comedy about love, genius, aging and priority. In Lovesong of the Electric Bear, Snoo Wilson offers a fanciful, post-modern portrait of the tragic life of Alan Turing. Most recently, A Disappearing Number won the 2008 Olivier Award for Best Play for its dramatization of the fascinating relationship between Hardy and Ramanujan. We will take a first hand look at some of these scripts and explore the complementary ways in which mathematicians and artists carry out their respective searches for truth.

Christie Lecture: Two (More) Morsels from Euler

Abstract: Euler's 2007 tercentenary generated a number of talks about his celebrated mathematical triumphs. Here we examine a pair of lesser-known theorems where his genius was on full display. In the first, we consider Euler's response to the challenge of finding four different whole numbers, the sum of any pair of which is a perfect square. With characteristic ingenuity, he came up with the fearsome foursome of 18530, 38114, 45986, and 65570. We'll look over his shoulder to see how he did it. Moving from number theory to analysis, we examine his summation of the series of reciprocals of squares – i.e., 1 + 1/4 + 1/9 + 1/16 + … -- as presented in his 1755 text on differential calculus. The amazing thing about this derivation is that it used l'Hospital's rule … not once nor twice, but thrice! These two results, which require only elementary mathematics, are reminders of why Euler should be celebrated on his 300th birthday and always.

Poster Session

"Great Moments in Teaching and Learning." Please set up your poster by 1PM. Posters should be self-supporting (e.g. trifolds) -- we will have tables, but not easels, available for your use. Please consider sharing your favorite teaching moments with your colleagues by preparing a poster!

Splendor in the Graphs

Abstract: Graph theory can provide an entertaining analysis of certain games and puzzles. Using elementary results, we will explore brainteasers such as Dots-and-Boxes, Bridg-It, Paradoxical Pennies, and Perplexing Prisoners. That should be preparation enough to set us off on a mathematical sort of safari.

Software Demos

GeoGebra is a free dynamic software that allows interactive explorations in different areas of mathematics (mainly in Geometry and Algebra) and the creation of interactive web-pages. The activities that will be presented will highlight the potentials of the software, which is the main objective of the session. Some of these activities are exploratory activities.

Examples are chosen from Algebra, basic Geometry, and basic Trigonometry. General tips and guidelines on how to use the software and how to create tools will be presented as well.

R Dichotomous response variables are common in Statistics classes. In most cases the Hyper-geometric Distribution is theoretically the correct distribution to use. For problems with a "large" population, the Binomial Distribution is often used instead. How good is the approximation? This presentation will demonstrate how students can explore the differences between the Hyper-geometric and Binomial Distributions, and how those differences change as population size increases. The work can be done utilizing a spreadsheet or R. Both will be shown.

MATHBuntu Come with just the shirt on your back. Leave with 23 (electronic) mathematics textbooks, a computer algebra system, interactive geometry software, MATLAB-compatible software, a complete office suite, a complete LaTeX distribution, and much more. These are not trial versions of the books or software. They are full-text and fully functional. And you can legally distribute copies to your friends, family, colleagues, or students. Use the texts and software in your courses, research, or personal endeavors. I'll show you how to instantly (OK, in 4 minutes) access all of this. Bring your laptop if you want to explore while I speak.

SAGE Many mathematics concepts, such as the Mean Value Theorem, modular exponentiation, and linear transformations, are well illustrated with visual demonstrations. Mathematics software can be the key to help students or faculty really *interact* with such visuals. In this demo, we'll introduce Sage (www.sagemath.org), a powerful free, open-source mathematics program, with an eye toward precisely this sort of interactive use. We'll end with a brief discussion of where to find more information and examples online.

GAP (Groups, Algorithms and Programming) is an extremely powerful CAS designed for and by researchers in Abstract Algebra. GAP is open source software which is supported and actively developed by a large team of Mathematicians and Computer Scientists. This demo session will focus on using GAP in the classroom setting. Among others, Hulpke and Rainbolt have shown the advantages of using GAP to help students develop their intuition -- giving them the opportunity to use the computer to explore. Students can develop many more examples (and more in-depth examples) using the computer to do the "heavy lifting."

Moodle is an open-source course management system that is particularly well-suited to use in mathematics courses. We will demonstrate ways of organizing a course (online or face-to-face), entering math notation into Moodle, as well as how to accomplish some online assessment of your students.

Frank Ford
Newsletter Editor
Dept of Math/CS
Providence College
Providence, RI 02918