

NORTHEASTERN SECTION



NEWSLETTER

Spring 2010

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UPCOMING SECTION MEETING

June 11 and 12, 2010 Spring Section Meeting
Salve Regina University, Newport, RI
Program Committee: Lisa Humphreys (chair), Rhode Island College
Robert Poodiack, Norwich University
Eric Johnson, US Coast Guard Academy
Ryan Mullen.
Local Chairs: Ernest Rothman, Salve Regina University
William Stout, Salve Regina University

FUTURE SECTION MEETINGS

Fall 2010: Providence College, Providence, RI

OTHER ACTIVITIES

June 11, 2009 Section NExT Meeting
Salve Regina University, Newport, RI

COORDINATORS

Dinner Meetings: Lucy Kimball
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Karen Stanish, Keene State College
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Contributed Papers: Eric Johnson, US Coast Guard Academy
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Message from the Chair.....Rob Poodiac

Happy Spring ... I think ... up here in northern Vermont, every time in the past few months we've thought that spring might be here, we get another foot of snow!

My name is Rob Poodiack from Norwich University, and this is my first newsletter as Chair of the Section. I officially became chair back in November at the end of the Fall Meeting as Jason Moliterno's term concluded. We all owe Jason a debt of gratitude for all the hard work he put in as Chair, and for the work he continues to put in as Past Chair. It's been comforting to know he's just an e-mail away ... and that he hasn't yet relegated me to his spam list!

The Fall Meeting at Western New England College was a rousing success, a great mix of excellent speakers and wonderful facilities and food! A big thank you goes to program chair Jennifer Beineke at WNEC and her program committee: Lauren Brewer and Vanessa Hill (Springfield Technical Community College), Sharon Frechette (Holy Cross), Tom Hull (WNEC), and Rachel Schwell (Central Conn. State Univ.). Kudos as well to the WNEC folks who worked out the local arrangements: Ann Kizanis (chair), Tom Hull, and Dick Pelosi.

Thanks also to Karen Stanish for organizing the Section NeXT portion of the meeting and to Karl-Dieter Crisman for introducing our Section's newest faculty to the free Sage software.

My duties as chair have forced me to give up some jobs I've enjoyed, but our section has always had a wealth of great volunteers. I rest easy knowing that Eric Johnson from Coast Guard Academy has taken over as Contributed Papers Coordinator and that Jenn Berg (Fitchburg State) and Joe Fields (Southern Conn. State Univ.) have taken over as coordinators of the NES/MAA Collegiate Math Competition. Jenn and Joe did a fantastic job at the fall meeting, getting 22 teams of two or three students from all over the Section to compete.

The upcoming Spring Meeting at Salve Regina University has a lot to live up to after the WNEC meeting, but that won't be a problem with Lisa Humphreys as program chair. She and her committee have put together an enticing program featuring, among others, former Polya lecturer Ed Burger of Williams College on how to win at limbo, and Kevin Short from UNH on the possibility of a mathematician at the Grammy Awards.

One great highlight from the Fall Meeting at Western New England College was

online registration. We hope to have online registration as a permanent feature for our meetings, and should have it ready for the Spring Meeting by the time you receive this newsletter. You'll be able to find information at our Section website: <http://www.maa.org/northeastern>.

We will also present the 2010 NES/MAA Award for Distinguished College/University Teaching to Susan Loepp of Williams College at the meeting.

Message from the Secretary-Treasurer Ann Kizanis

In the fall newsletter, I reported a balance of \$22,596.01. Since that time, the expenses from the successful fall meeting at Western New England College were \$5,837.69. We also spent \$325.00 on Student Awards for the Problem Solving Contest. The reimbursements for travel totaled \$841.00. The total expenses for the fall meeting were \$7,003.69, while the revenue from meeting registrations was \$7,581.51. The expenses for the printing and postage of the fall newsletter totaled \$1,255.90. Moreover, we earned \$27.88 in interest from money placed into a money market account, since the last newsletter. Our present balance is \$21,945.81.

The total expenses for our fall meeting were \$3,395.40 more than our spring meeting expenses, while the revenue from fall meeting registrations was \$5,215.51 more than the revenue from spring meeting registrations. The expenses for the postage and printing of our newsletter last fall increased slightly from last spring. We spent \$913.01 for the printing and postage of the spring 2009 newsletter and \$1,255.90 for the printing and postage of the fall 2009 newsletter.

In February, I wrote and submitted our Section's 2009 end of year Financial Report, and at the beginning of the summer, I shall be writing our section's Annual Report.

That is my update for now! We are all looking forward to the Spring MAA meeting at Salve Regina University on June 11-12, where I will update you further on our finances.

I wish you all a very enjoyable spring semester!

Two-year College Representative's ReportPhil Mahler

The big news for two-year college section members this year is that the annual AMATYC meeting will be in Boston in November (<http://www.amatyc.org>). Many members are gearing up to assist at this four-day meeting. Of course this is of interest to many four-year college members as well, as they find themselves doing more and more remedial work, and thinking about the calls for curriculum change voiced in AMATYC's Crossroads document (<http://beyondcrossroads.amatyc.org/>) , MAA's CUPM report (http://www.maa.org/cupm/curr_guide.html), and other places.

From the Newsletter Editor Frank Ford

Starting in June, we enter the “Rhode Island year” for the Northeastern Section of the MAA with the June 11 and 12th Spring meeting at Salve Regina University and the Fall meeting at Providence College. To top it off, Lisa Humphreys of Rhode Island College is the chair of the program committee for the Spring meeting. So come on down to our little state and have some clam cakes with your grinder and top it off with a coffee cabinet. You never know what creative events will occur at our meetings. At Western New England last Fall, we had student presentations in the form of short plays from students at Wheaton. The presentations are in the list below. It was an innovative way to get students interested in Mathematics and we enjoyed it. Who knows what we will have next?

Student Presentations at the Fall 2009 Meeting

Coexistence of Stable ECM Solutions in the Lang-Kobayashi System

Ericka Mochan, Western New England College

Counting and Comparison

Catherine Howes, Western New England College

Catalan Numbers are Everywhere!

Leigh Pratt, Western New England College

Integrating Graphs, Colorfully!

Marci Egbert, Alexis Lazarus, Amy Lindquist, Western New England College

Mathematics Magazine Problem #1811: Right Prime Rings

Joseph Fredette, Worcester State College

Symmetrization and the Isoperimetric Problem

Nate Harman, University of Massachusetts Amherst

Additive Linear Optimization Problem with Application to Queuing Network Control

Lauren Meitzler, Gordon College

Simulation-Based Function Approximation in Approximate Linear Programming

Lauren Berger, Gordon College

Determining the Determinant using Graphs

Zach Haney, Wheaton College

Proofs That Really Count

Kalani Efstathiou, Sacred Heart University

Haga Origamics: Extending Patterns

Stephanie Clapp, Fairfield University

Business Card Modulers

Alessandra Fiorenza, Fairfield University

How Many Numbers Have Ones?

James Maples, Western New England College

Socratic Methods of Mastering Mathematics and 'Moore'

Eric Drewniak, Christina Nelson, Marie Tolan, Wheaton College

A Sequence of Fibonacci Events

Eunice Bang, Rebecca Johnson, Danielle Phinney, Wheaton College

For the Love of Math and Physics: A conversation between Emilie du Chatelet and Voltaire

Lauren Dupee, Aurelie Marcotte, Ellen Perkins, Wheaton College

I Don't Want to Do Math: The Inner Struggle of Maria Agnesi

Abigail Erle, Tracey Lally, Aubrie Pace, Wheaton College

Pythagoras: The Man Behind the Math

Jill Boucher, Stephanie Jones, Allison Mehlhorn, Wheaton College

Contributed Papers Presented at the Fall 2009 Meeting

The Borda Count, the Kemeny Rule, and the Permutahedron

Karl-Dieter Crisman, Gordon College

Bite-sized Exams in Pre-calculus and Introductory Statistics

Maria Fung, Worcester State College

Teaching Mathematics in Colonial America

Marina Vulis, USMA Prep School

Another Inductive Proof of the Condition for the AM-GM Inequality

Carl Barratt, University of New Haven

Asymptotics of Height Pairing and Local Intersection Number

Bin Wang, Rhode Island College

Proofs of Decisiveness for New Connection Games

David Molnar, University of Connecticut

Quantitative Literacy Across the Curriculum

Semra Kilic-Bahi, Colby-Sawyer College

New Ways of Visualizing Sums

How Random are the Digits of Square Numbers?

Roger Bilisoly, Central Connecticut State University

The Analysis of Fixed Points in Private Key Ciphers

Annela Kelly, Roger Williams University

Risk and Discount Points

Brian Kelly, Bryant University

Role of Math in Science Paradigm

S. Pal Asija, CEO of Our Pal, LLC

Growth of the Number of Rational Periodic Points Under Iteration of Quadratic Maps

Benjamin Hutz, Amherst College

Fractal differential equations

Joseph E. Fields, Southern Connecticut State University

New Colleagues Talks Presented at the Fall 2009 Meeting

Introduction to Planar Algebras

Emily Peters, University of New Hampshire

How Low Can We Go? Lower Order Terms in CLTs from Benford's Law to Elliptic Curves

Steven J. Miller, Williams College

New Evidence for Popescu's Stark-Type Conjecture "over Z "

Jason Price, Nichols College

Global Function Fields and the Ihara Function

Laura Hall-Seelig, Merrimack College

Inverting Fundamental Equations from Neuroscience

Dylan Shepardson, Mount Holyoke College

From the Colleges returns in the Fall 2010 Newsletter

You can start sending information to fpford@providence.edu now.

Northeastern Section NExT at Fall Meeting.....Karen Stanish

Friday, June 11, 2010:

12:00-1:00PM Lunch

1:00-2:00PM How NOT to be the center of attention

Tommy Ratliff, Wheaton College, MA

The Northeastern section will be holding a Section NExT program for new and relatively new colleagues at this year's fall section meeting. By providing talks and workshops on issues of interest, opportunities to meet and share ideas with other new colleagues, and an introduction into Section activities, we hope to assist new faculty in their transition from graduate school to professional academic life. **We welcome all untenured full-time faculty, both those who have and have not been National NExT fellows.**

Lunch will be provided for the Section NExT program, and **the meeting registration fee will be waived for all Section NExT participants.** To register for the Section NExT program, you should contact Karen

Stanish, and you should fill out the preregistration form for the meeting and check off that you will be attending the Section NExT program. Her contact information is:

Karen Stanish
kstanish@keene.edu
Department of Mathematics
Keene State College
(603) 358-2587

Abstract: One of the main goals in all of my classes is that I want my students to become independent learners of mathematics; I do not want them to view me as their sole source of mathematical content for the course. In this talk, I will discuss some of the strategies that I have used to try to meet this goal, including reading assignments, group writing projects, and the structure of the class meetings. There will be plenty of time for participants to share their own experiences and to discuss how any of these approaches may be applicable to their own classes.

Bio of presenter: Tommy Ratliff is a Professor of Mathematics at Wheaton College, where he has been since 1996. His graduate work at Northwestern University was in algebraic topology, but his research has been in voting theory for the past decade. He is a former chair of the Northeastern Section and is co-author of the MAA publication *Crushed Clowns, Cars, and Coffee to Go . . . Writing Projects for Mathematics Courses*.

3:00PM Section Meeting Begins

NES/MAA Award for Distinguished College/University Teaching of Mathematics

Susan Loepp of Williams College wins Distinguished Teacher Award

(Editor's note: I wish to thank the Williams College Public Relations office for supplying some of the details in this note. Professor Loepp will receive her award at the Spring meeting at Salve Regina. She will speak at the Fall meeting at Providence College.)

Jason Moliterno, chair of the committee to select this year's distinguished teacher, is happy to announce that Professor Susan R. Loepp of Williams College won the award and becomes eligible to win the Haimo award given by the national MAA each year. Professor Loepp is the fourth winner from Williams College to receive the Section's award since its inception in 1992. At Williams since 1996, Loepp teaches Applied Abstract Algebra, Algebraic Error-Correcting Codes, and Galois Theory and Modules. She is an authority on commutative algebra. Her research has appeared in the Journal of Algebra and the Journal of Pure and Applied Algebra, among others. She received the Williams College 2001 Faculty of the Year Award, which is presented by the student body. When she was in graduate school, she was recognized four times for excellence in teaching. Loepp received her B.A. and B.S. from Bethel College in Kansas, and her Ph.D. in mathematics from the University of Texas at Austin. She received the 2007 Young Alumnus Award from Bethel. Before coming to Williams, she taught at the University of Nebraska.

Call for Undergraduate Presentations

Undergraduate students from the Northeastern Section are invited to present talks at the fall meeting on topics in mathematics, statistics, or computer science. The presentations should be 10 minutes in length, on expository work, research projects, employment experiences, or problems from mathematical periodicals. The registration fee and cost of meals will be waived for one student presenter per paper. Interested students should submit:

- the title of the presentation,
- an abstract of no more than 80 words,
- full name,
- email address,
- mailing address,

- college/university affiliation,
- indication of desire to attend the Friday Banquet, the Saturday lunch, or both,
- the name and email address of a faculty sponsor,

to Raimundo Kovac, rkovac@ric.edu, or Julie Levandosky, jlevandosky@frc.mass.edu; please use “NES/MAA Undergraduate Student Paper Session - Submission” for the subject line. The deadline for abstract submissions is May 28th. Presenters must also have their registration submitted to Salve Regina University.

Call for Contributed Papers and Graduate Student Papers

Participants at the Spring Meeting of the section are invited to submit contributed papers. We are particularly interested in papers which will appeal to a variety of participants. If you are planning to speak about results of your research, keep in mind that the audience most likely will not be familiar with your specialty, so you will want to give some motivation and context for your work. Your presentation should be approximately 15 minutes in length. Please send an abstract and your mailing address together with a list of any special equipment you may need to Eric Johnson at Eric.C.Johnson@uscga.edu. E-mail submissions are preferred, but you may also send a typed submission to

Eric C. Johnson
U.S. Coast Guard Academy
Mathematics Department
15 Mohegan Avenue
New London, CT 06320

The deadline for submission of abstracts for the Spring 2010 Meeting at Salve Regina University is May 28th, 2010.

Presenters must also have their registration submitted to Salve Regina..

**SALVE REGINA UNIVERSITY,
NEWPORT, RI**

Meeting web site: <http://www.salve.edu/maa2010/>

Friday, June 11, 2010

11:30-5:30	Registration	O'Hare, lobby
Noon-3:00	Section NExT (with lunch)	O'Hare 106
3:00- 3:50	Engaging Liberal Arts Mathematics Students Through Examples From Statistics	O'Hare 160
	David Abrahamson & Rebecca Sparks, Rhode Island College	

Beginning with 19th-century records of hits, runs, and errors, statistical measures from the world of sports have always appealed to fans. Recently, the number of measurements available to the fan has exploded, ranging from surprisingly useful things like some of baseballs sabermetrics to silly numbers like pro footballs passer rating. Several examples from the mushrooming collection of statistical commentary on sports will be discussed, with an eye to how they can fit in general education mathematics courses.

4:00-4:50	Green Operations Research at the US Coast Guard Academy and Beyond	O'Hare 160
	Ian Frommer, US Coast Guard Academy	

The use of quantitative methods as an aid in decision-making, has long been applied to energy and environmental areas. It is playing an increasingly important role in the challenges of sustainability such as green-house gas reduction, renewable energy, and waste flow and is particularly well suited for undergraduate research projects of a practical and local nature. In this talk I give an overview of work undertaken in "Green OR" and then discuss undergraduate projects I have advised on waste flow optimization, hazardous material reduction, and sustainable lighting. These projects combined OR techniques such as multi-objective linear programming and mixed-integer programming with some common-sense human considerations. I close with suggestions for

similar projects that can be undertaken by others at their own institutions.

5:00-6:00	Student Papers O'Hare 106, 107, 121, 228, and 229.
6:00-6:30	Reception Ochre Court, first floor
6:30-7:30	Dinner & Teaching Award Presentation Ochre Court, first floor
7:4-8:45PM	A Mathematician at the Grammys? O'Hare 160 Kevin Short, University of New Hampshire

This talk will look at the mathematics underlying the analysis of music signals, and how ideas like the uncertainty principle, convolution, partitions of unity, and the (fast) Fourier transform naturally arise in the analysis. Applications to music decomposition, compression and repair will be considered. Some examples will be shown of the work on restoring a 1949 Woody Guthrie wire recording that resulted in a Grammy award in 2008. Other examples may include real-time playback of layered decompositions of music, tracks from a compressed chaotic music synthesizer, and image and video compression. Some related mathematical concepts will be presented if time allows.

Saturday, June 12, 2010

8:30-11:00	Registration	O'Hare, lobby
9:00-9:50	An Introduction to Design Theory	O'Hare 160 Stephanie Costa, Rhode Island College

We are all familiar with the famous Bridges of Konigsberg problem, introduced by Leonhard Euler, which led to the development of the branch of mathematics known as graph theory. Closely related to graph theory is a branch of mathematics known as design theory. We will look at some famous problems in recreational mathematics that can be solved using design theory, such as Kirkman's schoolgirl problem and a variation of Euler's 36 officer problem. We will see how designs can be used to construct balanced statistical experiments and tournaments. Finally, we will

talk about some recent results and current research in design theory.

10:00-10:30 Break

10:30 11:20 Check Digits ` O'Hare 160
Keith Conrad, University of Connecticut

Numerical codes, such as credit card numbers, ISBNs on books, and VINs on cars, are ubiquitous. Nearly all of these codes come with a special number, called the check digit, whose purpose is to prevent the codes from being incorrectly processed. We will explain the mathematics behind the design of some of these check digit protocols and see how they are capable of detecting (or not detecting) certain kinds of errors.

11:20-11:45 Business Meeting O'Hare 106

Noon - 1:15 Lunch Miley Cafeteria

1:15-2:05 Battles Lecture: How Always to Win at Limbo
Ed Burger, Williams College O'Hare 160

Remember in your days of first-love how you would dream about that special someone and wonder to yourself: "How close are we?" This presentation will answer that question by answering: What does it mean for two things to be close to one another? We'll take a strange look at infinite series and dare to mention a calculus student's fantasy. We'll even attempt to build a series that can be used if you ever have to flee the country in a hurry: we'll either succeed or fail... Will you be at the edge of your seats? Perhaps; but if not, then you'll probably fall asleep and either way, after the talk, you'll feel refreshed. No matter what, you'll learn a sneaky way to always win at Limbo.

2:15-3:15 Contributed Papers

O'Hare 106, 107, 121, 228, and 229

Questions?

Have questions? Send an email to one of the below people.
Ernest Rothman at rothman@salve.edu or
William Stout at stout@salve.edu.

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