Program of Activities
For the Fall Meeting of the

Mathematical Association of America

Ohio Section

Fall, 2012
Baldwin Wallace University
Berea, Ohio
October 19 – 20, 2012

MAA Ohio Section

Program

Except where noted, all activities will take place in the Center for Innovation and Growth

Friday, October 19, 2012

11:30 -12:00	Nominating Committee	CIG 103
12:00 - 4:00	Registration	CIG Atrium
12:15 - 1:15	Committee Meetings: CENTENNIAL COMMITTEE CONCUR (Curriculum) CONSACT (Section Activities) CONSTUM (Student Members) CONTEAL (Teacher Education and Licensure)	 CIG 103 CIG 105 CIG 106 CIG 107 CIG 108
1:00 - 4:00	Vendor & Book Exhibits	CIG Atrium
1:15 - 1:30	Welcome and Announcements	CIG 113 & 114
1:30 - 2:30	Invited Address: **"Ruining Sports With Math**" Matt Neal, Denison University	CIG 113 & 114
2:30 - 2:55	Break	CIG Atrium
2:55 - 3:00	Centennial Minute – Dave Kullman	CIG 113 & 114
3:00 - 4:00	Invited Address: **"Who Has the Power in the Electoral College? You Might be Surprised."** Tommy Ratliff, Wheaton College	CIG 113 & 114
4:10 - 6:05	**Contributed Paper Sessions**	CIG 105, 106 & {107,108}
4:10 - 6:05	Executive Committee Meeting	CIG 103
6:05 - 6:30	Social Time	Strosacker Hall College Union
6:30 - 7:45	Banquet	
7:45 - 7:50	Maplesoft Raffle	
7:50 - 8:50	After Dinner Talk: **"Mirror Image Symmetry From Different Viewpoints"** Erica Flapan, Pomona College	
8:50 - 9:00	25/50 Year Recognition	

Saturday activities will take place in the Center for Innovation and Growth

Saturday, October 20

8:00 - 10:30	Vendor & Book Exhibits	CIG Atrium
8:00 - 8:50	Coffee and Donuts	CIG Atrium
8:00 - 8:50	Local Arrangements Committee & Executive Committee Meetings (if needed)	CIG 103 & 105
8:10 - 10:30	Registration	CIG Atrium
8:50 - 9:00	Announcements	CIG 113 & 114
9:00 - 10:00	CONCUR Panel: **"How We in the Ohio Section Teach Calculus**: **Interesting Results of the 2011 CONCUR Survey"** Bill Fuller, Chair; Anne Albert, Chandra Dinavahi, David Stuckey, Giorgi Shonia, David Cusick	CIG 113 & 114
10:00 - 10:30	Break	CIG Atrium
10:30 - 11:30	Invited Address: **"Topological Symmetry Groups"** Erica Flapan, Pomona College	CIG 113& 114
11:45 - 11:50	TI-Nspire & McGraw-Hill Higher Education Raffle	CIG 113 & 114
11:50 - 12:50	Invited Address: **"Mathematics in the Media: Leveraging Explorations of Higher Level Mathematics"** David Meel, Bowling Green State University	CIG 113 & 114
12:50 - 1:00	Closing Remarks	CIG 113 & 114

Abstracts of Invited Addresses

Friday

Speaker: Matt Neal, Denison University
Title: Ruining Sports With Math
Abstract: Over the last 30 years, mathematical modeling has drastically altered our perceptions about sports. This change has been comprehensive, affecting how we evaluate players and teams, predict future performance, construct payrolls, devise strategies, build ranking systems, and understand sports physics. Mathematics has also changed the narratives we use to explain what we see on the field. Through careful reasoning about confounding variables, the role of randomness, measurements, and sophisticated mathematics, many long cherished assumptions about sports have been discredited. These have often been replaced by fascinatingly counterintuitive explanations for what we see when we watch sports. Much of what you know about sports is wrong! As a wise teacher once said, you must unlearn what you have learned.

While the new methods of analysis are increasingly dominant in most sports organizations, these new narratives and methods have also been met with resistance. Indeed, they often conflict with what we want to be true about sports. This conflict between the old modes of reasoning and the new analytic methods is fertile ground for teaching both advanced mathematical modeling and basic quantitative reasoning. It is also a great vehicle for teaching persuasive and expository writing. Note that sometimes the "old school" is right (!), which creates opportunities to study the limitations and dangers of mathematical models.

In this talk you will see crazy examples of how math has turned sports inside out and how sports can be used to teach mathematical reasoning to students who may otherwise have no cognitive framework for grasping quantitative arguments. Be warned, you may never watch sports again after seeing this talk.

Speaker: Tommy Ratliff, Wheaton College
Title: Who Has the Power in the Electoral College? You Might be Surprised.
Abstract: As residents of Ohio in a Presidential election year, I am sure that everyone in the Ohio Section can identify the influence of the Electoral College in directing extraordinary attention to the so-called battleground states while Presidential campaigns effectively neglect the rest of the nation. The conventional wisdom is that small states would object to the elimination of the Electoral College because the inclusion of the two Senate seats in their Electoral College vote gives the small states power that is disproportionately large compared to their population. However, if we examine the Electoral College as a two-tiered voting system and compare the power of individual voters across states, we will see that individual voters in small states actually have less power than those in larger states. This talk will explore how power is measured in a two-

tier system and review several proposals for equalizing the voters' power in the Electoral College.

Speaker: Erica Flapan, Pomona College
Title: Mirror Image Symmetry From Different Viewpoints
Abstract: In this lecture I will give examples of mirror image symmetry in various contexts, from music to poetry to sports to people and finally to molecules. I will explain why it is important to know whether a molecule has mirror image symmetry, and present examples of molecules that are symmetric or asymmetric from different viewpoints. Finally, I will explain what "topology" is and why topological asymmetry is the deepest type of asymmetry. No background in chemistry or mathematics is necessary to understand the lecture.

Saturday

Speakers: Bill Fuller, Chair; Anne Albert, Chandra Dinavahi, David Stuckey, Giorgi Shonia, David Cusick
Title: How We in the Ohio Section Teach Calculus: Interesting Results of the 2011 CONCUR Survey
Abstract: Members of CONCUR will report on the development of the calculus survey and the surprising results. Teaching methods, use of technology, assessment methods, curriculum topics covered, classroom management, and the demographics of the respondents will be discussed. Join us for an open discussion of the results. Please see Appendix A at the end of this program for a list of the questions.

Speaker: Erica Flapan, Pomona College
Title: Topological Symmetry Groups
Abstract: Chemists have defined the *point group* of a molecule as the group of rigid symmetries of its molecular graph in R^3. While this group is useful for analyzing the symmetries of rigid molecules, it does not include all of the symmetries of molecules which are flexible or can rotate around one or more bonds. To study the symmetries of such molecules, we define the *topological symmetry group* of a graph embedded in R^3 to be the subgroup of the automorphism group of the abstract graph that is induced by homeomorphisms R^3. This group gives us a way to understand not only the symmetries of non-rigid molecular graphs, but the symmetries of any graph embedded in R^3. The study of such symmetries is a natural extension of the study of symmetries of knots. In this talk we will present results about the topological symmetry group and how it can play a role in analyzing the symmetries of non-rigid molecules.

Speaker: David Meel, Bowling Green State University
Title: Mathematics in the Media – Leveraging Explorations of Higher Level Mathematics
Abstract: This talk will first explore the various ways that mathematics, mathematics teaching and mathematics teachers are portrayed in media – namely, cartoons and comics. Using this as a backdrop, we will explore a particular way that mathematics in a video game was leveraged to engage a small group of BGSU freshman students to explore concepts in statistics, linear algebra and abstract algebra. Through their explorations, the students were engaged in real-world experiences of building, testing and proving conjectures.

Brief Biographies of Invited Speakers

Matt Neal, Denison University

Matt Neal is an associate professor at Denison University who got his Ph.D. from the University of Virginia. His research is in "pure" functional analysis, but he has developed several applied math courses at Denison. A lifelong sports enthusiast who at the age of eight used to make up pretend statistics for imaginary players, he has been delighted to incorporate sports in to his modeling courses. Matt enjoys making fun of terrible players and lousy organizations that everyone thinks are good. Tom Browning, a former star pitcher for the Cincinnati Reds, was once very upset with a talk Matt gave on baseball, seeing it as evidence of declining standards at Denison!

Tommy Ratliff, Wheaton College

Tommy Ratliff is a professor of mathematics at Wheaton College in Norton, Massachusetts. His current research is in voting theory, with a focus on issues related to electing groups of candidates as in committee elections. He completed his Ph.D. at Northwestern in algebraic topology and held visiting positions at Kenyon College and St. Olaf College before joining the faculty at Wheaton in 1996.

He is a firm believer in using writing projects and reading assignments in all levels of math courses, and is a co-author of the MAA book "Writing Projects for Mathematics Courses: Crushed Clowns, Cars & Coffee to Go". He was an original Project NExT fellow (1994-1995), has served as Chair of the Northeastern Section of the MAA, and is currently serving as the Governor for the Northeastern Section.

Erica Flapan, Pomona College

Erica Flapan received her BA from Hamilton College in 1977 and her PhD from the University of Wisconsin in 1983. She was a post-doc for two years at Rice University and for one year at the University of California at Santa Barbara. She joined the faculty at Pomona College in 1986. Since 2006, she has been the Lingurn H. Burkhead Professor of Mathematics at Pomona College. In addition to teaching at Pomona College, Flapan has been teaching regularly at the

Summer Mathematics Program for freshmen and sophomore Women at Carleton College.

In 2010, Flapan won the Distinguished Teaching Award from the Southern California and Nevada Section of the Mathematics Association of America. Then in 2011, Flapan won the Mathematical Association of America's Haimo award for distinguished college or university teaching of mathematics.

She has done research in knot theory and 3-manifolds. She is also one of the pioneers of the study of the topology of graphs embedded in 3-dimensional space, and has published extensively in this area and its applications to chemistry and molecular biology. In addition to her research papers, she has published an article in the College Mathematics Journal entitled "How to be a good teacher is an undecidable problem," as well as three books. Her first book, entitled ``When Topology Meets Chemistry" was published jointly by the Mathematical Association of America and Cambridge University Press. The second book entitled ``Applications of Knot Theory," is a collection of articles that Flapan co-edited with Dorothy Buck. Most recently, Flapan co-authored an elementary textbook entitled ``Number Theory: A Lively Introduction with Proofs, Applications, and Stories" with James Pommersheim and Tim Marks, published by John Wiley and sons. She is currently at work on a new book tentatively entitled "Knots, Molecules, and the Universe: An Introduction to Topology."

David Meel, Bowling Green State University

David Meel received his Ed.D.in Mathematics Education at the University of Pittsburgh in 1995 and joined Bowling Green State University's Department of Mathematics and Statistics in 1996, after spending a year as a post-doc at Carnegie Mellon University. His research program, although diverse, involves his students. When pressed, he will often say to his students, "My classroom is my laboratory; you are my guinea pigs since I am always looking for ways to help my students understand mathematics better." In particular, his research falls into five themes that include research into student understanding of calculus, student understanding of linear algebra, the theories and models of mathematical understanding, Mathematics Teaching Assistant (MTA) issues and training and tools designed to help practicing teachers. Over the years, David has directed research projects for 18 undergraduate students and 29 graduate students in addition to four small groups of freshman the past three years. In both 1999 and 2004, David received the Kappa Mu Epsilon Excellence in Teaching Mathematics Award at BGSU. He was awarded the 2011 Ohio Section *Award for Distinguished College or University Teaching of Mathematics.* David was a 1996-97 national Project NExT fellow (peach dot). Currently he serves as the assistant chair of the Mathematics and Statistics department at BGSU and the Mathematics Panel Lead for the Ohio Board of Regents Mathematics Transfer Assurance Guide (TAG) Committee.

Contributed Paper Sessions

*denotes undergraduate student

Friday, October 19
4:10—6:05

Time	**Session A** Room {107 &108} Session Chair: Tim Riggle	**Session B** Room 105 Session Chair: Flavia Sancier-Barbosa	**Session C** Room 106 Session Chair: Justin Post
4:10 – 4:25	***Did George Washington Know More Mathematics Than Anyone Else in Colonial America in 1750?*** Abstract 1 V. Frederick Rickey Professor Emeritus, West Point	***Negative Binomial Regression in Mathematica*** Abstract 2 Michael Zwilling University of Mount Union	***Intuition and Abstraction in the Process of Learning Mathematics*** Abstract 3 Ramiro H. Lafuente Bowling Green State University
4:30 – 4:45	***Early Education in Ohio*** Abstract 4 Thomas Hern Perrysburg, OH	***Simple Functions for Finding Normal Probabilities*** Abstract 5 Roger Abernathy Sinclair Community College	***Why Our Mathematics is Neither Necessary Nor Sufficient for Science*** Abstract 6 G. Arthur Mihram Ret.
4:50 – 5:05	***Schuyler, Warner, and Loomis: Baldwin Mathematics Pioneers*** Abstract 7 David Kullman Miami University	***On Coincidences*** Abstract 8 MB Rao University of Cincinnati	***Dual Hypercyclic Extension for an Operator on Hilbert Subspaces*** Abstract 9 Gokul R. Kadel Bowling Green State University

5:10 – 5:25	***On a Series of Fibonacci Reciprocals*** Abstract 10 Thomas Dence Ashland University	***Designing Better Medical Tests*** Abstract 11 Matthew McMullen Otterbein University	***A Brief Introduction to Linear Dynamics*** Abstract 12 Leonardo V. Pinheiro Bowling Green State University
5:30 – 5:45	***Fibonacci-With-Death*** Abstract 13 Gordon A. Swain Ashland University	***Temperature Dependency of Reaction Rate in Certain Reactions*** Abstract 14 Douglas D. Seaman Ret. EPA	***The Asymptotic Distribution of the Dickey-Hasza-Fuller Seasonal Unit Root Tests Under Weakly Dependent Errors*** Abstract 15 Maduka N. Rupasinghe Ashland University
5:50-6:05	***Series Tic Tac Toe - An HTML 5 Game for the Study of Convergence of Series*** Abstract 16 Barbara Margolius Cleveland State University	***The Lemniscate of Bernoulli: A Virtual Tour*** Abstract 17 Sander Mack-Crane* Case Western Reserve University	***Zhao Shuang and "The Hypotenuse Diagram"*** Abstract 18 Weiping Li Walsh University

Abstracts of Contributed Papers

Friday 4:10 – 4:25

Did George Washington Know More Mathematics Than Anyone Else in Colonial America in 1750?

V. Frederick Rickey,
Professor Emeritus, West Point

Abstract 1: How can one possibly answer this question? But I shall try. The cyphering books that George Washington compiled that between 1745 and 1748 when he was between ages 13 and 15 provide detailed information about what mathematics he had learned: arithmetic through square roots, geometry, trigonometry, logarithms, and surveying. But what mathematics did others know at the time, including college graduates, their professors, other surveyors and individuals educated in Europe? We shall shed light on these questions. This is joint work with Theodore J. Crackel, the editor-in-chief of The Papers of George Washington.

Negative Binomial Regression in Mathematica

Michael Zwilling
University of Mount Union

Abstract 2: Negative binomial regression is implemented in Mathematica using maximum likelihood estimation. The traditional model and the rate model with offset are illustrated using real data.

Intuition and Abstraction in the Process of Learning Mathematics

Ramiro H. Lafuente
Bowling Green State University

Abstract 3: The relation and interaction between intuition and abstraction in the process of learning mathematics is used successfully by students and researchers to reach higher levels of understanding. This dynamic of interaction between intuition and abstraction is based on previous knowledge and previous skills. In this talk I will provide some examples, and their discussions, of specific topics in which this interaction happens naturally.

Friday 4:30 – 4:45

Early Education in Ohio

Thomas Hern
Perrysburg, OH

Abstract 4: We will look at Madison College, Old Woodward, the common schools, and academies before the establishment of High Schools in Ohio.

Simple Functions for Finding Normal Probabilities

Roger Abernathy
Sinclair Community College

Abstract 5: In this presentation, I propose a method for finding normal probabilities using only the square root, the square, and the e^x buttons on a scientific calculator. Students will see how topics from calculus and statistics are integrated to derive the functions. Each of the intervals - (0<Z<=1), (1<Z<=1.65), and (1.65<Z<2.5)- has a function accurate to three decimals.

Why Our Mathematics is Neither Necessary Nor Sufficient for Science

G. Arthur Mihram
Ret.

Abstract 6: Both Quinn, in AMS's 2012 Notices, and LT More, Dean, in 1915 in his Limitations of Science, noted: Mathematics is not science.

Science is that human activity devoted to the search for the very explanation for (i.e., for the truth about) any particular naturally occurring phenomenon. (Modern) Science is actually natural philosophy, yet properly conducted: See Cotes's 1713 Preface to Newton's Mathematical Principles of Natural Philosophy.

First, mathematics is not sufficient for Science: Euclid's Elements, e.g.: mental abstractions. Secondly, it is not necessary: Charles Darwin and Nobel Laureate K Lorenz, e.g.

The first conclusion would have been quite evident to More. The second asks those intent on establishing mathematical biology, "Will this make their discipline more scientific?" Has the title of Newton's book misled many—such as any less mathematically inclined biological or social scientist—to despair unless expressing conclusions mathematically?

Friday 4:50 – 5:05

Schuyler, Warner, and Loomis: Baldwin Mathematics Pioneers

David Kullman
Miami University

Abstract 7: Aaron Schuyler was elected to the chair of mathematics at Baldwin University in 1861. An author of popular textbooks, he became Baldwin's president in 1875. His student, Ellen Warner, served as a tutor in mathematics at Baldwin and was one of the first American women to hold the title of Professor. Elisha Scott Loomis, who succeeded Schuyler in 1885, was a prolific author who is best known for his collection of more than 370 proofs of the Pythagorean theorem.

On Coincidences

MB Rao
University of Cincinnati

Abstract 8: A New Jersey woman had won lottery two times in a four month span! What an amazing coincidence! A woman in Fargo, North Dakota has delivered 8 babies all girls in consecutive pregnancies. What a rare occurrence! There is an impressive literature in understanding 'coincidences' statistically and probabilistically. In this talk, the subject is broached again from another angle.

Dual Hypercyclic Extension for an Operator on Hilbert Subspaces

Gokul R. Kadel
Bowling Green State University

Abstract 9: We give a short introduction to Hypercyclicity and also provide a result that gives a criterion for the existence of a dual Hypercyclic extension for a bounded linear operator on a Hilbert subspace.

Friday 5:10 – 5:25

On a Series of Fibonacci Reciprocals

Thomas Dence
Ashland University

Abstract 10: The series of reciprocals of the Fibonacci numbers is a series that is known to diverge, but I'll be looking at a particular subseries that converges.

Designing Better Medical Tests

Matthew McMullen
Otterbein University

Abstract 11: You test positive for a deadly disease...should you panic?! Given the accuracy (specificity and sensitivity) of the test, we can use Bayes' Theorem to answer this question. But how is the accuracy of the test determined? Expanding on a recent CMJ Classroom Capsule, we tackle this problem for certain types of medical tests, finding the specificity and sensitivity that minimize total social cost. Along the way, we raise further questions that are perfectly suited for a statistics-based student research project.

A Brief Introduction to Linear Dynamics

Leonardo V. Pinheiro
Bowling Green State University

Abstract 12: In this talk we will present some basic (and rather surprising!) results concerning the dynamics of linear operators on Hilbert Spaces. In particular, we will present a classic example of a linear operator which is indeed chaotic. The talk will be accessible to undergraduates with basic knowledge of linear algebra.

Friday 5:30 – 5:45

Fibonacci-With-Death

Gordon A. Swain
Ashland University

Abstract 13: Students at Ashland University recount that their professors seem to use the sequence of Fibonacci numbers as an example in almost every class, almost to the point of dreading it. With a group of students in both the Math Club and the Problem Solving Group I showed them Leonardo Pisano's original proposal of the problem involving pairs of rabbits, then we explored what would happen if the rabbits eventually died, calculating the Fibonacci-with-death numbers, and finding a recursive formula. I will review our work and derive the formula(s). This work is original for us, though it does appear (obscurely) in the literature.

Temperature Dependency of Reaction Rate in Certain Reactions

Douglas D. Seaman
Ret. EPA

Abstract 14: Time is equivalent to temperature for many reactions. This is an applied mathematical method to predict the rate of increase / decrease of the reaction rate (as a function of temperature) of certain physical / chemical reactions which can be (and have been) employed in a production plant.

The Asymptotic Distribution of the Dickey-Hasza-Fuller Seasonal Unit Root Tests Under Weakly Dependent Errors

Maduka N Rupasinghe
Ashland University

Abstract 15: The Dickey-Hasza-Fuller (DHF) test is frequently used by applied time series analysts to determine whether or not a seasonal unit root is present in the model underlying an observed process. The asymptotic distributions of the DHF test statistics have been derived, as functional of the standard Brownian motion, under the assumption that the time series can be represented by an autoregressive (AR) model that consists of only a seasonal factor, and independent and identically distributed innovations. In this paper, the asymptotic distribution of DHF type test statistics are derived under the assumption of weakly dependent innovations.

Friday 5:50 – 6:05

Series Tic Tac Toe - An HTML 5 Game for the Study of Convergence of Series

Barbara Margolius
Cleveland State University

Abstract 16: In this talk I will present a web-based game designed to help students practice applying convergence tests to series and reaching appropriate conclusions. The game is based on tic-tac-toe. Students are presented a game board with a series in each of the nine tiles. They select a tile, then apply one of eight convergence tests to show convergence or divergence of the series. I will discuss design considerations for the game and how it might be used in a second semester calculus class.

The Lemniscate of Bernoulli: A Virtual Tour

Sander Mack-Crane*
Case Western Reserve University

Abstract 17: This talk will present a short movie that explores the history and mathematical interest of the lemniscate of Bernoulli. The lemniscate is one of the richest algebraic curves, both in terms of its history and its structure. First investigated by Bernoulli in the late seventeenth century, it appears in many contexts and in the work of many mathematicians. From conic sections to spiric sections, from the Greek geometer Perseus to the mathematician and astronomer Giovanni Cassini, the Bernoulli lemniscate intersects a broad section of mathematics. We investigate the lemniscate using various methods, including plane geometry, circle inversion, and stereographic projection, building up to an understanding of the unique symmetry hidden in this mysterious curve.

Zhao Shuang and "The Hypotenuse Diagram"

Weiping Li
Walsh University

Abstract 18: The earliest proofs of Pythagorean Theorem are commonly attributed to ancient Greek mathematicians. Zhao Shuang, an ancient Chinese mathematician in about the third century, in his comment on Zhoubi Suanjing, which is one of the oldest and most famous Chinese mathematical texts, provided a geometric proof of the theorem using Xuan (Hypotenuse) Tu (Diagram). The Xuan Tu and the proof can be dated back to Zhou dynasty about 11 century BC. In the talk, we will present a detailed description of Zhao Shuang's comment on Xuan Tu and show that ancient Chinese gave a much earlier proof of the Pythagorean Theorem.

APPENDIX A

The Ohio Section of the Mathematical Association of America
2011 Survey on Personal Practice in Teaching Calculus

Purpose: To survey the state of current practice among teachers of Calculus who are also members of the Ohio Section of the MAA. The focus is on the personal choices in content, pedagogy, and methods that teachers make when they teach Calculus.

Summary of the Questions

1. In your Calculus courses how often do you utilize the method of straight lecture?
2. In your Calculus courses how often do you utilize the method of dialog lecture?
3. In your Calculus courses how often do you utilize the method of team learning?
4. In your Calculus courses how often do you utilize the Moore method?
5. How often do you include material designed for the different learning styles of students?
6. In your Calculus courses how often do you use each of the following media?
7. In preparing materials for the course how often do you use each of the following methods of preparing materials?
8. In communicating with students how often do you use each of the following methods?
9. How often do you incorporate active use of symbolic processing software in your teaching of the course?
10 & 11. Which of the following statements best describes your preferred practice with respect to student use of technology on quizzes, tests, and examinations in your Calculus courses?
12. How often do you incorporate the following instruments when you assess your students' performance in your Calculus courses?
13. Please indicate what your practice is with respect to covering each of the following topics when you teach Calculus.
14. Which of the following best describes your practice in monitoring attendance in your Calculus courses?
15. In the teaching of Calculus the question often comes up of maintaining a balance between time spent providing motivational examples and the pressure to cover all the topics in the syllabus. Which of the following statements best describes your current practice in maintaining the balance?
16. How many times a week does the majority of the sections of Calculus that you teach meet? Here "1 hour" means whatever length of time your institution considers 1 contact hour.
17. Please indicate the type of academic institution where you do the majority of your teaching of Calculus.
18. Please indicate your gender.
19. Please indicate the number of years you have been teaching.
20. Please indicate the type of students that constitute the majority of students you teach in your Calculus courses.

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Wiley, Cengage Learning, and McGraw-Hill Higher Education for joining us for this meeting.

Save these Dates!

The spring meeting of the Ohio Section will be held at Denison University on **April 5-6, 2013**. Featured speakers include

- Tom Hull, Western New England University
- Barbara Faires, Westminster College
- Bob Bosch, Oberlin College
- Wiebke Diestelkamp, University of Dayton

The Joint Mathematics Meetings will be in San Diego, **January 9-12, 2013**. Registration has begun!