

THE SEAWAY CURRENT

Newsletter of the Seaway Section of the Mathematical Association of America

Volume 38, Number 2

Spring, 2015

Our 75th birthday meeting, April 17-18, will be hosted by Colgate University.

This meeting celebrates the 75th birthday of the Seaway Section – as well as the 100th anniversary of the MAA. For several years prior to the establishment of the Seaway Section, the mathematics departments of Colgate University, Syracuse University and Hamilton College got together twice a year on a Saturday afternoon. Professor W. B. Carver of Cornell University, MAA president from 1939 to 1940, contacted association members at several New York State Universities to probe whether there was interest in establishing a section of the MAA. Professor C. W. Munshower of Colgate University contacted the mathematics departments of all colleges in the state inviting them to an organizational meeting. This meeting was held at Colgate University on Saturday Math 11, 1940, with 96 attendees including 43 MAA members. At the business meeting it was agreed to formulate a petition to the board of governors of the MAA to establish a section. So for our 75th birthday we are returning to the place where it all began. We even have a meeting T-shirt for our celebration.

Thanks to Colgate University for hosting our 75th birthday meeting this Spring!



Meeting Highlights

The speakers in our line-up for this meeting need little introduction.

Fittingly, our banquet speaker is our current governor, Dr. Gary Towsley of SUNY Geneseo, who will talk about what has changed and what has not changed in the Seaway section over its seventy-five year history, putting this in the context of the changes in higher education over this same time-span.

On Saturday morning, Dr. Jeffrey Weeks, freelance geometer and 1999 recipient of a MacArthur Fellowship, will kick off the program, using computer games and 3D graphics to introduce the concept of a multi-connected universe and to explore some possible shapes of space. He will end with some tantalizing clues provided by satellite imagery about the actual shape of our universe. Dr. Weeks will also run a workshop on Saturday afternoon: Visualizing Four Dimensions.

Our romp through space will be followed by a romp through the Mandelbrot set, under the expert guidance of Dr. Robert Devaney of Boston University. Dr. Devaney has an extraordinary record of research, teaching, speaking, writing and outreach in the field of dynamical systems, and has been given numerous awards for his work. As past-president of the MAA, he is visiting our section as a representative of the executive committee of the national MAA.

Our Gehman lecturer is no less illustrious: Dr. Jon Kleinberg, of Cornell University, will speak on *Bursts, Cascades, and Hot Spots: Mathematical Models of the Online World*. Dr. Kleinberg's expertise is in the field of algorithms and networks, with specific focus on the social and information networks that underpin the Web and other on-line media. Dr. Kleinberg too is a recipient of MacArthur fellowship. He is the author of the ground breaking 2010 book: *Networks, Crowds and Markets: Reasoning about a Highly Connected World*.

There is Seaway NExT workshop on Friday afternoon, with theme *What is Mathematics Now?* (For more information contact Seaway NExT chair, Matt Koetz: mkoetz "at" naz.edu.) On Saturday afternoon, in addition to Dr. Weeks' workshop, there will be a discussion on preserving and writing the history of mathematics departments in US colleges and universities (organized by Toke Knudsen of SUNY Oneonta, and Gary Towsley). There will also be a workshop in which participants will watch and discuss videos of an IBL introductory linear algebra class (organized by Dr. Xiao Xiao of Utica College, a participant in the Upstate New York Inquiry Based Learning consortium). And of course there are contributed talks, a student program (including a game show on Friday night), and a group effort to construct a mathematical sculpture, specifically a George Hart designed Do-Deck-ahedron!

More details can be found in what follows (including, at the end of this newsletter, abstracts for all contributed talks, and the full meeting program.)

The MAA Seaway section is celebrating its 75th birthday in style!

The Speakers:



Gary Towsley, SUNY Geneseo (Friday Banquet):

75 Years of Seaway

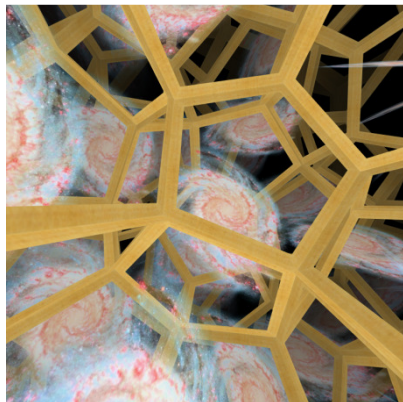
Abstract:

The name Seaway Section actually hasn't been around for 75 years. It reflects just one of the many changes in the section since it was formed. We will look at how the section has changed and how it has remained the same, and how it has mirrored the changes and continuities of higher education over the last three quarters of a century.

Biography:

Gary Towsley was born in Western New York many years ago and has spent all but four years of his life in the region. The last 41 have been in the village of Geneseo as a Professor of Mathematics at the State University of New York at Geneseo. His love of Mathematics began in kindergarten and has led to a Ph.D. in Compact Riemann Surfaces from the University of Rochester and a long career as a teacher of Mathematics. His teaching has been rewarded with the MAA's Haimo Award for Distinguished Teaching and being named by the Princeton Review as one of America's Best 300 Professors. He has served the Seaway Section as Governor, Chair, and Treasurer.

Jeffrey Weeks, Freelance Geometer : The Shape of Space



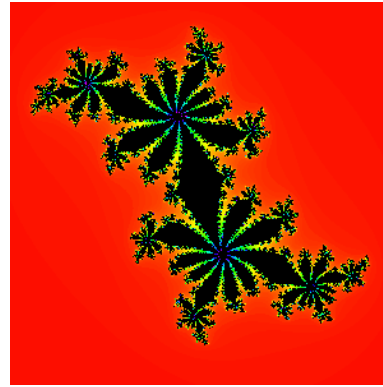
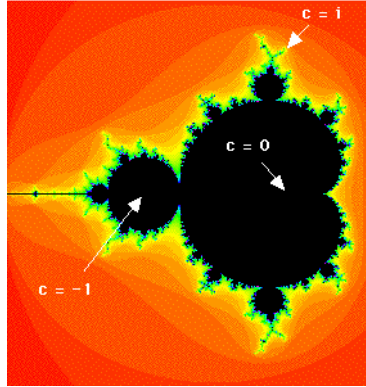
Abstract:

When we look out on a clear night, the universe seems infinite. Yet this infinity might be an illusion. During the first half of the presentation, computer games will introduce the concept of a “multiconnected universe”. Interactive 3D graphics will then take the viewer on a tour of several possible shapes for space. Finally, we'll see how satellite data provide tantalizing clues to the true shape of our universe. The only prerequisites for this talk are curiosity and imagination.

Biography:

Jeff Weeks fell in love with geometry in 12th grade when he read the book Flatland. While an undergraduate at Dartmouth College he bounced back and forth between math and physics, eventually settling on math and going on to study topology at Princeton University with Bill Thurston and his students, whose colored-chalk approach to mathematics Jeff loved. After teaching at Ithaca College, Jeff resigned to be a full-time Dad for several years. From there he became a free-lance geometer, at first part-time, then full-time. He enjoyed extensive work with the Geometry Center and the NSF as well as smaller gigs for science museums and teaching at Middlebury College. In 1999 an unexpected phone call brought a MacArthur Fellowship: five years of unfettered work on the topology of the universe, along with time to develop educational materials for middle schools and high schools. Jeff is currently working on Android and iOS versions of his 2- and 3-dimensional software, while writing new apps to help people learn to visualize four dimensions.

Robert Devaney, Boston University (MAA Past President): The Fractal Geometry of the Mandelbrot Set



Abstract:

In this lecture we describe several folk theorems concerning the Mandelbrot set. While this set is extremely complicated from a geometric point of view, we will show that, as long as you know how to add and how to count, you can understand this geometry completely. We will encounter many famous mathematical objects in the Mandelbrot set, like the Farey tree and the Fibonacci sequence. And we will find many soon-to-be-famous objects as well, like the “Devaney” sequence. There might even be a joke or two in the talk.

Biography:

Robert L. Devaney is currently Professor of Mathematics at Boston University. He received his undergraduate degree from the College of the Holy Cross in 1969 and his PhD from the University of California at Berkeley in 1973 under the direction of Stephen Smale. His main area of research is dynamical systems, primarily complex analytic dynamics, but also including more general ideas about chaotic dynamical systems.

He is the author of over one hundred research papers in the field of dynamical systems as well as a dozen pedagogical papers in this field. He is also the (co)-author or editor of fourteen books in this area of mathematics. Professor Devaney is involved in the [Boston University Ordinary Differential Equations Project](#) with Paul Blanchard and Glen R. Hall. This National Science Foundation project is an attempt to revitalize the sophomore level ordinary differential equations course by including material from dynamical systems theory in all aspects of the course. Professor Devaney has delivered over 1,500 [invited lectures](#) on dynamical systems and related topics in all 50 states in the US and in over 35 countries on six continents worldwide. He has also been the “Chaos Consultant” for several theaters’ presentations of Tom Stoppard’s play *Arcadia*. And, in 2007, he was the mathematical consultant for the Kevin Spacey movie “21”.

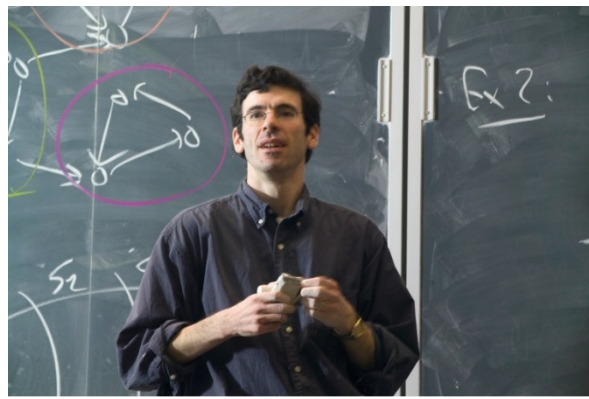
In 2013-15, he served as the President of the Mathematical Association of America. Now, in 2015-16, he is serving as Past President of the MAA.

He has received the MAA Deborah and Franklin Tepper Haimo Award for Distinguished University Teaching, the National Science Foundation Director’s Award for Distinguished Teaching Scholars, the ICTCM Award for Excellence and Innovation with the Use of Technology in Collegiate Mathematics, and the Trevor Evans Award from the MAA for an article entitled “[Chaos Rules](#)” published in *Math Horizons*. In 2004 he was named the Carnegie/CASE Massachusetts Professor of the Year. In 2009 he was inducted into the Massachusetts Mathematics Educators Hall of Fame. He has also been named the Feld Family Professor of Teaching Excellence at Boston University and a Fellow of the American Mathematical Society.

Since 1989 he has been director of the National Science Foundation’s [Dynamical Systems and Technology Project](#). The goal of this project is to show students and teachers how ideas from modern mathematics such as chaos, fractals, and dynamics, together with modern technology, can be used effectively in the high school and college curriculum. As part of this project, Professor Devaney and his students and colleagues have developed

numerous computer programs for exploring dynamical systems. He has also produced the [Mandelbrot Set Explorer](#), an on-line, interactive series of explorations designed to teach students at all levels about the mathematics behind the interesting images known as the Mandelbrot and Julia sets.

Jon Kleinberg, Cornell University (Gehman Lecture): Bursts, Cascades, and Hot Spots: Mathematical Models of the Online World



Abstract:

As an increasing amount of social interaction moves online, it becomes possible to study phenomena that were once essentially invisible: how our social networks are organized, how groups of people come together and attract new members, and how information spreads through society. With computational and mathematical ideas, we can begin to map the rich landscape that emerges, filled with "hot spots" of collective attention, and behaviors that cascade through complex networks of social connections.

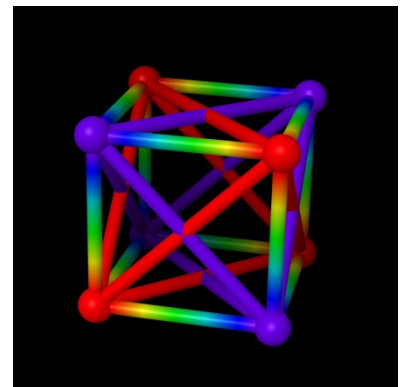
Biography:

Jon Kleinberg is the Tisch University Professor in the Departments of Computer Science and Information Science at Cornell University. His research focuses on issues at the interface of networks and information, with an emphasis on the social and information networks that underpin the Web and other on-line media. He is a member of the National Academy of Sciences and the National Academy of Engineering, and is the recipient of awards including a MacArthur Fellowship, the Nevanlinna Prize, the Harvey Prize, and the ACM-Infosys Foundation Award in the Computing Sciences.

Special events

Assembling Faces at the Seaway Section (Elizabeth Wilcox)

A dodecahedron is a three-dimensional platonic solid with 12 faces, each shaped like a regular pentagon. George Hart designed an artistic variation on the traditional dodecahedron, called the Do-Deck-ahedron using playing cards. Come work with others to build a Do-Deck-ahedron-based sculpture using cardstock, chipboard, or even playing cards. The materials will be provided.



Workshop: Visualizing Four Dimensions (Jeffrey Weeks)

This workshop will introduce a method for learning to visualize 4-dimensional space, give participants a chance to work on some 4D visualization exercises in small groups, and then present a few solutions using interactive 4D graphics software. The exercises range from elementary to advanced, so everyone from first-year undergraduates to seasoned geometers should find something they like.

Session on Preserving and Writing the History of Mathematics Departments in US Colleges and Universities (organized by Toke Knudsen and Gary Towsley)

Many mathematics departments at US colleges and universities have long and interesting histories, including the presence of notable faculty members. However, these histories are often not well known, and many details are prone to get lost over time (stories only known orally by senior people, information lost when department minutes are purged, information never recorded, and so on). This session intends to provide inspiration for researching and writing the history of a local mathematics department. The session will run 2:30-4:15 p.m. The first hour will feature three talks, after which there'll be discussion.

The session's three speakers are:

John McCleary, Vassar College

Cheryl Miller, SUNY Potsdam

Bob Rogers, SUNY Fredonia

Inquiry-based Learning Classroom Video Workshop (organized by Xiao Xiao)

During the one-hour video discussion session, we will watch a few short video clips of an introductory linear algebra course taught in an inquiry-based learning setting. The video clips are taken at various stages of the semester so we can observe how student participation evolves as the semester progresses. After each video, we will have round-table discussions and share our thoughts on how instructors can effectively help students tackle difficulties in various situations. We will also see an example of how students can collaboratively work out a (relatively hard) problem under proper guidance and discuss how and when instructors should offer help during this process. We welcome IBL users at all levels as well as non-IBL users to join us. This video session is organized and supported by the Greater Upstate New York Inquiry-Based Learning Consortium.

REPORTS

1. Minutes of the Executive Committee Meeting, Alfred University, October 10, 2014 – Gary Raduns

Present: Charlie Raggozine, John Maceli, Gary Towsley, Gary Raduns, Ryan Gantner, Jonathan Cox.

Scheduled start: October 10, 2014, 3:00 P.M.

Minutes of the Spring 2014 meeting were approved with a spelling correction.

Chair's Report: None.

Governor's Report: Gary Towsley was not able to attend the Governor's Meeting at MathFest. There was very little activity to report from the meeting. The Association's operating deficit has been reduced to approximately \$100K per year in part through combinations of outsourcing and insourcing. There was continuing discussion of how to make the Board of Governor's meetings more effective since much of the work is *pro forma* and the costs of the meetings is approximately the operating deficit. The Governors received a preliminary report from the CUPM.

Secretary's Report: The Section Officer's Meeting focused on the Centennial Celebration of the Association and discussion of the question: What if you couldn't have a meeting? The question is meant to encourage us to continue thinking about the purpose/mission of the Section(s). Is it just to have a meeting? If not, how else do we fulfill the mission?

Treasurer's Report: The treasurer reported proceeds from book sales following the spring meeting of \$230, but a net loss of \$581.33 on the spring meeting (excluding book sale proceeds). Nonetheless, including book sale and subvention the balance grew from \$15,230.35 on 3/1/2014 to \$16,138.00 on 9/15/2014.

1st Vice Chair: As of October 3 there were 117 registered for this meeting, 63 faculty, 53 students, and one from Business/Industry/Government. Keynote speakers at this meeting include George Hart, Carol Schumacher (Randolph Lecture), Joel Foisy, and Mark McKinzie. There will be a tribute to L.C. Kappe at the banquet. The Spring 2015 meeting will be held at Colgate University. The spring meeting will commemorate the 75th Anniversary of the Section (and the 100th Anniversary of the Association). Keynote speakers will include Gary Towsley on the history of the Section, MAA President Bob Devaney, Jeffrey Weeks, and the Gehman Lecture by John Kleinberg. Additional highlights will include a display of historical artifacts from the section. In 2015-16 we are eligible for a Polya lecture (Bill Dunham or Erica Flappan). Preliminary information on future sites: Fall 2015 at Saint Lawrence University and Spring 2016 possibly at RIT.

The Executive Committee heard a brief update on SUNY Seamless Transfer. Discrete Mathematics has been removed from the list, but Linear Algebra and Differential Equations are now included.

Additional topics of discussion included: endorsing by consensus the continuation of a chair's workshop at future meetings, soliciting designs for a commemorative t-shirt for the spring meeting, nominations are being sought for Section Governor. There was also discussion of means to increase participation in Section and National meetings including waivers, additional support for the Governor, and support for an officer's representative at the Joint Math Meetings.

John Maceli indicated that he will be joining the Association's Committee on Sections in January.

The session moved seamlessly to the Extended Executive Committee.

2. Minutes of the Executive Committee Meeting, Alfred University, October 10, 2014 – Gary Raduns

Also in attendance: Marlo Brown and Jane Cushman.

Minutes of the April 2014 Extended Executive Committee meeting were approved.

The program committee repeated the essence of their report to the Executive Committee (see above).

The student program committee reports approximately 50 students registered to attend and 13 student talks.

The Randolph Lecture Committee reminded us that Carol Schumacher will present the Randolph Lecture at this meeting and has been meeting with Seaway NExT/PFF presenting on IBL.

The Gehman Lecture Committee reports the selection of John Kleinberg as the Gehman lecturer for the Spring 2015 meeting at Colgate University.

The Educational Policies Committee had nothing to report.

The Distinguished Teaching Award Committee is seeking nominations.

The Nominating Committee consisting of Bob Rogers, John Maceli and Margaret Morrow is seeking nominees for Governor. Jim Conklin has accepted and the committee is awaiting a response from Joel Foisy.

The Seaway Current newsletter editor reports that the Newsletter is up and posted on the section web site. She is always pleased to include news or articles.

The Seaway NExT/PFF will have a session tomorrow run by Jeff Johannes.

The Webmaster requests updated information for the Executive Committee on the website.

Review of venues: Spring 2015 at Colgate University to mark the 75th Anniversary of the Section. Fall 2015—discussions are ongoing with St. Lawrence University.

SUNY Seamless Transfer Update: Discrete Mathematics is off the list. Linear Algebra and Differential Equations are on.

Jeff Johannes brought a programming suggestion from Patrick Rault that we consider a better way to “end” the meetings—perhaps closing with an invited speaker. The suggestion brought extended discussion but little resolution.

The session closed with open-ended discussion of possible means to commemorate the anniversary—interviewing long-term members, bonus features, magnets, t-shirts.

The Extended Executive Session adjourned at 5:34.

2. Minutes of the Business Meeting, Alfred University, October 11, 2014, 10:40 A.M. – Gary Raduns

Approximately 20 members in attendance.

The Program Committee Chair gave highlights to expect at the 75th Anniversary Meeting at Colgate University including speakers: Bob Devaney, John Kleinberg, Gary Towsley, and Jeffrey Weeks.

The Randolph Lecture will be given later today by Carol Schumacher. The Gehman Lecture Committee has selected John Kleinberg to give the Gehman Lecture at the Spring meeting.

There is nothing to report from the Educational Policies Committee.

The Nominations Committee is working on nominations for Governor.

The editor of the Seaway Current is looking for news to publish.

The webmaster was not present.

Chair, Charlie Raggozine

- Sought comment on potential dates for a Fall meeting at St. Lawrence University (possibly as late as the first week of November).
- Gave an update on SUNY Seamless Transfer (Discrete Mathematics is removed, Linear Algebra and Differential Equations are included).
- Indicated t-shirts commemorating the 75th Anniversary of the Section and 100th Anniversary of the Association will be available, and possibly some commemorative token.

Gary Towsley, Treasurer, reports balances prior to the spring 2014 meeting (\$15,230.36) and prior to this meeting (\$16,138.00). He particularly noted \$230 proceeds from the sale of books at and following the meeting. With a healthy balance to work with, he solicited suggestions for how to spend some money: suggestions from the floor included providing 1 year memberships, nice tokens, donation to Project NExT and/or providing some subsidy for Fellows from our Section, additional travel funds for Governor or representatives to Section Officers meetings at the Joint Math Meetings and MathFest, paying mileage for invited speakers.

The meeting adjourned at 10:55.

Respectfully submitted,

Gary L. Raduns, Jr.

Seaway Section Secretary

3. Treasurer’s Report – Spring 2015 – Gary Towsley

1. Balance as of 9/15/2014	\$16,138.00
2. Fall Meeting at Alfred University	
a) Meeting Receipts	\$5,808.72
b) Meeting Expenses	\$4,667.73
c) Net	\$1140.99

3. Speakers Expenses, Honoraria	\$390.28
5. MAA – Proceeds of Book Sale	\$71.58
6. Travel Support for Section Officer	\$250.00
7. Balance as of 3/01/2015	\$16,710.29

Note: The Section paid \$382.80 for the expenses of the IBL meeting and \$505.25 for book orders placed by the IBL group. The Section was reimbursed fully {\$888.05} from the grant funds of the IBL group.

4. Governor’s report, Spring 2015 - Gary Towsley

I attended the last Board of Governor’s Meeting of my term as governor of the section in January at JMM in San Antonio. The question that has preoccupied the board for the last three meetings (at least) is how to restructure the governance of the Association to better use the efforts of the governors and to save on the costs of holding two large and expensive all-day meetings the day before Mathfest or JMM begins? A group of governors, officers, and staff has been given the task of making recommendations concerning this matter at Mathfest this August.

Items of Interest:

1. The operating deficit for the Association is near \$500K this year mainly due to losses in Publications and the American Math Competitions. Both of these endeavors were undergoing large administrative changes which resulted in one-time expenditures. The Treasurer is hopeful that the steps taken over the past three years will lead to erasing the deficit in two to three years.
2. The Governors approved an increase from \$169 to \$175 for regular yearly dues.
3. A new form of departmental membership to the MAA was approved (subject to some small clarifications concerning costs). The new membership will offer free student membership with electronic journal subscriptions to all eligible students at member institutions. It would also include one faculty membership. This was not approved unanimously. There were serious concerns raised about the cost structure and about the availability of journal subscriptions to libraries at the member schools. Both questions are still under consideration.
4. President Bob Devaney reported great interest in both the goals and activities of the MAA by colleges and universities in Mexico, Central America, and South America. He attended an annual meeting of the various associations in North and South America and felt it was time to increase our outreach into the rest of this hemisphere. He also questioned the need to send the President of the Association to the International Congress of Mathematicians (held every four years). It is a large expense and he did not feel that his presence was necessary in any way. There was some debate concerning his question. It will be revisited at a future meeting.
5. CUPM reported on the continuing development of its curriculum report. There is now available a pamphlet which outlines the report (the report with all its appendices is very large). Also, rather than working on the curriculum every ten years, the committee plans on yearly monitoring and revision of the Courses and Programs sections of the report.

Section notes:

Erie Community College – City Campus

Beginning this summer the Mathematics Department will have a new department chair: **David Usinski**. (Lynn Meslinsky is stepping down).

St. Bonaventure University:

Dr. **Michael Klucznik** has organized a team of students to compete in the Up-Stat data competition.

Dr. **Chris Hill** has been working with students at several local schools on Zome Tool construction projects.

Dr. **Doug Cashing** is retiring this summer after 34 years on the faculty here.

SUNY Plattsburgh:

Joe Bodenrader will be retiring after 46 years of teaching in the Mathematics Department. He is much beloved by generations of students, and will be sorely missed.

Fall Meeting:

Fall 2015: November 6-7, at St. Lawrence University, Canton, NY.

Service to the MAA

Volunteers to help out on one of the committees of the Seaway Section, or to host meetings, are always most welcome. If you are willing to help, please contact the chair of the section, Charles Ragozzine, email ragozzc AT oneonta.edu.

Some Important Links

Seaway Section Website: <http://people.rit.edu/maacway/>

Governance: <http://people.rit.edu/maacway/governance.html>

The Seaway Current

The Seaway Current is published twice per year by the Seaway Section of the Mathematical Association of America for the benefit of its members. Its pages are open to all members of the MAA and, by invitation to others, for the exchange of information and opinion. Contributed announcements, articles, and editorials are welcome and should be sent to the editor.

Material may be submitted by e-mail. Presently, this newsletter is produced using Microsoft Word, which can import plain text files or files produced by most standard word-processing software.

Opinions expressed in this newsletter are those of the editor or of individual contributors and do not necessarily represent the views of the MAA or of the Seaway Section.

Editor

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Abstracts: Spring 2015; Saturday afternoon talks.

1. **Matthew Coppenger**, RIT *Designing a Mathematical Clock*

A few years ago I received a mathematical clock as a gift and I've had a love/hate relationship with it ever since. So this is a regular 12 hour clock face whose numerical symbols of 1 through 12 have been replaced with mathematical expressions that are supposed to be equivalent to the corresponding number indicating the hour on the clock. This talk is a discussion on the merits of the expressions/equations that appear as the numerical indicators of the hours on the clock face. If we wish to create our own clock, what should be the guidelines for crafting such a clock? Who is the audience? Which expressions/functions should be used to generate the most interest in mathematics? Presented will be my best answer as the ideal clock to display for undergraduates.

2. **Robert Keever**, Plattsburgh State University *Some Thoughts On Problem Solving And How To Teach It*

Eight problem solving techniques are discussed and examples of their use are given. These techniques are designed to help students in a general education undergraduate mathematics course make sense of and investigate strategies for solving problems rooted in basic mathematics.

3. **Patti Frazer Lock**, St. Lawrence University *Statistics and the Common Core*

The Common Core State Standards in Mathematics place an increased emphasis on statistics. In addition, the CCSSM recommend using simulation methods to help students understand the key ideas of statistics. This matches the trend we are seeing at the college level to use simulation methods to focus more on conceptual understanding.

This talk will address these simulation methods which are becoming necessary for teacher training and recommended for all introductory statistics students.

4. **James Marengo**, RIT *Patterns in Coin Tossing*

What is the probability distribution of the number of tosses of a fair coin that is necessary to obtain two consecutive heads (HH)? What is the expected number of tosses to obtain HH? Is this the same as the expected number of tosses necessary to get HT? We will answer these questions and investigate others during this talk, which will be accessible to any undergraduate student who has had a basic probability course.

5. **Yozo Mikata**, Bechtel *Solution of a CNT Self-Folding Problem by a Refinement of a Force Method*

This paper will discuss a refinement of a solution obtained by a force method (Mikata, 2013) for a CNT (carbon nanotube) self-folding problem. Approaches taken in this paper are based on energy and force methods, which have been developed by Mikata (2005, 2006, 2007, 2010, 2013). The central issue in the self-folding problem is to determine the minimum threshold length of the carbon nanotube at which it becomes possible for the carbon nanotube to self-fold due to the van der Waals force. In this paper, mathematical models are developed for a critical threshold length of the self-folding problem as Euler's elastica problem, and they are solved exactly using elliptic functions and elliptic integrals. As a particular example, estimates for the critical threshold (minimum) length are obtained for the (5,5) armchair carbon nanotube, and others. It is shown in the numerical examples that the refinement makes a significant difference.

6. **Jonathan Needleman**, Le Moyne College *Magic Finite Projective Space*

In this talk I will extend the notion of magic squares to finite projective space. Unfortunately, there is no way to make finite projective space magic with entries coming from the integers. However, if one allows the entries to come from an abelian group then sometimes one can make the space magic. First, I will classify all groups for which one can make the space magic. Then, for certain choices of groups, I will classify every way to label the space so that it is magic. This is joint work with David Nash.

7. Sam Northshield, SUNY Plattsburgh *On the infinitude of primes*

There are perhaps hundreds of proofs that there are infinitely many prime numbers. We present a selection of proofs, some old, some new. Among the new ones will be a non-topological version of Furstenberg's famous topological proof, a probabilistic proof, and a trigonometric proof.

8. Joseph Petrillo, Alfred University *Flipping Calculus: A Final Report on the Effectiveness of the AUCI*

The Alfred University Calculus Initiative (AUCI) is a flipped calculus course that combines a new curriculum with an active-learning classroom, video lessons, and online quizzes and homework. In this final report, we will summarize nearly three years' worth of compelling results that demonstrate the effectiveness of the AUCI. Data analysis includes common final exam grades, course grades, instructor effectiveness, impact on high school students in both university and high school settings, and other categories. This project is supported by the National Science Foundation Grant No. DUE-1140437.

9. Gabriel Prajitura, SUNY Brockport *Counting rabbits Fatou style*

We will discuss the dynamics of the digits of the Fibonacci numbers. In particular we will answer the following question: what percentage of Fibonacci numbers has the third digit 2 and what percentage has it 7?

10. Nathan Reff, SUNY Brockport *Mathematics and Juggling*

Besides being a great deal of fun, juggling abounds with symmetry and patterns that may be encoded and studied using mathematics. In fact, there are many interesting connections between juggling, algebra and combinatorics. In this talk I will present a sampling of these connections. No juggling ability is required for those attending.

Teachers' Masters Capstone Projects in Secondary and College Mathematics

Session Organizer, Keary Howard, SUNY Fredonia

Abstract:

These sessions are highlighted by the presentation of research results from secondary school mathematics teachers Masters theses. Topics and presenters include:

Session 1 (55 minutes)

College Student Misconceptions in Secondary School Mathematics

Misconceptions Regarding the Laws of Exponents: College Students' Struggles with Exponential Expressions. Danielle Czerwinski, SUNY Fredonia

Simplification of Mathematical Expressions: Cognition and Errors with First Year College Students. Wyatt Anderson, SUNY Fredonia

The Calculator Cruc: The Effect of Calculator Use on College Students' Abilities to Compute Basic Operational Mathematics. Leah Kleiman, SUNY Fredonia

Session 2 (55 minutes)

Instructional Improvements in Secondary and College Mathematics

Informal vs. Formal Mathematics Vocabulary: Exploring Middle School Students' Mathematical Vocabulary Comprehension. Heidi Gunio, SUNY Fredonia

Choice Matters? The Effect of Question Choice on Performance on a General Mathematics Assessment. Erin Thompson, SUNY Fredonia

Out with the Old and In with the New: An Empirical Comparison of the New York State 2005 School Performance Indicators and Past Regents Examinations with the Current New York State Common Core School Mathematics Standards and Assessments. Travis Mirabella, SUNY Fredonia

(The most up-to-date meeting program may be found on the meeting website,
http://people.rit.edu/maacway/Meetings/PDF/schedule_sp14.pdf)

Program, Spring Meeting 2015

SEAWAY SECTION
MATHEMATICAL ASSOCIATION
OF AMERICA
2015 SPRING MEETING
April 17-18
COLGATE
PROGRAM
Friday afternoon: McGregory 212
2:30 – 4:30 Project NExT Workshop
What is Mathematics Now?
–A round table discussion about what it means to study and practice mathematics in 2015
Friday afternoon: McGregory 202
3:00 – 6:00 Meeting of the Executive Committee
Friday Evening: Hall of Presidents, 2nd floor of James C. Colgate Hall
5:30 – 6:30 Sculpture activity facilitated by Elizabeth Wilcox, SUNY Oswego
Assembling Faces at the Seaway Section
5:30 – 6:30 Social Hour (cash bar)
6:30 – 8:00 Banquet
8:00 – 9:00 Gary Towseley, SUNY Geneseo
75 years of Seaway

9:30-10:30 Game Show hosted by Nathan Reff, SUNY Brockport
MAA Seaway Section Integration Bee
Saturday morning: Golden Auditorium, Little Hall
8:40 – 8:45 Welcome address by Douglas Hicks, Provost and Dean of Faculty
8:45 – 9:35 Jeffrey Weeks, Freelance Geometer
The Shape of Space
9:45 – 10:35 Robert Devaney, Boston University
The Fractal Geometry of the Mandelbrot Set
10:35 – 11:00 Business Meeting
11:10 – 12:00 Gebman Lecture: Jon Kleinberg, Cornell University
Bursts, Cascades, and Hot Spots: Mathematical Models of the Online World
Lunch: 12-1:30 Edge Cafe
Saturday afternoon: Olin 301
1:30-1:55 James Marengo, RIT
Patterns in coin tossing
2:00-2:25 Patti Frazer Lock, St. Lawrence University
Statistics and the Common Core

2:30-2:55 Joseph Petrillo, Alfred University
Flipping Calculus: A Final Report on the Effectiveness of the AUCI
3:00-3:25 Robert Keever, Plattsburgh State University
Some Thoughts On Problem Solving And How To Teach It
3:30-3:55 Matthew Coppenbarger, RIT
Designing a Mathematical Clock
Saturday afternoon: Olin 328
1:30-1:55 Yozo Mikata, Bechtel
Solution of a CNT Self-Folding Problem by a Refinement of a Force Method
2:00-2:25 Gabriel Prajito, SUNY Brockport
Counting rabbits Eatou style
2:30-2:55 Samuel Northshield, SUNY Plattsburgh
On the infinitude of primes
3:00-3:25 Nathan Reff, SUNY Brockport
Mathematics and Juggling
3:30-3:55 Jonathan Needleman, Le Moyne College
Magic Finite Projective Spaces

Saturday afternoon: Olin 304
Teachers' Masters Capstone Projects in
Secondary and College Mathematics

Organizer: **Keary Howard**, SUNY Fredonia

1:30-2:25 Session 1

College Student Misconceptions in Secondary
School Mathematics

- *Misconceptions Regarding the Laws of Exponents: College Students' Struggles with Exponential Expressions.* Danielle Czerwinski, SUNY Fredonia
- *Simplification of Mathematical Expressions: Cognition and Errors with First Year College Students.* Wyatt Anderson, SUNY Fredonia
- *The Calculator Crux: The Effect of Calculator Use on College Students' Abilities to Compute Basic Operational Mathematics.* Leah Kleiman, SUNY Fredonia

2:30-3:25 Session 2

Instructional Improvements in Secondary and
College Mathematics

- *Informal vs. Formal Mathematics Vocabulary: Exploring Middle School Students' Mathematical Vocabulary Comprehension.* Heidi Gunio, SUNY Fredonia
- *Choice Matters? The Effect of Question Choice on Performance on a General Mathematics Assessment.* Erin Thompson, SUNY Fredonia

- *Out with the Old and In with the New: An Empirical Comparison of the New York State 2005 School Performance Indicators and Past Regents Examinations with the Current New York State Common Core School Mathematics Standards and Assessments.* Travis Mirabella, SUNY Fredonia

Saturday Afternoon: McGregory 212

1:30-2:25 Workshop on Leadership in the
Mathematical Sciences

Organizer: **Dr. Mihail Barbosa**, RIT

Curriculum in Mathematics Programs &
Developing New Mathematics Programs

2:30-4:15 Session on Preserving and
Writing the History of
Mathematics Departments in US
Colleges and Universities

Organizers: **Toke Knudsen**, SUNY Oneonta
Gary Towley, SUNY Geneseo

Speakers:

John McCleary, Vassar College
Cheryl Miller, SUNY Potsdam
Bob Rogers, SUNY Fredonia

NEXT MEETING:J

November 6-7, 2015

St. Lawrence University

Saturday afternoon: McGregory 217

1:30-2:25 Workshop on Visualizing Four
Dimensions

Organizer: **Jeffrey Weeks**

2:30-3:25 Inquiry-based Learning Classroom
Video Workshop

Organizer: **Xiao Xiao**, Utica College

Saturday afternoon: Student Talks

The schedule can be found on the green sheet in
your folder.

Organizer: **David Brown**, Ithaca College

Registration, Meals, and Refreshments

Registration will take place at the Hall of Presidents on the second floor of Colgate Hall on Friday evening during the social hour from 5:30 to 6:30, and on Saturday morning from 8:00 outside the Golden Auditorium in Little Hall. Lunch will be served at noon in the Edge Cafe. Beverages and snacks will be served on Saturday morning at 8:00 in Little Hall and at 2:30 and 4:30 in Olin Hall.

Accommodations

Blocks of rooms have been reserved at Colgate Inn and Wendt University Inn. Mention "MAA Seaway Section" when making your reservation. The rooms are being held for the meeting until March 15, 2015.

Meeting Website www.colgate.edu/seaway