Wednesday, August 6

SOCIAL EVENT
Columbia Gorge National Scenic Area Tour
12:30 p.m. – 4:00 p.m., Departs from Hilton Portland Lobby
(Broadway Street Entrance)

SOCIAL EVENT
MAA–PME Student Reception
4:30 p.m. – 5:30 p.m., Hilton Portland, Plaza Level, Pavilion East

Thursday, August 7

SOCIAL EVENT
Wellness Strand - Thursday
6:30 a.m. – 7:30 a.m., Departs from Hilton Portland Lobby
(Broadway Street Entrance)

INVITED ADDRESS
MAA Invited Address
First Person Solvers - Using Video Games to Learn Mathematics and Solve Real Math Problems
8:30 a.m. – 9:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Keith Devlin, Stanford University

GENERAL CONTRIBUTED PAPER SESSION
Probability or Statistics
8:30 a.m. – 9:55 a.m., Hilton Portland, Ballroom Level, Galleria III
A Disproof of Tsallis’ Conjecture for the Exact Percolation Threshold of the Kagome Lattice
8:30 a.m. – 8:40 a.m.
John Charles Wierman, Johns Hopkins University
Probabilistic Proofs of Some Binomial Coefficient Identities
8:45 a.m. – 8:55 a.m.
Michael Z. Spivey, University of Puget Sound
The M-tile Deviation, A New Class of Measures of Dispersion: Assessing Learner Achievement
9:00 a.m. – 9:10 a.m.
David DiMarco, Neumann University Ryan Savitz, Neumann University Fred Savitz, Neumann University
An Investigation of Benford’s Law Characterizations
9:15 a.m. – 9:25 a.m.
Azar Khosravani, Columbia College Chicago; Constantin Rasinariu, Columbia College Chicago

Efficient Use of the Negative Hypergeometric Distribution in Randomized Response Sampling
9:30 a.m. – 9:40 a.m.
Stephen A Sedory, Texas A&M University-Kingsville;
Michael Lee Johnson, Texas A&M University-Kingsville;
Sarjinder Singh, Texas A&M University-Kingsville

Project-Based Approach to Understanding Quantile Regression
9:45 a.m. – 9:55 a.m.
James Helmreich, Marist College, Poughkeepsie, NY;
K. Peter Krog, Marist College, Poughkeepsie, NY

UNDERGRADUATE STUDENT ACTIVITY
MAA Student Paper Sessions
8:30 a.m. – 10:25 a.m., Hilton Portland, 3rd Floor
MAA Student Paper Session #1
8:30 a.m. – 10:25 a.m., Hilton Portland, 3rd Floor, Forum Suite
MAA Student Paper Session #2
8:30 a.m. – 10:25 a.m., Hilton Portland, 3rd Floor, Council Suite
MAA Student Paper Session #3
8:30 a.m. – 10:25 a.m., Hilton Portland, 3rd Floor, Directors Suite
MAA Student Paper Session #4
8:30 a.m. – 10:25 a.m., Hilton Portland, 3rd Floor, Studio Suite
MAA Student Paper Session #5
8:30 a.m. – 10:25 a.m., Hilton Portland, 3rd Floor, Executive Suite
MAA Student Paper Session #6
8:30 a.m. – 10:25 a.m., Hilton Portland, 3rd Floor, Senate Suite
### Thursday, August 7 (continued)

**GENERAL CONTRIBUTED PAPER SESSION**

#### Assorted Teaching Topics

8:30 a.m. – 10:25 a.m., Hilton Portland, Ballroom Level, Parlor AB

**Mathematics Teaching Transformed - Lessons to be Learned**
8:30 a.m. – 8:40 a.m. Jerry Dwyer, Texas Tech University

**Passive and Active Activities in the Flipped Classroom**
8:45 a.m. – 8:55 a.m.

- **David Jay Graser**, Yavapai College

**Flipping Precalculus-Incorporating Online and In-Class Activities**
9:00 a.m. – 9:10 a.m.

- **Mahmud Akelbek**, Weber State University

**Zombie Models: A Sexy Approach to Improving Mathematics One Brain at a Time**
9:15 a.m. – 9:25 a.m.

- **Victoria Kofman**, Quality Engineering Education, Inc.

**Making Problem**
9:45 a.m. – 9:55 a.m.

- **Tanaka Noriko**

**Reconceptualizing Mathematics for Elementary Teachers**
10:00 a.m. – 10:10 a.m.

- **Melissa A Desjarlais**, Valparaiso University

**Using Analogous Problems**
9:15 a.m. – 9:25 a.m. Victoria Kofman, Quality Engineering Education, Inc.

**Frieze Patterns of the Mamluks**
9:45 a.m. – 9:55 a.m.

- **B Lynn Bodner**, Monmouth University

**Mini-Flipping Biostatistics**
10:00 a.m. – 10:10 a.m.

- **Magdalena Luca**, MCPHS University

**Designing a Successful Capstone Course**
10:15 a.m. – 10:25 a.m.

- **Julian Michael Buck**, Francis Marion University

**GENERAL CONTRIBUTED PAPER SESSION**

### Interdisciplinary Topics in Mathematics

8:30 a.m. – 10:25 a.m., Hilton Portland, Ballroom Level, Parlor C

**Other Liberal Arts Disciplines Taught Together with Mathematics**
8:30 a.m. – 8:40 a.m.

- **Paul R. McCrery**, The Evergreen State College - Tacoma

**Flipping Linear Algebra**
8:45 a.m. – 8:55 a.m.

- **Michael Gagliardo**, California Lutheran University

**A Flipped Math for Nurses**
9:00 a.m. – 9:10 a.m.

- **Peter Olszewski**, Penn State Erie, The Behrend College; **Jessica Resig**, Penn State Erie, The Behrend College

**Bones, Muscles and Math: Biology and Geometry Working Together**
9:15 a.m. – 9:25 a.m.

- **Daniel R. Huber**, University of Tampa; **Leslie Braziel Jones**, University of Tampa

**Harold and the NMAH Object Groups: Young Children’s Responses to Crockett Johnson’s Mathematical Paintings**
9:30 a.m. – 9:40 a.m.

- **Amy Ackerberg-Hastings**, University of Maryland University College

**Measuring Mountain Impressiveness with New Topographic Functionals**
8:30 a.m. – 8:40 a.m.

- **David Metzler**, Albuquerque Academy; **Edward Earl**, Independent Researcher

**The Second-Order Lanczos Derivative and a Nonlocal Flux**
8:45 a.m. – 8:55 a.m.

- **Nathanial Burch**, Gonzaga University

**SIMIODE – Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations**
9:00 a.m. – 9:10 a.m.

- **Brian Winkel**, Emeritus US Military Academy

**The Collapse of the Tacoma Narrows Bridge**
9:15 a.m. – 9:25 a.m.

- **George Moss**, Union University

**How Popular Do You Want to Be? A Mathematical Model of College Friendships**
9:30 a.m. – 9:40 a.m.

- **Yan Hao**, Hobart and William Smith Colleges
Chronological Schedule

Thursday, August 7 (continued)

Weddell Seal Morphometrics: An Example of Mathematical Modeling to Solve a Polar Science Problem
9:45 a.m. - 9:55 a.m.
Lynn Foshee Reed, Einstein Educator Fellowship

Deducing the Age of an Ancient Natural Nuclear Reactor in a Pre-Calculus Class
10:00 a.m. - 10:10 a.m.
Alexander Atwood, SUNY Suffolk County Community College; Andrea Blum, SUNY Suffolk County Community College

The Mathematical Contest in Modeling
10:15 a.m. - 10:25 a.m.
Sol Garfunkel, COMAP

THEMED CONTRIBUTED PAPER SESSION
Undergraduate Research Activities in Mathematical and Computational Biology, Part I
8:30 a.m. - 10:25 a.m., Hilton Portland, Plaza Level, Broadway I & II

Timothy Comar, Benedictine University
A New Technological Paradigm for an Undergraduate Research Experience in Agent Based Modeling
8:30 a.m. - 8:45 a.m.
Anne Elizabeth Youst, Birmingham-Southern College
Impulsive Models with Stochastic Behavior in Pest Management and Epidemiology
8:50 a.m. - 9:05 a.m.
Timothy D Comar, Benedictine University
Getting into the Game: First Steps in Math-Bio Research
9:10 a.m. - 9:25 a.m.
David R Dorman, Middlebury College
A Course in Mathematical Biology Using Algebra and Discrete Mathematics
9:30 a.m. - 9:45 p.m.
Dan Hrozencik, Chicago State University
Mentoring an Undergraduate Research Project: Simulating the Effects of Plaque Aggregation on the Neuronal Network
9:50 a.m. - 10:05 a.m.
Irina Seceleanu, Bridgewater State University
Sensitivity Analysis of Stochastic Models of Integrin Signaling in Cellular Motility
10:10 a.m. - 10:25 a.m.
Hannah Biegel, University of Portland; Alex Quackenbush, University of Portland; Hannah Callender, University of Portland

UNDERGRADUATE STUDENT ACTIVITY
Student Hospitality Center
9:00 a.m. - 5:00 p.m., Hilton Portland, Exhibit Hall

INVITED ADDRESS
MAA Invited Address
Understanding Microorganism Swimming using Mathematics
9:30 a.m. - 10:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Ricardo Cortez, Tulane University

INVITED ADDRESS
Earle Raymond Hedrick Lecture Series
Lecture 1: Undecidability in Number Theory
10:30 a.m. - 11:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Bjorn Poonen, Massachusetts Institute of Technology

OTHER MATHEMATICAL SESSION
MAA Prize Session
11:30 a.m. - 12:00 p.m., Hilton Portland, Grand Ballroom

INVITED ADDRESS
The Jean Bee Chan and Peter Stanek Lecture for Students
The Founding of Pi Mu Epsilon 100 Years Ago
1:00 p.m. - 1:50 p.m., Hilton Portland, Ballroom Level, Grand Ballroom
Jack Graver, Syracuse University

WORKSHOP
What’s the Story? A Graduate Student Workshop on Formulating Research Presentation for a General Audience
1:00 p.m. - 2:20 p.m., Hilton Portland, Ballroom Level, Galleria I

PANEL SESSION
Mentoring Matters
1:00 p.m. - 2:20 p.m., Hilton Portland, 23rd Floor, Skyline 2

MINICOURSE
2. Boolean Network Models: A Non-Calculus Introduction to Mathematical Modeling for Biology (Part A)
1:00 p.m. - 3:00 p.m., Hilton Portland Executive Tower, Salon Ballroom I

MINICOURSE
6. SIMIODE - Teaching Differential Equations through Modeling and Technology (Part A)
1:00 p.m. - 3:00 p.m., Hilton Portland Executive Tower, Salon Ballroom III
### Thursday, August 7 (continued)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>1:00 p.m. - 3:50 p.m.</td>
<td><strong>INVITED PAPER SESSION</strong> Mathematical Epidemiology</td>
</tr>
<tr>
<td>Ricardo Cortez, Tulane University</td>
<td>Comparing Risk for Chikungunya and Dengue Emergence Using Mathematical Models 1:00 p.m. - 1:20 p.m.</td>
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<tr>
<td>Carrie Manore, Tulane University</td>
<td>How are Fish Population Dynamics Shared by a Changing Environment? Insights from a Mathematical Model Driven by Temperature and Dissolved Oxygen Data from Lake Erie 1:30 p.m. - 1:50 p.m.</td>
</tr>
<tr>
<td>Paul Hurtado, Mathematical Biosciences Institute</td>
<td>Determining Causal Networks in Nonlinear Dynamical Systems: Ecosystem Applications 2:00 p.m. - 2:20 p.m.</td>
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<tr>
<td>Bree Cummins, Montana State University</td>
<td>Epidemic Forecasting and Monitoring using Modern Data Assimilation Methods 2:30 p.m. - 2:50 p.m.</td>
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<tr>
<td>Kyle Hickmann, Los Alamos and Tulane University</td>
<td>Qualitative Inverse Problems using Bifurcation Analysis in the Recurrent Neutral Network Model 3:00 p.m. - 3:20 p.m.</td>
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<tr>
<td>Stephen Wirkus, Arizona State University</td>
<td>Mathematics of Planet Earth 2013+: Management of Natural Resources 3:30 p.m. - 3:50 p.m.</td>
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<tr>
<td>Abdul-Aziz Yakubu, Howard University</td>
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<tr>
<td>1:00 p.m. - 3:55 p.m.</td>
<td><strong>THEMED CONTRIBUTED PAPER SESSION</strong> Mathematics in Honors Programs</td>
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<tr>
<td>Jacci White, Saint Leo University</td>
<td>Applying Calculus Techniques to Analyze the Motion of Single and Double Ferris Wheels 1:00 p.m. - 1:15 p.m.</td>
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<tr>
<td>Paul E. Seeburger, Monroe Community College</td>
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<tr>
<td>Brian Camp, Saint Leo University</td>
<td>Creating a Freshman Honors Mathematics Course (for Non-Majors) 1:20 p.m. - 1:35 p.m.</td>
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<tr>
<td>David Clark, Randolph-Macon College</td>
<td>Dimension and Direction: A Journey Through Mathematical Space 1:40 p.m. - 1:55 p.m.</td>
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<tr>
<td>2:00 p.m. - 2:15 p.m.</td>
<td>Honors Calculus at South Dakota State University</td>
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<tr>
<td>Dan C Kemp, South Dakota State University</td>
<td>Searching For Great Issues In Mathematics</td>
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<td>Mark Bollman, Albion College</td>
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<td>Philip B. Yasskin, Texas A&amp;M University; Douglas B Meade, University of South Carolina</td>
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<tr>
<td>2:40 p.m. - 2:55 p.m.</td>
<td>Honors Elementary Statistics</td>
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<tr>
<td>3:00 p.m. - 3:15 p.m.</td>
<td>Why Statistics??? An Opportunity for Exploration and Reflection</td>
</tr>
<tr>
<td>Sarah L Mabrouk, Framingham State University</td>
<td>“To Be Honorable is to Serve” How to Align with this Motto in a General Education Honors Mathematics Course 3:40 p.m. - 3:55 p.m.</td>
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<tr>
<td>Lisa Marano, West Chester University</td>
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<tr>
<td>1:00 p.m. - 4:25 p.m.</td>
<td><strong>GENERAL CONTRIBUTED PAPER SESSION</strong> Assorted Mathematics Research Topics</td>
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<tr>
<td>Interesting Matrix Problems from Quantum Information Theory: Locally Distinguishing Quantum States 1:00 p.m. - 1:10 p.m.</td>
<td>Michael Nathanson, Saint Mary’s College of California</td>
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<tr>
<td>The Rank of a Recurrence Matrix 1:15 p.m. - 1:25 p.m.</td>
<td>Christopher R Lee, University of Portland; Valerie J. Peterson, University of Portland</td>
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<tr>
<td>A Busy Beaver Problem for Infinite-Time Turing Machines 1:30 p.m. - 1:40 p.m.</td>
<td>James Long, Lehigh University; Lee Stanley, Lehigh University</td>
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<tr>
<td>A Simplified Approach to the Cubic Formula 1:45 p.m. - 1:55 p.m.</td>
<td>Akhilan Boopathy, Lakeside School</td>
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<tr>
<td>On the Other Side of the World, or Right Next Door? 2:00 p.m. - 2:10 p.m.</td>
<td>Jeff Johannes, SUNY Geneseo</td>
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<tr>
<td>Exact Values of Trigonometric Functions 2:15 p.m. - 2:25 p.m.</td>
<td>Jeremiah Bartz, Francis Marion University</td>
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</tbody>
</table>
### Thursday, August 7 (continued)

**Perplexing Factorizations: An Undergraduate Research Project**  
2:30 p.m. - 2:40 p.m.  
Adrian Gentle, University of Southern Indiana

**Beautiful Integer Patterns**  
2:45 p.m. - 2:55 p.m.  
Charlie Smith, Park University

**Guarding a Koch Fractal Art Gallery**  
3:00 p.m. - 3:10 p.m.  
Lauren Cassell, Ohio Northern University;  
William Roger Fuller, Ohio Northern University

**Active Context Free Games with Finite Target Language**  
3:15 p.m. - 3:25 p.m.  
Lori McCune, Missouri Western State University;  
David McCune, William Jewell College

**Expressing Recursively Defined Polynomial Sequences in Terms of Extended Fibonacci Polynomials**  
3:30 p.m. - 3:40 p.m.  
Robert Russell Molina, Alma College

**Inverson Polynomials for Permutations Avoiding Consecutive Patterns**  
3:45 p.m. - 3:55 p.m.  
Kendra Killpatrick, Pepperdine University;  
Naomi Cameron, Lewis and Clark College

**Extending the Tables of Wallis: Conjectures on Catalan Numbers and the Gamma Function**  
4:00 p.m. - 4:10 p.m.  
Lee N. Collins, County College of Morris

**Repeating Fractions and Primes**  
4:15 p.m. - 4:25 p.m.  
Nick Huo Han Huang, Math Lover

**THEMED CONTRIBUTED PAPER SESSION**  
Recreational Mathematics: New Problems and New Solutions, Part I

1:00 p.m. - 4:55 p.m., Hilton Portland, Plaza Level, Pavilion West

**The Mathematics, Magic and Mystery of Martin Gardner**  
1:00 p.m. - 1:15 p.m.  
Colm Mulcahy, Spelman College

**Generalization of the Nine Card Problem**  
1:20 p.m. - 1:35 p.m.  
Brian J. Birgen, Wartburg College

### Thursday, August 7 (continued)

**The Uniqueness of Rock-Paper-Scissors-Lizard-Spock**  
1:40 p.m. - 1:55 p.m.  
Brian J. Birgen, Wartburg College

**Candy Crush Combinatorics**  
2:00 p.m. - 2:15 p.m.  
Dana Rowland, Merrimack College

**Exploring Sliding Tile Puzzles on your Smartphone**  
2:20 p.m. - 2:35 p.m.  
Doug Ensley, Shippensburg University

**Solitaire Mancala Games and the Chinese Remainder Theorem**  
2:40 p.m. - 2:55 p.m.  
Brant Jones, James Madison University;  
Laura Taalman, James Madison University;  
Anthony Tongen, James Madison University

**A New Twist on Wythoff’s Game**  
3:00 p.m. - 3:15 p.m.  
Alex Meadows, St. Mary's College of Maryland;  
Bradley Putman, St. Mary's College of Maryland

**Graphs and Puzzles**  
3:20 p.m. - 3:35 p.m.  
Paul Cull, Oregon State University

**When You Cross Latin and Gilbreath**  
3:40 p.m. - 3:55 p.m.  
Robert W. Vallin, Lamar University

**Mathematics, Magic Squares, and Mirth (Humor)**  
4:00 p.m. - 4:15 p.m.  
Doy Ott Hollman, Lipscomb University

**A Magic Square Equation**  
4:20 p.m. - 4:35 p.m.  
Donna Flint, South Dakota State University

**An Efficient Backtracking Method for Solving a System of Linear Equations over a Finite Set with Application for Construction of Magic Squares**  
4:40 p.m. - 4:55 p.m.  
Max Alekseyev, George Washington University
Thursday, August 7 (continued)

GENERAL CONTRIBUTED PAPER SESSION
Teaching or Learning Introductory Mathematics
1:00 p.m. – 5:25 p.m., Hilton Portland, Ballroom Level, Galleria III

Evangelizing for Mathematics
1:00 p.m. – 1:10 p.m.
Kayla Bradley Dwelle, Ouachita Baptist University

Rethinking Ball State University’s Liberal Arts Math Course
1:15 p.m. – 1:25 p.m.
Crystal Lorch, Ball State University; John Lorch, Ball State University

Writing Projects in a First Year Seminar Class in Mathematics
1:30 p.m. – 1:40 p.m.
Jason Molitierno, Sacred Heart University

PreCalculus Flipped Classroom and Active Learning
1:45 p.m. – 1:55 p.m.
Michael Weimerskirch, University of Minnesota

College Algebra: Improving Student Success using a Hybrid Approach
2:00 p.m. – 2:10 p.m.
Kay Geving, Belmont University

Active Learning Strategies to Improve Student Attitudes and Outcomes: The Studio Statistics Model at CSM
2:15 p.m. – 2:25 p.m.
Gus Greivel, Colorado School of Mines

Project Based Activities in Online Statistics
2:30 p.m. – 2:40 p.m.
Amy Wheeler, Hondros College

Bringing Variety to Elementary Statistics Problems Based on Real Data
2:45 p.m. – 2:55 p.m.
David Robert Gurney, Southeastern Louisiana University

Quantitative Reasoning for Business: An Inquiry-Based Approach
3:00 p.m. – 3:10 p.m.
Victor Ian Piercey, Ferris State University

Macroeconomics in Finite Math: Rediscovering and Recreating Leontief Analysis
3:15 p.m. – 3:25 p.m.
Gregory V Bard, The University of Wisconsin, Stout

Reaching More – A Hybrid Mathematics Course for Early Childhood, Elementary, and Special Education Majors
3:30 p.m. – 3:40 p.m.
Rebecca Metcalf, Bridgewater State University

Euclidean & Non-Euclidean Origametry
3:45 p.m. – 3:55 p.m.
Daniel J. Heath, Pacific Lutheran University

After the Test, What Now?
4:00 p.m. – 4:10 p.m.
Rachel Frankel, University of Cincinnati, Blue Ash College

Characteristic of Students During and After Introductory College Level Mathematics and Statistics Training
4:15 p.m. – 4:25 p.m.
Xuan Hien Nguyen, Iowa State University; Ian Mouzon, Iowa State University; Alicia Carriquiry, Iowa State University; Ulrike Genschel, Iowa State University; Elgin Johnston, Iowa State University; Andee Kaplan, Iowa State University; Wolfgang Kliemann, Iowa State University; Kenneth Koehler, Iowa State University

Developing an Introductory Mathematics Course in a South Asian Context
4:30 p.m. – 4:40 p.m.
Thomas Fryer, Asian University for Women

Supplemental Instruction at the University of North Alabama
4:45 p.m. – 4:55 p.m.
Ashley Johnson, University of North Alabama

Supplemental Instruction: Closing the Achievement Gap for Underrepresented Minorities
5:00 p.m. – 5:10 p.m.
Todd Cadwallader Olsker, California State University, Fullerton; Martin Bonsangue, California State University, Fullerton; Kathy Lewis, California State University, Fullerton; Ashley Thune-Aguayo, California State University, Fullerton; Jolene Fleming, California State University, Fullerton

Using Reading Guides in Mathematics Courses
5:15 p.m. – 5:25 p.m.
Melanie Butler, Mount St. Mary’s University
FLIPPING PEDAGOGY IN COLLEGE MATHEMATICS
COURSES, PART I

1:00 p.m. – 5:35 p.m., Hilton Portland, Plaza Level, Broadway III & IV

Jean McGivney-Burelle, University of Hartford
Larissa Schroeder, University of Hartford
John Williams, University of Hartford
Fei Xue, University of Hartford
Mako Haruta, University of Hartford
Ben Pollina, University of Hartford

Flipped/Inquiry-Based Learning Approach in a ‘Large’ College Algebra Classroom: An Interim Report
1:00 p.m. – 1:15 p.m.
Perry Y.C. Lee, Kutztown University of Pennsylvania
Padraig McLoughlin, Kutztown University of Pennsylvania

Flipping College Algebra: A Blended Approach
1:20 p.m. – 1:35 p.m.
Alison Reddy, University of Illinois

Procedural and Conceptual Thinking in a Flipped College Algebra Classroom
1:40 p.m. – 1:55 p.m.
Emilie Naccarato, University of Northern Colorado
Michael Spannuth, University of Northern Colorado
Bill Blubaugh, University of Northern Colorado
Gulden Karakok, University of Northern Colorado

Re “modeling” College Algebra: A Flipped, Inquiry-Based Approach
2:00 p.m. – 2:15 p.m.
Kathy Pinzon, Georgia Gwinnett College
Daniel Pinzon, Georgia Gwinnett College
Matt Stackpole, Georgia Gwinnett College

TEAL (Technology Enhanced Active Learning) College Algebra at Montana State University
2:20 p.m. – 2:35 p.m.
Heidi Staebler-Wiseman, Montana State University
Jocelyn Short, Montana State University
Kelsey Koch, Montana State University

Integrating Sustainability into Algebra Courses: A Flipped Classroom Model
2:40 p.m. – 2:55 p.m.
Rikki Wagstrom, Metropolitan State University

Flipping Freshman Mathematics
3:00 p.m. – 3:15 p.m.
Karen O’Hara, High Point University
Adam Graham-Squire, High Point University
Laurie Zack, High Point University
Jenny Fuselier, High Point University
Ron Lamb, High Point University

How Does Flipping Affect Students’ Perceptions about Learning Calculus?
3:40 p.m. – 3:55 p.m.
Larissa Bucchi Schroeder, University of Hartford
Jean Marie McGivney-Burelle, University of Hartford
Fei Xue, University of Hartford

How Does Flipping Affect Students’ Perceptions about Learning Calculus?
3:40 p.m. – 3:55 p.m.
Larissa Bucchi Schroeder, University of Hartford
Jean Marie McGivney-Burelle, University of Hartford
Fei Xue, University of Hartford

Flip the Calculus Classroom: What Works, For Whom and in What Context?
4:00 p.m. – 4:15 p.m.
Veselin Jungic, Simon Fraser University
Cindy Xin, Simon Fraser University
Jamie Mulholland, Simon Fraser University
Harpreet Kaur, Simon Fraser University
Sonja Surjanovic, Simon Fraser University

A Study of Flipping vs Not Flipping in Applied Calculus
4:20 p.m. – 4:35 p.m.
Lori Beth Ziegelmeier, Macalester College
Chad Topaz, Macalester College

Challenges and Pitfalls of Assessing the Effectiveness of Flipped Mathematics Courses
4:40 p.m. – 4:55 p.m.
Jean Marie McGivney-Burelle, University of Hartford
Larissa Bucchi Schroeder, University of Hartford

Meta-analysis of Flipped “Pedagogy” in Undergraduate Mathematics Courses
5:00 p.m. – 5:15 p.m.
Gulden Karakok, University of Northern Colorado
Emilie Naccarato, University of Northern Colorado

Flipping Calculus II: Did it Improve this Infamous Course?
5:20 p.m. – 5:35 p.m.
Mindy Capaldi, Valparaiso University

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Flipping Calculus II: Did it Improve this Infamous Course?
5:20 p.m. – 5:35 p.m.
Mindy Capaldi, Valparaiso University

Flipping the Integral Calculus Classroom with Multiple Instructors
5:40 p.m. – 5:55 p.m.
Jim Rolfs, Yale University
Yu-Wen Hsu, Yale University
Susie Kimport, Yale University
Jennifer Frederick, Yale University
THEMED CONTRIBUTED PAPER SESSION
Undergraduate Research in Mathematics: How, When, Why, Part I
1:00 p.m. – 3:55 p.m., Hilton Portland, Ballroom Level, Galleria II

Emek Kose, St. Mary’s College of Maryland; Casey Douglas, St. Mary’s College of Maryland; Angela Gallegos, Loyola Marymount University

Building Capacity for a Research Rich Curriculum in Mathematics at Georgia College
1:00 p.m. – 1:15 p.m.
Ryan Brown, Georgia College; Marcela Chiorescu, Georgia College; Darin Mohr, Georgia College

Creative UG Research Collaborations: Clash of the Critters; Statistical Analysis of SIDS and More
1:20 p.m. – 1:35 p.m.
Jane Friedman, University of San Diego; Lynn Carole McGrath, University of San Diego; Perla Myers, University of San Diego

CURM: What It Is and What Are Its Results
1:40 p.m. – 1:55 p.m.
Michael Dorff, Brigham Young University

HRUMC: The First Twenty Years
2:00 p.m. – 2:15 p.m.
Emelie Kenney, Siena College

Maple Scholars Program
2:20 p.m. – 2:35 p.m.
David Housman, Goshen College

The CSUMS/MCTP Program at Arizona State University
2:40 p.m. – 2:55 p.m.
Eric Kostelich, Arizona State University

The Summer 2014 SURPASs Program and My Role as Faculty Mentor
3:00 p.m. – 3:15 p.m.
Donna Beers, Simmons College

Talk Math 2 Me: A Seminar for Students by Students
3:20 p.m. – 3:35 p.m.
Joni Jane Schneider, Texas State University

Research Experiences for Undergraduate Faculty: Supporting Undergraduate Faculty in Mentoring Undergraduate Research
3:40 p.m. – 3:55 p.m.
Brianna Donaldson, American Institute of Mathematics; Leslie Hogben, American Institute of Mathematics and Iowa State University; Ulrica Wilson, Institute for Computational and Experimental Research in Mathematics and Morehouse College; Roselyn Williams, Florida A&M University

THEMED CONTRIBUTED PAPER SESSION
Embodied Activities in the Teaching and Learning of Mathematics
1:00 p.m. – 4:55 p.m., Hilton Portland, Ballroom Level, Parlor AB

Hortensia Soto-Johnson, University of Northern Colorado

Pre-service Elementary Teachers’ Perceptions of Geometric Translations in Embodied Activities
1:00 p.m. – 1:15 p.m.
Brent Hancock, University of Northern Colorado; Marki Dittman, University of Northern Colorado

Pre-service Elementary Teachers’ Conception of Perpendicular Bisector in an Embodied Reflection Task
1:20 p.m. – 1:35 p.m.
Marki Dittman, University of Northern Colorado; Brent Hancock, University of Northern Colorado

Hands-on Activities to Enrich Basic Geometry Proofs: Angles in a Triangle and Parallelogram
1:40 p.m. – 1:55 p.m.
Sandra Fital-Akelbek, Weber State University

Measuring Around The Unit Circle
2:00 p.m. – 2:15 p.m.
Susan Jeannine Durst, University of Arizona

The Use of 3D Multi-Sectional, Interlocking Geometric Models and Magnetic Nets as Teaching Aids for Spatial Ability Training and Middle School Geometry Education
2:20 p.m. – 2:35 p.m.
Oai Ha, Utah State University

What is the NORISHIRO? Plane Development of a Polyhedron with the Tabs
2:40 p.m. – 2:55 p.m.
Tanaka Noriko
Thursday, August 7 (continued)

Visualizing Multivariate Functions in a Desktop-Sized 3-D Coordinate System
3:00 p.m. – 3:15 p.m.
Charlotte Ann Knotts-Zides, Wofford College

Hands-On Exploration of Topological Invariants
3:20 p.m. – 3:35 p.m.
Nicole Fider, UCI; Casey Kelleher, UCI; Alessandra Pantano, University of California, Irvine; Ryan Sullivant, UCI

Problem Solving through Computer Simulations
3:40 p.m. – 3:55 p.m.
David Ely, The Ohio State University; Jeanette Palmiter, Portland State University

Modeling Biology in the Classroom: Birds, Bacteria, and Disease
4:00 p.m. – 4:15 p.m.
Joshua Lioi, University of Arizona

“Field” & Stream: Experiencing a Vector Field
4:20 p.m. – 4:35 p.m.
Steve B Zides, Wofford College

Report on the Bodies of Data Workshops
4:40 p.m. – 4:55 p.m.
Luke Wolcott, Lawrence University

INVITED PAPER SESSION
Connections between Logic and Arithmetic Geometry
1:45 p.m. – 3:45 p.m., Hilton Portland, Ballroom Level, Grand Ballroom II

Bjorn Poonen, Massachusetts Institute of Technology

Computability Theory at Work: Factoring Polynomials and Finding Roots
1:45 p.m. – 2:15 p.m.
Russell Miller, Queens College, City University of New York

The Zilber Trichotomy Principle for Algebraic Dynamics: Hands-On Examples of Deep Notions from Model Theory
2:30 p.m. – 3:00 p.m.
Alice Medvedev, University of California at Berkeley

On the Elementary Theory of Finitely Generated Fields
3:15 p.m. – 3:45 p.m.
Florian Pop, The Pennsylvania State University

MAA Student Paper Sessions
2:00 p.m. – 3:55 p.m., Hilton Portland, 3rd Floor

MAA Student Paper Session #7
2:00 p.m. – 3:55 p.m., Hilton Portland, 3rd Floor, Forum Suite

MAA Student Paper Session #8
2:00 p.m. – 3:55 p.m., Hilton Portland, 3rd Floor, Council Suite

MAA Student Paper Session #9
2:00 p.m. – 3:55 p.m., Hilton Portland, 3rd Floor, Directors Suite

MAA Student Paper Session #10
2:00 p.m. – 3:55 p.m., Hilton Portland, 3rd Floor, Studio Suite

Pi Mu Epsilon Student Paper Sessions
2:00 p.m. – 3:55 p.m. Hilton Portland, 3rd Floor

PME Student Paper Session #1
2:00 p.m. – 3:55 p.m. Hilton Portland, 3rd Floor, Executive Suite

PME Student Paper Session #2
2:00 p.m. – 3:55 p.m. Hilton Portland, 3rd Floor, Senate Suite

Workshop on Gaming in Mathematics
2:35 p.m. – 3:55 p.m., Hilton Portland, Ballroom Level, Galleria I

PANEL SESSION
How to Apply for Non-Academic Jobs
2:35 p.m. – 3:55 p.m., Hilton Portland, 23rd Floor, Skyline 2

MAA Section Officers Meeting
3:00 p.m. – 5:00 p.m., Hilton Portland, Grand Ballroom

MINICOURSE
3. Enhancing Conceptual Understanding of Multivariable Calculus Using CalcPlot3D for Visualization and Exploration (Part A)
3:30 p.m. – 5:30 p.m., Hilton Portland Executive Tower, Salon Ballroom I

MINICOURSE
5. Teaching Linear Algebra with GeoGebra: Making Connections between Algebra and Geometry (Part A)
3:30 p.m. – 5:30 p.m., Hilton Portland Executive Tower, Salon Ballroom III
Thursday, August 7 (continued)

POSTER SESSION
Poster Session on IBL Best Practices
3:30 p.m. – 5:00 p.m., Hilton Portland, Exhibit Hall

UNDERGRADUATE STUDENT ACTIVITIES
MAA Student Paper Sessions
4:00 p.m. – 6:15 p.m., Hilton Portland, 3rd Floor
   MAA Student Paper Session #11
   4:00 p.m. – 6:15 p.m., Hilton Portland, 3rd Floor, Forum
   MAA Student Paper Session #12
   4:00 p.m. – 6:15 p.m., Hilton Portland, 3rd Floor, Council
   MAA Student Paper Session #13
   4:00 p.m. – 6:15 p.m., Hilton Portland, 3rd Floor, Directors Suite
   MAA Student Paper Session #14
   4:00 p.m. – 6:15 p.m., Hilton Portland, 3rd Floor, Studio Suite

Pi Mu Epsilon Student Paper Sessions
4:00 p.m. – 6:15 p.m. Hilton Portland, 3rd Floor
   PME Student Paper Session #3
   4:00 p.m. – 6:15 p.m. Hilton Portland, 3rd Floor, Executive Suite
   PME Student Paper Session #4
   4:00 p.m. – 6:15 p.m. Hilton Portland, 3rd Floor, Senate Suite

PANEL SESSION
Lessons from Successful Calculus Programs
4:10 p.m. – 5:30 p.m., Hilton Portland, 23rd Floor, Skyline 2

UNDERGRADUATE STUDENT ACTIVITY
Estimathon!
5:00 p.m. – 7:00 p.m., Hilton Portland, Plaza Level, Pavilion West

SOCIAL EVENT
Graduate Student Reception
5:30 p.m. – 6:30 p.m., Hilton Portland, Plaza Level, Pavilion East

SIGMAA ACTIVITY
POM SIGMAA: SIGMAA on the Philosophy of Mathematics Reception
5:30 p.m. – 6:00 p.m., Hilton Portland, Ballroom Level, Galleria I

PME Student Paper Session #3
4:00 p.m. – 6:15 p.m. Hilton Portland, 3rd Floor, Executive Suite

PME Student Paper Session #4
4:00 p.m. – 6:15 p.m. Hilton Portland, 3rd Floor, Senate Suite

SIGMAA ACTIVITY
SIGMAA QL: SIGMAA on Quantitative Literacy RECEPTION
5:30 p.m. – 6:00 p.m., Hilton Portland, Plaza Level, Broadway I & II

SIGMAA QL Turns 10: A Discussion of the Past and Future of Quantitative Literacy -
6:00 p.m. – 7:00 p.m., Hilton Portland, Plaza Level, Broadway I & II
Friday, August 8

SOCIAL EVENT  
**Wellness Strand - Friday**

6:30 a.m. – 7:30 a.m., Departs from Hilton Portland Lobby (Broadway Street Entrance)

SOCIAL EVENT  
**AWM-MAA Morning Coffee**

8:00 a.m. - 8:25 a.m., Hilton Portland, Ballroom Level, Ballroom Foyer

INVITED ADDRESS  
**AWM-MAA Etta Z. Falconer Lecture**

*From Algebraic to Weak Subintegral Extensions in Algebra and Geometry*
8:30 a.m. – 9:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Marie A. Vitulli, University of Oregon

THEMED CONTRIBUTED PAPER SESSION  
**Undergraduate Research Activities in Mathematical and Computational Biology, Part II**

8:30 a.m. – 10:25 a.m., Hilton Portland, Plaza Level, Broadway I & II

Timothy Comar, Benedictine University  
*Sponsored by SIGMAA on Mathematical and Computational Biology [BIO SIGMAA]*

- Mathematical Biology as a Capstone Option for Science Majors
  8:30 a.m. - 8:45 a.m.
  Sheldon Lee, Viterbo University

- An Optimization Method for the Spent Fuel Pool Storage at Nuclear Power Plants
  8:50 a.m. – 9:05 a.m.
  Nathan Robert LaFerney, Texas A&M University

- Social Aggregation in Pea Aphids: Experimental Measurement and Stochastic Modeling
  9:10 a.m. – 9:25 a.m.
  Chad Topaz, Macalester College; Andrew Bernoff, Harvey Mudd College

- Spatial Simulations of Chaparral Vegetation Response to Frequent Wildfires
  9:30 a.m. – 9:45 a.m.
  Timothy A. Lucas, Pepperdine University

- Studying Imperfect Vaccine of Malaria Using Mathematical Models
  9:50 a.m. – 10:05 a.m.
  Ruijun Zhao, Minnesota State University, Mankato

- Understanding the Scales of Locomotion for Caenorhabditis Elegans in a Viscous Fluid
  10:10 a.m. – 10:25 a.m.
  Katie Marie Sipes, James Madison University

THEMED CONTRIBUTED PAPER SESSION  
**Active Learning in Mathematics, Part I**

8:30 a.m. – 11:25 a.m., Hilton Portland, Ballroom Level, Galleria II

David Taylor, Roanoke College; Robert Allen, University of Wisconsin, La Crosse; Lorena Bociu, North Carolina State University

- Active Learning in Redesigned College Algebra: Lessons Learned from Implementation
  8:30 a.m. – 8:45 a.m.
  Krista Foltz, Oregon State University; Mary Beisiegel, Oregon State University; Scott L. Peterson, Oregon State University

- Active Learning for Pre-service and In-service Teachers
  8:50 a.m. – 9:05 a.m.
  Bernadette Mullins, Birmingham-Southern College

- Turning Homework Problems into Inquiry Based Classroom Activities
  9:10 a.m. – 9:25 a.m.
  Suzanne Ingrid Doree, Augsburg College

- Active Algebra
  9:30 a.m. – 9:45 a.m.
  Mary D. Shepherd, Northwest Missouri State University

- Making Abstract Algebra Less Abstract
  9:50 a.m. – 10:05 a.m.
  Emma Norbrothen, Plymouth State University

- Strategies to Progressively Increase Students’ Intellectual Engagement in the Learning of Abstract Algebra
  10:10 a.m. – 10:25 a.m.
  Alessandra Pantano, University of California, Irvine

- Actively Learning Real Analysis
  10:30 a.m. – 10:45 a.m.
  Donna Flint, South Dakota State University

- Pull Out Your Phone: A Quick Search for Relevant Statistics
  10:50 a.m. – 11:05 a.m.
  Ben Galluzzo, Shippensburg University

- Exploring Velocity and Acceleration Vectors Visually
  11:10 a.m. – 11:25 a.m.
  Paul E. Seeburger, Monroe Community College
Friday, August 8 (continued)

**THEMED CONTRIBUTED PAPER SESSION**

**Flipping Pedagogy in College Mathematics Courses, Part II**
8:30 a.m. – 11:45 a.m., Hilton Portland, Ballroom Level, Parlor AB

Jean McGivney-Burelle, University of Hartford; Larissa Schroeder, University of Hartford; John Williams, University of Hartford; Fei Xue, University of Hartford; Mako Haruta, University of Hartford; Ben Pollina, University of Hartford

Reading Guides in a Flipped Classroom
8:30 a.m. – 8:45 a.m.
Mary D. Shepherd, Northwest Missouri State University

A Measured Approach to Flipping the Analysis Classroom
8:50 a.m. – 9:05 a.m.
Christine Ann Shannon, Centre College

A Day in the Life of an Inverted Classroom
9:10 a.m. – 9:25 a.m.
Reza O. Abbasian, Texas Lutheran University; John T Sieben, Texas Lutheran University

Flipping the Classroom in Introductory Statistics
9:30 a.m. – 9:45 a.m.
Emily Cilli-Turner, Salve Regina University

Introductory Statistics in a Flipped Format for Community College Students
9:50 a.m. – 10:05 a.m.
Jessica Knoch, Lane Community College

Math Bio or BioMath? Flipping a Mathematical Biology Course
10:10 a.m. – 10:25 a.m.
Eric Eager, University of Wisconsin - La Crosse

An Activity-Based Approach to Flipping Quantitative Literacy
10:30 a.m. – 10:45 a.m.
Rebecca Diischer, South Dakota State University

Flipping the Discrete Math Classroom
10:50 a.m. – 11:05 a.m.
Benjamin V.C. Collins, University of Wisconsin-Platteville; James A. Swenson, University of Wisconsin-Platteville

Technology Tips for Creating Videos in a Flipped Mathematics Course
11:10 a.m. – 11:25 a.m.
Fei Xue, University of Hartford; Larissa Bucchi Schroeder, University of Hartford

**Selling the Concept – a Primer on Salesmanship of the Flipped Classroom Model**
11:30 a.m. – 11:45 a.m.
Alex Capaldi, Valparaiso University

**GENERAL CONTRIBUTED PAPER SESSIONS**

**Mathematics and Technology**
8:30 a.m. – 11:40 a.m., Hilton Portland, Ballroom Level, Galleria III

Inspiring Critical Thinking Through Programming Projects in a Precalculus Class
8:30 a.m. – 8:40 a.m.
Andrea Blum, SUNY Suffolk County Community College; Alexander Atwood, SUNY Suffolk County Community College

Using an Online Homework System for Written Homework
8:45 a.m. – 8:55 a.m.
Matthew Leingang, New York University

Flipped Classrooms Require – and Should Inspire – Better Software
9:00 a.m. – 9:10 a.m.
John C. Miller, The City College of C.U.N.Y. (emeritus)

Evolution of a Statistics Classroom
9:15 a.m. – 9:25 a.m.
Steven Klassen, Missouri Western State University

Using Online Technologies to Create Journal Articles in Numerical Analysis
9:30 a.m. – 9:40 a.m.
Mili Shah, Loyola

Euclid 21: Euclid’s Elements for the 21st Century
9:45 a.m. – 9:55 a.m.
Eugene Boman, Penn State, Harrisburg Campus

The Sophisticated Pencil: Computation as Transformation of the Traditional Mathematics Curriculum
10:00 a.m. – 10:10 a.m.
Jeff Randell Knisley, East Tennessee State University

An Active Introduction to Sage
10:15 a.m. – 10:25 a.m.
Brian Katz, Augusta College

Advances in Lurch, A Word Processor that Can Check Students’ Proofs
10:30 a.m. – 10:40 a.m.
Nathan C. Carter, Bentley University; Kenneth G. Monks, University of Scranton
### Friday, August 8 (continued)

#### Dynamic Visualization’s Effect on Mathematics Graduate Student and Inservice Teachers’ Views of Transformations of Functions
10:45 a.m. – 10:55 a.m.
James Anthony Mendoza Epperson, The University of Texas at Arlington; Andrew Paul Byrns, Dallas Independent School District

#### Experience-Driven Evolution of Technology-Based Courses
11:00 a.m. – 11:10 a.m.
Rebekah Gilbert, University of Illinois at Urbana-Champaign

#### Staying In Touch with Students with Technology
11:15 a.m. – 11:25 a.m.
Ginger Harper, Kaplan University

#### Exploring the Use of Mobile Devices as Student Response Systems in Undergraduate Mathematics Courses
11:30 a.m. – 11:40 a.m.
Jana Talley, Jackson State University; Lecretia Buckley, Jackson State University; Jessica Buck Murphy, Jackson State University; Shontrice Garrett, Jackson State University

#### UNDERGRADUATE STUDENT ACTIVITIES

##### MAA Student Paper Sessions
8:30 a.m. – 11:45 a.m., Hilton Portland, 3rd Floor

- **MAA Student Paper Session #15**
  8:30 a.m. – 11:45 a.m., Hilton Portland, 3rd Floor, Forum Suite

- **MAA Student Paper Session #16**
  8:30 a.m. – 11:45 a.m., Hilton Portland, 3rd Floor, Council Suite

- **MAA Student Paper Session #17**
  8:30 a.m. – 11:45 a.m., Hilton Portland, 3rd Floor, Directors Suite

- **MAA Student Paper Session #18**
  8:30 a.m. – 11:45 a.m., Hilton Portland, 3rd Floor, Studio Suite

##### Pi Mu Epsilon Student Paper Sessions
8:30 a.m. – 11:45 a.m. Hilton Portland, 3rd Floor

- **PME Student Paper Session #5**
  8:30 a.m. – 11:45 a.m. Hilton Portland, 3rd Floor, Executive Suite

- **PME Student Paper Session #6**
  8:30 a.m. – 11:45 a.m. Hilton Portland, 3rd Floor, Senate Suite

#### GENERAL CONTRIBUTED PAPER SESSION

##### Teaching or Learning Calculus
8:30 a.m. – 12:00 p.m., Hilton Portland, Ballroom Level, Parlor C

- **Making Waves in Vector Calculus**
  8:30 a.m. – 8:40 a.m.
  John Thoo, Yuba College

- **Impact of a Large Lecture Model in Multivariable Calculus**
  8:45 a.m. – 8:55 a.m.
  Nathan P. Clements, University of Wyoming

- **Resequencing Calculus: An Early Multivariable Approach**
  9:00 a.m. – 9:10 a.m.
  Michael Axtell, University of St. Thomas; Dave Dwyer, University of Evansville; Mark Gruenwald, University of Evansville; Ken Luther, Valparaiso University

- **Flipping My Calculus Classes**
  9:15 a.m. – 9:25 a.m.
  John Frohliger, St. Norbert College

- **A Successful Week 1 in a Flipped Calculus 1 Course**
  9:30 a.m. – 9:40 a.m.
  Bob Sachs, George Mason University

- **Writing About Continuity**
  9:45 a.m. – 9:55 a.m.
  Derek Thompson, Trine University

- **Classroom Investigations to Prepare Students for Calculus**
  10:00 a.m. – 10:10 a.m.
  Ken Collins, Charlotte Latin School

- **Math Circle Problems in the Calculus Classroom**
  10:15 a.m. – 10:25 a.m.
  Cynthia Northrup, University of California, Irvine

- **Introductory Calculus with Meaning and without Limits**
  10:30 a.m. – 10:40 a.m.
  Stacy Marie Musgrave, Arizona State University

- **Effectiveness of Teaching From a Bound Set of Lecture Notes in a Calculus Course**
  10:45 a.m. – 10:55 a.m.
  Brandy Benedict, Merrimack College

- **Strategies to Promote Student Success in Calculus**
  11:00 a.m. – 11:10 a.m.
  Corinne Casolara, Montana State University - Bozeman; Veronica Baker, Montana State University - Bozeman
Friday, August 8 (continued)

The Effectiveness of Clickers in a Large-Enrollment Calculus Classroom
11:15 a.m. – 11:25 a.m.
Heather Bolles, Iowa State University;
Adrian Jenkins, Iowa State University;
Elgin Johnston, Iowa State University;
Xuan Hien Nguyen, Iowa State University

History and Exploration in the Teaching of Calculus
11:30 a.m. – 11:40 a.m.
Paul Sisson, LSU Shreveport;
Tibor Szarvas, LSU Shreveport

The Impact of Placement and Curriculum Reform on Success in First-Year Courses
11:45 a.m. – 11:55 a.m.
Edgar Fuller, West Virginia University;
Jessica Deshler, West Virginia University

Pi Mu Epsilon Student Paper Session
8:30 a.m. – 12:05 p.m. Hilton Portland, 23rd Floor

Emek Kose, St. Mary’s College of Maryland;
Casey Douglas, St. Mary’s College of Maryland;
Angela Gallegos, Loyola Marymount University

A Project-Based General Education Math Course
8:50 a.m. – 9:05 a.m.
Victor Ian Piercey, Ferris State University

Undergraduate Student Activity
Student Hospitality Center
9:00 a.m. – 5:00 p.m., Hilton Portland, Exhibit Hall

Emek Kose, St. Mary’s College of Maryland;
Casey Douglas, St. Mary’s College of Maryland;
Angela Gallegos, Loyola Marymount University

A Project-Based General Education Math Course
8:50 a.m. – 9:05 a.m.
Victor Ian Piercey, Ferris State University

High Dimensional Data Analysis Projects in a Freshman Mathematics Class
9:10 a.m. – 9:25 a.m.
Bruce Piper, Rensselaer Polytechnic Institute;
Kristin Bennett, Rensselaer Polytechnic Institute

How to Sustain Projects in College Algebra and Finite Mathematics
9:30 a.m. – 9:45 a.m.
David Jay Graser, Yavapai College

Researching the Effectiveness of Project-Based Learning in Elementary Statistics
9:50 a.m. – 10:05 a.m.
Dianna Spence, University of North Georgia;
Brad Bailey, University of North Georgia

Community-Based Projects Using Real-World Data
10:10 a.m. – 10:25 a.m.
G. Daniel Callon, Franklin College

Understanding Mathematics for Good: Undergraduates, Ethical Consulting, and Service Learning
10:30 a.m. – 10:45 a.m.
Judith E. Canner, California State University, Monterey Bay

Mathematizing Social Justice: Bringing University Events into the Mathematics Classroom
10:50 a.m. – 11:05 a.m.
Ksenija Simic-Muller, Pacific Lutheran University

Modeling Calculus: A Project-Based, First Term Calculus Class
11:10 a.m. – 11:25 a.m.
Mariah Birgen, Wartburg College;
Brian J. Birgen, Wartburg College

Undergraduate Student Activity
Student Hospitality Center
9:00 a.m. – 5:00 p.m., Hilton Portland, Exhibit Hall

INVITED ADDRESS
Earle Raymond Hedrick Lecture Series
Lecture 2: Undecidability in Analysis and Topology
9:30 a.m. – 10:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Bjorn Poonen, Massachusetts Institute of Technology

Workshop on Revitalizing Algebra in Remedial Courses While Preparing Instructors
10:00 a.m. – 11:20 a.m., Hilton Portland, Ballroom Level, Galleria I

INVITED ADDRESS
AMS-MAA Joint Invited Address
What is the Value of a Computer Proof in Research and Teaching?
10:30 a.m. – 11:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Sara Billey, University of Washington

INVITED ADDRESS
NAM David Harold Blackwell Lecture
Markov Decision Processes, Turnpike Horizons and Blackwell Optimality
1:00 p.m. – 1:50 p.m., Hilton Portland, Ballroom Level, Grand Ballroom I
Mark Lewis, Cornell University
Friday, August 8 (continued)

UNDERGRADUATE STUDENT ACTIVITY
Mathematical Research, It’s Not What You Think!
1:00 p.m. – 1:50 p.m., Hilton Portland, Plaza Level, Pavilion East

UNDERGRADUATE STUDENT ACTIVITY
Using Puzzles to Illuminate Mathematics
1:00 p.m. – 1:50 p.m., Hilton Portland, Ballroom Level, Grand Ballroom II

PANEL SESSION
Open Source Resources for Mathematics: Benefits and Costs
1:00 p.m. – 2:20 p.m., Hilton Portland, 23rd Floor, Skyline 2

GENERAL CONTRIBUTED PAPER SESSION
Mentoring
1:00 p.m. – 2:25 p.m., Hilton Portland, Ballroom Level, Galleria III

Creating Sustainable Programs to Support Women Faculty in Mathematics
1:00 p.m. – 1:10 p.m.

Jenna Carpenter, Louisiana Tech University

MPWR: Mentoring and Partnerships for Women in RUME
1:15 p.m. – 1:25 p.m.

Megan Wawro, Virginia Tech;
Jessica Ellis, San Diego State University;
Hortensia Soto-Johnson, University of Northern Colorado

Mentoring Undergraduates
1:30 p.m. – 1:40 p.m.

Gary MacGillivray, University of Victoria

The Intentional Mentoring
1:45 p.m. – 1:55 p.m.

Noureen Khan, UNT Dallas

The Power of a Good Mentor: Lessons Learned from a Four-Year After School Mathematics Program
2:00 p.m. – 2:10 p.m.

Lina Sanchez leal, Rutgers University;
Gabriela Garcia, Cliffside High School NJ

Measuring Educator Effectiveness & Pre-Service Teacher Supervision
2:15 p.m. – 2:25 p.m.

Daniel Patrick Wisniewski, DeSales University;
John T. Garey, DeSales University

GENERAL CONTRIBUTED PAPER SESSION
Outreach
1:00 p.m. – 2:25 p.m., Hilton Portland, Ballroom Level, Parlor C

Texas A&M Math Circle: Structure and Activities
1:00 p.m. – 1:10 p.m.

Philip B. Yasskin, Texas A&M University;
Alex Sprintson, Texas A&M University;
Kaitlyn Phillipson, Texas A&M University;
Trevor Olsen, Texas A&M University;
Frank Sottile, Texas A&M University

The UCI Math Circle: Afternoons of Mathematical Investigations for Middle and High School Students
1:15 p.m. – 1:25 p.m.

Leesa Anzaldo, University of California, Irvine;
Timmy Ma, University of California, Irvine;
Cynthia Northrup, University of California, Irvine;
Alessandra Pantano, University of California, Irvine

National Association of Math Circles, First National Survey Results
1:30 p.m. – 1:40 p.m.

Brandy S Wiegers, National Association of Math Circles, Central Washington University

Southern Connecticut State University’s GEAR UP Summer Mathematics Program
1:45 p.m. – 1:55 p.m.

Klay Kruczek, Southern Connecticut State University

Supporting Mathematics Research Projects for Advanced High School Students
2:00 p.m. – 2:10 p.m.

Daniel Teague, NC School of Science and Mathematics

Encouraging STEM Majors to Consider a Career in Teaching Through Nonprofit Partnership
2:15 p.m. – 2:25 p.m.

Stephanie Anne Salomone, University of Portland
Friday, August 8 (continued)

MINICOURSE
6. SIMIODE - Teaching Differential Equations through Modeling and Technology (Part B)
1:00 p.m. – 3:00 p.m., Hilton Portland Executive Tower, Salon Ballroom III

MINICOURSE
2. Boolean Network Models: A Non-Calculus Introduction to Mathematical Modeling for Biology (Part B)
1:00 p.m. – 3:00 p.m., Hilton Portland Executive Tower, Salon Ballroom I

THEMED CONTRIBUTED PAPER SESSION
Open and Accessible Problems in Real or Complex and Analysis
1:00 p.m. – 2:55 p.m., Hilton Portland, Plaza Level, Broadway I & II

Lynette Boos, Providence College
Su-Jeong Kang, Providence College

Quotient Sets
1:00 p.m. – 1:15 p.m.
Stephan Ramon Garcia, Pomona College

The Sum of Golden Ana Sets
1:20 p.m. – 1:35 p.m.
Robert W. Vallin, Lamar University

A Topology of Subdivision for the Real Numbers
1:40 p.m. – 1:55 p.m.
Jeffrey Clark, Elon University

Linear Operators, Zeros of Polynomials, and Orthogonal Polynomials
2:00 p.m. – 2:15 p.m.
Andrzej Piotrowski, University of Alaska Southeast

Locating the Roots of a Family of Polynomials: Three Open Questions
2:20 p.m. – 2:35 p.m.
Michael Brilleslyper, U.S. Air Force Academy;
Beth Schaubroeck, U.S. Air Force Academy

The Two Body Problem Elevated to the Complex Domain
2:40 p.m. – 2:55 p.m.
Donald Leigh Hitzi, Lockheed Palo Alto Research Lab (Retired);
Frank Zele, Lockheed Martin Advanced Technology Center (Retired)

THEMED CONTRIBUTED PAPER SESSION
Project-Based Curriculum, Part II
1:00 p.m. – 3:55 p.m., Hilton Portland, Plaza Level, Broadway III & IV

Emek Kose, St. Mary’s College of Maryland;
Casey Douglas, St. Mary’s College of Maryland;
Angela Gallegos, Loyola Marymount University

Annexation Question Leads to Applied Project
1:00 p.m. – 1:15 p.m.
Nora Strasser, Friends University

Challenge-Based Instruction: Analysis of Bullet Proof Vest
1:20 p.m. – 1:35 p.m.
Andres Abelardo Padilla-Oviedo

Building a Successful Project-based Mathematical Modeling Course
1:40 p.m. – 1:55 p.m.
Jean Marie Linhart, Texas A&I University/Central Washington University

Encouraging Deeper Understanding Through Mathematical Modeling-Focused Projects
2:00 p.m. – 2:15 p.m.
Corban Harwood, George Fox University

PIC Math: Preparing Students for Careers in Business, Industry, and Government
2:20 p.m. – 2:35 p.m.
Michael Dorff, Brigham Young University

Embedding Undergraduate Research in a Senior Capstone Course
2:40 p.m. – 2:55 p.m.
Shawn Chiappetta, University of Sioux Falls

Implementing Project-Based Learning in the Differential Equations Curriculum
3:00 p.m. – 3:15 p.m.
Sukanya Basu, Wentworth Institute of Technology

Undergraduate Curriculum on the Relationship between Mathematics and Computer Science with Other Disciplines
3:20 p.m. – 3:35 p.m.
Agendia Timothy Atabong, Madonna University Nigeria

Using Matlab to Present Multidimensional Information
3:40 p.m. – 3:55 p.m.
Emma Smith Zbarsky, Wentworth Institute of Technology
Friday, August 8 (continued)

THEMED CONTRIBUTED PAPER SESSION
Recreational Mathematics: New Problems and New Solutions, Part II
1:00 p.m. – 4:35 p.m., Hilton Portland, Ballroom Level, Galleria I

Paul Coe, Dominican University;
Sara Quinn, Dominican University;
Kristen Schemmerhorn, Dominican University

The Elusive Mobius and the Intractable Hexagon: Geometric Cross Sections in Bead Crochet
1:00 p.m. – 1:15 p.m.
Susan Goldstine, St. Mary’s College of Maryland;
Ellie Baker, Freelance

Coloring the Plane with Rainbow Squares
1:20 p.m. – 1:35 p.m.
Mike Krebs, California State University Los Angeles

Dividing the Plane: Variations on a Theme
1:40 p.m. – 1:55 p.m.
David Molnar

Integer-Sided Triangles with Trisectible Angles
2:00 p.m. – 2:15 p.m.
Russ Gordon, Whitman College

On Mod n Spirals
2:20 p.m. – 2:35 p.m.
Andrew Richard Reiter Robin Young, University of Massachusetts-Amherst

Finding the Catalan Numbers in the Sandpile Model
2:40 p.m. – 2:55 p.m.
Grant Barnes, Luther College;
Michael Johnson, Luther College;
Cadence Sawyer, Luther College

A Characterization of Balance in Oriented Hypernetworks via Generalized Signed Walks
3:00 p.m. – 3:15 p.m.
Angeline Rao, Clements High School;
Alexander Yang, Clements High School;
Vinciane Chen, Westwood High School

Revisiting 12 Marbles, an Old-Fashioned Scale Puzzle
3:20 p.m. – 3:35 p.m.
Shenglan Yuan, LaGuardia Community College, CUNY

The Car Talk Trip
3:40 p.m. – 3:55 p.m.
Frank Lynch, Eastern Washington University

THEMED CONTRIBUTED PAPER SESSION
Active Learning in Mathematics, Part II
1:00 p.m. – 4:55 p.m., Hilton Portland, Ballroom Level, Galleria II

David Taylor, Roanoke College;
Robert Allen, University of Wisconsin-La Crosse;
Lorena Bociu, North Carolina State University

Surviving Active Learning in Mathematics
1:00 p.m. – 1:15 p.m.
Jerry Dwyer, Texas Tech University;
Levi Johnson, Texas Tech University;
Brock Williams, Texas Tech University

Activities for Calculus
1:20 p.m. – 1:35 p.m.
Matt Boelkins, Grand Valley State University

Student Conjecturing in Linear Algebra
1:40 p.m. – 1:55 p.m.
Elizabeth Thoren, University of California, Santa Barbara

Discovering Concepts in Calculus II
2:00 p.m. – 2:15 p.m.
William Abrams, Longwood University

Opening Up the Space: Creating Collaborative Learning Environments Outside of the Classroom
2:20 p.m. – 2:35 p.m.
Randall E. Cone, Virginia Military Institute;
Angie Hodge, University of Nebraska - Omaha

Test Tuesday
2:40 p.m. – 2:55 p.m.
Lew Ludwig, Denison University

Mathematics without the Math: Using Group Worksheets to Circumvent Math Anxiety
3:00 p.m. – 3:15 p.m.
Michael Nathanson, Saint Mary’s College of California
Friday, August 8 (continued)

Pre-Calculus Lab Book
3:20 p.m. – 3:35 p.m.
Brandy S Wiegers, National Association of Math Circles, Central Washington University;
Addie Evans, SFSU;
Servando Pineda, SFSU;
Matthew Kim, SFSU

Algorithmic Thinking Unplugged with Puzzles and Games
3:40 p.m. – 3:55 p.m.
Edmund A Lamagna, University of Rhode Island

Using Games to Engage Students in Discrete Mathematics
4:00 p.m. – 4:15 p.m.
Tim Gegg-Harrison, Winona State University;
Nicole Anderson, Winona State University

Learning Math by Doing Math: Problem-Solving Workshops in Calculus
4:20 p.m. – 4:35 p.m.
Silvia Saccon, The University of Texas at Dallas

Active Exploration of Graphs and Graph Theory
4:40 p.m. – 4:55 p.m.
Steven Klee, Seattle University

THEMED CONTRIBUTED PAPER SESSION
Curriculum Development to Support First Year Mathematics Students, Part I
1:00 p.m. – 4:55 p.m., Hilton Portland, Ballroom Level, Parlor AB

Donna Flint, South Dakota State University;
Rebecca Diischer, South Dakota State University;
Charles Bingen, University of Wisconsin Eau Claire

Developmental Mathematics Redesign at Fitchburg State University
1:00 p.m. – 1:15 p.m.
Mary Ann Barbato, Fitchburg State University

Comparing Student Attitudes and Successes in College Algebra using Emporium, Problem Solving, and Traditional Methods
1:20 p.m. – 1:35 p.m.
Lanee Young, Fort Hays State University;
Jeff Sadler, Fort Hays State University

Taking Over an Existing Developmental Math Program: What Works and Determining What to Improve
1:40 p.m. – 1:55 p.m.
Charles Bingen, University of Wisconsin Eau Claire

The Math Zone: An Open Emporium-Style Model Attempting the Fast Track
2:00 p.m. – 2:15 p.m.
Craig Miller, University of New Haven

The Startup of a Math Emporium – Trials and Tribulations
2:20 p.m. – 2:35 p.m.
Senan Hayes, Western Connecticut State University

Restructuring of the Remedial Program at South Dakota State University (SDSU)
2:40 p.m. – 2:55 p.m.
Donna Flint, South Dakota State University

Improving Remedial Success Using an Enhanced Mastery-Based Format
3:00 p.m. – 3:15 p.m.
Carri Hales, South Dakota State University

A Co-Requisite Model for College Algebra
3:20 p.m. – 3:35 p.m.
Rebecca Diischer, South Dakota State University

Rethinking First Year Mathematics to Improve Student Retention
3:40 p.m. – 3:55 p.m.
Cheryl Jarrell McAllister, Southeast Missouri State University;
Daniel Daly, Southeast Missouri State University;
Tamela Randolph, Southeast Missouri State University

It’s Not Just About the Content: Holistic Change in a First-Year Mathematics Course
4:00 p.m. – 4:15 p.m.
Mary Beisiegel, Oregon State University;
Krista Foltz, Oregon State University;
Scott L. Peterson, Oregon State University

Peer Led Team Learning in Foundation Mathematics for College Students: A University Approach
4:20 p.m. – 4:35 p.m.
Camille A. McKayle, University of the Virgin Islands;
Robert Stolz, University of the Virgin Islands

Improving Student Success in Calculus at the University of South Carolina
4:40 p.m. – 4:55 p.m.
Douglas B. Meade, University of South Carolina;
Philip B. Yasskin, Texas A&M University
Friday, August 8 (continued)

INVITED PAPER SESSION

Computational Aspects of Algebra, Geometry and Combinatorics
1:00 p.m. - 5:15 p.m., Hilton Portland, Plaza Level, Pavilion West

Sara Billey, University of Washington;
Benjamin Young, University of Oregon

The Combinatorics of CAT(0) Cubical Complexes and Robotic Motion Planning
1:00 p.m. - 1:30 p.m.
Federico Ardila, San Francisco State University

A Borsuk-Ulam Equivalent that Directly Implies Sperner's Lemma
1:45 p.m. - 2:15 p.m.
Kathryn Nyman, Willamette University

The Combinatorics of Fully Packed Loops and Razumov-Stroganov Conjectures
2:30 p.m. - 3:00 p.m.
Dan Romik, University of California, Davis

Parking Functions and Tree Inversions
3:15 p.m. - 3:45 p.m.
David Perkinson, Reed College

Expanding Hall-Littlewood Polynomials into Schur Functions
4:00 p.m. - 4:30 p.m.
Austin Roberts, University of Washington

Self-Organizing Cellular Automata
4:45 p.m. - 5:15 p.m.
Alexander E. Holroyd, Microsoft Research

OTHER MATHEMATICAL SESSION

Alder Award Session
2:00 p.m. - 2:50 p.m., Hilton Portland, Ballroom Level, Grand Ballroom

The Joy of Discovery
2:00 p.m.
Lara Pudwell, Valparaiso University

There's Treasure Everywhere: When Student Work Matters
2:30 p.m.
Dominic Klyve, Central Washington University

UNDERGRADUATE STUDENT ACTIVITY

Pi Mu Epsilon Student Paper Session
2:00 p.m. - 3:55 p.m. Hilton Portland, 3rd Floor

PME Student Paper Session #8
2:00 p.m. - 3:55 p.m. Hilton Portland, 3rd Floor, Executive Suite

PME Student Paper Session #9
2:00 p.m. - 3:55 p.m. Hilton Portland, 3rd Floor, Senate Suite

PME Student Paper Session #10
2:00 p.m. - 3:55 p.m. Hilton Portland, 3rd Floor, Forum Suite

PME Student Paper Session #11
2:00 p.m. - 3:55 p.m. Hilton Portland, 3rd Floor, Council Suite

PME Student Paper Session #12
2:00 p.m. - 3:55 p.m. Hilton Portland, 3rd Floor, Directors Suite

INVITED PAPER SESSION

The Mathematics of Biological Fluid Dynamics
2:00 p.m. - 4:50 p.m., Hilton Portland, Plaza Level, Pavilion East

Ricardo Cortez, Tulane University

Neuromechanics and Fluid Dynamics of an Undulatory Swimmer
2:00 p.m.
Lisa Fauci, Tulane University

Mathematical Modeling of Sperm Motility and Mucociliary Transport
2:30 p.m.
Robert Dillon, Washington State University

Modeling E. Coli Aspartate Chemotaxis in a Stokes Flow
3:00 p.m.
Hoa Nguyen, Trinity University

Modeling Interactions between Tumor Cells, Interstitial Fluid and Drug Particles
3:30 p.m.
Katarzyna A. Rejniak, H. Lee Moffitt Cancer Center & Research Institute and University of South Florida

Sperm Motility and Cooperativity in Epithelial Detachment
4:00 p.m.
Julie Simons, Tulane University

Swimming through Heterogeneous Viscoelastic Media
4:30 p.m.
Jacek Wrobel, Tulane University
Friday, August 8 (continued)

PANEL SESSION
Non-Academic Career Paths for Students Who Like Mathematics
2:35 p.m. - 3:55 p.m., Hilton Portland, 23rd Floor, Skyline 2

SIGMAA ACTIVITY
SIGMAA MCST: SIGMAA on Math Circles for Students and Teachers: Problems Well-Suited for Math Circles
2:35 p.m. - 3:55 p.m., Hilton Portland, Ballroom Level, Grand Ballroom II

GENERAL CONTRIBUTED PAPER SESSION
Research in Applied Mathematics
3:00 p.m. - 4:55 p.m., Hilton Portland, Ballroom Level, Parlor C

- The Study of Complex Dynamics of Methamphetamine Use and Markets in California
  3:00 p.m. - 3:10 p.m.
  Steve Szymanowski, Northeastern Illinois University

- Optimal Control of the Spread of Cholera
  3:15 p.m. - 3:25 p.m.
  Javier Garza, Tarleton State University

- Computing the Value Function for a Singular Optimal Control Problem
  3:30 p.m. - 3:40 p.m.
  Jesus Pascal, The American University of Afghanistan

- Assembling Broken Surfaces using Differential Invariant Signatures
  3:45 p.m. - 3:55 p.m.
  Robert Thompson, Macalester College

- Effect of Thermal Diffusion And Chemical Reaction on Heat And Mass Transfer in Micropolar Fluid
  4:00 p.m. - 4:10 p.m.
  Louis Essien Effiong, Fluid Dynamics

- Heat and Mass Transfer in a Micropolar Fluid With Thermal Radiation Over a Vertical Plate
  4:15 p.m. - 4:25 p.m.
  Oahimire Imumolen Jonathan, Fluid Dynamics

- Complete Synchronization on Networks of Identical Oscillators with Diffusive Delay-Coupling
  4:30 p.m. - 4:40 p.m.
  Stanley Ryan Huddy, State University of New York at New Paltz;
  Joseph Skufca, Clarkson University

- Measuring Distances between Weighted Graphs by Graph Diffusion
  4:45 p.m. - 4:55 p.m.
  David Kenric Hammond, Oregon Institute of Technology - Wilsonville;
  Yaniv Gur, SCI Institute, University of Utah

GENERAL CONTRIBUTED PAPER SESSIONS
Research in Graph Theory or Combinatorics
3:00 p.m. - 5:10 p.m., Hilton Portland, Ballroom Level, Galleria III

- Dynamic Storage Allocation using Tolerance Graphs
  3:00 p.m. - 3:10 p.m.
  Karin Saoub, Roanoke College

- Eternal Colorings and k -Eternal Graphs
  3:15 p.m. - 3:25 p.m.
  Mark Anderson, Rollins College;
  Shiyeng Gu, Rollins College;
  Charles Evans Hedges, Rollins College;
  Felipe Quiroga, Rollins College

- Extremal H-Colorings of Trees and Forests
  3:30 p.m. - 3:40 p.m.
  John Engbers, Marquette University

- Prime Labelings of Graphs
  3:45 p.m. - 3:55 p.m.
  Cayla McBee, Providence College

- Group-Antimagic Labelings of Graphs
  4:00 p.m. - 4:10 p.m.
  Richard Low, San Jose State University;
  Dan Roberts, Illinois Wesleyan University

- Inflection Points of Reliability Polynomials
  4:15 p.m. - 4:25 p.m.
  Christina Graves, The University of Texas at Tyler;
  David Milan, The University of Texas at Tyler

- Insights into Mâry Partitions from an Mâry Tree
  4:30 p.m. - 4:40 p.m.
  Timothy B Flowers, Indiana University of Pennsylvania;
  Shannon R Lockard, Bridgewater State University

- OnC z-Factorizations with Two Associate Classes
  4:45 p.m. - 4:55 p.m.
  Michael Tiemeyer, Armstrong Atlantic State University

- Hamiltonian Cycles in Cayley Graphs of Complex Reflection Groups
  5:00 p.m. - 5:10 p.m.
  Cathy Kriloff, Idaho State University;
  Terry Lay, Idaho State University Retired
### Chronological Schedule

**Friday, August 8 (continued)**

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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| 3:10 p.m. - 4:30 p.m. | **PANEL SESSION**  
The New Mathways STEM Prep Initiative: Results from the Design Team | Hilton Portland, Ballroom Level, Grand Ballroom I |
| 3:30 p.m. - 5:30 p.m. | **MINICOURSE**  
1. A Beginner’s Guide to the Scholarship of Teaching and Learning in Mathematics (Part A)  
| 3:30 p.m. - 5:00 p.m. | **POSTER SESSION**  
PosterFest 2014: A Poster Session of Scholarship by Early Career Mathematicians and Graduate Students | Hilton Portland, Exhibit Hall  |

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| 4:10 p.m. - 5:30 p.m. | **PANEL SESSION**  
Chairing the Academic Department: Advice and Perspectives from the Pros | Hilton Portland, Ballroom Level, Ballroom I |
| 4:10 p.m. - 5:30 p.m. | **PANEL SESSION**  
Integrating Mathematical Software into Lower-Division Mathematics Courses | Hilton Portland, 23rd Floor, Skyline 2  |
| 5:30 p.m. - 5:50 p.m. | **SIGMAA ACTIVITY**  
WEB SIGMAA: Business Meeting | Hilton Portland, Ballroom Level, Parlor AB  |
| 5:30 p.m. - 7:00 p.m. | **SOCIAL EVENT**  
Pi Mu Epsilon Centennial Celebration Banquet | Hilton Portland, Plaza Level, Broadway |
| 8:00 p.m. - 8:50 p.m. | **INVITED ADDRESS**  
Pi Mu Epsilon J. Sutherland Frame Lecture  
Fibonacci and the First Personal Computing Revolution  
Keith Devlin, Stanford University | Hilton Portland, Ballroom Level, Grand Ballroom  |
| 9:00 p.m. - 10:00 p.m. | **SOCIAL EVENT**  
MAA Ice Cream Social and Undergraduate Awards Ceremony | Hilton Portland, Plaza Level, Broadway  |
Saturday, August 9

SOCIAL EVENT
Wellness Strand - Saturday
6:30 a.m. – 7:30 a.m., Departs from Hilton Portland Lobby
(Broadway Street Entrance)

INVITED ADDRESS
James R. C. Leitzel Lecture
Research in Mathematics by Undergraduates: Past, Present, and Future
8:30 a.m. – 9:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Joseph Gallian, University of Minnesota Duluth

GENERAL CONTRIBUTED PAPER SESSION
Research in Analysis
8:30 a.m. – 9:25 a.m., Hilton Portland, Ballroom Level, Parlor C

- Hypercyclicity and the Range of an Operator
  8:30 a.m. – 8:40 a.m.
  Kevin Rion, Bridgewater State University

- A Solution to Boundary Value Problems and Volterra Integral Equations with Parker and Sochacki Method
  8:45 a.m. – 8:55 a.m.
  Hamid Semiari, James Madison University

- Behavior of Boundary Convergency for Power Series
  9:00 a.m. – 9:10 a.m.
  Xiao-Xiong Gan, Morgan State University

- Analytical and Numerical Investigations of the Riemann Hypothesis
  9:15 a.m. – 9:25 a.m.
  Donald Hitzl, Lockheed Palo Alto Research Lab (Retired)

GENERAL CONTRIBUTED PAPER SESSION
Teaching or Learning Developmental Mathematics
8:30 a.m. – 9:25 a.m., Hilton Portland, Ballroom Level, Galleria III

- Using Pictures to Study Students’ Mathematical Beliefs and Attitudes
  8:30 a.m. – 8:40 a.m.
  Ben Ntatin, Austin Peay State University

- Activities to Reinforce Fraction Concepts in the Developmental Math Classroom
  8:45 a.m. – 8:55 a.m.
  Ann Hanson, Columbia College Chicago

- Using Critical Thinking Skills in Developmental Mathematics
  9:00 a.m. – 9:10 a.m.
  Mary B. Walkins, The Community College of Baltimore County

“Is It Time To Go Home Yet?”; Student Engagement in Extracurricular Mathematics, Grades 2–4
9:15 a.m. – 9:25 a.m.
Christina Tran, California State University, Fullerton;
Benjamin David Blazak, California State University, Fullerton

GENERAL CONTRIBUTED PAPER SESSION
Research in Number Theory
8:30 a.m. – 11:10 a.m., Hilton Portland, Ballroom Level, Galleria I

- Difference Sets, Singer Designs, and Singer Difference Sets
  8:30 a.m. – 8:40 a.m.
  Bud Brown, Virginia Tech

- Odd Numbers, Their Relation to Primitive Pythagorean Suits and Traingles Numbers - Theorem Ren
  8:45 a.m. – 8:55 a.m.
  Renilson Adriano Silva, Federal Institute of Education, Science and Technology of Sao Paulo and University Center Modulo

- Arithmetic of k-Regular Partition Functions
  9:00 a.m. – 9:10 a.m.
  David Penniston, University of Wisconsin Oshkosh

- A Computational Method for Solving Exponential-Polynomial Diophantine Equations
  9:15 a.m. – 9:25 a.m.
  Jiayuan Wang, George Washington University; Max Alekseyev, George Washington University

- A Set of Two-color Off-Diagonal Rado Numbers for $x_1 + x_2 + \ldots + x_m = ax_0$
  9:30 a.m. – 9:40 a.m.
  Don Vestal, South Dakota State University

- Squarefree Parts of Polynomial Values
  9:45 a.m. – 9:55 a.m.
  David Krumm, Claremont McKenna College

- Emergent Reducibility in Polynomial Dynamics
  10:00 a.m. – 10:10 a.m.
  Jason Preszler, University of Puget Sound

- Connections Between Furstenberg’s and Euclid’s Proofs of the Infinitude of Primes
  10:15 a.m. – 10:25 a.m.
  Nathan Carlson, California Lutheran University

- The Gaussian Moat Problem
  10:30 a.m. – 10:40 a.m.
  Anthony Shaheen, CSU Los Angeles

- Some Palatable Morsels, Integer Sequences and Number Theory Trivia
  10:45 a.m. – 10:55 a.m.
  Jay Lawrence Schiffman, Rowan University
Saturday, August 9 (continued)

Divisibility Tests Unified: Stacking the Trimmings for Sums  
11:00 a.m. – 11:10 a.m.  
Edwin O’Shea, James Madison University

GENERAL CONTRIBUTED PAPER SESSION  
Research in Algebra

8:30 a.m. - 11:10 a.m., Hilton Portland, Plaza Level, Broadway I & II

Various Extensions of Commutative Rings  
8:30 a.m. – 8:40 a.m.  
Papiya Bhattacharjee, Penn State Behrend

Calm Ring Extensions and Associated Primes  
8:45 a.m. – 8:55 a.m.  
Hannah Robbins, Roanoke College

The Generalization of HNP Ring, 2 Bezout Ring and P-Bezout Ring  
9:00 a.m. – 9:10 a.m.  
Irawati Irawati, Institut Teknologi Bandung

\( \tau \)-Factorizations, when \( \tau \) is an Equivalence Relation  
9:15 a.m. – 9:25 a.m.  
Reyes Matiel Ortiz-Albino, University of Puerto Rico-Mayaguez Campus; Cesar Serna-Rapello, University of Puerto Rico-Mayaguez

The Number of Zeros of Linear Recurring Sequences Over Finite Fields  
9:30 a.m. – 9:40 a.m.  
Suwanda Hennedige Yasanthi Kottegoda, Southern Illinois University Carbondale

Two Groups Associated with an \((R, s + 1,k)\)-Potent Matrix  
9:45 a.m. – 9:55 a.m.  
Jeffrey Stuart, Pacific Lutheran University; Minerva Catral, Xavier University; Leila Lebtahi, Universitat Politècnica de València; Nestor Thome, Universitat Politècnica de València; James Weaver, University of West Florida

An Algebra with Characteristic Dependent Associativity  
10:00 a.m. – 10:10 a.m.  
Lydia Kennedy, Virginia Wesleyan College

The Frobenius Number of Balanced Numerical Semigroups  
10:15 a.m. – 10:25 a.m.  
Jeremy Thompson, USAFA

Isomorphy Classes of Involutions of \( Sp(2n,k) \)  
10:30 a.m. – 10:40 a.m.  
Robert Wayne Benim, Pacific University; Loek Helminck, North Carolina State University; Farrah Jackson, Elizabeth City State University

Directly Finite Modules of \( sl_2d \)  
10:45 a.m. – 10:55 a.m.  
Christopher Kennedy, Christopher Newport University

Characteristics of Algebraic Symbol Sense  
11:00 a.m. – 11:10 a.m.  
Margaret T. Kinzel, Boise State University

THEMED CONTRIBUTED PAPER SESSION  
Undergraduate Research in Mathematics: How, When, Why, Part II

8:30 a.m. – 11:25 a.m., Hilton Portland, Ballroom Level, Galleria II

Ensuring Engagement in Math Research  
8:30 a.m. – 8:43 a.m.  
Therese Shelton, Southwestern University

6959 Open Problems for Undergraduates  
8:50 a.m. – 9:05 a.m.  
Tom Edgar, Pacific Lutheran University

Exploring Auction Theory in Undergraduate Research  
9:10 a.m. – 9:25 a.m.  
William Gryc, Muhlenberg College

Singularities of 2-Dimensional Invertible Piecewise Isometric Dynamics  
9:30 a.m. – 9:45 a.m.  
Byungik Kahng, University of North Texas at Dallas

One Approach to Undergraduate Research in Computational Galois Theory  
9:50 a.m. – 10:05 a.m.  
Chad Awtrey, Elon University

Undergraduate Research Projects with a Dozen or So Math, Physics, and CS Students Over the Past Decade  
10:10 a.m. – 11:05 a.m.  
David Strong, Pepperdine University
Saturday, August 9 (continued)

**Undergraduate Math Research at the U.S. Naval Academy**
11:10 a.m. - 11:25 a.m.
Will Traves, United States Naval Academy

**THEMED CONTRIBUTED PAPER SESSION**
**Curriculum Development to Support First Year Mathematics Students, Part II**
8:30 a.m. - 11:45 a.m., Hilton Portland, Ballroom Level, Parlor AB

Donna Flint, South Dakota State University; Rebecca Diischer, South Dakota State University; Charles Bingen, University of Wisconsin, Eau Claire

A Multi-tiered Support System
8:30 a.m. - 8:45 a.m.
G. Daniel Callon, Franklin College

An Effective Approach to Increase Mathematics Readiness of Freshmen STEM Students
8:50 a.m. - 9:05 a.m.
Mazen Shahin, Delaware State University; Andrew Lloyd, Delaware State University; Tomasz Smolinski, Delaware State University; Melissa Harrington, Delaware State University

Creating a Mathematics First Year Seminar Course
9:10 a.m. - 9:25 a.m.
Frederick Butler, York College of Pennsylvania

Designing a Mathematical Support Structure for Entering Students
9:30 a.m. - 9:45 a.m.
Emma Smith Zbarsky, Wentworth Institute of Technology; Amanda Hattaway, Wentworth Institute of Technology; Ophir Feldman, Wentworth Institute of Technology

Embedded Tutoring in First Year College Mathematics Classes
9:50 a.m. - 10:05 a.m.
Michael Allen Lundin, Central Washington University

Requiring Instructor-Generated Learning Activities in Online College Algebra Can Reduce Failure and Withdrawal Rates
10:10 a.m. - 10:25 a.m.
Jennifer Hegeman, Missouri Western State University

How a Co-Requisite Calculus I Lab Can Improve Student Success in Calculus I
10:30 a.m. - 10:45 a.m.
Sharon Vestal, South Dakota State University

Remedial Efforts in Calculus Classes at Simon Fraser University: Results and Challenges
10:50 a.m. - 11:05 a.m.
Malgorzata Dubiel, SFU; Justin Gray, SFU; Natalia Kouzniak, SFU; Cameron Morland, SFU; Jamie Mulholland, SFU

Concepts, not Calculations: Helping First Year Mathematics Students Learn What Mathematics Is
11:10 a.m. - 11:25 a.m.
Bonnie Gold, Monmouth University

Precalculus Redesign: The Influence of a Placement Program and the Power of a Name
11:30 a.m. - 11:45 a.m.
Alison Reddy, University of Illinois

**UNDERGRADUATE STUDENT ACTIVITY**
**MAA Mathematical Competition in Modeling (MCM) Winners**
9:00 a.m. - 10:30 a.m., Hilton Portland, Plaza Level, Broadway III & IV
Ben Fusaro, Florida State University

**Student Hospitality Center**
9:00 a.m. - 12:30 p.m., Hilton Portland, Exhibit Hall

**SIGMAA ACTIVITY**
**SIGMAA MCST: Math Circle Demonstration**
9:00 a.m. - 9:55 a.m., Hilton Portland, Plaza Level, Pavilion East

**INVITED ADDRESS**
**Earle Raymond Hedrick Lecture Series**
Lecture 3: Undecidability Everywhere
9:30 a.m. - 10:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom
Bjorn Poonen, Massachusetts Institute of Technology

**GENERAL CONTRIBUTED PAPER SESSION**
**Research in Geometry**
10:00 a.m. - 11:10 a.m., Hilton Portland, Ballroom Level, Parlor C

Fibonacci and Logarithmic Spirals
10:00 a.m. - 10:10 a.m.
Steven Edwards, Southern Polytechnic State University

The Convex Body Isoperimetric Conjecture
10:15 a.m. - 10:25 a.m.
Frank Morgan, Williams College

Periodic Orbits in the Heisenberg-Kepler Problem
10:30 a.m. - 10:40 a.m.
Corey Shanbrom, California State University, Sacramento

An Intrinsic Relationship Between Finite Projective Planes and Finite (Galois) Fields
10:45 a.m. - 10:55 a.m.
Alvin Swimmer, Arizona State University
New Directions in Staircase Metric Geometry  
11:00 a.m. – 11:10 a.m.  
Jack Mealy, Austin College  
Samantha Le, Austin College  

**GENERAL CONTRIBUTED PAPER SESSION: Assessment**  
10:30 a.m. – 11:25 a.m., Hilton Portland, Ballroom Level, Galleria III  

University Students’ Perception on Poor Achievement of Undergraduates in Introductory Mathematics–Related Courses in Taraba State – Nigeria  
10:30 a.m. – 10:40 a.m.  
Solomon Abogunde Iyekekpolor, Federal University, Wukari - Nigeria  

A Research-Based Rubric To Assess Students’ Creativity in Proof and Proving  
10:45 a.m. – 10:55 a.m.  
Gail Tang, University of La Verne; Milos Savic, University of Oklahoma; Gulden Karakok, University of Northern Colorado; Houssein El Turkey, University of Oklahoma; Molly Stubblefield, University of Oklahoma  

An Improved Mixed Clustering Approach for Teaching Evaluation  
11:00 a.m. – 11:10 a.m.  
Sijie Liu, University of Alabama, Tuscaloosa  

The Relationship between Calibration, Anxiety, and Achievement in Preservice Elementary Teachers Mathematics  
11:15 a.m. – 11:25 a.m.  
Brian Christopher, University of Northern Colorado  

**INVITED ADDRESS**  
**MAA Invited Address**  

Mathematical Models of the Retina and In Silico Experiments: Shedding Light on Vision Loss  
10:30 a.m. – 11:20 a.m., Hilton Portland, Ballroom Level, Grand Ballroom  
Erika Camacho, Massachusetts Institute of Technology and Arizona State University  

**SIGMAA ACTIVITY**  
**SIGMAA MCST: Math Wrangle**  
10:30 a.m. – 11:25 a.m., Hilton Portland, Plaza Level, Pavilion East  

**OTHER MATHEMATICAL SESSION**  
**MAA Business Meeting**  
11:30 a.m. – 12:00 p.m., Hilton Portland, Grand Ballroom
MINICOURSE
3. Enhancing Conceptual Understanding of Multivariable Calculus Using CalcPlot3D for Visualization and Exploration (Part B)
1:00 p.m. – 3:00 p.m., Hilton Portland Executive Tower, Salon Ballroom I

MINICOURSE
5. Teaching Linear Algebra with GeoGebra: Making Connections between Algebra and Geometry (Part B)
1:00 p.m. – 3:00 p.m., Hilton Portland Executive Tower, Salon Ballroom III

GENERAL CONTRIBUTED PAPER SESSION
Teaching or Learning Advanced Mathematics
1:00 p.m. – 3:55 p.m., Hilton Portland, Ballroom Level, Parlor C

The Best Tasting Basis Ever!
1:00 p.m. – 1:10 p.m.
Alan Alewine, McKendree University

More Geometry with SET
1:15 p.m. – 1:25 p.m.
Timothy Edward Goldberg, Lenoir-Rhyne University

Chemistry, Legos, and Proofs
1:30 p.m. – 1:40 p.m.
Bonnie Amende, Saint Martin’s University; Carol Overdeep, Saint Martin’s University

Introducing Mathematical Induction Using Combinatorial Games
1:45 p.m. – 1:55 p.m.
David McCune, William Jewell College

Liedoku for Abstract Algebra
2:00 p.m. – 2:10 p.m.
David Nacin, William Paterson University

More Bang From Your Book: A Simple Strategy to Promote Active Reading
2:15 p.m. – 2:25 p.m.
Scott R. Kaschner, The University of Arizona

Using Individual Oral Exams in Mathematics Courses
2:30 p.m. – 2:40 p.m.

Programming Mathematics as an Advanced Math Course
2:45 p.m. – 2:55 p.m.
Lisa Oberbroeckling, Loyola University Maryland

An Ethnomathematics Graduate Course
3:00 p.m. – 3:10 p.m.
Ximena Catepillan, Millersville University of Pennsylvania
Cynthia Taylor, Millersville University of Pennsylvania

A Capstone Seminar on the Mathematics of Voting
3:15 p.m. – 3:25 p.m.
Jan Cameron, Vassar College

The Over-Easy Classroom
3:30 p.m. – 3:40 p.m.
Lew Ludwig, Denison University

Flipping Differential Equations
3:45 p.m. – 3:55 p.m.
Lenny Ornas, McNeese State University

GRADUATE STUDENT ACTIVITY
Great Talks for a General Audience: Coached Presentations by Graduate Students
1:00 p.m. – 5:30 p.m., Hilton Portland, Plaza Level, Broadway I & II

UNDERGRADUATE STUDENT ACTIVITY
Student Problem Solving Competition
1:00 p.m. – 2:15 p.m., Hilton Portland, Plaza Level, Broadway III & IV

THEMED CONTRIBUTED PAPER SESSION
Curriculum Development to Support First Year Mathematics Students, Part III
1:00 p.m. – 2:35 p.m., Hilton Portland, Ballroom Level, Parlor AB

Donna Flint, South Dakota State University; Rebecca Diischer, South Dakota State University; Charles Bingen, University of Wisconsin, Eau Claire

A Collaborative Transition to Applied Calculus with Modeling
1:00 p.m. – 1:15 p.m.
Robin A. Cruz, The College of Idaho; Dave Rosoff, The College of Idaho; Nicole Seaders, Willamette University

Experiments with Large-Lecture/Lab Hybrid Models for Business Calculus
1:20 p.m. – 1:35 p.m.
Darci L. Kracht, Kent State University

Interactivity and Intervention: An Overview of Calculus Redesign at Missouri S&T
1:40 p.m. – 1:55 p.m.
Paul N. Runnion, Missouri University of Science and Technology
ALEKS in Calculus I at the University of Wyoming
2:00 p.m. – 2:15 p.m.
Nathan P. Clements, University of Wyoming
Improving Student Success in Calculus
2:20 p.m. – 2:35 p.m.
Allison Henrich, Seattle University;
J. McLean Slaughter, Seattle University

INVITED PAPER SESSION
The Eyes Have It: Mathematical Modeling of the Retina
1:00 p.m. – 2:50 p.m., Hilton Portland, Plaza Level, Pavilion West
Erika Camacho, Massachusetts Institute of Technology and Arizona State University
Mechanical Models for Exudative Retinal Detachments
1:00 p.m. – 1:20 p.m.
Thomas Chou, Department of Biomathematics, UCLA
New Paradigms in Retinal Blood Flow Simulation
1:30 p.m. – 1:50 p.m.
Andrea Dziubek, Mathematics Department, SUNY Institute of Technology
Analytical Mechanics and Evolution of a Detaching Retina
2:00 p.m. – 2:20 p.m.
William J. Bottega, Department of Mechanical and Aerospace Engineering, Rutgers University
Stochastic Modeling of Melanopsin Activation and Deactivation
2:30 p.m. – 2:50 p.m.
Christina Hamlet, Center for Computational Science, Tulane University

INVITED PAPER SESSION
Fast Algorithms on Large Graphs (and Matroids)
1:00 p.m. – 3:45 p.m., Hilton Portland, Plaza Level, Pavilion East
Brigitte Servatius, Worcester Polytechnic Institute;
Martin Milanič, University of Primorska
Pick a Tree, Any Tree
1:00 p.m. – 1:30 p.m.
Gary Gordon, Lafayette College
Multi-Source Spanning Trees of Graphs
1:45 p.m. – 2:15 p.m.
Andrzej Proskurowski, University of Oregon

Large Graphs in Internet Tomography and Cyber Defense
2:30 p.m. – 3:00 p.m.
Randy Paffenroth, Numerica Corporation
Large and Sparse Graphs
3:15 p.m. – 3:45 p.m.
Brigitte Servatius, Worcester Polytechnic Institute

THEMED CONTRIBUTED PAPER SESSION
More Favorite Geometry Proofs
1:00 p.m. – 4:15 p.m., Hilton Portland, Ballroom Level, Galleria I
Sarah Mabrouk, Framingham State University
A Proof of Ptolemy’s Theorem via Inversions
1:00 p.m. – 1:15 p.m.
Deirdre Longacher Smeltzer, Eastern Mennonite University
Archimedes’ Twin Circles in an Arbelos
1:20 p.m. – 1:35 p.m.
Dan C Kemp, South Dakota State University
Euler’s Famous Line: Gateway to The Harmonic 2:1 Centroid Concurrency
1:40 p.m. – 1:55 p.m.
Alvin Swimmer, Arizona State University
Reflections in Geometry
2:00 p.m. – 2:15 p.m.
David Marshall, Monmouth University
Reflections on Reflections
2:20 p.m. – 2:35 p.m.
Thomas Q. Sibley, St. John’s University
The Shortest Path Between Two Points and a Line
2:40 p.m. – 2:55 p.m.
Justin Allen Brown, Olivet Nazarene University
The Perfect Heptagon from the Square Hyperbola
3:00 p.m. – 3:15 p.m.
Genghmun Eng
The Many Shapes of Hyperbolas in Taxicab Geometry
3:20 p.m. – 3:35 p.m.
Ruth I. Berger, Luther College
Geometry Knows Topology: The Gauss-Bonnet Theorem
3:40 p.m. – 3:55 p.m.
Jeff Johannes, SUNY Geneseo
Saturday, August 9  (continued)

Finding the Fermat Point by Physics and by Transformation
4:00 p.m. – 4:15 p.m.
Philip Todd, Saltire Software

THEMED CONTRIBUTED PAPER SESSION
Undergraduate Research in Mathematics: How, When, Why, Part III
1:00 p.m. – 2:35 p.m., Hilton Portland, Ballroom Level, Galleria II

Emek Kose, St. Mary's College of Maryland
Casey Douglas, St. Mary’s College of Maryland
Angela Gallegos, Loyola Marymount University

Four Steps to Undergraduate Research Success!
1:00 p.m. – 1:15 p.m.
Stephan Ramon Garcia, Pomona College

Strategies for Mentoring Undergraduate Research Teams: Lessons Learned from the CURM Model
1:20 p.m. – 1:35 p.m.
Hannah Callender, University of Portland

Research Communities as a Vehicle to Boost Students' Interest in Mathematical Research
1:40 p.m. – 1:55 p.m.
Alessandra Pantano, University of California, Irvine

A Student’s Perspective on Undergraduate Research
2:00 p.m. – 2:15 p.m.
Heather Gronewald, Southwestern University

Engaging Students as Math Researchers
2:20 p.m. – 2:35 p.m.
Violeta Vasilevska Utah Valley University

Mentoring Minority Undergraduate Students in Mathematics at Norfolk State University
2:40 p.m. – 2:55 p.m.
Aprillya Lanz Norfolk State University

Year Long Undergraduate Research at Minimal Cost
3:00 p.m. – 3:15 p.m.
Zsuzsanna Szaniszlo Valparaiso University

Undergraduate Research with Future Teachers
3:20 p.m. – 3:35 p.m.
Saad El-Zanati Illinois State University

Balancing Undergraduate Research While Teaching Four Courses
3:40 p.m. – 3:55 p.m.
Britney Hopkins University of Central Oklahoma
Kristi Karber University of Central Oklahoma

PANEL SESSION
Writing for MAA Journals and Magazines
1:20 p.m. – 2:20 p.m., Hilton Portland, 23rd Floor, Skyline 2

INVITED ADDRESS
Martin Gardner Centennial Lecture
The Magic of Martin Gardner
2:30 p.m. – 3:20 p.m., Hilton Portland, Ballroom Level, Grand Ballroom
Persi Diaconis, Stanford University

MINICOURSE
1. A Beginner’s Guide to the Scholarship of Teaching and Learning in Mathematics (Part B)
3:30 p.m. – 5:30 p.m., Hilton Portland Executive Tower, Salon Ballroom I

MINICOURSE
4. Instructional Supports for Implementing Inquiry-Oriented Curricula for Linear Algebra, Differential Equations, and Abstract Algebra (Part B)
3:30 p.m. – 5:30 p.m., Hilton Portland Executive Tower, Salon Ballroom III

PANEL SESSION
Innovative Curricula for Developmental Mathematics
2:35 p.m. – 3:55 p.m., Hilton Portland, Plaza Level, Broadway III & IV

PANEL SESSION
2:35 p.m. – 3:55 p.m., Hilton Portland, 23rd Floor, Skyline 2

SOCIAL EVENT
Closing Banquet
6:00 p.m. – 9:00 p.m., Hilton Portland, Plaza Level, Pavilion
Emcee: Annalisa Crannell, Franklin & Marshall College
Speaker: Michael Starbird, University of Texas at Austin

Sunday, August 10

SOCIAL EVENT
Willamette Valley Wine Tour
12:30 p.m. – 4:00 p.m., Departs from Hilton Portland Lobby
(Broadway Street Entrance)