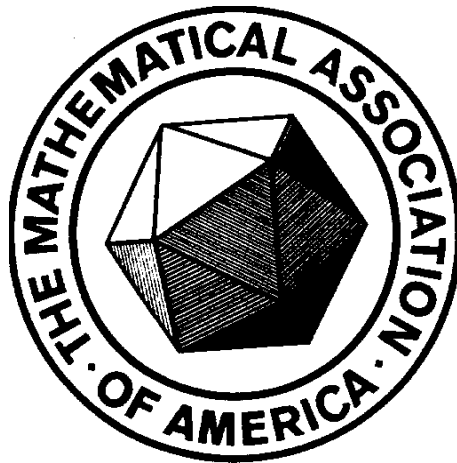


The Mathematical Association of America

**Joint Meeting of the
New Jersey
And
Eastern Pennsylvania and Delaware
Sections**



**La Salle University
Philadelphia, PA**

Saturday, November 6, 2010

Abstracts and Biographies of Speakers

Two (More) Morsels from Euler
William Dunham
Koehler Professor of Mathematics
Muhlenberg College

Euler's 2007 tercentenary generated a number of talks about his celebrated mathematical triumphs. Here we examine a pair of lesser-known theorems in which his genius was on full display.

In the first, we consider Euler's response to the challenge of finding four different whole numbers, the sum of any pair of which is a perfect square. With characteristic ingenuity, he came up with the fearsome foursome of 18530, 38114, 45986, and 65570. We'll look over his shoulder to see how he did it.

Moving from number theory to analysis, we examine his summation of the series of reciprocals of squares – i.e., $1 + 1/4 + 1/9 + 1/16 + \dots$ -- as presented in his 1755 text on differential calculus. The amazing thing about this derivation is that it used l'Hospital's rule ... not once nor twice, but thrice!

These two results, which require only elementary mathematics, are reminders of why Euler should be celebrated on his 300th birthday and always.

William Dunham, who received his B.S. (1969) from the University of Pittsburgh and his M.S. (1970) and Ph.D. (1974) from Ohio State, is the Truman Koehler Professor of Mathematics at Muhlenberg College.

Dunham has directed NEH-funded seminars on math history at Ohio State and has spoken on historical topics at the Smithsonian Institution, on NPR's "Talk of the Nation: Science Friday," and on the BBC. In 2008, as a Visiting Professor at Harvard University, he taught a class on the mathematics of Leonhard Euler. He has just completed a DVD course, titled "Great Thinkers, Great Theorems," for The Teaching Company. In the 1990s, Dunham wrote three books – *Journey Through Genius* (1990), *The Mathematical Universe* (1994), and *Euler: The Master of Us All* (1999) – and in the present century he has done two more: *The Calculus Gallery: Masterpieces from Newton to Lebesgue* (2005) and *The Genius of Euler: Reflections on His Life and Work* (2007). Dunham's expository writing has been recognized by the MAA with the George Pólya Award in 1993, the Trevor Evans Award in 1997 and 2008, the Lester R. Ford Award in 2006, and the Beckenbach Prize in 2008. The Association of American Publishers designated *The Mathematical Universe* as the Best Mathematics Book of 1994.

Rubik's Cube Games on Spheres: Geometry of Spherical Orbifolds

Sarah Greenwald, Appalachian State University

Imagine a spherical Rubik's game where you can rotate spherical triangles on the surface of the sphere. This game exists and is called the Impossiball. We will use the Impossiball to help understand orbifolds, where we slice up spheres in order to form new spaces like footballs and triangular pillows. Orbifolds furnish a natural starting point for the study of singular spaces and they are especially of interest to mathematicians and physicists. Diverse applications of orbifolds include connections to crystallography, string theory and music theory. Many results, such as those requiring local analysis, generalize easily to the orbifold setting, but most global results do not. What surfaces and orbifolds locally look like the sphere? What do the spaces look like and how can we distinguish them? We will answer these questions as we look at the history of orbifolds and many interesting examples.

Sarah J. Greenwald is Professor of Mathematics and a Women's Studies core faculty member at Appalachian State University. She received her PhD from the University of Pennsylvania. Her scholarship areas include Riemannian geometry, popular culture as it pertains to mathematics, and women and minorities in mathematics, and she is a 2005 Mathematical Association of America Alder Award winner for distinguished teaching and the 2010 Appalachian State University Wayne D. Duncan Award for Excellence in Teaching in General Education. She is a member of the executive committee of the Association for Women in Mathematics and the editorial board of PRIMUS. She co-created the educational website SimpsonsMath.com with Andrew Nestler. While it is not affiliated with the show, the site was mentioned in the audio commentary of the 7th season of *The Simpsons*. Her interactive mathematics lecture has been distributed on approximately one million DVDs worldwide as a 25-minute DVD extra for the 20th Century Fox *Futurama* movie *Bender's Big Score* and it is listed as "Mind-bending." Dr. Greenwald has spoken about the impacts of scientific popular culture representations on NPR's Science Friday and all over the country.

Partition Dynamics ABCs: Avalanche Models, Bulgarian Solitaire, and Combinatorial Proofs
Brian Hopkins, St. Peter's College

We will explore the impact of ideas from dynamical systems on the venerable topic of integer partitions. Given an operation on partitions, the partitions of a fixed integer can be thought of as a finite dynamical system. There are three immediate natural questions: How many components are in the system? Which partitions are fixed points or in cycles? Which partitions are Garden of Eden states, with no predecessor? Answers to these questions use generating functions and combinatorial proofs. This approach helps in analyzing Bulgarian Solitaire popularized by Martin Gardner and various sand pile model examples of "self-organized criticality" in theoretical physics. It can also be enlightening to "operationalize" bijections of partition identities, such as Glaisher's proof that there are as many partitions of n into distinct parts as there are partitions of n into just odd parts. This talk assumes no prerequisites besides addition of positive integers and perhaps some polynomial algebra; there will be lots of pictures.

Brian Hopkins is an associate professor at Saint Peter's College, a Jesuit liberal arts college in Jersey City, New Jersey. He received his Ph.D. from the University of Washington for work in algebraic combinatorics pertinent to the representation theory of Lie algebras. Other professional interests include partition theory, Rado numbers, mathematics motivated by social science, and teacher professional development. He also enjoys choral singing and New York City

Abstracts and Biographies of Workshop Leaders

Content-Based Teacher Professional Development
Brian Hopkins, St. Peter's College

In this workshop, we will discuss and experience secondary school teacher professional development (PD) that is centered on content. Many PD programs focus on pedagogy or classroom-ready materials. In contrast, content-based PD is about stimulating teachers with engaging mathematics that is likely new to them.

The speaker has been involved in this work for twelve years with the Park City Mathematics Institute and has led related workshops in Seattle WA, Breckenridge CO, and Ocean Grove NJ. The approach is usually discovery style, often done in groups, which reminds teachers of the joys and frustrations of

grappling with new material (which students do constantly). In addition to discussing these and related points, participants will also spend some time doing (possibly) new math with colleagues.

WeBWork

Karen Clark and Tom Hagedorn, The College of New Jersey

WeBWork is an open source online homework system that is supported by NSF funding, and is housed at the MAA. Students receive immediate feedback on their work, and numbers are randomized so that students are given individualized homework sets. The WeBWork problem library contains over twelve thousand problems. In this workshop we will cover the basics of how WeBwork is used – how to create homework sets and monitor student progress.

Karen Clark has been teaching at The College of New Jersey for sixteen years. She attended a minicourse on WeBWork in 2003 and has been using it ever since in her Calculus and Linear Algebra courses. She and Tom Hagedorn were the recipients of an NSF grant to develop WeBWork problems in linear algebra.

Tom Hagedorn is Professor of Mathematics and Statistics and the Coordinator of the First Seminar Program at The College of New Jersey, and is the Vice-Chair for Speakers for MAA-NJ. He was the director of the Garden State Undergraduate Math Conference from 2007-2010. Together with the University of Rochester, Karen Clark and he have worked to create and maintain the Linear Algebra problem library for WeBWork. In his spare time, he is currently learning to play the guitar.

Announcements

Election of MAA-NJ Officers

The slate of candidates proposed by the MAA-NJ Nominating Committee for the Fall 2010 Meeting elections:

Chair-Elect:	Carol Avelsgaard:	Middlesex County College
Vice Chair for Speakers:		Tom Hagedorn, The College of New Jersey
Vice Chair for Innovation:		Theresa C. Michnowicz, New Jersey City University
Vice Chair for Student Activities:		Aihua Li, Montclair State University
Vice Chair for Two -Year Colleges:		Siham Alfred, Raritan Valley Community College
Treasurer:		Karen Clark, The College of New Jersey

Nominations will also be accepted from the floor.

Lunch Discussion Tables-Fall 2010 Meeting

Organized by Theresa C. Michnowicz, New Jersey City University

There will be 6 discussion tables at lunch:

1. Complex Systems (2011 Math Awareness Topic), Elizabeth B. Uptegrove, Felician College
2. Mathematical Surprises (<http://divisbyzero.com/2010/08/18/mathematical-surprises/>), David Richeson, Dickinson College
3. On-Line Courses, Mark S. Korlie, Montclair State University
4. Philosophy of Mathematics, Bonnie Gold, Monmouth University
5. Running a First Year Seminar Course in Mathematics, Sarah J. Greenwald, Appalachian State University, NC
6. Undergraduate Research, Douglas Ensley, Shippensburg University

Those who pre-registered have priority at these discussion tables. We look forward to a set of lively and interesting discussion!

(Continued on page 8, after the schedule)

**Mathematical Association of America
New Jersey Section Fall 2010 Meeting Program**

All talks and workshops will take place in the Rudden Theater and Holroyd Science Center Respectively

8:30 – 10:45	Registration and Coffee , Holroyd Science Cenetr Atrium
8:30 – 1:30	Book Exhibits , The Mansion, first floor
9:20 – 9:30	Welcome by Geoffrey Weinman , La Salle Union, Rodden Theater
9:30 – 10:25	<i>Two (More) Morsels from Euler</i> , William Dunham, Muhlenberg College
9:30-10:25	Student Paper Session , Holroyd 190
10:25 – 10:50	Intermission (Coffee and Book Exhibits), Holroyd Science Center Atrium,
10:50 – 11:45	Partition Dynamics ABCs: Avalanche Models, Bulgarian Solitaire, and Combinatorial Proofs Brian Hopkins, St. Peter’s College
10:00 – 11:45	Student Paper Session , Holroyd 190
11:45-12:00	MAA-NJ Business Meeting, with Election of Officers , Holroyd 290
12:00 – 1:20	Lunch , La Salle Union, Union Ballroom
1:20 – 2:35	Workshops <ul style="list-style-type: none"> • Content-Based Teacher Professional Development, Brian Hopkins, St. Peter’s College (Holroyd 290) • WeBWork, Karen Clark and Tom Hagedorn, The College of New Jersey (Holroyd 390) Student Paper Session , Holroyd 190
2:35-3:00	Intermission and Refreshments , Holroyd Science Ceneter Atrium(Silent auction bidding ends at 3:15)
3:00 – 3:55	Rubik’s Cube Games on Spheres: Geometry of Spherical

	<p>Orbifolds Sarah Greenwald, Appalachian State University</p>
3:00-3:55	<p>Student Paper Session, Holroyd 190</p>
3:55-4:30	<p>Prizes: Drawing of door prizes, and announcement of silent auction winners (must be present to win)</p>
3:55 – 4:30	<p>Reception</p>

Call for Nominations for the New Jersey Section Award for Distinguished College or University Teaching

Honor one of your colleagues! Nominate him/her for the section's Distinguished Teaching Award. The deadline is soon: November 12. But it's easy to do: just send the person's name to the section Secretary, Aihua Li, lia@mail.montclair.edu. The nominee must have been an MAA member for at least two years prior to this year, and have been teaching full-time during that period. (And the nominator must be an MAA member or a department chair.)

Future MAA-NJ Meetings

The spring 2011 MAA-NJ Section meeting will be held, in conjunction with the eighth annual Garden State Undergraduate Mathematics Conference, at Essex County College on Saturday, April 2. Jonathan Rogness of the University of Minnesota will be the joint MAA-GSUMC speaker.

Call for Contributed Papers and Lunch Table Discussion Topics for the Spring 2011 MAA-NJ Meeting

There will be one general contributed paper session and three special sessions. All papers will be reviewed by the organizers and the selection committee. Please submit title, 3-4 line summary, and 1 page abstract in word by **February 10, 2011** to the organizer of the session.

- *Complex Systems organized by Srabasti Dutta, College of St. Elizabeth, srabastidutta@gmail.com*
- *On-Line Courses organized by Mark S. Korlie, Montclair State University, korliem@mail.montclair.edu*

- *Statistics: Practice and Pedagogy* organized by Dexter C. Whittinghill III, Rowan University, whittinghill@rowan.edu
- *General Contributed Session* organized by Theresa C. Michnowicz, New Jersey City University, tmichnowicz@njcu.edu

People interested in leading a Lunch Table Discussion at the Spring 2011 meeting are asked to submit their proposals to Theresa C. Michnowicz, New Jersey City University, tmichnowicz@njcu.edu, by **February 4, 2011**.

NJAMTE Meeting Announcement

The spring meeting of the New Jersey Association of Mathematics Teacher Educators will take place at The College of New Jersey on May 20, 2011. It will include a session of contributed papers (15 minutes in length, plus 15 minutes for discussion). To propose a talk, send a one-page description to Cathy Liebars, liebars@tcnj.edu, by March 1, 2011.

GSUMC 2011 Mark your calendars and bring your students! The Eighth Annual Garden State Undergraduate Mathematics Conference (known as GSUMC) will be held on Saturday, April 2, 2010 at Essex County College. Over 140 students and 30 schools participated in last year's conference. GSUMC 2011 will have a team mathematics competition, a student poster session, student talks, and a keynote speech. For more information, contact Srabasti Dutta (srabastidutta@gmail.com) or Aihua Li (lia@mail.montclair.edu).

Student Oral presentations: There will be parallel student oral presentation sessions. Student presentations on undergraduate mathematics research projects are welcome from all universities and colleges. Different than previous years, there is no limit on the number of oral presentation **GSUMC 2011s** from each school. Student presentations must register in advance. Registration information will be given later. All abstracts of student talks will be evaluated by a selection committee. Accepted talks will be given 15 minutes to present in the conference. For further information, contact Dr. Chengwen Wang (wang@essex.edu).

Student poster session: There will be an open student poster session. Sign-ups will occur at the time of advance registration. It is expected there will be prizes for the top posters. For further information contact Dr. David Trubatch (trubatchd@mail.montclair.edu).

Joint Meetings 2010

The 2011 Joint Meetings of the AMS and MAA will take place in New Orleans, LA January 6-9. More information about the meetings can be found online at http://www.ams.org/meetings/national/jmm/2125_intro.html.

MathFest 2011

The Mathematical Association of America will hold its annual MathFest in Lexington, KY, August 4-6. Check MAA Online at <http://www.maa.org> for more information.

Other Future National MAA Meetings

- 2012 Joint Mathematics Meeting, Boston, MA, January 4-7.
- 2012 MathFest , Madison, WI, August 2-4.

2011 PREP Workshops

The program costs as well as the costs of food and lodging during the workshop are covered by PREP. However, there is a registration fee for each workshop. Visit MAA Online at <http://www.maa.org/prep/> for information.

Why I Joined the MAA

If you would be willing to have your 2-3 paragraph statement, “Why I Joined the MAA”, be posted on the MAA website, contact Bob Anastasio, Director of Marketing and Management, ranastasio@maa.org.

JOIN THE MAA: http://www.maa.org/subpage_1.html

Governor's Report

MAA Board of Governors Meeting at MathFest 2010

The MAA Board of Governors had a lively summer meeting at the 2010 MathFest on August 4th in Pittsburgh. In addition to its usual business, the Board heard reports from the Washington Office, MAA officers, strategic planning working groups, and editors of MAA publications. Further, the Board voted on prizes and awards, and conducted elections. Some of the Board's decisions and reports presented at this meeting are highlighted in this report.

David Bressoud, President of the MAA, reported that work on the NSF-DRL REESE grant, *Characteristics of Successful Programs in College Calculus*, has continued. A survey is underway to collect information from course coordinators, instructors, and students in Calculus I. The survey will be administered this fall, and About 530 colleges and universities (two- and four-year undergraduate programs) have been contacted through the chairs of their mathematics departments.

The Board chose Jeffrey Lagarias of University of Michigan, Ann Arbor as the George Pólya Lecturer for 2011-2013. As a Pólya Lecturer, he will be available as a speaker to MAA sections. A section is entitled to a Pólya Lecturer once every five years. As part of the planning process for the 2011 MathFest, the Board chose Philip Kutzko of the University of Iowa as the 2011 James R. Leitzel Lecturer. Bernd Strumfel of University of California, Berkeley was chosen as the Earl Raymond Hedrick Lecturer for the 2012 MathFest. Lexington, Kentucky will host the 2011 MathFest, and in 2012, MathFest will be held in Madison, Wisconsin.

Scott Chapman of Sam Houston State University, Texas will be the next editor of the American Mathematical Monthly. The Board chose him to succeed Dan Velleman, the currently Editor of the Monthly. Scott Chapman will serve as Editor-Elect in 2011 and as Editor in 2012-2016.

Fernando Q. Gouvêa will step aside as Editor of MAA FOCUS at the end of the Joint Mathematics Meetings in January 2011. He has served as Editor for FOCUS for 11 years. He was given a joyous standing ovation during the Board meeting in appreciation for his service to the MAA. After he steps aside, FOCUS will be produced at MAA headquarters in Washington D.C. MAA plans to hire a Magazine Managing Editor whose responsibilities will include editing and producing MAA FOCUS in consultation with Ivars Peterson, Director of MAA Publications and Communications, as Editor in Chief, and the MAA FOCUS Editorial Board.

The MAA has revised its program for MAA officers to serve as speakers at sections meetings. The program is now called the MAA Section Visitors Program. Through this program, every year, each MAA section is eligible to have one MAA officer (section visitor) to attend and participate in a section meeting with all travel expenses paid by the MAA. The program is intended to maintain close links between the MAA and the sections. After a section visit, a section visitor is required to prepare a report of her activities and observations during her visit for the MAA Executive Committee. She will also prepare a similar report to be sent to the section chair and the section governor. In addition, in the second year after a Pólya Lecturer, a section is eligible for an MAA editor lecturer.

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Past-Chair

Hieu D. Nguyen, Rowan University

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Speakers**

Thomas Hagedorn, TCNJ

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Teaching Award Committee Bruce Bukiet, NJIT; Janet H. Caldwell, Rowan University; Amy Cohen (chair), Rutgers University; Bonnie Gold, Monmouth University; Kenneth Wolff, Montclair State University

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Acknowledgments

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