MathFest 2010

August 5-7 | Pittsburgh, PA

The Mathematical Community's Premier Summer Meeting

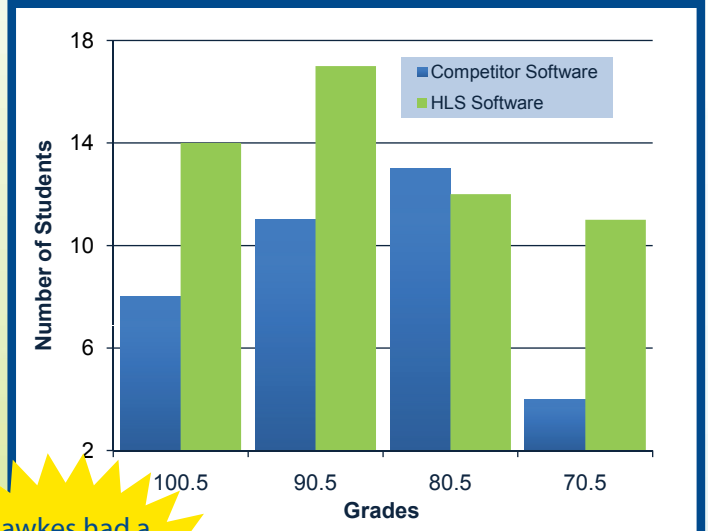
MAA
MATHEMATICAL ASSOCIATION OF AMERICA

HAWKES LEARNING SYSTEMS

PROVEN RESULTS AT ECONOMICAL PRICES.

- ☑ Proven to increase grades & retention
- ☑ Mastery-based learning
- ☑ Diagnoses student errors & provides specific feedback
- ☑ Ability to work online or offline
- ☑ Free to school & lowest cost to students
- ☑ Students have lifetime access

Navarro College
Final Grades



Hawkes had a **20% higher success rate** than the competitor software.

Visit us at booths 11 & 12!

WIN A LAPTOP!

Come to our software presentation to be entered to win!

When: Friday, August 6th at 3:30pm
Where: Churchill Room

HAWKES LEARNING SYSTEMS
math courseware specialists

hawkeslearning.com

MathFest

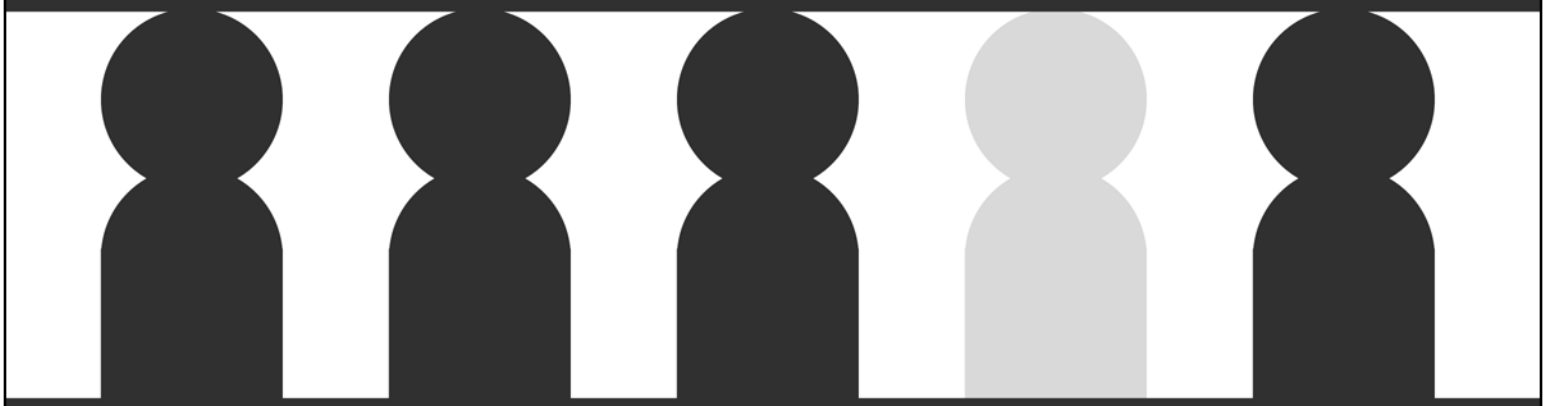
Pittsburgh, August 5–7, 2010

MAA
MATHEMATICAL ASSOCIATION OF AMERICA

TABLE OF CONTENTS

Invited Addresses	5
Invited Paper Sessions	9
Contributed Paper Sessions	10
Panels and Other Sessions	13
Undergraduate Student Activities	14
Graduate Student Activities	14
SIGMAA Activities	17
Minicourses	18
Short Course	19
Biomathematics at MathFest 2010	20
Exhibitors	21
Timetable	24
Social Events	44
Sudoku	49

Be Significαnt



Don't be just another number. Join the American Statistical Association today at the student rate of only $10!

Members Enjoy:

- A subscription to *Amstat News*, the ASA's monthly membership magazine
- Online access to our first-rate journals and *CHANCE* magazine
- Career opportunities through the Career Placement Service at the Joint Statistical Meetings and JobWeb
- Access to the online ASA Community—a place for like-minded statisticians to connect and share
- A network of professional colleagues and peers made up of more than 18,000 ASA members, including 4,000 students

Learn more about the premier association serving the statistics community since 1839 at *www.amstat.org*.

INVITED ADRESSES

Earl Raymond Hedrick Lecture Series

Complex Dynamics and Crazy Mathematics

Robert L. Devaney,
Boston University

The 2010 Hedrick Lectures will investigate some of the complicated dynamics and beautiful images that arise when complex functions are iterated. The chaotic regimes for these maps, the so-called Julia sets, are extremely rich from both a topological and geometric point of view. Yet to this day, the Julia sets for such simple maps as the quadratic function $z^2 + c$ and the exponential map λe^z are not completely understood. Each of these lectures will be independent and will focus on a particular class of complex maps. As a sub theme, each lecture will feature some of the "crazy" mathematics that is used to understand these sets.

Lecture 1: The Fractal Geometry of the Mandelbrot Set
Thursday, August 5, 10:30 am – 11:20 am

In this lecture we will describe the structure of the Mandelbrot set, the parameter plane for the quadratic function $z^2 + c$. While the geometry of this set is very intricate, much of it can be understood as long as you know how to add and count the crazy way some number theorists do.

Lecture 2: Exponential Dynamics and Topology
Friday, August 6, 9:30 am – 10:20 am

In this lecture we turn attention to the very different behavior of the complex exponential function λez. We will describe some of the incredible bifurcations this map undergoes when λ varies. And we'll see that many crazy topological objects like Cantor bouquets and indecomposable continua arise in these Julia sets.

Lecture 3: Sierpiński Galore
Saturday, August 7, 9:30 am - 10:20 am

In this lecture we describe the dynamics of certain families of rational maps. Here we will focus on maps for which the Julia sets are Sierpiński curves. We will see that these types of Julia sets arise in a myriad of different ways and that they also exhibit some crazy geometric and topological properties.

MAA Invited Address

An Attempt to Turn Geometry into (Decorated) Graphs

Rebecca Goldin,
George Mason University
Thursday, August 5, 8:30 am – 9:20 am

In the late 19th century, mathematicians were interested in problems such as this one: given four generically placed lines in three dimensions, how many other lines intersect all four? This question and many others can be formulated in terms of the intersections of subvarieties of the Grassmannian of k-planes in n-space, or more generally, flag varieties (whose points are sequences of inclusions of vector spaces).

These intersection questions inside the flag variety and some generalizations, together with related algebraic and combinatorial questions, form the field of Schubert calculus. Of primary importance is that flag varieties can be realized as algebraic, symplectic manifolds with Hamiltonian actions by a compact torus. Among the magic properties are that the torus acts with isolated fixed points, and that codimension-one tori fix only points and two-spheres.

The desire to compute associated algebraic invariants, such as the product structure of associated rings in special bases, has spawned many combinatorial and graph-theoretic objects. In this talk, we will discuss some graphs associated to certain manifolds with torus actions, and ask the question of how combinatorial games involving the graphs can be used to answer geometric questions about the original manifold and intersections of subvarieties therein.

INVITED ADRESSES

...continued

MAA Invited Address

Mathematics Motivated by Biology

Martin Golubitsky,
Ohio State University
Thursday, August 5, 9:30 am – 10:20 am

Interesting areas in biology (I'll stress neuroscience) often lead to new mathematics. For example, the characteristic rhythms of animal gaits lead to a classification of spatio-temporal symmetries of periodic solutions; the abstraction of experimentally determined connections between hypercolumns in the visual cortex (itself a Nobel Prize winning idea) leads to an embedding of the Euclidean group in the visual system (and a possible description of geometric visual hallucinations); and an attempt to understand the remarkable variety of bursting neurons leads to the understanding of the dynamics of bursting in multiple time-scale systems. In this talk I'll survey some of these connections.

MAA Lecture for Students

Faster, Safer, Healthier with Operations Research

Sommer Gentry,
United States Naval Academy
Thursday, August 5, 1:00 pm – 1:50 pm

While mathematical advances of all sorts have impacted our world for the better, operations research is a branch of mathematics that is expressly focused on applying advanced analytical methods to help make better decisions.

Operations researchers have eased traffic jams by closing selected streets, and gotten packages to you more quickly by planning U.P.S. routes with fewer left turns. Operations researchers have shown which personal decisions are the leading causes of death, and planned emergency responses for bioterror attacks and natural disasters.

Operations research can increase the supply of kidneys available for patients who need a transplant. In a kidney paired donation, one patient and his incompatible donor is matched with another patient and donor in the same situation for an organ exchange. Patient-donor pairs can be represented as the vertices of a graph, with an edge between two vertices if a paired donation is possible. A maximum matching on that graph is an arrangement in which the largest number of people can receive a transplant. Operations research techniques even proved the impact of paired donation on the kidney shortage, motivating Congress to pass a law allowing the United Network for Organ Sharing to arrange these transplants.

AWM-MAA Etta Z. Falconer Lecture

Mathematical Challenges in the Treatment of Cancer

Ami Radunskaya,
Pomona College
Friday, August 6, 8:30 am – 9:20 am

What can mathematics tell us about the treatment of cancer? Cancer is a myriad of individual diseases, with the common feature that an individual's own cells have become malignant. It is believed that a healthy individual keeps potentially cancerous cells from developing into a threatening tumor through a complicated network of immune response and mechanisms built into the cell cycle that recognize aberrant cells and control their proliferation. Thus, the treatment of cancer poses great challenges, since an attack must be mounted against cells that are nearly identical to normal cells. Mathematical models that describe tumor growth in tissue, the immune response, and the administration of different therapies can suggest treatment strategies that optimize treatment efficacy and minimize negative side effects. However, the inherent complexity of the immune system and the spatial heterogeneity of human tissue gives rise to mathematical models that pose unique analytical and numerical challenges. These include modeling behavior over vastly different time scales, incorporating delays into the model, optimization in high-dimensional spaces, and fitting large sets of dependent parameters to data.

In this talk I will present an overview of work that I have done in this area, with the help of many collaborators, over the last ten years, highlighting the various approaches we have taken to tackle these mathematical challenges.

INVITED ADRESSES

...continued

James R. Leitzel Lecture

Exploring School Mathematics with Felix Klein

William McCallum, *University of Arizona*

Friday, August 6, 10:30 am– 11:20 am

Felix Klein's *Elementary Mathematics from an Advanced Standpoint*, published in 1908, is a tour of the school mathematics of his time, guided by profound mathematical knowledge and deep appreciation of teachers. 100 years later it inspired the Klein Project, a joint effort of the International Mathematical Union and the International Commission on Mathematical Instruction, to develop resources that will help secondary mathematics teachers make connections between what they teach and the field of mathematics more broadly. What would a Klein tour of U.S. school mathematics look like today? How much of the countryside remains the same, and what new sights are there to see? In what condition are the original buildings? In this talk I will briefly revisit some of Klein's most striking illustrations of the fundamental unity of mathematics from high school to the frontiers of research, and then take a look at the current scenery of high school mathematics from Klein's perspective.

NAM David Blackwell Lecture

The Riordan Group Revisited: From Algebraic Structure to RNA

Asamoah Nkwanta,

Morgan State University

Friday, August 6, 1:00 pm – 1:50 pm

The purpose of this talk is to survey an infinite ordered matrix group called the Riordan group. The Riordan group arises in counting problems, combinatorial number theory, and the study of special functions. In this presentation we will focus on the algebraic structure of the group and explore some applications to molecular biology.

Pi Mu Epsilon J. Sutherland Frame Lecture

Incomprehensibility

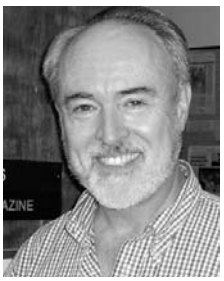
Nathaniel Dean,
Texas State University

Friday, August 6, 8:00 pm – 8:50 pm

After data collection the analysis of complex systems is usually accomplished by analyzing the data using various statistical approaches. However, to understand the structural interactions between entities (for example, people, objects or groups), systems of interactions can be modeled as *graphs* linking *nodes* (entities) with *edges* that represent various types of relations between the entities. Then the graph can be visualized, explored and analyzed using a variety of mathematical algorithms and computer tools. In this talk we discuss the limitations of this approach, why some graphs cannot be visualized, and hence why certain data are visually incomprehensible.

MAA Invited Address

Creating Symmetry



Frank Farris,
Santa Clara University

Saturday, August 7, 8:30 am – 9:20 am

A child can create symmetry by repeatedly stamping out a pattern with a cut potato, but a mathematician enamored of smoothness might prefer to find mathematical objects whose very nature is symmetry. A main example of a vibrating wallpaper drum leads to a more general story about symmetry that combines everyone's favorite objects: Fourier series, the Laplacian, and group actions.

INVITED ADRESSES

...continued

MAA Invited Address

The Mathematics of Math Circles

Zvezdelina Stankova,
Mills College

Saturday, August 7, 10:30 am – 11:20 am

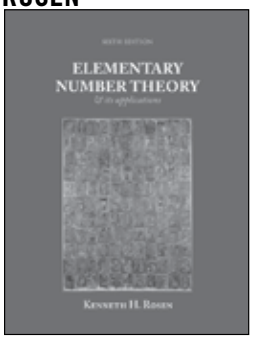
The creation of math circles in the San Francisco Bay Area started a chain reaction, spreading to California and neighboring states that resulted in over 75 circles in the U.S. and Canada. What is a math circle? Are math circles designed for talented pre-college students or for those who don't yet know if they like mathematics? Must they concentrate on math contest preparation or on discovering interesting mathematical facts? Could and should circlers be introduced to advanced mathematical theories and research?

The answer depends on which U.S. math circle you consider. Born within a day apart in 1998, the Berkeley (BMC) and San Jose Math Circles (SJMC) combine all of the above aspects. They attract and train IMO medalists and Putnam winners; but more importantly, they introduce students to beautiful mathematics in inspiring sessions by mathematical stars such as Vladimir Arnold, Elwyn Berlekamp, Robin Hartshorne, Olga Holtz, Ravi Vakil, and Kiran Kedlaya. Are you, as a mathematician, brave, skillful and confident to turn an advanced, even research, topic into a math circle session and deliver it with success? Are such "miracles" possible on a weekly basis? Does this have anything to do with your career as a research mathematician or as a math educator? In this talk, we shall address these questions and explore several possible paths of transforming advanced math topics and research into math circle sessions, by following examples selected from sessions at the BMC and SJMC over the past decade.

PEARSON

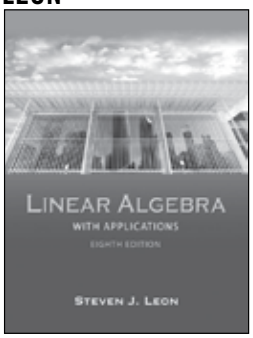
COUNT ON US for the Best in Advanced Mathematics!
New Editions from Authors You Know

ROSEN



Elementary Number Theory, **Sixth Edition**
by Kenneth H. Rosen • © 2011
ISBN-13: 978-0-321-50031-1
ISBN-10: 0-321-50031-8

LEON



Linear Algebra with Applications, **Eighth Edition**
by Steven J. Leon • © 2010
ISBN-13: 978-0-13-600929-0
ISBN-10: 0-13-600929-8

ROYDEN • FITZPATRICK

Real Analysis, **Fourth Edition**
by Halsey Royden and Patrick Fitzpatrick • © 2010
ISBN-13: 978-0-13-143747-0
ISBN-10: 0-13-143747-X

ARTIN

Algebra, **Second Edition**
by Michael Artin • © 2011
ISBN-13: 978-0-13-241377-0
ISBN-10: 0-13-241377-9

Find the Title that's Right for You with FIND YOUR FIT

Our popular **Find Your Fit** tool will help you find the best book for your course. Visit **www.pearsonhighered.com/findyourfit**

COUNT ON US
PEARSON MATHEMATICS

For a complete list of titles, please visit **www.pearsonhighered.com/math**

INVITED PAPER SESSIONS

Visualizing Combinatorics Through Tilings

James Sellers, *Penn State University*
Thursday, August 5, 1:00 pm – 2:50 pm

Speakers: Art Benjamin, Jennifer Quinn, Brigitte Servatius, and Bruce Sagan

Combinatorial Games and Schubert Calculus

Rebecca Goldin, *George Mason University*
Thursday, August 5, 1:00 pm – 4:50 pm
Friday, August 6, 2:00 pm – 3:50 pm

Speakers: Bill Graham, Julianna Tymoczko, Frank Sottile, Milena Pabiniak, Kevin Purbhoo, David Johannsen, Shrawan Kumar, Tara Holm, Aba Mbirika, Erik Insko, Susan Tolman, and Jennifer Morse
This session complements the Invited Address by Rebecca Goldin.

Complex Dynamics: Opportunities for Undergraduate Research

Dan Look, *St. Lawrence University*
Elizabeth Russell, *United States Military Academy*
Thursday, August 5, 1:00 pm – 5:20 pm
Friday, August 6, 3:00 pm – 5:50 pm

Speakers: Jeffrey Houghton, Ross Ptacek, John Mayer, Debra Mimbs, Daniel M. Look, Sarah Koch, Rich Stankewitz, Annalisa Crannell, Elizabeth Russell, Lorelei Koss, Clinton Curry, Gareth Roberts, Kendrick White, and Sebastian Marotta
This session complements the Earl Raymond Hedrick Lectures.

Mathematical Modeling of the Immune Response, Cancer Growth, and Treatments

Ami Radunskaya, *Pomona College*
Saturday, August 7, 1:00 pm – 4:50 pm

Speakers: Lisette de Pillis, Peter Hinow, Kasia Rejniak, Doron Levy, Jana Gevertz, Rene Fister, Kara Pham
This session complements the Etta Z. Falconer Lecture.

Mathematical Neuroscience

Jonathan Rubin, *University of Pittsburgh*
Friday, August 6, 1:00 pm – 2:50 pm

Speakers: Winfried Just, Jozsi Jalics, Peter Thomas, and Stefanos Folias
This session complements the Invited Address by Martin Golubitsky.

Mathematical Visualization

Frank Farris, *Santa Clara University*
Saturday, August 7, 1:00 pm – 2:50 pm

Speakers: Thomas Banchoff, Frank Farris, Ockle Johnson, and Jonathan Rogness
This session complements the Invited Address by Frank Farris.

The Mathematics of Math Circles and Beyond

Zvezdelina Stankova, Mills College and UC Berkeley, Director of Berkeley Math Circle
Tatiana Shubin, *San Jose State University, Director of San Jose Math Circle*
Saturday, August 7, 1:00 pm – 4:20 pm

Speakers: Inna Zakharevich, Evan O'Dorney, Tiankai Liu, Ivan Matic, and Gabriel Carroll
This session complements the Invited Address by Zvezdelina Stankova.

The Klein Project

William McCallum, *University of Arizona*
Saturday, August 7, 1:00 pm – 4:50 pm

Speakers: James Madden, Al Cuoco, Hyman Bass, Harriet Pollatsek, Roger Howe, Susanna Epp, Bill Barton, Sybilla Beckmann
This session complements the James R. Leitzel Lecture.

An Invitation to Geometric Group Theory

Dan Margalit, *Tufts University*
Friday, August 6, 1:00 pm – 4:50 pm

Speakers: Greg Bell, Tara Brendle, Matt Clay, Johanna Mangahas, John Meier, Eduardo Martinez Pedroza, Kim Ruane, and Angela Kubena

For full descriptions of the Invited Paper Sessions go to http://www.maa.org/mathfest.

CONTRIBUTED PAPER SESSIONS

The History of Mathematics and Its Uses in the Classroom
Herbert Kasube, *Bradley University*
John Lorch, *Ball State University*
Joanne Peeples, *El Paso Community College*
Session I, Thursday, August 5, 1:00 p.m. – 3:35 p.m.
Session II. Friday, August 6, 8:30 a.m. – 11:45 a.m.

Math & Bio 2010 in 2010
Timothy Comar, *Benedictine University*
Raina Robeva, *Sweet Briar College*
Thursday, August 5, 1:00 p.m. – 5:15 p.m.

Open and Accessible Problems in Applied Mathematics
David Housman, *Goshen College*
Friday, August 6, 8:30 a.m. – 11:45 a.m

Getting Students Involved in Writing Proofs
Aliza Steurer, *Dominican University*
Jennifer Franko-Vasquez, *University of Scranton*
Rachel Schwell, *Central Connecticut State University*
Session I, Thursday August 5, 8:50 a.m. – 10:25 a.m.
Session II, Friday August 6, 9:10 a.m. – 11:45 a.m.

Geometry Topics That Engage Students Sarah Mabrouk, Framingham State College
Sarah Mabrouk, *Framing Ham State College*
Session I, Friday, August 6, 1:00 p.m. – 4:55 p.m.
Session II, Saturday August 1:00 p.m. – 4:15 p.m.

Innovative Ideas for an Introductory Statistics Course
Nancy Boynton, *SUNY Fredonia*
Patricia Humphrey, *Georgia Southern University*
Michael Posner, *Villanova University*
Session I, Friday August 6,, 1:00 p.m. – 4:55 p.m.
Session II, Saturday August 7, 8:30 a.m. – 11:45 a.m.

Open and Accessible Problems in Number Theory and Algebra
Thomas R. Hagedorn, *The College of New Jersey*
Friday, August 6, 1:00 p.m. – 5:35 p.m

Effective Practices for Teaching Mathematical Communication Skills
Russell Goodman, *Central College*
Saturday, August 7, 8:30 a.m. – 11:45 a.m.

Active Learning Intervention Strategies Accompanying Introductory Mathematics Courses
Catherine Beneteau, *University of South Florida*
Helmut Knaust, *University of Texas at El Paso*
Emil Schwab, *University of Texas at El Paso*
Gabriela Schwab, *El Paso Community College – Rio Grande Campus*
Saturday, August 7, 1:00 p.m. – 4:55 p.m.

First Year Seminar/First Year Experience Mathematics Courses
Jon Johnson, *Elmhurst College*
Cheryl McAllister, *Southeast Missouri State University*
Session I, Saturday August 7, 8:30 a.m. – 11:45 a.m.
Session II, Saturday August 7, 1:00 p.m. – 4:55 p.m.

Recreational Mathematics: New Problems and New Solutions
Paul R. Coe, *Dominican University*
Kristen Schemmerhorn, *Dominican University*
Saturday, August 7, 1:00 p.m. – 3:15 p.m.

General Contributed Paper Sessions
Shawnee McMurran, *California State University, San Bernardino*
Suzanne Dorée, *Ougsburg College*
Session I, Thursday August 5, 8:30 a.m. – 10:25 a.m.
Session II, Thursday August 5, 1:00 p.m. – 5:40 p.m.
Session III, Friday August 6, 8:30 a.m. – 11:55 a.m.
Session IV, Friday August 6, 8:30 a.m. – 11:55 a.m.
Session V, Friday August 6, 1:00 p.m. – 5:55 p.m.
Session VI, Saturday August 7, 8:30 a.m. – 11:55 a.m.
Session VII, Saturday August 7, 8:30 a.m. – 11:55 a.m.
Session VIII, Saturday August 7, 1:00 p.m. – 5:55 p.m.

For full descriptions of the Contributed Paper Sessions go to http://www.maa.org/mathfest.

Let your passion for math lead you to a winning career choice. Step up and teach in public secondary schools in the New York City region to make a difference in mathematics education and help solve our nation's math literacy problem.

MƒA provides aspiring math teachers with:

- A full scholarship for a master's degree or teacher credentialing program in Mathematics Education
- Up to $100,000 in stipends, in addition to a full-time teacher's salary
- Mentoring, job search support and ongoing professional development opportunities
- Membership in a national corps of highly qualified secondary math teachers

MƒA Math for America

www.mathforamerica.org

Helping Scores of Students

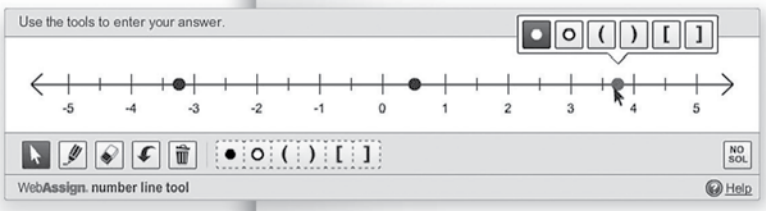
GOOD MATH.

IT'S WEBASSIGN, ONLY BETTER.

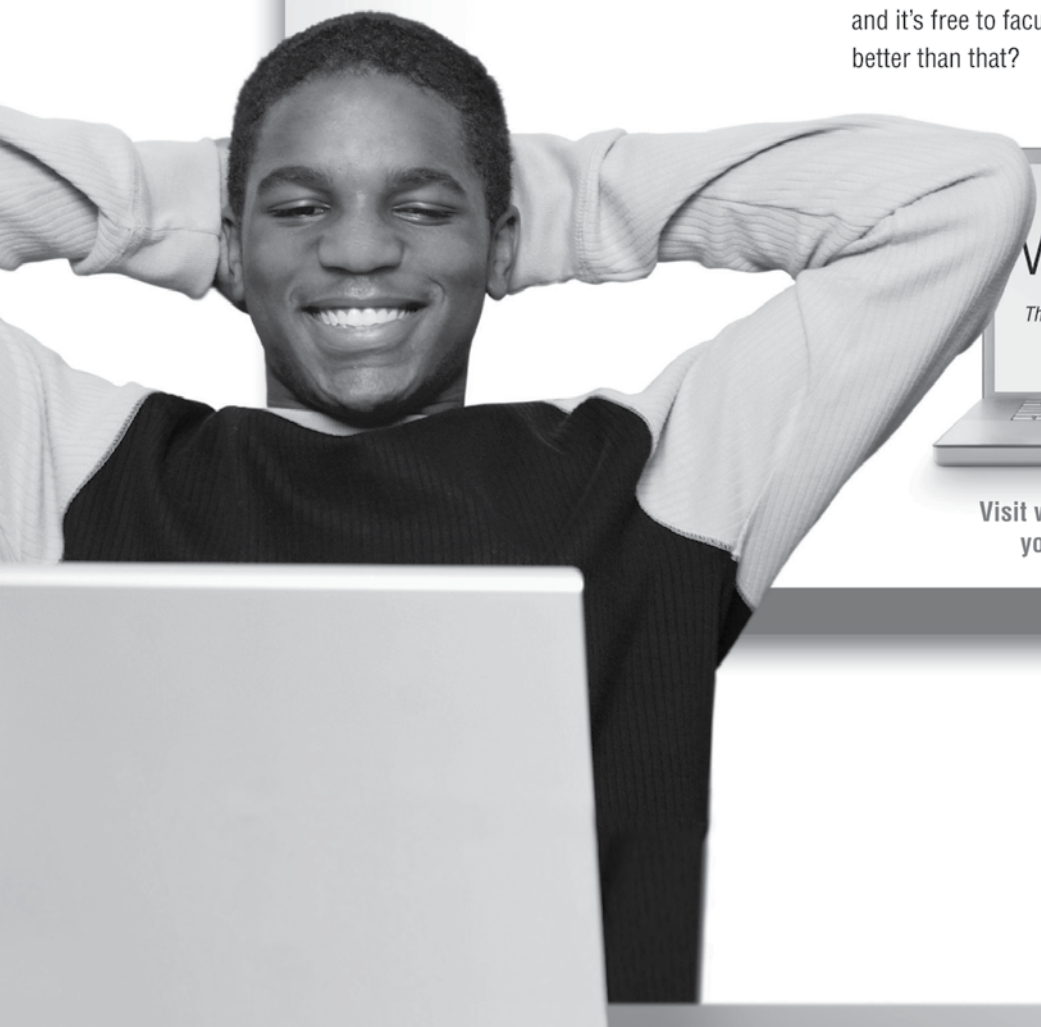
Only WebAssign is supported by every publisher and supports every course in the curriculum from developmental math to calculus and beyond. That's good. Now we've added the latest homework tools to bring you the ultimate learning environment for math. That's better.

Welcome to a better WebAssign. There are new tools —including number line, that lets students plot data graphically, then automatically assesses their work. There are more books, over 170 titles from every major publisher. And there's more server capacity with an expanded support team just waiting to serve you and over half a million loyal WebAssign users each term. It's the culmination of a team-wide effort to build the best WebAssign ever.

The ingenuity of WebAssign for math. It's available now and it's free to faculty at WebAssign.net. Now what could be better than that?



Students use number line to plot data graphically with automatic assessment.



Visit www.webassign.net to sign up for your free faculty account today.

PANELS AND OTHER SESSIONS

Panel: The Role of Mentoring in Undergraduate Mathematics: Promising Recruitment and Retention Strategies
Sylvia Bozeman, *Spelman College*
Ken Millett, *University of California, Santa Barbara*
William Velez, *University of Arizona*
Thursday, August 5, 1:00 pm – 2:20 pm

Workshop: What's the Story? A Graduate Student Workshop on Creating a Research Presentation for Undergraduates
Aaron Luttman, *Clarkson University*
Rachel Schwell, *Central Connecticut State University*
Thursday, August 5, 2:00 pm – 3:20 pm

Panel: Teaching Mathematics with Tablet Computers
Jason Aubrey, *University of Missouri*
Michael B. Scott, *California State University -Monterey Bay*
Thursday, August 5, 2:30 pm – 3:50 pm

MAA Section Officers Meeting
Richard A. Gillman, *Valparaiso University*
Thursday, August 5, 3:30 pm – 5:00 pm

Panel: Mathematics in Interdisciplinary Survey Courses
Cinnamon Hillyard, *University of Washington Bothell*
Stuart Boersma, *Central Washington University*
Thursday, August 5, 3:30 pm – 4:50 pm

Poster Session: The Early Career and Graduate Students PosterFest at MathFest
Ed Aboufadel, *MAA Committee on Early Career Mathematicians*
Ralucca Gera, *Young Mathematicians' Network*
Aaron Luttman, *MAA Committee on Graduate Students*
Thursday, August 5, 3:30 pm – 5:00 pm

Workshop: Understanding and Assessing Mathematical Proofs
Sean Larsen, *Portland State University*
Stacy Brown, *Pitzer College*
Natasha Speer, *University of Maine*
Thursday, August 5, 3:40 pm – 5:00 pm

Open Meeting Getting Started with Online Teaching
Doug Ensley, *Shippensburg University*
Mike May, *Saint Louis University*
Thursday, August 5, 4:30 pm – 6:00 pm

MAA Prize Session
Barbara Faires, *MAA Secretary*
Friday, August 6, 11:30 am – 12:00 noon

Panel: How to Apply for a Job
David Manderscheid, *University of Nebraska Lincoln*
Friday, August 6, 2:10 pm – 3:30 pm

Alder Award Session
David Bressoud, *Macalester College, MAA President*
Friday, August 6, 2:15 p.m – 3:05 pm

Panel: Celebrating Mathematics and Bio 2010
Raina Robeva, *Sweet Briar College*
Jennifer Galovich, *St. John's University and College of St. Benedict*
Friday, August 6, 3:40 pm – 5:00 pm

Panel: Issues for Early Career Mathematicians in Academia
Michael Dorff, *Brigham Young University*
Edward Aboufadel, *Grand Valley State University*
Friday, August 6, 4:00 pm – 5:20 pm

Mathematics Circles Demonstration
Tatiana Shubin, *San Jose State University*
Elgin Johnston, *Iowa State University*
James Tanton, *St. Mark's School in Southborough, MA*
Saturday, August 7, 9:00 am – 10:20 am

MAA Business Meeting
David Bressoud, *Macalester College, MAA President*
Saturday, August 7, 11:30 a.m – 12:00 noon

Panel: Transforming Undergraduate Education in STEM: Recent Changes at NSF
Saturday, August 7, 1:00 – 2:20 pm
Sponsor: MAA Science Policy Committee

Panel: The Single Mathematician
Georgia Benkart, *University of Wisconsin*
Maura Mast, *University of Massachusetts Boston*
Maeve Lewis McCarthy, *Murray State University*
Saturday, August 7, 3:00 pm – 4:20 pm

Math Circles: Transforming (or Subverting) Pre-College Mathematics
Tatiana Shubin, *San Jose State University*
Elgin Johnston, *Iowa State University*
James Taylor, *Santa Fe Preparatory School, Santa Fe, NM*
Saturday, August 7, 4:30 pm – 6:00 pm

For full descriptions of Panels and Other Sessions go to http://www.maa.org/mathfest.

UNDERGRADUATE STUDENT ACITIVITIES

MAA-PME STUDENT RECEPTION
Wednesday, August 4, 4:30 pm – 5:30 pm

Math Jeopardy
Robert Vallin, *Slippery Rock University and the MAA*
Michael Berry, *University of Tennessee*
Wednesday, August 4, 5:30 pm – 6:15 pm

Student Hospitality Center
Richard and Araceli Neal, *American Society for the Communication of Mathematics*
Thursday, August 5, 9:00 am – 5:00 pm
Friday, August 6, 9:00 am – 5:00 pm
Saturday, August 7, 9:00 am – 1:00 pm

MAA LECTURE FOR STUDENTS:
Faster, Safer, Healthier with Operations Research
Sommer Gentry, *United States Naval Academy*
Thursday, August 5, 1:00 pm – 1:50 pm

MAA UNDERGRADUATE STUDENT ACTIVITY:
Connecting Digraphs and Determinants
Jennifer Quinn, *University of Washington Tacoma*
Friday, August 6, 1:00 pm – 1:50 pm

MAA UNDERGRADUATE STUDENT ACTIVITY:
A Mathematical Tour of the State of the Planet
Tom Pfaff, *Ithaca College*
Friday, August 6, 1:00 pm – 1:50 pm

MAA Student Paper Sessions
J. Lyn Miller, *Slippery Rock University*
John Hamman, *Montgomery College*
Daluss Siewert, *Black Hills State University*
Thursday, August 5, 8:30 am – 10:30 am and 2:00 pm – 6:15 pm
Friday, August 6, 8:30 am – 12:00 am and 2:00 pm – 5:00 pm

Pi Mu Epsilon Student Paper Sessions
Angela Spalsbury, *Youngstown State University*
Thursday, August 6, 2:00 pm - 6:15 pm
Friday, August 7, 8:30 am – 12:00 am and 2:00 pm – 5:00 pm

Pi Mu Epsilon Student Banquet and Awards Ceremony
Friday, August 6, 6:00 pm - 7:45 pm

PI MU EPSILON J. SUTHERLAND FRAME LECTURE
Incomprehensibility
Nathaniel Dean, *Texas State University*
Friday, August 6, 8:00 p.m – 8:50 pm

MAA Ice Cream Social
Friday, August 6, 9:00 pm – 10:00 pm

MAA Mathematical Competition in Modeling (MCM) Winners
Ben Fusaro, *Florida State University*
Saturday, August 7, 9:00 am – 10:30 am

Student Problem Solving Competition
Richard Neal, *American Society for the Communication of Mathematics*
Saturday, August 7, 1:00 pm – 2:15 pm

SPECIAL SESSION:
Great Talks for a General Audience: Coached Presentations by Graduate Students
Jim Freeman, *Cornell College*
Saturday, August 7, 1:00 pm – 5:30 pm

For full descriptions of the Undergraduate Student Sessions go to http://www.maa.org/mathfest.

GRADUATE STUDENT ACTIVITIES

GRADUATE STUDENT WORKSHOP
What's the Story? A Graduate Student Workshop on Creating a Research Presentation for Undergraduates
Aaron Luttman, *Clarkson University*
Rachel Schwell, *Central Connecticut State University*
Thursday, August 5, 2:00 pm – 3:20 pm

For full descriptions of the Graduate Student Sessions go to http://www.maa.org/mathfest.

GRADUATE STUDENT POSTER SESSION
The Early Career and Graduate Students PosterFest at MathFest
Ed Aboufadel, *MAA Committee on Early Career Mathematicians*
Ralucca Gera, *Young Mathematicians' Network*
Aaron Luttman, *MAA Committee on Graduate Students*
Thursday, August 5, 3:30 pm – 5:00 pm

GRADUATE STUDENT RECEPTION
David Manderscheid, *University of Nebraska-Lincoln*
James Freeman, *Cornell College*
Thursday, August 5, 5:00 pm – 6:00 pm

How to Apply for a Job
David Manderscheid, *University of Nebraska Lincoln*
Friday, August 6, 2:10 pm – 3:30 pm

Issues for Early Career Mathematicians in Academia
Michael Dorff, *Brigham Young University*
Edward Aboufadel, *Grand Valley State University*
Friday, August 6, 4:10 pm – 5:30 pm

An invitation to explore… http://mathcircles.org

National Association of Math Circles (NAMC)

What is a Math Circle?

Mathematicians and mathematical scientists meet with pre-college students (and sometimes their teachers) in informal settings to work on interesting problems and topics in mathematics.

These interactions excite students about mathematics and provide them with a community to foster their passion for mathematical thinking.

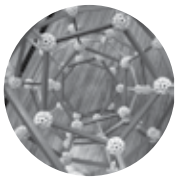
The Math Circles Experience

Math Circles emphasize bringing together professional mathematicians and secondary school students on a regular basis for problem solving and mathematical exploration.

Providing resources to create new Math Circles, maintain a directory of programs, and support the development of the Math Circle community.

Our focus is to continue development of the NAMC Website (http://mathcircles.org) which already includes the Circle in a Box wiki, contacts for Math Circles throughout North America, the Math Circle Problem Collection, and a forum for discussion of Math Circles and related issues among NAMC members.

Math Circles Wiki



Topics Include: • What is a Math Circle • History of Math Circles
• National Association of Math Circles • Molding a Math Circle
• Finding Support • Organizing the Academics • Sustaining Math Circle

With links to the *Circle in a Box* book and *Within a Circle* DVD

Math Circle Problem Collection The star of the website. The Collection includes a wide variety of popular Math Circle-type problems with **search capability** based on topic, prerequisite, author, and more.

Math Circle Community

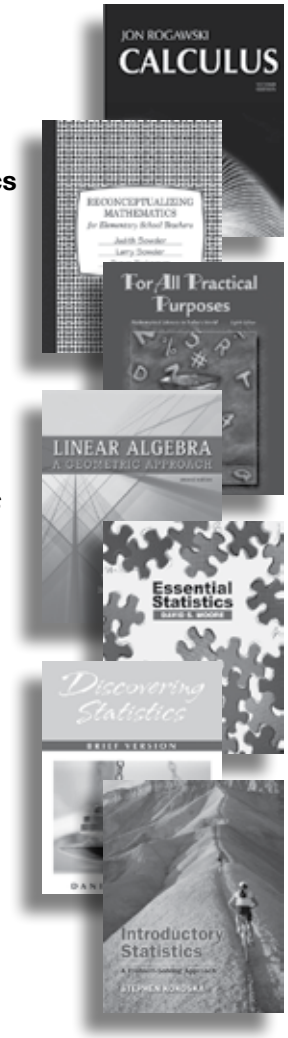
Existing Math Circle Programs More and more math circle programs are popping up around the globe – check them all out on our **interactive map**. You can also **locate a Math Circle in your area** with our worldwide Math Circles Directory. If your Math Circle isn't listed, adding your Circle is as easy as 1-2-3! Math Events Competitions and Summer Programs: Looking for fun, motivating and education activities for your Math Circle to attend? Review our list of events, competitions, and summer and national programs.

Social Networking The NAMC website will now provide the opportunity for connecting Math Circlers across the country. Share your lesson plans, post your favorite Math Circle problems, and use the site to connect to other Math Circle participants, instructors and directors.

Circle on the Road The annual NAMC Circle on the Road is a Math Circle Workshop combined with a Math Festival with many sample circle sessions for local students and teachers. The Math Circle Workshop that will serve as an introduction to instructional techniques for circle leaders and a laboratory for circle evaluators. Participating in this workshop will give the people wishing to start Math Circles a hands-on introduction to appropriate Math Circle activities and the benefit of the advice of experienced circle leaders while developing a Math Circle. If you aren't able to attend Circle on the Road you can still participate with online videos and other program resources made available through the NAMC website.

W. H. FREEMAN AND COMPANY

Solutions for Success



MATHEMATICS

- **New! Calculus, Second Edition**
  Jon Rogawski
- **Reconceptualizing Mathematics**
  Judith Sowder | Larry Sowder
  Susan Nickerson
- **For All Practical Purposes, Eighth Edition**
  COMAP, Inc.
- **New! Linear Algebra, Second Edition**
  Theodore Shifrin | Malcolm Adams

STATISTICS

- **New! Essential Statistics**
  David S. Moore
- **New! Discovering Statistics: Brief Version**
  Daniel T. Larose
- **New! Introductory Statistics: A Problem Solving Approach**
  Stephen Kokoska

NEW MEDIA FOR MATHEMATICS AND STATISTICS

MATHPORTAL
CALCPORTAL
STATSPORTAL
STAT TK STATISTICS VIDEO TOOL KIT

VISIT W. H. FREEMAN AT BOOTH #18 FOR MORE INFORMATION AND MEDIA DEMOS

www.whfreeman.com

Thank You
MATHFEST SPONSORS

MAA would like to thank our 2010 Sponsors for so generously contributing to the success of MathFest.

A K Peters

Hawkes Learning Systems

Maplesoft

Math for America

National Association of Math Circles

WebAssign

MAA
MATHEMATICAL ASSOCIATION OF AMERICA

SIGMAA ACTIVITIES

BIO SIGMAA

CONTRIBUTED PAPER SESSION

Math & Bio 2010 in 2010

Timothy Comar, *Benedictine University* **and Raina Robeva,** *Sweet Briar College*

Thursday, August 5, 1:00 pm – 5:15 pm

PANEL DISCUSSION

Celebrating Mathematics and Bio 2010

Raina Robeva, *Sweet Briar College,* **and Jennifer Galovich,** *St. John's University and the College of St. Benedict*

Friday, August 6, 3:40 pm – 5:00 pm

HOM SIGMAA

CONTRIBUTED PAPER SESSION

The History of Mathematics and Its Uses in the Classroom

Herbert Kasube, *Bradley University,* **John Lorch,** *Ball State University,* **and Joanne Peeples,** *El Paso Community College*

Thursday, August 5, 1:00 pm – 3:55 pm

WEB SIGMAA

PANEL DISCUSSION

Teaching Mathematics with Tablet Computers

Jason Aubrey, University of Missouri, and Michael B. Scott, California State University-Monterey Bay

Thursday, August 5, 2:30 pm – 3:50 pm

OPEN MEETING

Getting Started with Online Teaching

Doug Ensley, *Shippensburg University,* **and Mike May,** *Saint Louis University*

Thursday, August 5, 4:30 pm – 6:00 pm

SIGMAA RUME

WORKSHOP

Understanding and Assessing Mathematical Proofs

Sean Larsen, *Portland State University;* **Stacy Brown,** *Pitzer College;* **and Natasha Speer,** *University of Maine*

Thursday, August 5, 3:40 pm – 5:00 pm

SIGMAA QL

PANEL DISCUSSION

Mathematics in Interdisciplinary Survey Courses

Cinnamon Hillyard, *University of Washington Bothell,* **and Stuart Boersma,** *Central Washington University*

Thursday, August 5, 3:30 pm – 4:50 pm

SIGMAA EM

Lecture and Business Meeting

Ben Fusaro, *Florida State University*

Speaker: To be announced

Thursday, August 5, 5:30 pm – 7:00 pm

POM SIGMAA

INVITED SPEAKER AND RECEPTION

Structural Proof Theory: Uncovering Capacities of the Mathematical Mind

Wilfried Sieg, *Carnegie Mellon University*

Thursday, August 5, 5:30 pm – 7:00 pm

SIGMAA STAT-ED

CONTRIBUTED PAPER SESSION

Innovative Ideas for an Introductory Statistics Course

Nancy Boynton, *SUNY Fredonia;* **Patricia Humphrey,** *Georgia Southern University;* **and Michael Posner,** *Villanova University*

Friday, August 6, 1:00 pm – 5:00 pm

SIGMAA on Math Circles

Mathematics Circles Demonstration

Tatiana Shubin, *San Jose State University;* **Elgin Johnston,** *Iowa State University;* **and James Tanton,** *St. Mark's School*

Saturday, August 7, 9:00 am – 10:20 am

INVITED PAPER SESSION

The Mathematics of Math Circles and Beyond

Zvezdelina Stankova, *Mills College,* **and Tatiana Shubin,** *San Jose State University*

Saturday, August 7, 1:00 pm – 4:20 pm

PANEL DISCUSSION

Math Circles: Transforming (or Subverting) Pre-College Mathematics

Tatiana Shubin, *San Jose State University,* **and Elgin Johnston,** *Iowa State University;* **Eric Hsu,** *San Francisco State University;* **Jim Lewis,** *University of Nebraska;* **William McCallum,** *University of Arizona;* **James Tanton,** *St. Mark's School;* **and James Taylor,** *Santa Fe Preparatory School*

Saturday, August 7, 4:30 pm – 6:00 pm

MINICOURSES

MINICOURSE #1

Recruiting Students to Take More Mathematics Courses and to be Math Majors

Michael Dorff, *Brigham Young University*
Part 1, Thursday, August 5, 1:00 pm – 3:00 pm
Part 2, Friday, August 6, 1:00 pm – 3:00 pm

We will discuss some principles and specific activities we have used to increase the number of students taking mathematics courses and becoming math majors. Principles include creating a culture of "Math is cool!", exposing students to careers and opportunities available to those who study mathematics, and being proactive in your efforts. Specific activities include a "Careers in Mathematics" seminar, a freshman/sophomore class titled "Intro to being a math major," the creation of a student advisory council, a big screen HDTV display with a PowerPoint presentation about mathematics, a set of math t-shirts, and the "When Will I Use Math" website.

MINICOURSE #2

Perspective Viewing and Drawing Make Good Math Problems

Marc Frantz, *Indiana University*
Annalisa Crannell, *Franklin & Marshall College*
Part 1, Thursday, August 5, 1:00 pm – 3:00 pm
Part 2, Friday, August 6, 1:00 pm – 3:00 pm

The execution of the simplest line drawings in perspective can pose math problems that challenge the brightest of students. Nevertheless, the solutions are pleasingly easy to use and remember. The other side of the coin—viewing a work in perspective from the correct viewpoint—poses similarly interesting problems. When applied to viewing real artwork (or posters), these techniques lead to an astonishing experience of depth and realism that leaves a lasting impression on viewers. This minicourse conveys these techniques through hands-on activities, which the facilitators have taught to over 170 instructors in faculty development workshops. No artistic experience is required.

MINICOURSE #3

An Introduction to Geogebra, a Tool for Demonstration, Exploration, and Applet Creation

Mike May, S.J., *Saint Louis University*
Part 1, Thursday, August 5, 3:30 pm – 5:30 pm
Part 2, Saturday, August 7, 1:00 pm – 3:00 pm

GeoGebra is an easy to use, free, open source, cross platform, program that allows users to visualize and experiment with both algebraic and geometric representations of mathematical concepts. Constructions can be used as live demonstration or exploration tools, or saved as applets used with any java enabled browser. Sample applets can be found at http://www.slu.edu/classes.maymk/GeoGebra/. The minicourse assumes only novice computer skills and covers an introduction to GeoGebra up through deploying applets in web pages. We will work through creating several activities to illustrate features of the program and to get participants to create their own activities. All participants are expected to bring a laptop computer to the minicourse.

MINICOURSE #4

Effective Placement Testing for Introductory College Mathematics Courses

Raymond Cannon, *Baylor University*
Marilyn Carlson, *Arizona State University*
Wade Ellis, *West Valley College*
Louise Krmpotic, *Maplesoft*
Bernard L. Madison, *University of Arkansas*
James W. Stepp, *University of Houston*
Gordon Woodward, *University of Nebraska*
Part 1, Thursday, August 5, 3:30 pm – 5:30 pm
Part 2, Saturday, August 7, 1:00 pm – 3:00 pm

Building on experience from MathFest 2009, this minicourse will describe and analyze ways to develop or modify placement testing programs so that they are more effective in placing students into challenging introductory courses where they can succeed. The topics will include innovations in item types and cognitive design, the increasingly complex transition testing landscape, structuring a placement program, and available testing resources. Both participants who are just beginning placement testing work and those with considerable experience are welcome. Prior to the minicourse, participants will be surveyed as to their expectations of the course and their experience with placement testing. Some experienced participants will be invited to share their experiences and respond to questions from others.

MINICOURSE #5

A Game Theory Path to Quantitve Literacy

David Housman, *Goshen College*
Rick Gillman, *Valparaiso University*
Part 1, Friday, August 6, 3:30 pm – 5:30 pm
Part 2, Saturday, August 7, 3:30 pm – 5:30 pm

Game Theory, defined in the broadest sense, can be used to model many real-world scenarios of decision making in situations involving conflict and cooperation. Further, mastering the basic concepts and tools of game theory require only an understanding of basic algebra, probability, and formal reasoning. These two features of game theory make it an ideal path to developing habits of quantitative literacy among our students. This audience participation

mini-course develops some of the material used by the presenters in their general education courses on game theory and encourages participants to develop their own, similar, courses.

MINICOURSE #6

Creating Demonstrations and Guided Explorations for Multivariable Calculus Using CalcPlot3D

Paul Seeburger, *Monroe Community College*

Part 1, Friday, August 6, 3:30 pm – 5:30 pm

Part 2, Saturday, August 7, 3:30 pm – 5:30 pm

It is often difficult for students to develop an accurate and intuitive understanding of the geometric relationships of calculus from static diagrams alone. This course explores a collection of freely available Java applets designed to help students make these connections. Our primary focus will be visualizing multivariable calculus using CalcPlot3D, a versatile new applet developed by the presenter through NSF-DUE-0736968. Participants will also learn how to customize this applet to create demonstrations and guided exploration activities for student use. Images created in this applet can be pasted into participants' documents. See http://web.monroecc.edu/calcNSF/. Some basic HTML experience is helpful. All participants are expected to bring a laptop computer to the minicourse.

MAA Publications

Stop by the MAA Booth for a book signing with Underwood Dudley, Problem of the Day contests, Prizes and More!

Also look for our special coupon flier in your registration packet!

MAA
MATHEMATICAL ASSOCIATION OF AMERICA

SHORT COURSE

The MathFest 2010 Short Course is presented in honor of William F. Lucas.

TWO-DAY SHORT COURSE

Hands-On Explorations in Algebra and Combinatorics

Patrick Bahls, *University of North Carolina at Asheville*
Robert A. Beeler, *East Tennessee State University*
Neil Calkin, *Clemson University*
Dante Manna, *Virginia Wesleyan College*
Dan Warner, *Clemson University*

Part I: Tuesday, August 3, 9:00 am – 5:00 pm

Part II: Wednesday, August 4, 9:00 am – 5:00 pm

In recent years, a new piece of mathematical software has appeared on the scene: Sage (www.sagemath.org) is an open source package capable of doing high-powered symbolic and numerical computations. It features a web-based notebook interface, local or remote operation, and can interact with other packages, both open source and commercial (if available). In this short course we will introduce the package, giving multiple examples of how to use it for mathematical explorations, both elementary and advanced. We will focus on algebraic and combinatorial investigations.

The course will consist of seven presentations and a final panel discussion. The first two sessions will focus on using Sage. The next five sessions will start with a problem or collection of problems in discrete mathematics and explore the topic with the assistance of the more advanced tools in Sage. Each of these sessions will end with a period of guided exploration by the participants. The closing session will focus on the questions: "What have we learned?" and "Where do we go from here?"

Topics covered in this short course include:

- Introduction to Sage
  Neil Calkin and Daniel Warner
- Elementary Mathematics with Sage
  Neil Calkin and Daniel Warner
- Exploring Combinatorial Group Theory
  Patrick Bahls
- Generating Functions and Sage
  Robert A. Beeler
- Benoulli Convolutions
  Neil Calkin
- Combinatorial Games and Symmetry
  Daniel Warner
- Generalizing the Bernoulli and Euler Polynomials
  Dante Manna

BIOMATHEMATICS AT MATHFEST 2010

MAA INVITED ADDRESS

Mathematics Motivated by Biology
Martin Golubitsky, *Ohio State University*
Thursday, August 5, 9:30 am – 10:20 am

AWM–MAA ETTA Z. FALCONER LECTURE

Mathematical Challenges in the Treatment of Cancer
Ami Radunskaya, *Pomona College*
Friday, August 6, 8:30 am – 9:20 am

NAM DAVID BLACKWELL LECTURE

The Riordan Group Revisited: From Algebraic Structure to RNA
Asamoah Nkwanta, *Morgan State University*
Friday, August 6, 1:00 pm – 1:50 pm

MAA LECTURE FOR STUDENTS

Faster, Safer, Healthier with Operations Research
Sommer Gentry, *United States Naval Academy*
Thursday, August 5, 1:00 pm – 1:50 pm

INVITED PAPER SESSION

Mathematical Modeling of the Immune Response, Cancer Growth, and Treatments
Ami Radunskaya, *Pomona College*
Saturday, August 7, 1:00 pm – 4:50 pm

INVITED PAPER SESSION

Mathematical Neuroscience
Jonathan Rubin, *University of Pittsburgh*
Friday, August 6, 1:00 pm – 2:50 pm

CONTRIBUTED PAPER SESSION

Math & Bio 2010 in 2010
Timothy Comar, *Benedictine University*
Raina Robeva, *Sweet Briar College*
Thursday, August 5, 1:00 pm – 5:15 pm

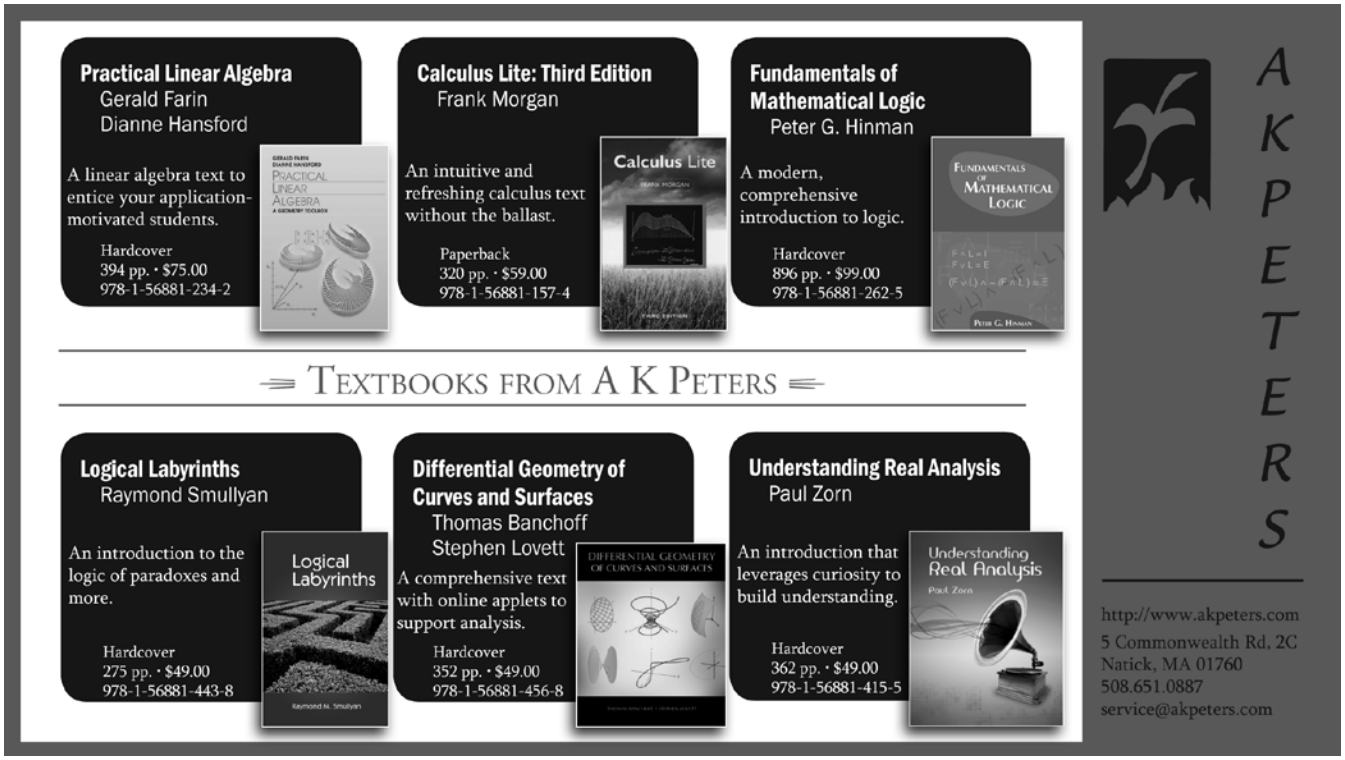
PANEL DISCUSSION

Celebrating Mathematics and Bio 2010
Raina Robeva, *Sweet Briar College*
Jennifer Galovich, *St. John's University and the College of St. Benedict*
Friday, August 6, 3:40 pm – 5:00 pm

PRESENTATION OF JANET L. ANDERSEN AWARDS

Friday, August 6, 6:00 pm – 8:00 pm and 9:00 pm – 10:00 pm
These awards are for outstanding student presentations related to mathematical or computational biology.

For full descriptions of the Biomathematics Sessions go to http://www.maa.org/mathfest.



EXHIBITORS

• A+ Compass

A+ Compass designs, produces and markets math education tools and materials. We are also distributors for a small number of select products from other sources. Our primary products are whiteboard compasses, magnetic straightedges, large magnetic protractors, LASER cut puzzles and demonstrations and graphing boards. We also produce templates for use with document cameras and overhead projectors. Visit our website at www.apluscompass.com and contact us via the website.

• A K Peters – 2010 Sponsor

A K Peters, Ltd. is a leading independent, scientific-technical publisher specializing in mathematics, physics, computer graphics, and computer games. A K Peters has over 300 titles in print and publishes approximately 25-30 new titles annually, including four journals. Recent releases include Origami Polyhedra Design, Leonhard Euler and the Bernoullis, Bright Boys, Understanding Real Analysis, Differential Geometry of Curves and Surfaces, and many more. Stop by our booth and save 20%!

• AMS

The American Mathematical Society publishes books, journals (electronic and print), and MathSciNet-the Mathematical Reviews Database. Our top-tier research publications span the entire spectrum of pure and applied mathematics for professionals, graduate students, and advanced undergraduates. For more information or to purchase AMS publications, go to www.ams.org/bookstore.

• Cambridge

Cambridge's publishing in books and journals combines state-of-the-art content with the highest standards of scholarship, writing and production. Visit our stand to browse new titles, available at a 20% discount, and to pick up sample issues of our journals. Visit our website to see everything we do: www.cambridge.org/us/.

• Division of Undergraduate Education, National Science Foundation

NSF's goals—discovery, learning, research infrastructure and stewardship—provide an integrated strategy to advance the frontiers of knowledge, cultivate a world-class, broadly inclusive science and engineering workforce and expand the scientific literacy of all citizens, build the nation's research capability through investments in advanced instrumentation and facilities, and support excellence in science and engineering research and education through a capable and responsive organization. Within the NSF, the Division of Undergraduate Education's mission is to promote excellence in undergraduate science, technology, engineering, and mathematics (STEM) education for all students. Website: http://www.nsf.gov/div/index.jsp?org=DUE .

• Hawkes Learning Systems – 2010 Sponsor

Discover the advantages of interactive software created by a company that has been specializing in mathematics for over 30 years. Hawkes Learning Systems (HLS) promotes grade improvement and motivates students by engaging them in the learning process. Students learn more effectively through tutorials, unlimited practice, mastery-based homework, and error-specific feedback. HLS is the solution for your students' success!

• Make Textbooks Affordable

Make Textbooks Affordable is a non-profit student campaign to reduce textbook costs by promoting affordable alternatives like open-access textbooks. The campaign is a project of the Student PIRGs, which is a national network of state-based student groups that work to solve problems related to the environment, consumer protection, and government reform. www.studentpirgs.org/open-textbooks

• Maplesoft– 2010 Sponsor

Maplesoft offers a collection of testing solutions which can free schools from the cost, effort, and limitations of paper-and-pencil assessment. Drawing on the power of Maple, web-based solutions from Maplesoft make it easy to deliver meaningful tests on any subject involving mathematical content. Through an exciting partnership with the MAA, Maplesoft brings you the Maple TA MAA Placement Test Suite. For all of your other math, engineering and science testing and assessment requirements, try Maple T.A. Both solutions bring the power of Maple into your testing and assessment program.

EXHIBITORS

• Math for America– 2010 Sponsor

Founded in 2004, Math for America (M*f*A) is a private nonprofit organization with a mission to improve math education in US public secondary schools. With sites in Boston, Los Angeles, New York City, San Diego and Washington, DC, M*f*A recruits, trains and retains outstanding mathematics teachers. M*f*A offers Fellowships for both new and experienced teachers, including the M*f*A Fellowship, which aims to increase the number of mathematically talented individuals entering the teaching profession, as well as the M*f*A Early Career Fellowship and M*f*A Master Teacher Fellowship, which support outstanding mathematics teachers already in the classroom. Visit http://www.mathforamerica.org

• Mathematics Department at the University of California, Riverside

The Mathematics Department at University of California, Riverside is one of the few Math departments in the country that offers diversity in research, small hands-on classes and the unique opportunity to learn from some of the most prominent mathematicians.

The cumulative experiences of our mathematics program prepares graduates to enter top mathematics education programs, to take on important leadership roles in mathematics education communities, and enter classrooms better equipped to teach lessons that encourage deeper mathematical thinking.

At UCR, our graduate studies program emphasizes strong interaction with faculty in order to gain maximum benefit from course work. First, it allows students to explore new mathematical understanding in both personal and social contexts. Secondly, it immerses students deeply in exploration, inquiry and analysis. Finally, it familiarizes students with the ever-changing body of research literature related to learning and teaching mathematics and contemporary research methodologies.

PhD and Master's Degrees offered.

Apply online http://www.graduate.ucr.edu/Admtoc.html

• National Association of Math Circles— 2010 Sponsor

The National Association of Math Circles provides a community for Math Circles and similar programs via a website http://mathcircles.org. This fun and interactive website includes a database of Math Circles worldwide, a wiki started by Sam Vandervelde's Circle in a Box Math Circle book, a Math Circle Problem and Lesson Collection, as well as a developing forum for discussion of Math Circle related ideas. Visit our booth to learn more or attend one of the SIGMAA-MCST sessions to learn more about Math Circles.

• National Security Agency

The National Security Agency/ Central Security Service (NSA/CSS) is home to America's codemakers and codebreakers. The National Security Agency has provided timely information to U.S. decision makers and military leaders for more than half a century.

NSA/CSS is unique among the U.S. defense agencies because of our government-wide responsibilities. NSA/CSS provides products and services to the Department of Defense, the Intelligence Community, government agencies, industry partners, and select allies and coalition partners. In addition, we deliver critical strategic and tactical information to war planners and war fighters.

• Pearson

Educating more than 100 million people worldwide, Pearson is the global leader in education publishing. With such renowned imprints as Addison-Wesley and Prentice Hall, Pearson provides quality mathematics education solutions in all available media.

• Rational Reasoning, LLC

Rational Reasoning markets research-based mathematics materials for students and instructors. The texts are designed to help all students acquire the foundational knowledge to continue studying mathematics. The curricular materials are based on research on knowing and learning mathematics and have been repeatedly studied and revised to assure their effectiveness. An online text accompanies each bounded text. Videos, animations and check your understanding tasks are included to engage students in the deep thinking, reflection and practice necessary for learning new ideas. Procedures and skills can also be reviewed and practiced online with students receiving instant results and detailed solutions.

Teacher support tools accompany each Rational Reasoning text. Conceptually focused worksheets with solutions and teacher notes pose problems and questions to help students develop essential understandings and critical connections. Powerpoint slides with detailed teacher notes and linked animations help novice and expert teachers provide lively and coherent lectures. A professional development website accompanies each text and includes classroom videos of teachers implementing our materials. Visit RationalReasoning.net.

EXHIBITORS

• Springer

Stop by the Springer booth and browse and over 1,000 books! Our new touch-screen technology lets you browse titles with a single touch. It not only lets you view an entire book online, it also lets you order it as well. It's as easy as 1-2-3.

• Texas Instruments

Supporting educators' passion for teaching, TI's research-based technology for instruction and assessment, curricular materials and professional development combine to provide essential elements for greater student achievement in math and science. The TI-Nspire™ learning handhelds and computer software build on proven graphing technology and further enable students to explore multiple representations of concepts on a single screen. The TI-Navigator™ classroom learning system engages each student and provides real-time assessment of student understanding. Visit education.ti.com.

• WebAssign– 2010 Sponsor

WebAssign, the independent online homework and assessment solution, continues to innovate. New math tools for 2010 include the calcPad answer palette and an interactive numberline. With pre-coded questions from 200 leading math titles from every major publisher, WebAssign makes online homework easy. Stop by our booth to learn more.
Website: www.webassign.net

•W.H. Freeman & Company

W.H. Freeman & Company publishes high-quality textbooks and media in mathematics and statistics. Visit booth #18 to learn more about our titles, including the successful Rogawski Calculus, COMAP For All Practical Purposes 8/e, and four new titles: Sowder Reconceptualizing Mathematics, Moore Essential Statistics, Larose Discovering Statistics: Brief Version, and Kokoska Introductory Statistics. Demonstrations will also be provided of our innovative media and online homework systems, including CalcPortal, MathPortal, and StatsPortal, as well as our new StatClips tutorial videos.

• Wiley

Founded in 1807, John Wiley & Sons, Inc. is an independent, global publisher of print and electronic products. Wiley Higher Education publishes for a broad range of post secondary education with leading programs in the Sciences, Business, Technology and the Social Sciences. Wiley's Internet Site can be accessed at http://www.wiley.com.

• Worldwide Center of Mathematics

The Center of Math was founded in 2008 by David B. Massey, an award-winning professor with 26 years of collegial teaching experience, and a leading research mathematician in the field of singularities. We currently offer a host of multimedia products and services that help us to enrich and enhance the lives of scholars, students, and the community at large through the increased dissemination of mathematical knowledge. We are here exhibiting our revolutionary, multimedia calculus textbooks: Worldwide Differential Calculus and Worldwide Integral Calculus. These textbooks are produced as PDFs, which allow us to hyperlink all of the cross-references in the books, put in pop-up margin comments, and embed videos at the beginning of each section that actually teach the student the content of that section; in essence, our textbooks are electronic versions of courses. Please stop by our booth (#34) to check out our interactive exhibit where you can try the books out for yourself!

• xyAlgebra

xyAlgebra is a completely free Algebra I software package. Solutions can be entered step-by-step, not just as short final answers. xyAlgebra responds intelligently to each step by suggesting appropriate next steps for any solution method, flagging incorrect steps and reviewing appropriate prerequisite(s). Intelligent responses are even available at each step of verbal problems. xyAlgebra configuration options include initial placement, instruction, unlimited practice, periodic testing and distance learning. Please stop at Booth 17 for a demo.

TIMETABLE

TUESDAY, August 3

9:00am-5:00pm, Allegheny
SHORT COURSE
Hands-On Explorations in Algebra and Combinatorics

6:00-7:00pm, Conference C
SHORT COURSE RECEPTION

WEDNESDAY, August 4

9:00am-5:00pm, Allegheny
SHORT COURSE
Hands-On Explorations in Algebra and Combinatorics

4:30-5:30pm, Sky
MAA-PME STUDENT RECEPTION

5:30-6:15pm, Urban
MATH JEOPARDY
Organizers: Robert Vallin, MAA and Michael Berry, University of Tennessee

6:00-7:30pm, William Penn Ballroom
GRAND OPENING AND RECEPTION

7:30-9:30pm, Grand Ballroom
OPENING BANQUET
MC: James Sellers, Penn State University

SEEING MATHEMATICS
Speaker: Jonathan Rogness, University of Minnesota

THURSDAY, August 5

8:30-9:20am, Grand Ballroom
MAA INVITED ADDRESS
An Attempt to Turn Geometry into (Decorated) Graphs
Rebecca Goldin, George Mason University

8:30-10:30am, Conference B
MAA STUDENT PAPER SESSION #1

8:30-10:30am, Conference C
MAA STUDENT PAPER SESSION #2

8:30-10:25am, Phipps
MAA STUDENT PAPER SESSION #3

8:30-10:25am, Oliver
MAA STUDENT PAPER SESSION #4

8:30-10:25am, Carnegie III
MAA STUDENT PAPER SESSION #5

8:30-10:25am, Three Rivers
MAA STUDENT PAPER SESSION #21
Organizers: J. Lyn Miller, Slippery Rock University; John Hamman, Montgomery College; and Daluss Siewert, Black Hills State University

8:50-10:25am, Monongahela
CONTRIBUTED PAPER SESSION
Getting Students Involved in Writing Proofs, Session 1
Organizers: Aliza Steurer, Dominican University; Jennifer Franko-Vasquez, University of Scranton; and Rachel Schwell, Central Connecticut State University

8:50-9:05am
Elements of Style for Proofs
Anders O.F. Hendrickson, Concordia College

9:10-9:25am
Involving Students in Proof Writing with Peer Review
Penelope Dunham, Muhlenberg College

9:30-9:45am
Learning Proof-Writing: Applying English Composition Pedagogical Strategies to Undergraduate Mathematics
Betseygail Rand, Texas Lutheran University

9:50-10:05am
Learning from my students: a personal experience with the Moore Method
Patrick Rault, SUNY Geneseo

10:00-10:10am
The Role of Quantitative and Covariational Reasoning in Trigonometry Curriculum
Kevin Charles Moore, Arizona State University - RIMSE

10:15-10:25am
Aspects of a Neoteric Approach to Advance Students' Ability to Conjecture, Prove, or Disprove
Padraig McLoughlin, Kutztown University of Pennsylvania

9:00-10:25 am, Sky

GENERAL CONTRIBUTED PAPER SESSION #1
Organizers: Kyle Riley, South Dakota State of Mines and Technology and Barbara Margolius, Cleveland State University

9:00-9:10am
Categorizing Musical Pieces by Their Correlation Coefficients
Ilhan M. Izmirli, George Mason University

9:15-9:25am
A Mathematical Tour of Robotics
Kyle Riley, SD School of Mines & Technology

9:30-9:40am
Flash applets for WeBWorK online homework system
Barbara Margolius, Cleveland State University

9:45-9:55am
Some Highs and Lows Using WeBWorK Throughout the Calculus Curriculum
Geoffrey Dietz, Gannon University

10:00-10:10am
The Role of Quantitative and Covariational Reasoning in Trigonometry Curriculum
Kevin Charles Moore, Arizona State University-RIMSE

10:15-10:25am
Applied Maple Projects in Linear Algebra
Jason Molitierno, Sacred Heart University

9:00am-5:00pm, Sternwheeler

STUDENT HOSPITALITY CENTER
Organizers: Richard and Araceli Neal, American Society for the Communications of Mathematics

9:30-10:20am, Grand Ballroom

MAA INVITED ADDRESS
Mathematics Motivated by Biology
Martin Golubitsky, Ohio State University

10:30-11:20am, Grand Ballroom

EARL RAYMOND HEDRICK LECTURE I
The Fractal Geometry of the Mandelbrot Set
Robert L. Devaney, Boston University

1:00-1:50pm, Grand Ballroom

MAA LECTURE FOR STUDENTS
Faster, Safer, Healthier with Operations Research
Sommer Gentry, United States Naval Academy

1:00-2:20pm, Urban

PANEL
The Role of Mentoring in Undergraduate Mathematics: Promising Recruitment and Retention Strategies
Organizers: Sylvia Bozeman, Spelman College; Ken Millett, University of California Santa Barbara; and William Velez, University of Arizona
Panelists: Sylvia Bozeman, Spelman College; Michelle Craddock, US Military Academy; Rebecca Garcia, Sam Houston State University; and William Velez, University of Arizona

1:00-2:50 pm, Monongahela

INVITED PAPER SESSION
Visualizing Combinatorics through Tilings
Organizer: James Sellers, Penn State University

1:00-1:20pm
Combinatorial Trigonometry
Art Benjamin, Harvey Mudd College

1:30-1:50pm
Linear Recurrences Involve Weighted Tilings
Jennifer Quinn, University of Washington

2:00-2:20pm
Stalking the Wild Fibonomial
Bruce Sagan, Michigan State University and NSF; Carla Savage, North Carolina State University

2:30-2:50pm
Symmetry, automorphisms, and self-duality of infinite planar graphs and tilings
Brigitte Servatius, Worcester Polytechnic Institute

1:00-3:00pm, Keystone/Doubletree

MINICOURSE #1 PART 1
Recruiting Students to Take More Mathematics Courses and to be Math Majors
Presenter: Michael Dorff, Brigham Young University

1:00-3:00pm, Erie/Doubletree

MINICOURSE #2 PART 1
Perspective Viewing and Drawing Make Good Math Problems

Presenters: Marc Frantz, Indiana University and Annalisa Crannell, Franklin & Marshall College

1:00-3:35pm, Frick

CONTRIBUTED PAPER SESSION
The History of Mathematics and Its Uses in the Classroom Session 1
Organizers: Herbet Kasube, Bradley University; John Lorch, Ball State University; and Joanne Peeples, El Paso Community College

1:00-1:15pm
Bringing Mr. Jefferson into the Classroom
Jim Tattersall, Providence College

1:20-1:35pm
Formulating Figurate Numbers
Janet Beery, University of Redlands

1:40-1:55pm
Lessons from reading Clavius
Anders O.F. Hendrickson, Concordia College

2:00-2:15pm
Light through a window: evidence of Muslim mathematics in Spanish colonial missions of San Antonio?
Rachel Cywinski

2:20-2:35pm

Math Set in Stone: Famous Stones in the History of Math
Doy Ott Hollman, Lipscomb University

2:40-2:55pm

Teaching Introductory Analysis in Its Historical Setting
Robert Rogers, SUNY Fredonia

3:00-3:15pm

The Cubic Controversy
Charlie Smith, Park University

3:20-3:35pm

The Heavens and the Scriptures in the Eyes of Johannes Kepler
Dale L. McIntyre, Grove City College

1:00-4:50pm, Conference A

INVITED PAPER SESSION

Combinatorial Games and Schubert Calculus, Session 1
Organizer: Rebecca Goldin, George Mason University

1:00-1:20pm

Poset pinball and Schubert calculus
Julianna Tymoczko, University of Iowa; Megumi Harada, McMaster University

1:30-1:50pm

A tableaux rasa talk on affine Schubert calculus and Macdonald polynomials
Jennifer Morse, Drexel University

2:00-2:20pm

Localization and specialization in equivariant cohomology
Milena Pabiniak, Cornell University

2:30-2:50pm

Eigencone, saturation and Horn problems for symplectic and odd orthogonal groups
Shrawan Kumar, University of North Carolina

3:00-3:20pm

Divisibility, tori, and the moment polytope
David Johannsen, George Mason University

3:30-3:50pm

Ideals of symmetric functions and a possible application to cohomology
Aba Mbirika, Bowdoin College

4:00-4:20pm

Relative Lie algebra cohomology and the Belkale-Kumar product
William Graham, University of Georgia

4:30-4:50pm

Schubert-type formulas for Hamiltonian manifolds
Susan Tolman, University of Illinois

1:00-5:15pm, Three Rivers

CONTRIBUTED PAPER SESSION

Math & Bio 2010 in 2010
Organizers: Timothy Comar, Bendictine University and Raina Robeva, Sweet Briar College

1:00-1:15pm

Connecting First-Year Students to Current Trends in Mathematical Biology
Talitha M. Washington, University of Evansville

1:20-1:35pm

Connecting the disciplines through writing assignments in a calculus course for biology majors
Florence Newberger, California State University, Long Beach

1:40-1:55pm

On Becoming Indepent Problem Solvers in Biocalculus Courses
Timothy Comar, Benedictine University

2:00-2:15pm

Math, our Community and Civic Engagement - a SENCER based Approach
Urmi Ghosh-dastidar, NYCCT, CUNY

2:20-2:35pm

Mathematics of Life
Theodore Theodosopoulos, Saint Ann's School

2:40-2:55pm

Ten Equations that changed how I teach Biomathematics
Maeve Lewis McCarthy, Murray State University

3:00-3:15pm

A hitchhiker's guide to data assimilation in the ecological sciences
John Zobitz, Augsburg College

3:20-3:35pm

Using Virtual Laboratory Experiments to Motivate Mathematical Models in Biology
Glenn Ledder, University of Nebraska-Lincoln

3:40-3:55pm

Something Like a New Sense: The Biological ESTEEM Collection: Part I
Anton Weisstein, Truman State University

4:00-4:15pm

Something Like a New Sense: The Biological ESTEEM Collection: Part II
Gretchen A. Koch, Goucher College

4:20-4:35pm

The Mathbio Wiki: a module resource and educational tool
Rebecca Vandiver, Bryn Mawr College

4:40-4:55pm

Modeling Uncertainty: Challenges and Opportunity in Undergraduate Biomathematics Research
Matthew Glomski, Marist College

5:00-5:15pm

Undergraduate Research Projects in DNA Microarray Data Analysis
Darlene Olsen, Norwich University

1:00-5:20 pm, Allegheny

INVITED PAPER SESSION

Complex Dynamics: Opportunities for Undergraduate Research Session 1
Organizers: Dan Look, St. Lawrence University and Elizabeth Russell, United States Military Academy

1:-00-1:20pm

Undergraduate explorations in complex dynamics
Rich Stankewitz, Ball State University

1:30-1:50pm

The Complex Dynamics of Rational Maps
Elizabeth Russell, United States Military Academy

2:00-2:20pm

Iterating Elliptic Functions
Lorelei Koss, Dickinson College

2:30-2:50pm

Fibonacci plays the chaos game
Sebastian Marotta, University of the Pacific

3:00-3:20pm

Matings of Polynomials
Sarah Koch, Harvard University

3:30-3:50pm

From Julia sets to laminations
William Bond, University of Alabama- Birmingham

4:00-4:20pm

Pullback Laminations
John Mayer, University of Alabama Birmingham

4:30-4:50pm

Critical Leaf Configurations for $\Gamma 3$
Debra Mimbs, University of Alabama Birmingham

5:00-5:20pm

Useful Tools in the Study of Laminations
Jeffrey Houghton, University of Alabama Birmingham

1:00-5:55pm, Sky

GENERAL CONTRIBUTED PAPER SESSION

Assesment, Teaching Communication, and Outreach
Organizers: Anne Albert, University of Findlay; Jeff Hildebrand, Georgia Gwinnett College; Monika Vo, St. Leo University; Jeff Clark, Elon College; Betsy Yanik, Emporia State University; and John Frohliger, St. Norbert College

1:00-1:10pm

Assessment - Required; Worthwhile? - Yes!
Anne G. Albert, The University of Findlay

1:15-1:25pm

Designing an assessment program for a mathematics major.
Jeff Hildebrand, Georgia Gwinnett College

1:30-1:40pm

The Mathematics Seminar and Program Assessment at a Small Liberal Arts College
Jeffery D. Sykes, Ouachita Baptist University

1:45-1:55pm

A Capstone Course for Mathematics Majors
Ronald M. Brzenk, Hartwick College

2:00-2:10pm

A summer interdisciplinary model of service learning for First Year Seminar
Zdenka Guadarrama, Rockhurst University

2:15-2:25pm

Senior Projects in Computational Mathematics with MATLAB at the University of Houston-Downtown
Timothy A. Redl, University of Houston-Downtown

2:30-2:40pm

Developing Mathematical Thinking and Communication Skills through Guided Discovery Learning in Modern Algebra
Molli R. Jones, Immaculata University

2:45-2:55pm

The Developmental Discussion in the Mathematics Classroom: Let's Do It Together
Sarah L. Mabrouk, Framingham State College

3:00-3:10pm

Undergraduate Research and LaTeX
Jeffrey Clark, Elon University

3:15-3:25pm

Using "jigsaw" presentations to develops student communication skills
Diana White, University of Colorado Denve

3:30-3:40pm

WAC - Writing Across the Curriculum in Mathematics classes
Monika Vo, Saint Leo University

3:45-3:55pm

Auditory Mathematics: Podcasting as Mathematics Outreach
Samuel Hansen, University of Nevada, Las Vegas/ACMEScience

4:00-4:10pm

Differentiated Instruction and Gender: the Illinois College Science and Math Learning Collaborative
Patricia Kiihne, Illinois College

4:15-4:25pm

How To Get More Underrepresented Minority Students in Mathematics Related Fields
Senan Hayes, Western Connecticut State University

4:30-4:40pm

Outreach programs for Hispanic Students
Elizabeth Yanik, Emporia State University

4:45-4:55pm

St. Norbert College's Natural Science PRIDE Program
John Frohliger, St. Norbert College

5:00-5:10pm

Texas A&M Summer Educational Enrichment (SEE-Math) for Middle School Students: The Use of Technology
Philip B. Yasskin, Texas A&M University

5:15-5:25pm

Top Ten Mathematical Topics that Undergraduates in Mathematics should Master
Aloysius B. Kasturiarachi, Kent State University at Stark

5:30-5:40pm

Effects of Staggered Lunch Periods on Geometry Students at an Inner-City High School
Kristel Ehrhardt, University Maryland Baltimore County

5:45-5:55pm

Where is a Mathematically Competent Teacher Candidate?
Kazuko Ito West, Keio Academy of New York

2:00-3:20pm, Bob Hope

A GRADUATE STUDENT WORKSHOP ON CREATING A RESEARCH PRESENTATION FOR UNDERGRADUATES
What's the story?
Organizers: Aaron Luttman, Clarkson University, and Rachel Schwell, Central Connecticut State University

2:00-3:55pm, Conference B

MAA STUDENT PAPER SESSION #6

2:00-3:55pm, Conference C

MAA STUDENT PAPER SESSION #7

2:00-3:55pm, Carnegie III

MAA STUDENT PAPER SESSION #8
Organizers: J. Lyn Miller, Slippery Rock University; John Hamman, Montgomery College; and Daluss Siewert, Black Hills State University

2:00-3:55pm, Oliver

PI MU EPSILON STUDENT PAPER SESSION #1

2:00-3:55pm, Phipps

PI MU EPSILON STUDENT PAPER SESSION #2
Organizer: Angela Spalsbury, Youngstown State University

2:30-3:50pm, Grand Ballroom

PANEL
Teaching Mathematics with Tablet Computers
Organizers: Jason Aubrey, University of Missouri and Michael B. Scott, California State University Monterey Bay
Panelists: Andrew G. Bennett, Kansas State University; Lila Roberts, Clayton State University; Marilyn A. Reba, Clemson University; and Maria Anderson, Muskegon Community College

3:30-5:00pm, Urban

MAA SECTION OFFICERS MEETING
Organizer: Rick Gillman, Valparaiso University

3:30-4:50pm, Monongahela

PANEL
Mathematics in Interdisciplinary Survey Courses
Organizers: Cinnamon Hillyard, University of Washington Bothell and Stuart Boersma, Central Washington University
Panelists: Maura Mast, University of Massachusetts Boston; Mike Pinter, Belmont University; Robert Root, Lafayette College; Alexandre Barchechat, University of Washington Bothell; and Nancy Kool, University of Washington Bothell

3:30-5:30pm, Sternwheeler

THE EARLY CAREER AND GRADUATE STUDENTS POSTERFEST AT MATHFEST
Organizers: Ed Aboufadel, MAA Committee on Early Career Mathematicians; Ralucca Gera, Young Mathematicians' Network; and Aaron Luttman, MAA Committee on Graduate Students

3:30-5:30pm, Keystone/Doubletree

MINICOURSE #3 PART 1
An Introduction to GeoGebra, a Tool for Demonstration, Exploration, and Applet Creation
Presenter: Mike May, S.J., Saint Louis University

3:30-5:30pm, Erie/Doubletree

MINICOURSE #4 PART 1
Effective Placement Testing for Introductory College Mathematics Courses
Presenters: Bernard Madison, University of Arkansas; Raymond Cannon, Baylor University; Marilyn Carlson, Arizona State University; Wade Ellis, West Valley College; Louise Krmpotic, Microsoft; James W. Stepp, University of Houston; and Gordon Woodward, University of Nebraska

3:40-5:00pm, Bob Hope

WORKSHOP
Understanding and Assessing Mathematical Proofs
Organizers: Sean Larsen, Portland State University; Stacy Brown, Pitzer College; and Natasha Speer, University of Maine
Presenters: Keith Weber, Rutgers University, and Evan Fuller, Montclair State University

4:20-6:15pm, Conference B

MAA STUDENT PAPER SESSION #9

4:20-6:15pm, Conference C

MAA STUDENT PAPER SESSION #10

4:20-6:15pm, Carnegie III

MAA STUDENT PAPER SESSION #11
Organizers: J. Lyn Miller, Slippery Rock University; John Hamman, Montgomery College; and Daluss Siewert, Black Hills State University

4:20-6:15pm, Phipps

PI MU EPSILON STUDENT PAPER SESSION #3

4:20-6:15pm, Oliver

PI MU EPSILON STUDENT PAPER SESSION #4
Organizer: Angela Spalsbury, Youngstown State University

4:30-6:00pm, Frick

WEB SIGMAA OPEN MEETING
Getting Started with Online Teaching
Organizers: Doug Ensley, Shippensburg University, and Mike May, Saint Louis University

5:00-6:00pm, Balcony, Grand Ballroom

GRADUATE STUDENT RECEPTION
Organizers: David Manderscheid, University of Nebraska Lincoln and James Freeman, Cornell College

5:30-7:00pm, Allegheny

SIGMAA EM LECTURE AND BUSINESS MEETING
Organizer: Ben Fusaro, Florida State University
Speaker: James H. Case "Free Trade and the Environment"

5:30-7:00pm, Monongahela

POM SIGMAA INVITED SPEAKER AND RECEPTION
"Structural Proof Theory: Uncovering Capacities of the Mathematical Mind"
Speaker: Wilfried Sieg, Carnegie Mellon University

FRIDAY, August 6

8:00-8:25am, Grand Ballroom

AWM-MAA MORNING COFFEE

8:30-9:20am, Grand Ballroom

AWM-MAA ETTA Z. FALCONER LECTURE
The Mathematical Challenges in the Treatment of Cancer
Ami Radunskaya, Pomona College

8:30-11:45am, Allegheny

CONTRIBUTED PAPER SESSION
The History of Mathematics and Its Uses in the Classroom Session 2
Organizers: Herbet Kasube, Bradley University; John Lorch, Ball State University; and Joanne Peeples, El Paso Community College

8:30-8:45am

Ciphering to the Rule of Three and the Evolution of Teaching Proportion
Deana Deichert, University of Central Florida

8:50-9:05am

Deduction Through the Ages: Teaching Elementary Logic via Primary Historical Sources
Jerry Lodder, New Mexico State University

9:10-9:25am

Euclid's Neglected Postulate
Jeff Johannes, SUNY Geneseo

9:30-9:45am

History and Mathematics in Cryptology
Charles Rocca, Western Connecticut State University

9:50-10:05am

Rethinking the way we teach Point-Set Topology
Nicholas A Scoville, Ursinus College

10:10-10:25am

The Benefits of Primary Sources in an ODE class.
Adam Edgar Parker, Wittenberg University

10:30-10:45am

The ordered pair: how its history and philosophy has pedagogical importance in teaching mathematics
Jeff Buechner, Rutgers Univ-Newark

10:50-11:05am

The other curves of Agnesi
Antonella Cupillari, Penn State Erie

11:10-11:25am

Using the History of Divergent Series to Motivate Discussions about Series Convergence
Shawnee L. McMurran, California State University San Bernardino; Jim Tattersall, Providence College

11:30-11:45am

Using The History of Mathematics in a Basic Statistics Course
Pat Touhey, Misericordia University

8:30-11:45am, Conference A

CONTRIBUTED PAPER SESSION

Open and Accessible Problems in Applied Mathematics
Organizers: David Houseman, Goshen College, and Lynette Boos, Providence College

8:50-9:05am

A Mathematical Modeling of Glassy-winged Sharpshooter Population in the Texas Vineyards
Jeong-Mi Yoon, University of Houston-Downtown

9:10-9:25am

Mathematical Modeling of Solute Transfer during Hemodialysis Session
Kodwo Annan, Minot State University

9:30-9:45am

An Applied Mathematician Visits the Navier-Stokes Equations
Ricardo Sanchez, DRC Data Recognition Corporation

9:50-10:05am

Homotopy Analysis Method: Analytical Solutions for the 21st Century
Antonio Mastroberardino, Penn State Erie

10:10-10:25am

So You Think You Can Add? The Summed Behavior of Nonlinear Systems
Robert Rovetti, Loyola Marymount University

10:30-10:45am

Tangling and Untangling DNA
Junalyn Navarra-Madsen, Texas Woman's University

10:50-11:05am

Graph Theory Takes on International Terrorism in the United States
Pamela Kay Warton, The University of Findlay

11:10-11:25am

Zipf's Distribution in "Gadsby"
Guang-Chong Zhu, Lawrence Technological University

11:30-11:45am

Four Lower Division Student Research Topics: Preliminary Materials from UCI's Interdisciplinary Computational Applied Mathematics Program (iCamp)
Sarah Elizabeth Eichhorn, UC Irvine

8:30-11:25am, Sky

GENERAL CONTRIBUTED PAPER SESSION

Calculus
Organizers: Stephen Davis, Davidson College; Stephen Kokoska, Bloomsburg University of Pennsyvania; Paul Seeburger, Monroe Community College; and Susan Wildstrom, Montgomery County Public Schools

8:30-8:40am

AP Calculus: Facts, Figures, and FAQs, I
Stephen Davis, Davidson College

8:45-8:55am

AP Calculus: Facts, Figures, and FAQs (II)
Stephen Kokoska, Bloomsburg University

9:00-9:10am

What to do on Day One in Calculus One
Thomas McMillan, University of Arkansas at Little Rock

9:15-9:25am

Calculus Consultants
Linda McGuire, Muhlenberg College

9:30-9:40am

Engaging Projects for Problem-Based Learning in Calculus
Guang-Chong Zhu, Lawrence Technological University

9:45-9:55am

Early Vector Calculus: A Path Through Third-Semester Calculus
Bob Robertson, Drury University

10:00-10:10am

Resequencing Calculus: An Early Multivariate Approach
David Dwyer, University of Evansville

10:15-10:25am

Helping Students Make Sense of Multivariable Functions: A Case Study
Eric Weber, Arizona State University

10:30-10:40am

Playing with Multivariable Calculus Concepts Wearing 3D Glasses
Paul Seeburger, Monroe Community College

10:45-10:55am

Homework Helpers–Using MAPLE in a Multivariable Calculus Course
Susan Wildstrom, Walt Whitman High School

11:00-11:10 am

Using Gateway Exams in Calculus I
Teena Carroll, St. Norbert College

11:15-11:25 am

Is Your Integral Zero?
Kenneth Luther, Valparaiso University

8:30-11:55 am, Frick

GENERAL CONTRIBUTED PAPER SESSION

Teaching Introductory Mathematics I

Organizers: Carol Vobach, University of Houston; Michael Miner, American Military University; Natalya Vinogradovak, Plymouth State University; and Sue Beck, Montgomery County Public Schools

8:30-8:40am

An Examination of Student Attitudes in a Business Statistics Course
Deborah J. Gougeon, University of Scranton

8:45-8:55am

Community Engagement in an Applied Statistics Course
Carol Vobach, University of Houston Downtown

9:00-9:10am

Effective Ideas to Engage Repeating Developmental Mathematics Students
Gowribalan Vamadeva, University of Cincinnati

9:15-9:25am

Current Events Friday
Kira Hamman, Penn State Mont Alto

9:30-9:40am

Increase Success Using Stories That Teach Mathematics
Susan Lea Beane, University of Houston-Downtown

9:45-9:55am

Gateways Ensuring Mathematics Mastery
Dan Hrozencik, Chicago State University

10:00-10:10am

Introducing Online Resources to College Algebra Students in Online Classes
Michael Miner, American Public University System

10:15-10:25am

Quantitative Reasoning
Darcel Ford, Strayer University

10:30-10:40am

Questioning the Questions of Liberal Arts Math Students
Kayla Bradley Dwelle, Ouachita Baptist University

10:45-10:55am

Rigor, Error, and Humor in the Mathematics Classroom
Christian Constanda, University of Tulsa

11:00-11:10am

Show me the formula
Natalya Vinogradova, Plymouth State University

11:15-11:25am

Success in Face-to-Face versus Online Finite Mathematics Class
David Shoenthal, Longwood University

11:30-11:40

Reforming Developmental Mathematics at the College and High School Level
Sue R. Beck, Morehead State University

11:45-11:55pm

Preparatory Assignments: Changing Students' Attributions, Motivations & Epistemic Beliefs
Allen Gregg Harbaugh, Seattle Central Community College

8:30-11:55am, Conference B

MAA STUDENT PAPER SESSION #12

8:30-11:55am, Conference C

MAA STUDENT PAPER SESSION #13

8:30-11:55am, Carnegie III

MAA STUDENT PAPER SESSION #14

8:30-11:55am, Three Rivers

MAA STUDENT PAPER SESSION #22

Organizers: J. Lyn Miller, Slippery Rock University; John Hamman, Montgomery College; and Daluss Siewert, Black Hills State University

8:30-10:55am, Phipps

PI MU EPSILON STUDENT PAPER SESSION #5

8:30-10:55am, Oliver

PI MU EPSILON STUDENT PAPER SESSION #6

Organizer: Angela Spalsbury, Youngstown State University

9:00am-5:00pm, Sternwheeler

STUDENT HOSPITALITY CENTER

Organizers: Richard and Araceli Neal, American Society for the Communications of Mathematics

9:10-11:45am, Monongahela

CONTRIBUTED PAPER SESSION

Getting Students Involved in Writing Proofs, Session 2

Organizers: Aliza Steurer, Dominican University; Jennifer Franko-Vasquez, University of Scranton; and Rachel Schwell, Central Connecticut State University

9:10-9:25am

Student Proofs: Points of Entry in Developmental & Precalculus Math Courses
Allen Gregg Harbaugh, Seattle Central Community College

9:30-9:45am

A Proof a Day keeps the Red Pen Away
Jennifer Gorman, Kutztown University

9:50-10:05am

Introduce Students to Their First Proofs
Yun Lu, Kutztown University of PA

10:10-10:25am

Proof Writing Activities in Abstract Algebra
Violeta Vasilevska, The University of South Dakota

10:30-10:45am

Growing Proof-Writing Skills Throughout the Undergraduate (Majors') Curriculum
Bonnie Gold, Monmouth University

10:50-11:05am

Writing Proofs in Undergraduate Mathematics Courses
Joyati Debnath, Winona State University

11:10-11:25am

Improving Proof Writing by Increasing Confidence, Communication, and Understanding
Molli R. Jones, Immaculata University

11:30-11:45am

Successful Strategies for Getting Students Involved in Proof Writing at Multiple Levels.
Kathleen Shannon, Salisbury University

9:30-10:20am, Grand Ballroom

EARL RAYMOND HEDRICK LECTURE II
Exponential Dynamics and Topology
Robert L. Devaney, Boston University

10:30-11:20am, Grand Ballroom

JAMES R. LEITZEL LECTURE
Exploring School Mathematics with Felix Klein
William McCallum, University of Arizona

11:30am-12:00noon, Grand Ballroom

MAA PRIZE SESSION

1:00-1:50pm, Urban

MAA UNDERGRADUATE STUDENT ACTIVITY
Connecting Digraphs and Determinants
Jennifer Quinn, University of Washington

1:00-1:50pm, Monongahela

MAA UNDERGRADUATE STUDENT ACTIVITY
A Mathematical Tour of the State of the Planet
Tom Pfaff, Ithaca College

1:00-1:50pm, Grand Ballroom

NAM DAVID BLACKWELL LECTURE
The Riordan Group Revisited: From Algebraic Structure to RNA
Asamoah Nkwanta, Morgan State University

1:00-2:50pm, Allegheny

INVITED PAPER SESSION
Mathematical Neuroscience
Organizer: Jonathan Rubin, University of Pittsburgh

1:00-1:20pm

Exploring a simple discrete model of neuronal networks
Winfried Just, Ohio University

1:30-1:50pm

Spatially-localized synchronous oscillations in neuronal networks
Stefanos Folias, University of Pittsburgh

2:00-2:20pm

Stimulus-driven Traveling Waves in a Neuronal Model
Jozsi Jalics, Youngstown State University; G. Bard Ermentrout, University of Pittsburgh; Jonathan Rubin, University of Pittsburgh

2:30-2:50pm

Synchronization of Noisy Integrate and Fire Neurons
Peter Thomas, Case Western Reserve University

1:00-3:00pm, Keystone/Doubletree

MINICOURSE #1 PART 2
Recruiting Students to Take More Mathematics Courses and to be Math Majors
Presenter: Michael Dorff, Brigham Young University

1:00-3:00pm, Erie/Doubletree

MINICOURSE #2 PART 2
Perspective Viewing and Drawing Make Good Math Problems
Presenter: Marc Frantz, Indiana University, and Annalisa Crannell, Franklin & Marshall College

1:00-4:50pm, Conference A

INVITED PAPER SESSION
Geometric Group Theory
Organizer: Dan Margalit, Tufts University

1:00-1:20pm

Free Group Stretching Exercise
Matt Clay, Allegheny College

1:30-1:50pm

Ping-Pong for Free Groups
Johanna Mangahas, University of Michigan

2:00-2:20pm

Groups and Trees: Action!
Angela K. Kubena, University of Michigan

2:30-2:50pm

Examples of CAT(0) Groups
Kim Ruane, Tufts University

3:00-3:20pm

Dehn Functions of Groups
Eduardo Martinez-Pedroza, McMaster University

3:30-3:50pm

Mapping class groups: where algebra meets topology
Tara Brendle, University of Glasgow

4:00-4:20pm

Introduction to asymptotic dimension
Greg Bell, University of North Carolina

4:30-4:50pm

What's at the End of an Infinite Group?
John Meier, Lafayette College

1:00-4:15pm, Three Rivers

CONTRIBUTED PAPER SESSION

Innovative Ideas for an Introductory Statistics Course Session 1
Organizers: Nancy Boynton, SUNY Fredonia; Patricia Humphrey, Georgia Southern University; and Michael Posner, Villanova University

1:00-1:15pm

Y'all Ready For This? The First Night of Stats Class!
Michael Miner, American Public University System

1:20-1:35pm

Using the Wolfram Demonstrations Project to Illustrate Elementary Statistical Concepts
Jeff Hamrick, Rhodes College

1:40-1:55pm

Analyzing Real Biomedical Data Using Scientific Writing and TI Calculators
Magdalena Luca, Massachusetts College of Pharmacy and Health Sciences

2:00-2:15pm

Popular Media and Introductory Statistics
Karen Sue Briggs, North Georgia College & State University

2:20-2:35pm

An Outbreak of Outliers
Sue McMillen, Buffalo State College

2:40-2:55pm

Interdisciplinary Statistics Projects: Competitive Cross Curriculum Projects in Statistics
Nathan Shank, Moravian College

3:00-3:15pm

Authentic Discovery Experiences and Student-Centered Statistical Research Projects
Robb Sinn, North Georgia College & State University

3:20-3:35pm

What's in your wallet? Analyzing dollar bills to reinforce statistical concepts
Brian Hollenbeck, Emporia State University

3:40-3:55pm

Putting the Inferential back in Introductory Statistics: A randomization approach
Vicki-Lynn Holmes, Hope College; Brooke Quisenberry, Hope College

4:00-4:15pm

Probability with the Survivor Function and Expected Value Games
Annela Kelly, Roger Williams University

1:00-4:55pm, Frick

CONTRIBUTED PAPER SESSION

Geometry Topics That Engage Students, Session 1
Organizer: Sarah Mabrouk, Framingham State College

1:00-1:15pm

Activities to Enliven a Course on Euclidean and non-Euclidean Geometries
Sarah J. Greenwald, Appalachian State University

1:20-1:35pm

Finite Geometries and Games
Kay Ellen Smith, Saint Olaf College

1:40-1:55pm

Excursions on the Sphere
Kristen Schemmerhorn, Dominican University

2:00-2:15pm

Engaging Students in Learning about Scaling
Davida Fischman, CSU San Bernardino

2:20-2:35pm

Geometric Art and Algebraic Surfaces
Ivona Grzegorczyk, California State University Channel Islands

2:40-2:55pm

Projective Geometry-Visualizing proofs and interpretations in Euclidean Space
Xiaoxue Hattie Li, Emory & Henry College

3:00-3:15pm

Non-euclidean geometry across the '7th grade / major' spectrum
Jack Mealy, Austin College

3:20-3:35pm

A Feuerbach Refresher
Len Smiley, University of Alaska Anchorage

3:40-3:55pm

An inquiry-based approach to middle-level geometry for preservice secondary teachers
Diana White, University of Colorado Denver

4:00-4:15pm

Developing Visualization Skills through an Exploration of Platonic Solids Using Technology and Traditional Method
Cheryll Elizabeth Crowe, Eastern Kentucky University

4:20-4:35pm

Informal Geometry for Aspiring TV/Film Directors and K-8 Educators
Lucy Dechene, Fitchburg State College

4:40-4:55pm,

Reuse, Recycle, Re-Ceva
Martha Waggoner, Simpson College

1:00-5:15pm, Bob Hope

CONTRIBUTED PAPER SESSION
Open and Accessible Problems in Number Theory and Algebra
Organizer: Thomas R. Hagedorn, The College of New Jersey

1:00-1:15pm
Catalan's Factorial Problem
Thomas Koshy, Framingham State College

1:20-1:35pm
Mapping the Discrete Logarithm
Joshua Holden, Rose-Hulman Institute of Technology

1:40-1:55pm
Interesting Problems in Apollonian Circle Packings
Michael "Cap" Khoury, University of Michigan

2:00-2:15pm
Number derivatives: A treasure trove of undergraduate research projects
Michael Krebs, California State University, Los Angeles

2:20-2:35pm
On Conjugacies of the $3x+1$ Map Induced by Continuous Endomorphisms of the Shift Dynamical System
Benjamin Kraft, Liberty High School

2:40-2:55pm
Open Questions About Compositions
Brian Hopkins, Saint Peter's College

3:00-3:15pm
Some accessible problems mostly involving sequences
Sam Northshield, SUNY Plattsburgh

3:20-3:35pm
Polytopes, Polynomials, and String Theory
Ursula Whitcher, Harvey Mudd College

3:40-3:55pm
Conjugating matrices to get uniform diagonals
Michael Nathanson, St. Mary's College of California

4:00-4:15pm
Absolute Length in Triangle Groups
Brian Drake, Grand Valley State University

4:20-4:35pm
Tabulating Irreducible Polynomials over Finite Fields
Andrew Shallue, Illinois Wesleyan University

4:40-4:55pm
The Probability of Relatively Prime Polynomials in $(\mathbf{Z}/p^k\mathbf{Z})[x]$
Thomas Hagedorn, The College of New Jersey

5:00-5:15pm
Is the Square Root of 2 Rational?
Mu-Ling Chang, University of Wisconsin-Platteville

1:00-5:55pm, Sky

GENERAL CONTRIBUTED PAPER SESSION
PURE MATHEMATICS
Organizers: Anita Mareno, Penn State University; Adam Coffman, Indiana University-Purdue University Fort Wayne; Sayel Ali, Minnesota State University Moorhead; Chris Moseley, Calvin College; Benselamonyuy Ntatin, Austin Peay State University; and Norman Johnson, Wheaton College

1:00-1:10pm
Maximum Principles and Higher-order partial differential equations
Anita Mareno, Penn State Harrisburg

1:15-1:25pm
The unresolved Kadison-Singer Problem and its implications.
Srilal Krishnan, Iona College

1:30-1:40pm
On Quasi-Cauchy Sequences
Huseyin Cakalli, Maltepe University

1:45-1:55pm
An order-preserving property of additive invariants for Takesue-type reversible cellular automata
Gianluca Caterina, Endicott College

2:00-2:10pm
Glaeser's inequality on an interval
Adam Coffman, Indiana University - Purdue University Fort Wayne

2:15-2:25pm
Verblunsky Coefficients for Paraorthogonal Polynomials on the Unit Circle
Brian Simanek, California Institute of Technology

2:30-2:40pm
Taylor Polynomials positive on the Real Line
Alan Horwitz, Penn State University

2:45-2:55pm
The Phi-Ratio Test
Sayel Ali, Minnesota state university Moorhead; Marion Deutsche Cohen, Arcadia University, PA

3:00-3:10pm
How Rare is Independence?
John Patrick Coleman, Franciscan University of Steubneville

3:15-3:25pm
Geometry of control systems with drift
Christopher G. Moseley, Calvin College

3:30-3:40pm
Introductory Frame Theory
Papiya Bhattacharjee, Penn State Erie, The Behrend College

3:45-3:55pm

Sum of terms of periodic continued fractions
Brad Emmons, Utica College

4:00-4:10pm

Combinatorial Interpretations of Convolutions of Catalan Numbers.
Steven J. Tedford, Misericordia University

4:15-4:25pm

Proving Fibonacci Identities Using Generating Functions
Eric M. Werley, Lehigh University

4:30-4:40pm

Sequences of Rationals from Games
Paul D. Olson, Penn State Erie

4:45-4:55pm

The Collatz Conjecture and the 2-adic Integers
Ryan Stuffelbeam, Transylvania University

5:00-5:10pm

Basic systems of integral octonions
Norman W. Johnson, Wheaton College (Mass.)

5:15-5:25pm

On Orbits of Semi-simple Lie Groups acting on Flag Manifolds
Benselamonyuy Ntatin, AustinPeay State University

5:30-5:40pm

Eigencone, saturation and Horn problems for symplectic and odd orthogonal groups
Shrawan Kumar, University of North Carolina

5:45-5:55pm

Complex Numbers in Plane Geometry
Chris Frenzen, Naval Postgraduate School

2:00-3:50pm, Monongahela

INVITED PAPER SESSION
Combinatorial Games and Schubert Calculus, Session 2
Organizer: Rebecca Goldin, George Mason University

2:00-2:20pm

Geometry of Jeu de Taquin
Kevin Purbhoo, University of Waterloo

2:30-2:50pm

Schubert Calculus and the Cohomology Ring of the Peterson Variety
Erik Insko, University of Iowa

3:00-3:20pm

Galois groups for Schubert problems
Frank Sottile, Texas A&M

3:30-3:50pm

Equivariant topology for Hamiltonian torus actions on symplectic orbifolds
Tara Holm, Cornell University

2:00-3:55pm, Conference B

MAA STUDENT PAPER SESSION #15

2:00-3:55pm, Conference C

MAA STUDENT PAPER SESSION #16

2:00-3:55pm, Carnegie III

MAA STUDENT PAPER SESSION #17
Organizers: J. Lyn Miller, Slippery Rock University; John Hamman, Montgomery College; and Daluss Siewert, Black Hills State University

2:00-3:55pm, Phipps

PI MU EPSILON STUDENT PAPER SESSION #7

2:00-3:55pm, Oliver

PI MU EPSILON STUDENT PAPER SESSION #8
Organizer: Angela Spalsbury, Youngstown State University

2:10-3:30pm, Urban

PANEL
How to Apply for a Job
Organizer: David Manderscheid, University of Nebraska Lincoln
Panelists: Tricia Brown, Armstrong Atlantic State University; James Freeman, Cornell College; David Manderscheid, University of Nebraska; and Joanne Peeples, El Paso Community College

2:15-3:05pm, Grand Ballroom

ALDER AWARD SESSION
David Bressoud, MAA President
Speakers: Kathleen Fowler, Clarkson University, and Nathan Carter, Bentley University

3:00-5:50pm, Allegheny

INVITED PAPER SESSION
Complex Dynamics: Opportunities for Undergraduate Research Session 2
Organizers: Dan Look, St. Lawrence University, and Elizabeth Russell, United States Military Academy

3:00-3:20pm

Parameter spaces for some slices of cubics
Clinton Curry, Stony Brook University

3:30-3:50pm

Dynamics of Cubic Siegel Laminations
Ross Ptacek, University of Alabama Birmingham

4:00-4:20pm

Degeneracy of Cubic Pull-Back Laminations
Kendrick White, University of Alabama Birmingham; John Mayer, University of Alabama Birmingham; Lex Oversteegen, University of Alabama-Birmingham

4:30-4:50

Elusive Zeros Under Newton's Method
Gareth Roberts, College of the Holy Cross

5:00-5:20pm

Fibonacci Harps and a Shift of Finite Type
Annalisa Crannell, Franklin and Marshall College

5:30-5:50pm

Introduction to Complex Dynamics via Multiple Circle Inversions
Daniel M. Look, St. Lawrence University

3:30-5:30pm, Keystone/Doubletree

MINICOURSE #5 PART 1
A Game Theory Path to Quantitative Literacy
Presenters: David Housman, Goshen College, and Rick Gillman, Valpraiso University

3:30-5:30pm, Erie/Doubletree

MINICOURSE #6 PART 1
Creating Demonstrations and Guided Explorations for Multivariable Calculus using CalcPlot3D
Presenter: Paul Seeburger, Monroe Community College

3:40-5:00pm, Grand Ballroom

PANEL
Celebrating Mathematics and Bio 2010
Organizers: Raina Robeva, Sweet Briar College, and Jennifer Galovich, St. John's University
Panelists: Lester Claudill, University of Richmond; Carole Hom, University of California Davis; Aminul Huq, Department of Mathematics; Kelsey Metzger, Department of Biology University of Minnesota Rochester; and Randall Pruim, Calvin College

4:00-5:20pm, Monongahela

PANEL
Issues for Early Career Mathematicians in Academia
Organizers: Michael Dorff, Brigham Young University, and Edward Aboufadel, Grand Valley State University
Panelists: Michael Bolt, Calvin College; James Sellers, Penn State University; and Dana Ernst, Plymouth State University

4:20-6:15pm, Conference B

MAA STUDENT PAPER SESSION #18

4:20-6:15pm, Conference C

MAA STUDENT PAPER SESSION #19

4:20-6:15pm, Carnegie III

MAA STUDENT PAPER SESSION #20
Organizers: J. Lyn Miller, Slippery Rock University; John Hamman, Montgomery College; and Daluss Siewert, Black Hills State University

4:20-6:15pm, Phipps

PI MU EPSILON STUDENT PAPER SESSION #9

4:20-6:15pm, Oliver

PI MU EPSILON STUDENT PAPER SESSION #10
Organizer: Angela Spalsbury, Youngstown State University

6:00-7:45pm, Urban

PI MU EPSILON STUDENT BANQUET AND AWARD CEREMONY

8:00-8:50pm, Grand Ballroom

PI MU EPSILON J. SUTHERLAND FRAME LECTURE
Incomprehensibility
Nathaniel Dean, Texas State University

9:00-10:00pm, Monongahela

MAA ICE CREAM SOCIAL

SATURDAY, August 7

8:30-9:20am, Grand Ballroom

INVITED ADDRESS
Creating Symmetry
Frank Farris, Santa Clara University

8:30-11:05am, Conference A

CONTRIBUTED PAPER SESSION
Innovative Ideas for an Introductory Statistics Course, Session 2
Organizers: Nancy Boynton, SUNY Fredonia; Patricia Humphrey, Georgia Southern University; and Michael Posner, Villanova University

8:30-8:45am
Examples of data collection using clickers
Paul Taylor, Shippensburg University

8:50-9:05am
Happyville and Statistical Thinking
Kevin Scott Robinson, Millersville University of Pennsylvania

9:10-9:25am
A Hole in One: Using Miniature Golf in an Introductory Statistics Course
Patrick Gorman, Kutztown University

9:30-9:45am
Exploring Linear Regression with Bouncing Balls
Dean Nelson, University of Pittsburgh at Greensburg

9:50-10:05am
A Matched Pairs Study Involving Proportions
Chris Oehrlein, Oklahoma City Community College

10:10-10:25am
Exploring Probabilities Through Simulations with Pigs
Lanee Young, Fort Hays State University

10:30-10:45am
Martin vs. Westvaco: Honors Statistics Mock Trial
Sarah L. Mabrouk, Framingham State College

10:50-11:05am
Benford's Law, a growth industry
Kenneth A. Ross, MAA

8:30-11:45am, Three Rivers

CONTRIBUTED PAPER SESSION
Effective Practices for Teaching Mathematical Communication Skills
Organizer: Russell Goodman, Central College

8:30-8:45am
Strategies for Improving Writing by Cultivating Metacognition
Tessa Weinstein, Coastal Carolina University

8:50-9:05am
Initial Experiences with Case Studies
Brian Kelly, Bryant University

9:10-9:25am
Mathematical Communication Skills in Undergraduate Curriculum
Joyati Debnath, Winona State University

9:30-9:45am
Communicating Statistically
Kim Roth, Juniata College

9:50-10:05am
Bridges from Math to English
Benjamin Galluzzo, Shippensburg University

10:10-10:25am
Preparing students to communicate technical information
Lew Ludwig, Denison University

10:30-10:45am
First-Year Introduction to Communications
Charles Rocca, Western Connecticut State University; David Burns, Western Connecticut State University

10:50-11:05am
Using Wikis and Journals to Increase Communication in Mathematics Courses
Jennifer Franko Vasquez, The University of Scranton; Steven T. Dougherty, The University of Scranton

11:10-11:25am
Conversational Mathematics: Fostering Mathematical Communication Skills and Thinking in Introductory Courses
Martha Allen, Georgia College & State University; Blair T. Dietrich, Georgia Military College

11:30-11:45am
Real Analysis on the Road to Mathematical Maturity
Emily Elizabeth Puckette, University of the South

8:30-11:55am, Sky

GENERAL CONTRIBUTED PAPER SESSION
Graph Theory and Geometry
Organizers: Rebecca Gera, Naval Postgraduate School; Hollie Buchanan, West Virginia University; Jack Mealy, Austin College; and Kevin Ferland, Bloomsburg University of Pennsylvania

8:30-8:40am
Functigraphs: A generalization of permutation graphs
Ralucca M. Gera, Naval Postgraduate School

8:45-8:55am
A $(2n\text{-}2)$ regular Graph on $2n+1$ Vertices Admits a Hamiltonian Decomposition
Hollie L. Buchanan, West Liberty University

9:00-9:10am
Covering powers of cycles by equivalence graphs
Robin Blankenship, Morehead State University

9:15-9:25am

On antimagic labelings of graphs
Michael D. Barrus, Black Hills State University

9:30-9:40am

The uplift principle and the Riordan group
Louis Shapiro, Howard University Mathematics Department

9:45-9:55am

Group Divisible Designs with Block Size Six and First and Second Associates
Melanie Laffin, Michigan Technological University

10:00-10:10am

A Modification of Sylvester's Four Point Problem
Rosemary Sullivan, West Chester University

10:15-10:25am

Constructing hyperbolic-like systems via Snell Geometry
Jack Mealy, Austin College

10:30-10:40am

Exploring Relationships Within Families of Triangles Via Reperesentation Spaces
G. Gerard Wojnar, Frostburg State University

10:45-10:55am

Generalizing the Pythagorean Theorem and Its Proof
Kevin Ferland, Bloomsburg University

11:00-11:10am

Rep-tiling the trapezoid
Leon Brin, Southern CT State University

11:30-11:40

Undergraduate Research Projects on Hextile Knot Mosaics
Robin Blankenship, Morehead State University

11:45-11:55am

Interrelating tumors and fractals
Timothy Atabong Agendia, Madonna University Okija, Elele Campus (Nigeria)

8:30-11:55am, Frick

GENERAL CONTRIBUTED PAPER SESSION

Teaching Introductory Mathematics II
Organizers: J. Bradford Burkman, Louisiana School for Math; Science and the Arts, Alison Ahlgren, University of Illinois; Ivona Grzegorczyk, California State University Channel Islands; and Mary Walkins, Lee University

8:30-8:40am

Choosing Exercises for Well-Rounded Problem Sets
J Bradford Burkman, Louisiana School for Math, Science, and the Arts

8:45-8:55am

Implementation of web-based skill tests for Pre-calculus, Calculus I and Calculus II
Lynne Yengulalp, University of Dayton

9:00-9:10am

Readiness Assessment, Course Placement, and Effective Course Redesign through Introductory Calculus
Alison Ahlgren, University of Illinois

9:15-9:25am

Redesigning Algebra in the Classroom: Using Assessment to Drive Instruction
Mike Hall, Arkansas State University

9:30-9:40am

Pixie Sines: Viewing $y = \sin(50x)$ through the "Wrong" Windows on the TI-84+
Andy Martin, Kentucky State University

9:45-9:55am

Use of Online Homework System in Teaching Mathematics
Yun Lu, Kutztown University of PA

10:00-10:10am

The Math Dimension: A Centralized Mathematics Tutoring Center
Gina Monks, Pennsylvania State University

10:15-10:25am

A Calculus-oriented Inquiry Based Learning approach to teach a PreCalculus course
Rama Rao, University of North Florida

10:30-10:40am

Mathematical Habits of Mind: Teaching Students How to Think Mathematically
Marshall Gordon, Park School of Baltimore

10:45-10:55am

First-Year Mathematics at USMA: Modeling in a Real and Complex World
David Arney, United States Military Academy

11:00-11:10am

Models and Not Models--College Algebra and the Real World
Saleem Watson, California State University, Long Beach

11:15-11:25am

Poetry, games and art activities in algebra classroom
Ivona Grzegorczyk, California State University Channel Islands

11:30-11:40am

Two Kinds of College Algebra for Two Kinds of Students
Beverly K. Michael, University of Pittsburgh

11:45-11:55am

Using Critical Thinking Skills in College Algebra
Mary B. Walkins, Lee University

9:00-10:20am, Monongahela

MATHEMATICS CIRCLES DEMONSTRATION

Organizers: Tatiana Shubin, San Jose State University; Elgin Johnston, Iowa State University; and James Tanton, St. Mark's School

9:00-10:30am, Urban

MAA MATHEMATICAL COMPETITION IN MODELING (MCM) AWARDS CEREMONY
Organizer: Ben Fusaro, Florida State University

9:00am-1:00pm, Sternwheeler

STUDENT HOSPITALITY CENTER
Richard and Araceli Neal, American Society for the Communications of Mathematics

9:30-10:20am, Grand Ballroom

EARL RAYMOND HEDRICK LECTURE III
Sierpinski Galore
Robert L. Devaney, Boston University

9:30-11:45am, Allegheny

CONTRIBUTED PAPER SESSION
First Year Seminar/ First Year Experience Mathematics Courses Session 1
Organizers: Jon Johnson, Elmhurst College, and Cheryl McAllister, Southeast Missouri State University

9:30-9:45am
First Year Seminar Voting Theory Course at TCNJ
Karen Clark, The College of New Jersey

9:50-10:05am
Freshmen, Problem Solving, and the Unknown Audience
Matthew Menzel, Marietta College

10:10-10:25am
The Art of Mathematical Thinking
Lew Ludwig, Denison University

10:30-10:45am
A Course on the Mathematics of *Numb3rs*
Sarah Elizabeth Eichhorn, UC Irvine

10:50-11:05am
A Model of a First-Year Seminar Integrated with a College Algebra Course
Joyce Cutler, Framingham State College

11:10-11:25am
Reluctantly Creating a Mathematics First Year Seminar
David Marshall, Monmouth University

11:30-11:45am
"Equation" as a Metaphor for Life in a Two Cultures Class
Steven B. Zides, Wofford College

10:30-11:20am, Grand Ballroom

MAA INVITED ADDRESS
The Mathematics of Math Circles
Zvezdelina Stankova, Mills College

11:30am-12:00noon, Grand Ballroom

MAA BUSINESS MEETING
David Bressoud, MAA President

1:00-2:15pm, Lawrence Welk

STUDENT PROBLEM SOLVING COMPETITION
Organizers: Richard and Araceli Neal, American Society for the Communications of Mathematics

1:00-2:20pm, Carnegie III

TRANSFORMING UNDERGRADUATE EDUCATION IN STEM: RECENT CHANGES AT NSF
Sponsored by MAA Science Policy Committee. Panelists: Joan Ferrini-Mundy, National Science Foundation; Jim Lewis, University of Nebraska-Lincoln; Dan Maki, University of Indiana-Bloomington. Moderator: Jason Miller, Truman State University.

1:00-2:50pm, Urban

INVITED PAPER SESSION
Mathematical Visualization
Organizer: Frank Farris, Santa Clara University

1:00-1:20pm
How to See Normal and Tangential Euler Numbers for a 2-Surface in 4-Space
Thomas Banchoff, Brown University

1:30-1:50pm
Lissajous Spheres: Twisted Spheres in 4-Space
Frank Farris, Santa Clara University

2:00-2:20pm
Visualizing the Normal Euler Class for Polyhedral Surfaces in 4-Space
Ockle Johnson, Keene State College

2:30-2:50pm
Flying through 3-Manifolds
Jonathan Rogness, University of Minnesota

1:00-3:00pm, Keystone/Doubletree

MINICOURSE #3 PART 2
An Introduction to GeoGebra, a Tool for Demonstration, Exploration, and Applet Creation
Presenter: Mike May, S.J., Saint Louis University

1:00-3:00pm, Erie/Doubletree

MINICOURSE #4 PART 2
Effective Placement Testing for Introductory College Mathematics Courses
Presenters: Bernard Madison, University of Arkansas; Raymond Cannon, Baylor University; Marilyn Carlson, Arizona State University; Wade Ellis, West Valley College; Louise Krmpotic, Microsoft; James W. Stepp, University of Houston; and Gordon Woodward, University of Nebraska

1:00-3:15, Conference B

CONTRIBUTED PAPER SESSION

Recreational Mathematics: New Problems and New Solutions
Organizers: Paul R. Coe, Dominican University, and Kristen Schemmerhorn, Dominican University

1:00-1:15pm

Withdrawn - No Presentation

1:20-1:35pm

Tantrix and the Permutahedron
Heidi Burgiel, Bridgewater State College; Mahmoud El-Hashash, Bridgewater State College

1:40-1:55pm

A Non Random Dice Rolling Game
Ryan Mullen, Sacred Heart University

2:00-2:15pm

Exploring Prime Decades Less Than Ten Billion
Jay Lawrence Schiffman, Rowan University

2:20-2:35pm

Title: Randomness and Patterns in the Digits of Squares
Roger Bilisoly

2:40-2:55pm

Symmetry vs. Economy in Dissections of Squares and Cubes
Greg N. Frederickson, Purdue University

3:00-3:15pm

Oodles and Oodles of Googols; Iterations of the *Words to Numbers* Function
Matthew Coppenbarger, Rochester Institute of Technology

1:00-4:00pm, Monongahela

INVITED PAPER SESSION

The Mathematics of Math Circles
Organizers: Zvezdelina Stankova, Mills College, and Tatiana Shubin, San Jose State University

1:00-1:20pm

How to Allocate Indivisible Objects to People
Gabriel Carroll, MIT

1:30-1:50pm

Hilbert's Third Problem for All Ages
Inna Zakharevich, MIT

2:00-2:20pm

The Dynamics of Continued Fractions
Evan O'Dorney, Berkeley Math Circle

2:30-2:50pm

Modern Perspectives on Classical Geometry
Tiankai Liu, MIT

3:00-3:20pm

Collaborative Strategies in Multi-Player Mathematical Games
Ivan Matic, University of California, Berkeley

3:30-4:00pm

Math Circles and Research Mathematics: Gaps, Bridges, and Successes
Panel discussion: nine past/present math circlers will share their stories.

1:00-3:35pm, Three Rivers

CONTRIBUTED PAPER SESSION

First Year Seminar/ First Year Experience Mathematics Courses Session 2
Organizers: Jon Johnson, Elmhurst College, and Cheryl McAllister, Southeast Missouri State University

1:00-1:15pm

A First Year Seminar on Cryptography
Darren Glass, Gettysburg College

1:20-1:35pm

An interdisciplinary first seminar on symmetry
Tamara Lakins, Allegheny College

1:40-1:55pm

An Interdisciplinary First Year Experience in Mathematics and Music Theory
Emily Helen Sprague, Edinboro University of PA

2:20-2:35pm

Culture, Science, and Mathematics in the Pre-Columbian Americas
Ximena Catepillan, Millersville University of Pennsylvania

2:40-2:55pm

Four Different Experiences
Jeff Johannes, SUNY Geneseo

3:00-3:15pm

FYS: Cryptologic Mathematics
Timothy John McDevitt, Elizabethtown College

3:20-3:35pm

Teaching a First Year Seminar on STEM Breakthroughs and Controversies
Sarah J. Greenwald, Appalachian State University

3:20-3:35pm

Balancing Numerous Goals in a Mathematics FYS - My Penn State Experience
James Sellers, Penn State University

1:00-4:20pm, Conference A

INVITED PAPER SESSION
Mathematical Modeling of the Immune Response, Cancer Growth and Treatments
Organizer: Ami Radunskaya, Pomona College

1:00-1:20pm
Modeling the Immune Response to Cancer
Lisette de Pillis, Harvey Mudd College

1:30-1:50pm
Can Mathematics Cure Leukemia?
Doron Levy, University of Maryland

2:00-2:20pm
Optimal Control Scenarios in Cancer Dynamics
Renee Fister, MAA

2:30-2:50pm
A Spatial Model of Tumor-Host Interaction: Application of Chemotherapy
Peter Hinow, University of Wisconsin

3:00-3:20pm
Linking Changes in Epithelial Morphogenesis to Cancer Mutations: An Integrative Model
Kasia Rejniak, Moffitt Cancer Center

3:30-3:50pm
Mathematical Simulations of Tumor Response to Cancer Treatment
Jana Gevertz, The College of New Jersey

4:00-4:20pm
Predictions of tumor morphological stability and evaluation against experimental observations
Kara Thuy Pham, Mathematics Department, University of California, Irvine

1:00-4:15pm, Frick

CONTRIBUTED PAPER SESSION
Geometry Topics That Engage Students, Session 2
Organizer: Sarah Mabrouk, Framingham State College

1:00-1:15pm
Centers of Triangles (for GSP 5 and Geogebra)
Jane Cushman, Buffalo State College

1:20-1:35pm
GeoGebra and the Fermat-Torricelli Point
Marc Renault, Shippensburg University

1:40-1:55pm
Minkowski geometry and special relativity
Theodore Theodosopoulos, Saint Ann's School

2:00-2:15pm
Baserunner's Optimal Path
Frank Morgan, Williams College

2:20-2:35pm
A modern geometry class works overtime
Premalatha Junius, MansfieldUniversity

2:40-2:55pm
On Drawing Stuff
Mark Schwartz, Ohio Wesleyan University

3:00-3:15pm
A Golden Graph
Sam Northshield, SUNY Plattsburgh

3:20-3:35pm
Origami and Symmetric Colorings of the Platonic Solids
Lisa Mantini, Oklahoma State University

3:40-3:55pm
Using Biology to Teach Geometry: Protein Structure Tessellations in Matlab
Majid Masso, George Mason University

4:00-4:15pm
Nearest Neighbors: Mathematics and Geography
Leon Hannah Tabak, Cornell College

1:00-4:50pm, Allegheny

INVITED PAPER SESSION
The Klein Project
Organizer: William McCallum, University of Arizona

1:00-1:20pm
Algebraic structure as a source of coherence in the school curriculum
Hyman Bass, University of Michigan

1:30-1:50pm
Cyclotomic Polynomials
Harriet Pollatsek, Mount Holyoke College

2:00-2:20pm
Eudoxus, Euclid and Hölder on measurement, ratio and proportion
James madden, Louisiana State University

2:30-2:50pm
Issues in the Transition from Concrete to Formal Mathematics
Susanna Epp, DePaul University

3:00-3:20pm
Repeating Decimal Representations of Fractions and Group Theory
Sybilla Beckmann, University of Georgia

3:30-3:50pm
Revisiting Felix Klein's Elementary Mathematics From An Advanced Standpoint
Bill Barton, University of Auckland

4:00-4:20pm
The Mathematics of Task Design
Al Cuoco, Educational Development Center; Glenn Stevens, Boston University

4:30-4:50pm
The Secret Life of the $ax+b$ Group
Roger Howe, Yale University

1:00-4:55pm, Bob Hope

CONTRIBUTED PAPER SESSION

Active Learning Intervention Strategies Accompanying Introductory Mathematics Courses
Organizers: Catherine Beneteau, University of South Florida; Helmut Knaust, University of Texas at El Paso; Emil Schwab, University of Texas at El Paso; and Gabriela Schwab, University of Texas at El Paso - Rio Grand Campus

1:00-1:15pm

An innovative approach to trigonometry recitation involving pre-service secondary math teachers
Diana White, University of Colorado Denver

1:20-1:35pm

Do inquiry-based active learning strategies add value to computer-assisted instruction?
William Bond, University of Alabama-Birmingham

1:40-1:55pm

Electronic Study Guide for Precalculus and Calculus
Philip B. Yasskin, Texas A&M University

2:00-2:15pm

Enhanced Student Services in Calculus 1 Classes
Cristina Villalobos, University of Texas-Pan American

2:20-2:35pm

Formative Assessments to Improve Performance in Pre-calculus and Calculus
Jose Huberto Giraldo, Texas A&M University Corpus Christi

2:40-2:55pm

Service Learning In A Precalculus Class: An Environmental Awareness Campaign
Angie Hodge, North Dakota State University

3:00-3:15pm

I Lost My Voice and Learned to Teach
Leslie M. Horton, Delta State University

3:20-3:35pm

Moore Method in PreCalculus: An Interim Report
Karen Sue Briggs, North Georgia College & State University

3:40-3:55pm

Promoting Success in Calculus Through Problem Solving and Undergraduate Teaching Assistants
David Wilson, SUNY, Buffalo State

4:00-4:15pm

Service learning in a Precalculus class: An environmental awareness campaign
Zdenka Guadarrama, Rockhurst University

4:20-4:35pm

Supplemental Instruction Model for Precalculus
Emil Daniel Schwab, The University of Texas at El Paso

4:40-4:55pm

Tasks in an Emerging Scholars Program in Pre-Calculus and Calculus via an Active Learning Lens
Julie Marie Skinner, University of Texas-Arlington

1:00-5:30pm, Phipps

GREAT TALKS FOR A GENERAL AUDIENCE: COACHED PRESENTATIONS BY GRADUATE STUDENTS

Organizer: Jim Freeman, Cornell College

1:00-5:40pm, Sky

GENERAL CONTRIBUTED PAPER SESSION

Applications of Mathematics
Organizers: Mike Johnson, Meredith College; Julia Arciero, University of Pittsburgh; Eduardo Montoya, California State University Bakersfield; Murphy Waggoner, Simpson College; Richard Marchand, Slippery Rock University; and Shawn McMurran, California State University San Bernardino

1:00-1:10pm

Random Walks and Continuum Coupling
Sheldon Lee, Viterbo University

1:15-1:25pm

Queueing Models with Unknown Service Parameters for Congested Systems
Mike J. Johnson, Meredith College

1:30-1:40pm

Dynamics of a two-patch model for plant-insect interactions
Yun Kang, Arizona State University; Dieter Armbruster, ASU

1:45-1:55pm

Mathematical model of necrotizing enterocolitis: effects of probiotic treatment and Toll-like receptor 4 inhibition
Julia Arciero, University of Pittsburgh

2:00-2:10pm

Mathematical Modeling of Atmospheric Dispersion: An Undergraduate Research Project.
J. Christopher Tweddle, University of Evansville

2:15-2:25pm

Rationality as a Threshold for Evolution Towards Cooperation.
Kathryn Weld, Manhattan College

2:30-2:40pm

Using Distorted Gaussians To Model Device Lifetimes
Genghmun Eng

2:45-2:55pm

Ray-based Tomography: An application for linear algebra
Martha Waggoner, Simpson College

3:00-3:10pm

Solutions to a generalization of the mixture problem from differential equations.
John Noonan, Mount Vernon Nazarene University

3:15-3:25pm

The effects of climate change on a species with temperature dependent sex determination.
Amy Parrott, University of Wisconsin-Oshkosh

3:30-3:40pm

An Epidemiology Model Suggested by Yellow Fever
Daniel Joseph Galiffa, Penn State Erie

3:45-3:55pm

Sensitivity and robustness of a neuron model are affected by dendrite shape
Christina Weaver, Franklin & Marshall College

4:00-4:10pm

The evolution of mountain pine beetle development time in response to climate change
Brian Patrick Yurk, Hope College

4:15-4:25pm

Relative efficiency gains of a monotone functional non-linear model.
Eduardo Montoya, CSU-Bakersfield

4:30-4:40pm

Spirographic Orbits in Extended Mass Distributions: Results From a Collaborative Research Effort with Undergraduates
Lisa Joan Holden, Northern Kentucky University

4:45-4:55pm

A comparison of mechanical and thermal damping in a thermoelastic beam
Richard Marchand, Slippery Rock University

5:00-5:10pm

A Dynamic Network Interdiction Problem
Brian J. Lunday, Grado Department of Industrial and Systems Engineering, Virginia Polytechnic Institute and State University

5:15-5:25pm

Analyzing Differentially Expressed Genes in Short Time Series Microarray Data
Darlene Olsen, Norwich University

5:30-5:40pm

What does the Julia Set for $f(z)=z^{5/2}-1/2+i/10$ *really* look like?
Joshua C Sasmor, Seton Hill University

3:00-4:20pm, Lawrence Welk

PANEL
The Single Mathematician
Organizers: Georgia Benkart, University of Wisconsin; Maura Mast, University of Massachusetts Boston; and Maeve Lewis McCarthy, Murry State University
Panelists: Julie Barnes, Western Carolina University; Ellen Kirkman, Wake Forrest University; Deborah Lockhart, National Science Foundation; and Mary Beth Ruskai, Tufts University

3:30-5:30pm, Keystone/Doubletree

MINICOURSE #5 PART 2
A Game Theory Path to Quantitative Literacy
Presenters: David Housmaen, Goshen College, and Rick Gillman, Valpraiso University

3:30-5:30pm, Erie/Doubletree

MINICOURSE #6 PART 2
Creating Demonstrations and Guided Explorations for Multivaiable Calculus using CalcPlot3D
Presenter: Paul Seeburger, Monroe Community College

4:30-6:00pm, Monongahela

PANEL
Math Circles: Transforming (or Subverting) Pre-College Mathematics
Organizers: Tatiana Shubin, San Jose State University, and Elgin Johnston, Iowa State University
Panelists: Eric Hsu, San Francisco State University; Elgin Johnston, Iowa State University; Jim Lewis, University of Nebraska; William McCallum, University of Arizona; James Tanton, St. Mark's School; and James Taylor, Sante Fe Prepatory School

6:00-7:00pm, Urban

SILVER & GOLD RECEPTION

7:00-9:00pm, Urban

SILVER & GOLD BANQUET
MC: Barbara Faires, Westminster College

CLIMATE CHANGE AT THE TOP OF THE WORLD: A PURE MATHEMATICIAN WORRIES ABOUT A DECIDEDLY APPLIED PROBLEM
Speaker: Robert Megginson, University of Michigan

SOCIAL EVENTS

Clayton and Frick Museum Tour

Wednesday, August 4
9:30 am – 4:00 pm

Travel to the Clayton Estate, one of the nation's most complete Victorian homes and the residence of the industrialist Henry Clay Frick. Enjoy the quiet refinement of a Victorian past, visit the extensive car and carriage museum for a look at old-time travel, and enjoy the estate's lovely greenhouse. The Clayton estate is also the home to a private art museum that has an exquisite permanent collection of European and Asian paintings, sculpture, and decorative arts from the 12th to 18th century. The tour will stop by the Cathedral of Learning at the University of Pittsburgh to see the 27 Nationality Rooms. Lunch is included and tickets are $53 per person.

MAA-PME Student Reception

Wednesday, August 4, 4:30 pm – 5:30 pm

Math Jeopardy

Wednesday, August 4 , 5:30 pm – 6:15 pm
Robert Vallin, *Slippery Rock University and MAA*
Michael Berry
University of Tennessee

Answer: A fun undergraduate mathematics contest to lead off MathFest.
Question: What is Math Jeopardy? Four teams of students will provide the questions to go with the mathematical answers in many categories. Come cheer for your favorite team. The session will be emceed by Michael Berry.

Opening Reception

Wednesday, August 4, 6:00 pm – 7:30 pm

The MAA is pleased to hold a reception with a cash bar for all MathFest participants immediately preceding the Opening Banquet.

Opening Banquet

Wednesday, August 4, 7:30 p.m – 9:30 pm

Continue the exciting evening by joining new and longtime friends and colleagues for a fine dinner. There will be an after dinner presentation by Jonathan Rogness, University of Minnesota who will present the talk: "Seeing Mathematics!"

Serving as master of ceremonies will be James Sellers from Penn State University (Governor, Allegany Mountain Section). Tickets are $52 per person. Purchasing tickets through advanced registration is recommended, since only a limited number of tickets will be available for sale on site. Choice of entrees available.

Graduate Student Reception

David Manderscheid, *University of Nebraska-Lincoln*
James Freeman, *Cornell College*
Thursday, August 5, 5:00 pm – 6:00 pm

AWM-MAA Morning Coffee

Friday, August 6, 8:00 am – 8:25 am

The Association for Women in Mathematics and the Mathematical Association of America invite you to enjoy coffee and light refreshments before the Etta Z. Falconer Lecture.

Pi Mu Epsilon Student Banquet and Awards Ceremony

Friday, August 6, 6:00 pm – 8:00 pm

All PME members and their supporters are welcome. See the registration form for more information on this ticketed event.

MAA Ice Cream Social

Friday, August 6, 9:00 pm – 10:00 pm

Besides ice cream, we will recognize all students who gave talks in the MAA Student Paper Sessions, and award prizes for the best of them. All undergraduate students are invited to attend.

3rd Annual MathFest 5K Fun Run/Walk

Saturday, August 7, 6:30 am

Get active with your colleagues and have some fun Saturday, August 7 along the bike path at North Shore Park! More than 150 MathFest attendees participated in the 2009 MathFest 5K Fun Run/Walk and this year is sure to be a hit. The fee is $25 and all participants will receive a t-shirt. Donations are being accepted to present to a local Pittsburgh charity.

Silver & Gold Banquet

Saturday, August 7, 6:00 pm – 9:00 pm

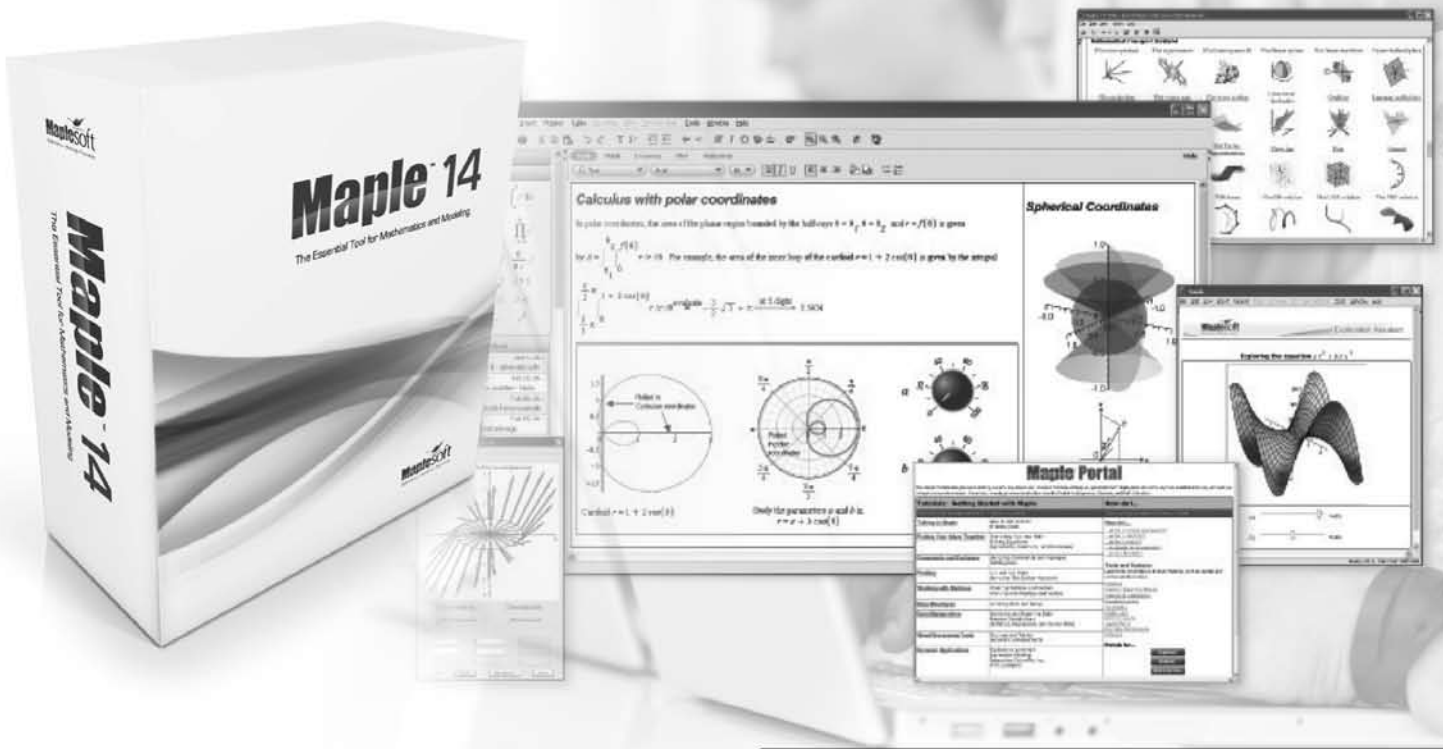
Our annual end-of-meeting banquet is a time to honor long-time MAA members and have a very special conclusion to the meeting. Please join us for this ticketed event. Robert Megginson from the University of Michigan is the invited speaker. His talk will be "Climate Change at the Top of the World: A Pure Mathematician Worries About a Decidedly Applied Problem." Barbara Faires, Westminster College (MAA Secretary) will be the emcee. Cash bar. Tickets are $60 per person. Purchasing tickets through advance registration is recommended, since only a limited number of tickets will be available for sale on site.

Fallingwater Tour

Sunday, August 8
9:00 am – 4:00 pm

Fallingwater is nestled in the heart of the Laurel Highlands in the small village of Mill Run, PA. It is one of the most widely acclaimed works of architect Frank Lloyd Wright. Fallingwater is Wright's greatest essay in horizontal space, with his most powerful piece of structural drama. The group will visit the Christian Klay Winery for a tasting and also enjoy a hay ride to the crest of the mountain where the vineyards are and tour the wine processing area. Since considerable walking and steps are involved, good walking shoes are strongly advised. Lunch is included and tickets are $66.

Maplesoft Solutions for Mathematics Education



With Maplesoft solutions:

- **Bring your lessons to life** through dynamic demonstrations that incorporate amazing graphics, visualizations, and animations.
- **Save time and effort** in placement testing, lesson preparation, grading, in-class demonstrations, technical report writing, and project documentation.
- **Extend your reach** with online learning initiatives, innovative laboratory exercises that bring theory to life, or challenging research problems.

Maplesoft's solutions include:

- **Maple 14**: the essential tool for researchers, teachers, and students in any mathematical discipline.
- **Maple T.A.**: a web-based system for creating tests, assignments, and exercises particularly suited for mathematics.
- **Maple T.A. MAA Placement Test Suite**: the renowned Mathematical Association of America placement tests in an online testing environment.

Visit booth #13 and ask about Maplesoft's complimentary evaluation opportunities!

Maplesoft Presentation at MathFest 2010

Friday August 6th, 3:30 to 5:00, Fox Chapel Room

Redefining Math Education with Clickable Math

Clickable Math offers educators a better way of engaging students so that they fully understand the materials they are being taught. It responds to the most common complaint of faculty who integrate software into the classroom – time is spent teaching the tool, not the concepts. Join Louise Krmpotic as she demonstrates Clickable Math techniques that are redefining mathematics education.

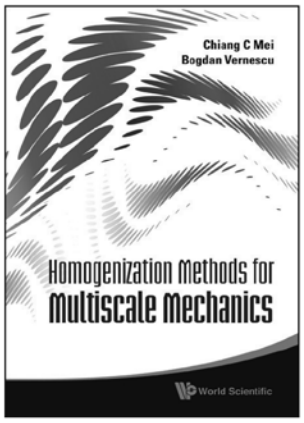
Maplesoft
Mathematics • Modeling • Simulation

www.maplesoft.com | info@maplesoft.com

© Maplesoft, a division of Waterloo Maple Inc., 2010. Maplesoft, Maple, and Maple T.A. are trademarks of Waterloo Maple Inc. All other trademarks are the property of their respective owners.

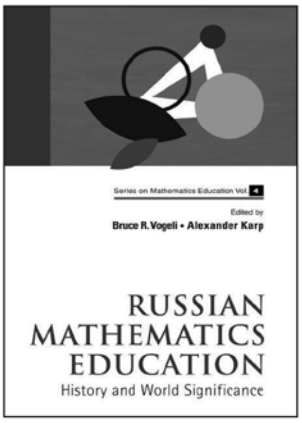
World Scientific
Connecting Great Minds

Quote **DCD102010** for a **20%** discount on all books! Valid till **31st Oct 2010.**



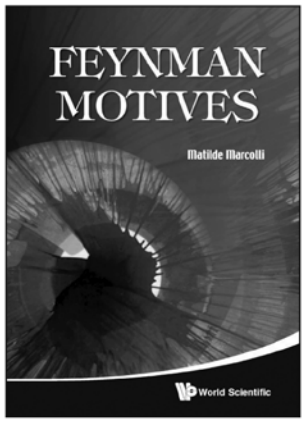
by **Chiang C Mei** *(Massachusetts Institute of Technology, USA)* & **Bogdan Vernescu** *(Worcester Polytechnic Institute, USA)*

350pp (approx.)	Summer 2010	
978-981-4282-44-4	US$72	£54
978-981-4282-45-1(ebk)	US$94	



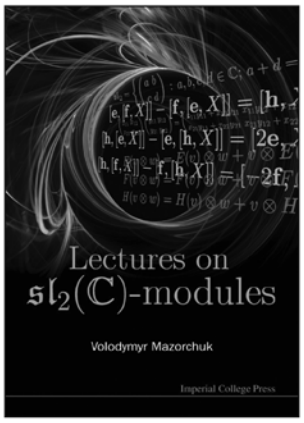
edited by **Alexander Karp** & **Bruce R Vogeli** *(Columbia University, USA)*

300pp (approx.)	Spring 2010	
978-981-4277-05-1	US$78	£59
978-981-4277-06-8(ebk)	US$101	



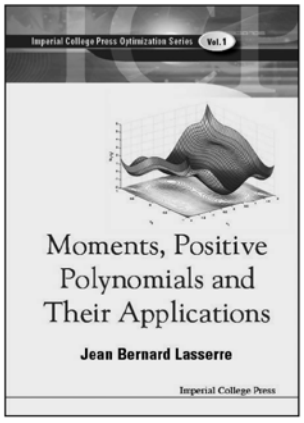
by **Matilde Marcolli** *(California Institute of Technology, USA)*

236pp	Dec 2009	
978-981-4271-20-2	US$48	£36
978-981-4304-48-1(pbk)	US$24	£18
978-981-4271-21-9(ebk)	US$62	



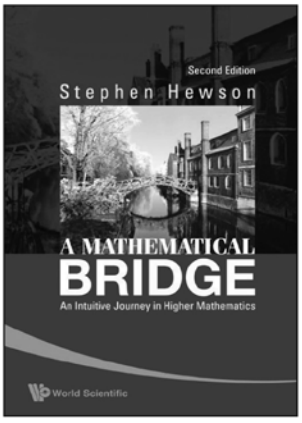
by **Volodymyr Mazorchuk** *(Uppsala University, Sweden)*

276pp	Dec 2009	
978-1-84816-517-5	US$65	£49



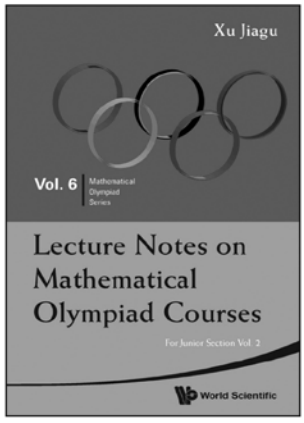
by **Jean Bernard Lasserre** *(LAAS-CNRS and Institute of Mathematics, University of Toulouse, France)*

384pp	Oct 2009	
978-1-84816-445-1	US$75	£56
978-1-84816-446-8(ebk)	US$98	



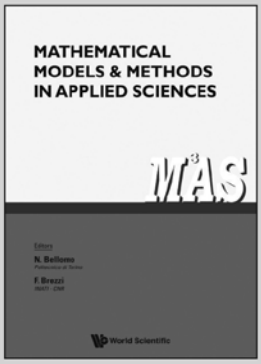
by **Stephen Hewson**

672pp	Jan 2009	
978-981-283-407-2	US$98	£53
978-981-283-408-9(pbk)	US$58	£31



by **Xu Jiagu** *(Former Professor of Mathematics, Fudan University, China)*

Set	376pp	
978-981-4293-53-2(pbk)	US$40	£30
Vol. 1	184pp	Dec 2009
978-981-4293-54-9(pbk)	US$25	£19
Vol. 2	192pp	Dec 2009
978-981-4293-55-6(pbk)	US$25	£19



M3AS's Impact Factor has improved from 1.671 in 2007 to 2.333 in 2008! It now ranks 6th out of 175 journals in the Applied Maths category.

www.worldscinet.com/m3as

AD/JH/01/10/37/SY

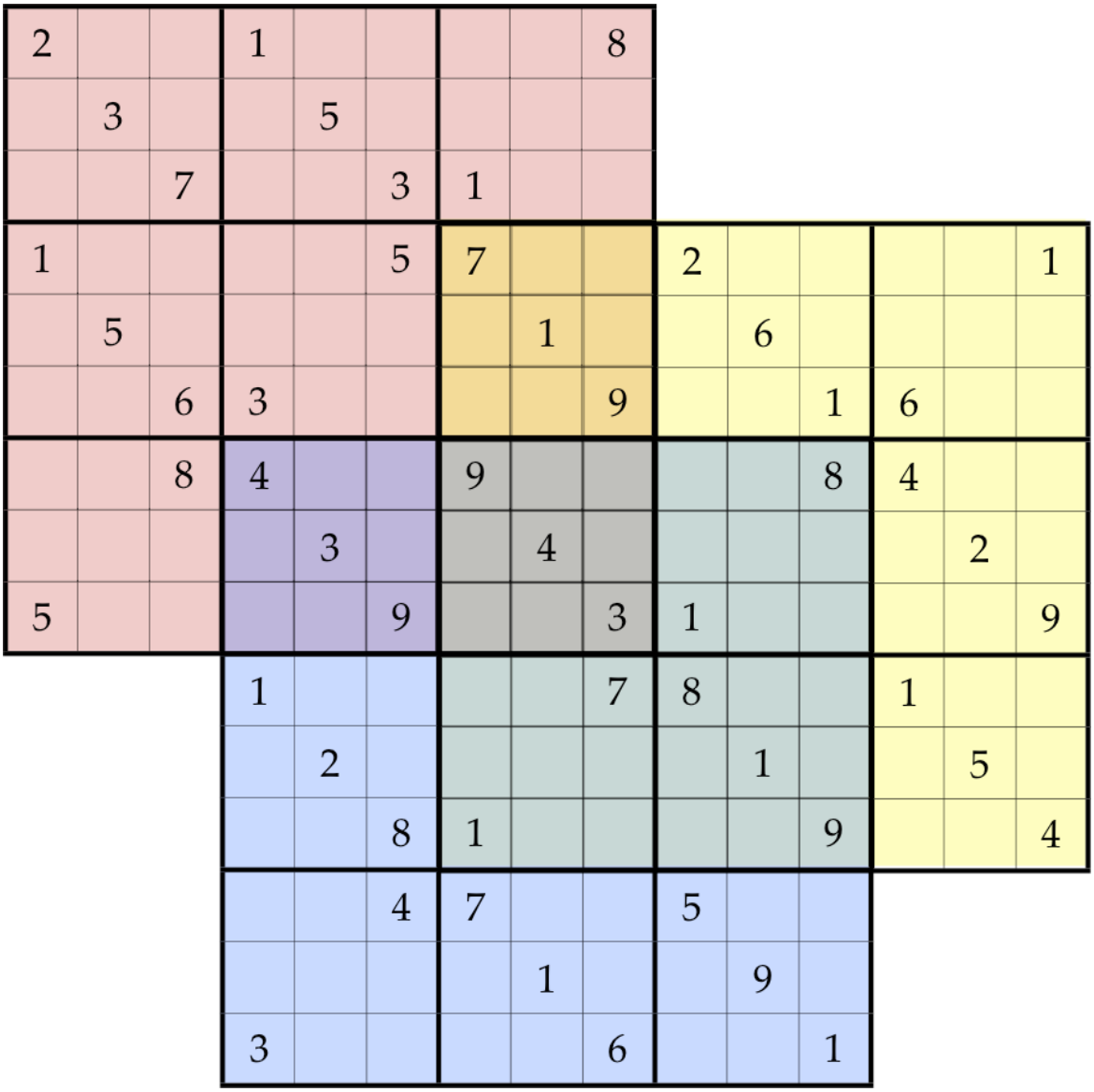
For orders or enquiries, please contact any of our offices below or visit us at: **www.worldscientific.com**

- **NORTH & SOUTH AMERICA** — **World Scientific Publishing Co. Inc.**
  27 Warren Street, Suite 401-402, Hackensack, NJ 07601, USA Toll-free fax: 1 888 977 2665 Toll-free: 1 800 227 7562 Email: sales@wspc.com
- **EUROPE & THE MIDDLE EAST** — **World Scientific Publishing (UK) Ltd.**
  c/o Marston Book Services, P O Box 269, Abingdon, Oxon OX14 4YN, UK Fax: 44 (0) 123 646 5555 Tel: 44 (0) 123 646 5500 Email: direct.orders@marston.co.uk
- **ASIA & THE REST OF THE WORLD** — **World Scientific Publishing Co. Pte. Ltd.**
  Farrer Road, P O Box 128, SINGAPORE 912805 Fax: 65 6467 7667 Tel: 65 6466 5775 Email: sales@wspc.com.sg

* Prices subject to change without prior notice

Venn Sudoku

SATURDAY'S "PROBLEM OF THE DAY"



The three grids are pseudo-puzzles, each with the same symmetric configuration of clues. Taken separately, the pink grid has 1977 solutions, the yellow has 2231, and the blue has 2181. But only ONE combination is a solution to the combined Venn diagram combination of puzzles.

Complete the pink, yellow, and blue grids simultaneously so that for every grid, each row, column, and block contains the numbers 1–9 exactly once.

Thanks to Brainfreeze Puzzles (brainfreezepuzzles.com) for providing this year's MathFest Sudoku.
This year's puzzle will appear in a new book, tentatively titled *Taking Sudoku Seriously*,
by Laura Taalman and Jason Rosenhouse, to be published in 2011 by Oxford University Press

MathFest

Lexington, Kentucky | August 4–6 2011

JOIN US FOR THE LARGEST ANNUAL
SUMMER CELEBRATION OF MATHEMATICS
IN THE UNITED STATES.

MAA
MATHEMATICAL ASSOCIATION OF AMERICA