

THE SEAWAY CURRENT

Newsletter of the Seaway Section of the Mathematical Association of America

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MAA Seaway Meeting: SUNY Fredonia – October 23-24, 2009

SUNY Fredonia will host the Fall Meeting of the Seaway Section of the Mathematical Association of America October 23-24, 2009.



The speakers for Friday evening's banquet are Jeff Johannes and Gary Towsley from SUNY Geneseo. They will present the entire history of Calculus in under 45 minutes. They give this talk annually to a packed crowd of students at Geneseo. The fact that most students attending the talk have been browbeaten by the faculty to attend does not reflect on the quality of the talk.

Saturday Morning

The Randolph Lecture

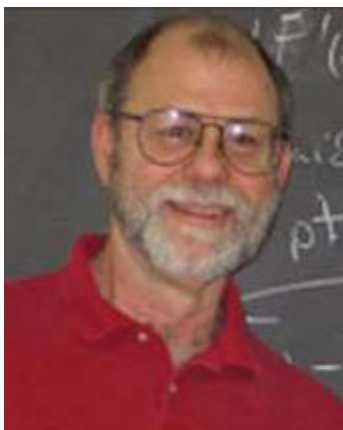


Sam Vandervelde, St. Lawrence University

Title: King Solomon on Teaching Math

Abstract: When it comes to offering an instructive mathematical experience for

students, is there really anything new under the sun? While the principles motivating recent pedagogical innovations may be rooted in antiquity, the innovations themselves provide a fresh implementation that can substantially boost the degree to which students actively engage in learning mathematics. We will discuss or even experience firsthand several novel techniques including IF-ATs, Polished Proof Portfolios and Homework Wikis. The goal will be to share such a wide variety of ideas that everyone will discover something new that they are inspired to incorporate into an upcoming course syllabus.



**Dan Teague, North Carolina
State University**

**Title: The Infamous Five
Color Theorem**

Abstract: Sure, its kid brother, the Four Color Theorem, gets all the big press, but the Five Color Theorem has its own rich history and is much more fun. This talk will present a few fundamentals of graph theory and then describe the development of the Five Color Theorem and some of its derivatives. We will also take a few excursions into the history of the problem and note some current developments.



**Gino Biondini, SUNY
Buffalo**

**Title : Solitons: From Water
Waves to Optical Fibers**

Abstract: Soliton theory, which began over forty years ago with Zabusky and Kruskal's discovery that the solitary waves of the Korteweg-deVries (KdV) equation interact elastically, continues to be an active area of

research. After briefly reviewing the history of the subject and how KdV solitons arise in the theory of water waves, we will discuss some of the many remarkable properties of the KdV equation.

We will then see how such properties are not unique to KdV, but are shared by a class of nonlinear evolution equations.

Importantly, many of these soliton equations are also relevant in the applied sciences since they arise as universal models in a variety of nonlinear physical phenomena. In particular, we will see how another such equation, the nonlinear

Schroedinger equation, has been used as a fundamental tool to study the behavior of optical fiber communication systems. Finally, in the last part of the talk we will briefly discuss some recent advances in soliton theory (e.g., soliton behavior in boundary-value problems and in multi-dimensional systems) and we will outline some of the many research problems still open.

Biographies of the Speakers

Dan Teague:

Dan Teague has been an Instructor of Mathematics at the North Carolina School of Science and Mathematics since 1982. He received his undergraduate degree from the University of North Carolina at Chapel Hill, a Masters of Education from Springfield College, and his Ph.D. in Mathematics Education from North Carolina State University. He has strong interests in mathematical modeling, statistics education, and mathematics education in Japan.

Dr. Teague is presently serving as 2nd Vice President of the MAA. He has been the MAA Governor-at-Large for Secondary Teachers and helped organize and has chaired the MAA Special Interest Group on Teaching Advanced High School Mathematics (SIGMAA TAHSM). He has served on the Mathematical Sciences Education Board, two terms on the U.S. National Commission on Mathematics Education, and on the NRC's Committee on Programs for Advanced Study of Math and Science in American High Schools. Dan served on the AP Statistics Test Development Committee and the Mathematical Sciences Academic Advisory Committee at the College Board.

He has been recognized with the Presidential Award for Excellence in Mathematics Teaching, the University of North Carolina Board of Governor's Award for Excellence in Teaching, and the Edith May Sliffe Award for Excellence in Secondary Mathematics Teaching (twice). For ten years, Dr. Teague was the section editor of "Everybody's Problems" for COMAP's Consortium. He is co-author of the texts Contemporary Precalculus Through Applications and Contemporary Calculus Through Applications.

Gino Biondini:

Gino Biondini received the Doctorate in theoretical physics from the University of Perugia in 1997. From 1997 to 1999 he was a post-doctoral Research Associate in the Department of Applied Mathematics at the University of Colorado; from 1999 to 2001 he was a Research Assistant Professor in the Department of Engineering Sciences and Applied Mathematics at Northwestern University; and from 2001 to 2004 he was a Zassenhaus Assistant Professor in the Department of Mathematics at the Ohio State University. In fall 2004 he joined the Department of Mathematics of the State University of New York at Buffalo, where he is now an Associate Professor.

His research area is in physical applied mathematics; his specific interests include analytical, asymptotic and computational methods for nonlinear evolution equations, solitons and integrable systems, their connections with algebraic geometry and combinatorics, applied probability and stochastic processes, and applications to

nonlinear optics and water waves.

He has authored more almost fifty refereed journal publications, many of which are heavily cited. He has advised many graduate and undergraduate students, and he holds two U.S. patents about the application of importance sampling techniques to polarization-induced effects in optical fiber communication systems.

Sam Vandervelde :

Sam Vandervelde has been teaching mathematics at the high school and college level for fifteen years. He received his Ph.D. from the University of Chicago and recently joined the faculty at St. Lawrence University. He has been heavily involved in math circles, founding the Stanford Math Circle in 2005 and directing the board that established the Teacher's Circle in 2006. He is also the author of *Circle in a Box*, a book about math circles newly published by the AMS this year. His favorite course to teach is Bridge to Higher Mathematics, the "p roofs" course at St. Lawrence for which he is currently in the process of writing and revising his own textbook.

Meeting Program

SEAWAY SECTION MATHEMATICAL ASSOCIATION OF AMERICA

2009 FALL MEETING

October 23-24

SUNY FREDONIA

PROGRAM

Friday afternoon, Conference Room, Clarion Hotel

3:00 – 6:00 Meeting of the Executive Committee

Friday Evening, Lighthouse Ballroom, Clarion Hotel Dunkirk, NY

6:00 – 7:00 Social Hour (cash bar)

7:00 – 8:30 Banquet

8:30 – 9:30 Jeff Johannes & Gary Towsley, SUNY Geneseo
An “Outrageously” Concise History of Calculus

Saturday Morning, McEwen Hall, Room 209

08:40 – 08:45 *Welcome address*
Dennis Hefner, President, SUNY Fredonia

08:45 – 09:35 Daniel J. Teague, NC State University

The Infamous Five Color Theorem

09:45 – 10:35 Gino Biondini, SUNY Buffalo
Solitons: From Water Waves to Optical Fibers

10:35 – 11:00 Business Meeting

11:10 – 12:00 **Randolph Lecture**
Sam Vandervelde, St. Laurence University
King Solomon on Teaching Math

GROUP PHOTO

Lunch: 12-1:30 Williams Center

Saturday Afternoon, Fenton Hall, 153

1:30 – 1:55 James Marengo, RIT

An Upper Bound for the Expected Difference Between Order Statistics

2:00 – 2:25 Chulmin Kim, RIT

An Alternative Expression of the Covariance and its Inverse of the Antedependence Models

2:30 – 2:55 Scott Preston, SUNY Oswego

An Optimization Problem from Statistics and a Complementary Assessment Scheme

3:00–3:25 Charles Jacobson, Elmira College

A High School Prom Theorem for Variance

3:30-3:55 Joanne Redden, Elmira College

On the Continuing Story of the Covering Number of Small Alternating Groups

Saturday Afternoon, Fenton Hall 159

1:30 - 1:55 Joshua Palmatier, SUNY Oneonta

M-Zeroids: Structure and its Effect on the Additive Operation

2:00- 2:25 Tony Mastroberardino, Pen State Erie, The Behrend College

The Fermi-Pasta-Ulam Problem

2:30 - 3:00 Olympia Nicodemi, SUNY Geneseo

Wavelets and Elementary Linear Algebra

3:00 - 3:25 Joseph Kolacinski, Elmira College

How Close was it Really? Alternative Voting Methods and the 2008 Minnesota Senate Race

3:30-3:55 Robert Rogers, SUNY Fredonia

Teaching Introductory Analysis Using its Historical Context

Saturday Afternoon, Fenton Hall, 168

1:30 – 1:55 Xiwei Chen, RIT

Eigenfaces vs. Fisherfaces - Face Recognition

2:00 – 2:25 Keith Jones, SUNY Binghamton

A Geometric Invariant for Finitely Generated Groups

2:30 – 2:55 Viji Z. Thomas, SUNY Binghamton

Cantor's Diagonalization Revisited: Constructing Transcendental Numbers.

3:00 – 3:25 Yang Zhao, RIT

Generalized Linear Models and Actuarial Science

Saturday Afternoon Fenton Hall, 170

1:30- 1:55 Sam Northshield, SUNY-Plattsburgh

A Short Proof of Lagrange's Theorem on Continued Fractions

2:00-2:25 Gabriel Prajitura

The Sum of the Reciprocals of Factorials

2:30 - 2:55 Gary Towsley, SUNY Geneseo

Dante and the Three Sphere

3:00-3:55 Paul Seeburger, MCC

*Dynamic Visualization Tools for Multivariable Calculus
(Computer Lab, Fenton 2164)**

Saturday Afternoon, Fenton Hall 108

Student Program: Organizer: Derek Habermas, SUNY Potsdam. Any student wishing to contribute a talk should send the title and brief abstract to habermds@potsdam.edu.

Registration, Meals, and Refreshments

Registration will take place in the **Lighthouse Ballroom, Clarion Hotel** on Friday evening during the social hour from 6:00 to 7:00, and on Saturday morning from 8:00 until 11:00 in **McEwen Lobby**. Snacks will be served in **Fenton Hall** and lunch will be served in **Williams Center**.

Accommodations

The "headquarters hotel" is the [Clarion](#) in Dunkirk, NY. It's on Lake Erie, about 2.5 miles from campus. This is where the Friday evening banquet and program will take place. A block of rooms has been reserved; mention "math meeting" when making your reservation

Meeting Website

http://www.fredonia.edu/department/math/seaway2009/seaway_directions.asp

NEXT MEETING:

2010 SPRING MEETING

News from the Section

News from the Section

Nazareth College

The department has a new member: Nicole Juersivich. Nicole received her Ph.D. in Mathematics Education in August 2009 from the University of Virginia, Charlottesville, VA.

Dissertation: Using Geometer's Sketchpad to Enhance Non-Accelerated Middle School Students' Understanding of Negative Numbers and Equality.

Much to our dismay and against all efforts to retain her, Susan Riegle has retired. Susan has been elected as Associate Professor Emerita.

The department is nevertheless in good hands, since professor Cheri Boyd is now our chair and spiritual leader.

With all the merits and pomposity of the occasion, Heather Lewis has been promoted to Professor of Mathematics.

SUNY Cortland

In 2008/2009, faculty from the Mathematics Department accomplished a number of grant activities:

- Drs. Gfeller and Schubert co-authored the Noyce Teacher Scholarship Grant with Dr. Gregory Phalen (PI) and Dr. Rena Janke from the sciences. SUNY Cortland was awarded nearly \$900,000 to assist up to 50 students interested in becoming math and science teachers. The Noyce Teacher Scholarship Program seeks to encourage talented science, technology, engineering and mathematics (STEM) majors and professionals to become K-12 mathematics and science teachers. Starting this fall, SUNY Cortland will award between eight and 14 scholarships each year for five years. Undergraduates will receive \$12,500 and graduate students will receive \$15,000.
- Dr. Gfeller was awarded a \$16,000 PDS grant titled "A Partnership in Supporting Student Discourse in the Mathematics Classroom." This partnership with the Cortland City School District provides a learning community which will investigate standards-based curricula and research on student discourse for learning key mathematical concepts. Classroom teachers will receive professional

development on student discourse and use this knowledge to show pre-service teachers the importance of student discourse in the mathematics classroom in their methods courses.

- Dr. Dickerson continued his involvement with Michigan State University on a second year of the US TEDS-M Study of mathematics teacher education programs.

Lastly, to better serve our pre-service teachers, the Mathematics Department was able to secure a dedicated mathematics classroom equipped with the latest technologies including a Smartboard. Mathematics methods courses as well as math for elementary school teachers courses will be taught in this classroom starting in Spring 2010.

Brock University

Brock University's New Online Mathematics Skills Tests

One of the primary reasons that first-year university mathematics and science students fail or drop out of their programs is insufficient facility with basic high-school mathematics. To remedy this, the Brock University Mathematics Department has introduced a program of seven online Mathematics Skills Tests, which has been implemented in time for the 2009/2010 academic year.

The tests cover the most important foundational skills needed by incoming students: (1) numerical calculations and basic geometry; (2) algebra; (3) functions in general, and quadratic, polynomial, and rational functions; (4) exponential and logarithmic functions; (5) trigonometry and trigonometric functions; (6) solving equations and inequalities; (7) recognition and understanding of basic graphs. Each of the seven tests includes problem solving.

Currently the tests are taken by all students enrolled in Calculus I; the program will be expanded in future so that more students can make use of the training. Students enrolled in Calculus I must pass each of the seven mathematics skills tests with a minimum grade of 70% as a requirement for obtaining a credit in the course.

Students may attempt each of the skills tests as many times as they wish, with a deadline of two weeks after classes begin. The rationale for this is as follows: We wish students to ensure they are competent in basic prerequisite skills very early in the semester, preferably before classes begin. The tests help students to identify which areas of high-school mathematics they are weak in; then they may make use of the relevant practice material (or make use of textbooks, internet, or other resources) to help them strengthen their preparation. Allowing them to re-take tests multiple times encourages them to do the necessary work to master *all* of the pre-requisite material, at least up to the required 70% level.

The online skills tests run on WeBWorK, the homework and testing software originally developed by Arnold Pizer and Michael Gage at the University of Rochester. This powerful tool has allowed us to create a testing system to suit our needs, and to support students taking the tests with a large amount of practice material. It also allows us to efficiently monitor student progress and to easily respond by email to student queries about problems they have with individual test or practice questions.

Some students are able to pass through their high-school math courses with quite good marks, while at the same time not having a very good grasp of the material. Partial credit (“part-marks”) is part of the reason for this. The intention of partial credit may be a good one (to reward effort in order to motivate students to persist in the complex and lengthy process of learning mathematical concepts), but the unintended consequence is bad: Some students learn that they don’t really have to put in the effort required to really understand mathematics. As long as they have a so-so understanding, they will garner a sufficient number of part-marks to achieve an acceptable grade. The effects are cumulative, with the result that some students enter university with a false sense of what their current mathematical capabilities are, and with a false sense of the amount and kind of work that is required to develop a working knowledge of mathematics and science. Brock’s online mathematics skills tests are intended to serve as an early wake-up call, and to encourage the kind of effort that will serve students well in their first year of studies, and throughout their university career. Soon a parallel system will be made available to high-school students, so that students can benefit from this training before they enter university. Moving the general mathematics education culture towards one of mastery would be a very welcome benefit.

A final intended benefit of Brock’s online mathematics skills tests is that lecture time in Calculus I that would otherwise have been spent on reviewing pre-requisite material might now be minimized. This will free up lecture time for pursuing the kind of rich, conceptual, applications, or problem-solving activities that will make Calculus I much more meaningful, memorable, and useful for students.

For further information, please contact

Dr. S. D’Agostino, Mathematics Department, Brock University, sdagostino@brocku.ca

Colgate University

News from the Colgate Mathematics Department, Fall 2009:

1. Evelyn Hart has been promoted to Professor of Mathematics. Even before it became official, she began serving as department chair.
2. Jonathan Bloom, a Colgate alumnus, has joined the department as Visiting Instructor for the year.
3. Aaron Robertson received an NSF grant to study Theoretical and Computational Ramsey Theory.
4. Mariela Beatriz Rivera Gonzalez joined the family of Joaquin Rivera-Cruz and his wife Sheryl on August 3. Everyone (even Dad) is doing well.

Monroe Community College

The department is pleased to welcome three new faculty members: Mark Bellavia and Wadiha Haddad in tenure-track positions, and Judy Dean in a one-year, full-time temporary position. Our new department chair is Annette Leopard, replacing Peter Collinge who served for five years. There were several promotions: Jackie Donofrio and Pat Kuby were promoted to Professor; Aimee Calhoun was promoted to Associate Professor; and Brigitte Martineau and Neeta Primo were granted tenure and promoted to Assistant Professor.

SUNY Fredonia

Joseph Straight was named a SUNY Distinguished Service Professor. Joe is one of just 10 faculty in the SUNY system to receive a promotion to the distinguished ranks this year. Last year, Joe received a SUNY Chancellor's Award for Excellence in Faculty Service and the MAA Meritorious Service Award. He has served in a variety of leadership positions at SUNY Fredonia, and with the MAA and other organizations. MAA and Seaway Section service does pay off!

One of last year's seniors and this year's graduate assistants, Rachel Olson, received the Chancellor's Award for Student Excellence. The Chancellor's Award for Student Excellence recognizes students who have best demonstrated academic excellence and accomplishments in the areas of leadership, athletics, community service, creative and performing arts, or career achievement.

SUNY Fredonia faculty have been very active in the Association of Mathematics Teachers of New York State (AMTNYS). Bob Rogers is editor of *The New York State Mathematics Teachers' Journal* (the journal of AMTNYS), with Keary Howard and Jamar Pickreign (College of Education) as associate editors. Bob Rogers and Keary Howard are on the AMTNYS Executive Board.

Bob Rogers is a member of the MAA Committee on Undergraduate Programs in Mathematics (CUPM). Nancy Boynton is chair-elect of the MAA SIGMAA on Statistics Education.

SUNY Fredonia hosted our ninth annual Mathematics and Science Challenge in May. We hosted about 350 students from 19 schools for a day of team competitions and fun in mathematics and science!

Buffalo State College

The department welcomes Hongliang (Jimmy) Xu as a tenure-track faculty member. Dr. Xu comes to us after spending over 10 years as a Research Scientist at the Hauptman-Woodward Medical Research Institute. He will contribute greatly to the department's new Applied Mathematics program.

In September:

Valentin Brimkov received the President's Award for Excellence in Research, Scholarship, and Creativity.

Jodelle Magner was promoted to Associate Professor.

Peter Mercer was promoted to Full Professor.

John Slivka began his 41st year with the department.

Congratulations to all!!

SUNY Oswego

Kathy Lewis is back from Gambia where she was teaching last year. Lynn Carlson was tenured. We were joined by Victor Protsak, most recently from Cornell. Victor has a PhD from Yale and has varied research interests in algebra, geometry and combinatorics. Our Department was awarded a grant to redesign its College Algebra course using information technology. The students now meet with their instructor once a week and are required to work in a computer lab three hours a week using Hawkes Learning Systems software with the assistance of upperclass learning assistants. Our pilot was completed in the spring of 2009 and this semester we are in full implementation of the redesign.

Roberts Wesleyan College

Barbara Rose retired in May following 41 years of service to Roberts Wesleyan College; her recognition as Professor Emerita was recently announced to the campus community. Barbara was Professor of Mathematics and Education and served for the last several years as Chair of the Natural Sciences and Mathematics Division. Dr. Robert Brabenec of Wheaton College, Illinois, visited Roberts Wesleyan College in early October to present a series of lectures and discussions on the history and philosophy of mathematics.

Canisius College

Tony Weston was promoted to Professor and Byung-Jay (B.J.) Kahng was promoted to Associate Professor and tenured. Leonid Khinkis completed his second term as chair and was appointed acting Dean of the College of Arts and Sciences. Dietrich Kuhlmann is our new chair.

Our REU on “Geometry and Physics on Graphs” completed its fifth successful summer. Terry Bisson, Stratos Prassidis, and B.J. Kahng take turns in pairs leading the REU. Senior Elena Caffarelli participated in the REU at Brigham Young University and presented her research on the Steiner Problem on surfaces of revolution in a student talk at MathFest 2009 in Portland, Oregon. Junior Katelynn Kochalski participated in the Summer Math Program for Women at Carleton College in Minnesota.

Meeting Registration:

Accomodations

The "headquarters hotel" is the [Clarion](#) in Dunkirk, NY. It's on Lake Erie, about 2.5 miles from campus. This is where the Friday evening banquet and program will take place. A block of rooms has been reserved; mention "math meeting" when making your reservation.

Other Area Hotels:

[White Inn](#)

If you're looking for a unique place to stay, this historic inn is it. The White Inn is located about 1/2 mile from the campus, in the village of Fredonia.

[Best Western](#)

About 1 mile from campus, and easily accessible from NYS Thruway Exit 59.

[Comfort Inn](#)

About 1 mile from campus, and easily accesible from NYS Thruway Exit 59.

Meeting web site:

For information about local accommodations, as well as updated program information (as it becomes available) follow the links from the seaway section web-page,

<http://www.fredonia.edu/department/math/seaway2009/index.asp>

Local contact

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Some Important Links

Seaway Section Website:
Under Construction

Governance:
Under Construction

Standing Committees:
Under Construction

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 on paper, by e-mail or on CD. 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.

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