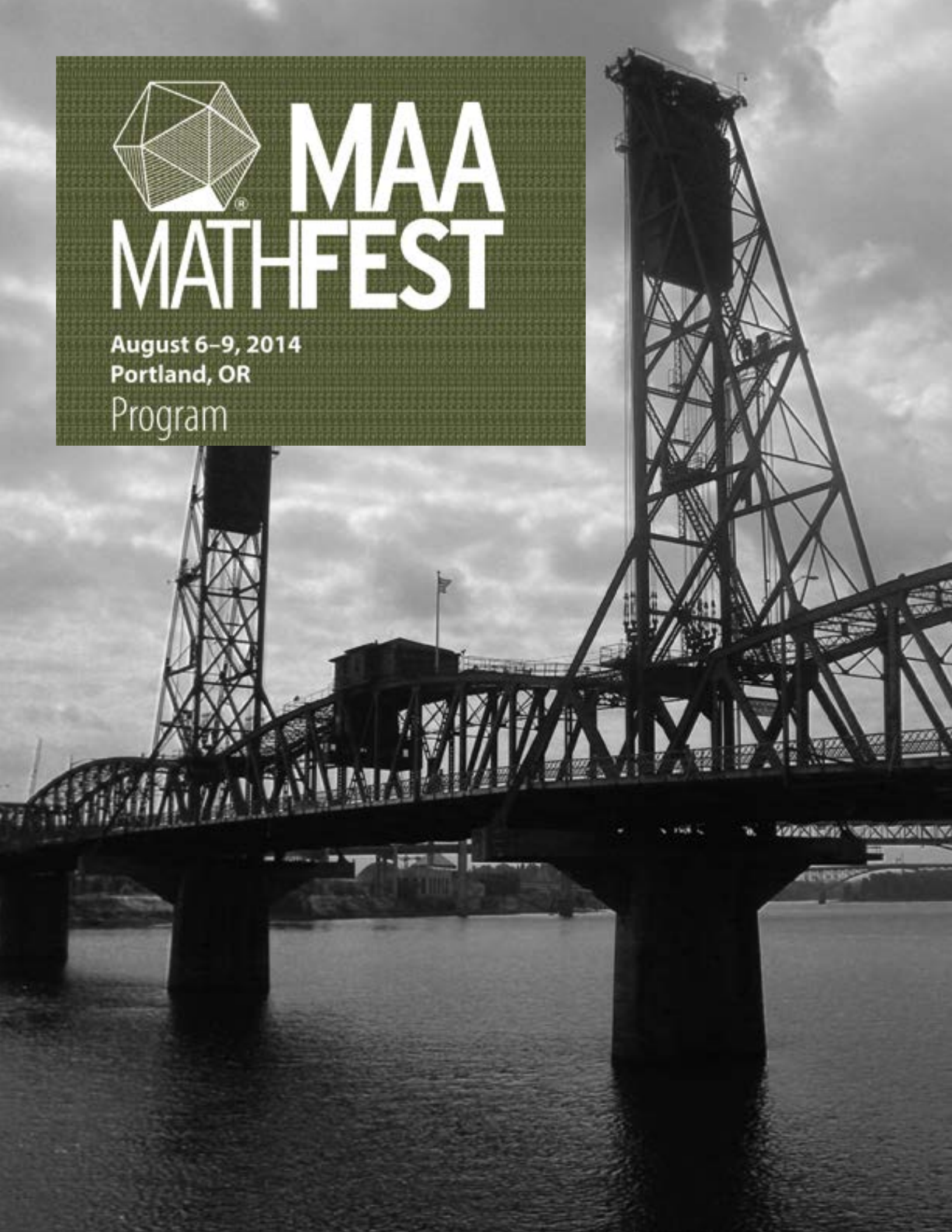

MAA MATHFEST

August 6–9, 2014
Portland, OR

Program

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MAA MATHFEST

WELCOME
TO MAA MATHFEST IN PORTLAND!

MAA committee members and staff have once again developed an exciting and interesting program this year.

MAA MathFest will officially open with the Grand Opening Reception on Wednesday, August 6, from 6:00 to 8:00 p.m., the evening before the scientific program commences on Thursday morning. The reception will take place in the exhibit hall and all registered participants and guests are welcome to attend and enjoy complimentary light hors d'oeuvres and a cash bar while you mingle with other attendees.

The program for this year's MAA MathFest promises to be stimulating and informative. The Hedrick Lectures will be given by Bjorn Poonen, Massachusetts Institute of Technology. His lectures will touch on undecidability in number theory, analysis, and topology. In addition there are numerous other invited lectures covering a wide range of topics in contemporary mathematics. A special feature this year is the Martin Gardner Centennial Lecture by Persi Diaconis. There will also be a number of invited paper sessions involving topics from mathematical epidemiology, connections between logic and arithmetic geometry, computational aspects of algebra, geometry and combinatorics, mathematics of biological fluid dynamics, mathematical modeling of the retina and fast algorithms and matroids. In addition there are eleven different contributed paper sessions, six minicourses, twelve panels, and three workshops. There is also the MAA Prize Session on Thursday. MAA MathFest will conclude on Saturday evening with a Closing Banquet, to which all attendees are invited. It will feature Michael Starbird as the after-dinner speaker and will honor long-time MAA Silver and Gold members.

For students, there are plenty of fun and interesting activities as well. Pi Mu Epsilon is celebrating its centennial and will help kick off MAA MathFest activities by hosting the MAA-PME student reception on Wednesday afternoon at 4:30 p.m. followed immediately by the ever-popular Math Jeopardy. There is also the graduate student reception on Thursday. Jack Graver will give the Jean Bee Chan and Peter Stanek Lecture for Students on Thursday and Keith Devlin will present the Pi Mu Epsilon J. Sutherland Frame Lecture on Friday. In addition there are several panel presentations aimed at students, and numerous student paper sessions on Thursday and Friday, followed by the MAA Ice Cream Social and Award Ceremony on Friday evening and the Student Problem Solving Competition on Saturday.

While Pi Mu Epsilon is a lot "older" than the MAA (well, one year older...), I hope that you will all help celebrate their centennial at the Pi Mu Epsilon Centennial Celebration Banquet on Friday evening before the Frame Lecture. Pi Mu Epsilon was certainly the visionary society that launched undergrad research in mathematics way back when. Indeed, my own very first research paper appeared in the Pi Mu Epsilon Journal (around 1720 or so, if my memory is still working...). The mathematics community owes a lot to the PME folks, so let's celebrate with them in Portland!

Robert L. Devaney
MAA President

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Invited Addresses

EARLE RAYMOND HEDRICK LECTURE SERIES

Lecture 1:

Undecidability in Number Theory

Thursday, August 7, 10:30 a.m. – 11:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Lecture 2:

Undecidability in Analysis and Topology

Friday, August 8, 9:30 a.m. – 10:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Lecture 3:

Undecidability Everywhere

Saturday, August 9, 9:30 a.m. – 10:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Bjorn Poonen, *Massachusetts Institute of Technology*

Hilbert's Tenth Problem asked for an algorithm that, given a multivariable polynomial equation with integer coefficients, would decide whether there exists a solution in integers. Around 1970, Matiyasevich, building on earlier work of Davis, Putnam, and Robinson, showed that no such algorithm exists. But the answer to the analogous question with integers replaced by rational numbers is still unknown, and there is not even agreement among experts as to what the answer should be. Meanwhile, over the past decades, many problems in areas of mathematics other than number theory have also been found to be undecidable. I will present a sampling of these, and discuss a few problems whose undecidability status is not yet known.

Biography: Bjorn Poonen is the Claude Shannon Professor of Mathematics at The Massachusetts Institute of Technology (MIT). He received A.B. and Ph.D. degrees from Harvard and Berkeley, respectively, and held positions at MSRI, Princeton, and Berkeley before moving to MIT in 2008. Poonen's research focuses mainly on number theory and algebraic geometry; in particular, he is interested in the rational number solutions to equations. Poonen is the founding managing editor of Algebra & Number Theory. He is a fellow of the American Academy of Arts and Sciences and of the American Mathematical Society. He has received the Guggenheim, Packard, Rosenbaum, and Sloan fellowships, as well as a Miller Professorship and the 2011 Chauvenet Prize. Earlier, he was a four-time Putnam Competition winner, an International Mathematical Olympiad medalist, and the unique perfect scorer out of 385,000 participants in the 1985 American High School Mathematics Exam. Fifteen mathematicians have completed a Ph.D. thesis under his guidance.

AMS-MAA JOINT INVITED ADDRESS

What is the Value of a Computer Proof in Research and Teaching?

Friday, August 8, 10:30 a.m. – 11:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Sara Billey, *University of Washington*

In this talk, we will introduce some of the history of computer assisted proofs, modern applications, and how you can incorporate this technique into your every day life. Beyond the famous 4-Color Theorem, computer assisted proofs are found in hypergeometric series, geometry of Kepler's conjecture, and algebraic geometry related to Schubert varieties. Each new computer assisted proof adds to our collective repertoire with this relatively new technique. We will talk about some specific easy problems that can be verified by computer and some results in the literature for which no human only proof is known. We will address the important question "What does a computer proof add to our mathematical intuition?" We also will give several suggestions for where computer assisted proofs can be added in the undergraduate curriculum. In the long run, we speculate that computer assisted proofs will be taught right alongside the techniques of induction and proof by contradiction.

Biography: Sara C. Billey is Professor of Mathematics at the University of Washington. She earned her undergraduate degree at MIT and went on to study mathematics at the University of California in San Diego, where she earned MA and Ph.D. degrees in mathematics. Profesor Billey's research specialty is combinatorics. She is known for her contributions on Schubert polynomials, singular loci of Schubert varieties, Kostant polynomials, Kazhdan–Lusztig polynomials often using computer verified proofs. She is a strong advocate of using computers to do research in mathematics, in particular for obtaining data for conjectures and computer verified proofs.

In 2000 Professor Billey received the Presidential Early Career Award for Scientists and Engineers (PECASE). She has also been the recipient of an NSF Career award. In 2012 she became a fellow of the American Mathematical Society.

For more information on Professor Billey, see the delightful prize-winning essay The Most Famous Sara in Mathematics by Rebecca Myers.

Invited Addresses (continued)

MAA INVITED ADDRESS

Understanding Microorganism Swimming using Mathematics

Thursday, August 7, 9:30 a.m. – 10:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Ricardo Cortez, *Tulane University*

Biological fluid flows, like those surrounding moving bacteria and spermatozoa, are generated by viscous forces, which completely dominate inertial effects, so that their dynamics may be modeled as a sequence of steady-state snapshots. Microorganism motility has been an active area of research for the last 60 years motivated by questions like: What are effective locomotion strategies of microorganisms? How do they interact with the surrounding environment? How do microorganisms combine to create patterns of collective motion? What force-generating mechanisms do the organisms use to propel themselves? The only way to answer these questions is through a combination of theory, experiments, mathematical modeling and simulation. We will present recent collaborative mathematical work, some of it done with undergraduate students, that sheds light on these biological systems and challenges ahead.

Biography: Ricardo Cortez received a B.A. in mathematics and a B.S. in mechanical engineering from Arizona State University. He earned a Ph.D. in applied mathematics from the University of California at Berkeley in 1995 and became an NSF postdoctoral fellow and Courant Instructor at New York University. He joined the faculty at Tulane University in 1998, where he is the Pendergraft William Larkin Duren Professor of Mathematics and Director of the Center for Computational Science. Prof. Cortez was the 2012 recipient of the Blackwell-Tapia prize for significant contributions to research and for serving as a role model for mathematical scientists and students from underrepresented minority groups. His research interests include computational mathematics, mathematical biology, modeling, and secondary mathematics education.

MAA INVITED ADDRESS

Mathematical Models of the Retina and In Silico Experiments: Shedding Light on Vision Loss

Saturday, August 9, 10:30 a.m. – 11:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Erika Camacho, *Massachusetts Institute of Technology and Arizona State University*

Mathematical modeling has been used to study diverse biological topics ranging from protein folding to cell interactions to interacting populations of humans but has only recently been used to study the physiology of the eye. In recent years, computer (in silico) experiments have given researchers invaluable insights and in some cases have re-directed experimental research and theory. In this talk I will give a brief overview of the relevant physiology of the eye as it pertains to Retinitis Pigmentosa (RP), a group of inherited degenerative eye diseases that is characterized by the premature death of both rod and cone photoreceptors often resulting in total blindness. With mathematics and in silico experiments, we explore the experimentally observed results highlighting the delicate balance between the availability of nutrients and the rates of shedding and renewal of photoreceptors needed for a normal functioning retina. This work provides a framework for future physiological investigations potentially leading to long-term targeted multi-faceted interventions and therapies dependent on the particular stage and subtype of RP under consideration. The mathematics presented will be accessible to an undergraduate math audience and the biology will be at the level of a novice (and with a little help from Dr. Seuss).

Biography: Erika Tatiana Camacho grew up in East Los Angeles and was taught by Jaime Escalante at Garfield High School. She received her Ph.D. in Applied Mathematics from Cornell University. She has held positions at Los Alamos National Laboratory, Loyola Marymount University, and ASU. She is currently an MLK Visiting Assistant Professor of Mathematics at Massachusetts Institute of Technology (MIT). She co-founded and co-directed the Applied Mathematical Sciences Summer Institute (AMSSI), dedicated to the recruitment of undergraduate women, underrepresented minorities, and those that might not otherwise have the opportunity. Her current research is at the interface of mathematics, biology, physiology, and sociology and involves mathematically modeling degenerative eye diseases, gene networks within yeast, social networks, alcohol effects on a neuron firing, and fungal resistance under selective pressure. Her leadership, scholarship, and mentoring has won her

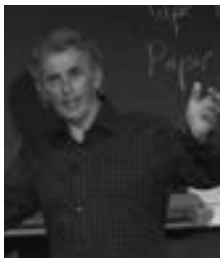
Invited Addresses (continued)

national recognition including the SACNAS Distinguished Undergraduate Mentoring Award in 2012 and the National Hispanic Women Corporation Latina Leadership Award in 2011, recognition as one of 12 Emerging Scholars of 2010 by Diverse: Issues in Higher Education, and a citation for mentoring and guiding undergraduates in research by the U.S. National Security Agency. Some of her local recognitions include the Dr. Manuel Servin Faculty Award for excellence in exemplifying achievement in research, mentorship of Hispanic students, leadership at ASU and in the community in 2013, the New College of Interdisciplinary Arts and Sciences Faculty Service Award in 2013, the 40 Hispanic Leaders Under 40 Award in 2012 and the ASU Faculty Women's Association Outstanding Faculty Mentor Award in 2011.

MAA INVITED ADDRESS

First Person Solvers – Using Video Games to Learn Mathematics and Solve Real Math Problems

Thursday, August 7, 8:30 a.m. – 9:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom



Keith Devlin, *Stanford University*

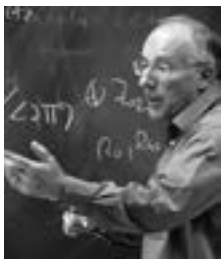
The design of a good interface to an activity can have a significant impact on learning and use. The piano provides a more intuitive and direct interface to music than symbolic musical notation, the Hindu-Arabic numerals revolutionized arithmetic (and with it, trade and commerce), and symbolic algebraic notation was so successful that most people today think the interface is algebra, rather than the mathematical processes the notation represents. Devlin has spent the past several years developing casual games that provide representations of mathematics that enable children (and adults) to learn basic mathematics by "playing", the same way we can learn music by learning to play the piano.

Biography: Keith Devlin is a co-founder and Executive Director of Stanford University's H-STAR institute, a co-founder of the Stanford Media X research network, and a Senior Researcher at CSLI. He is a World Economic Forum Fellow, a Fellow of the American Association for the Advancement of Science, and a Fellow of the American Mathematical Society. His current research is focused on the use of different media to teach and communicate mathematics to diverse audiences. In this connection, he is a co-founder and President of an educational video games company, InnerTube Games. He also works on the design of information/reasoning systems for intelligence analysis. Other research interests include: theory of information, models of reasoning, applications of mathematical techniques in the study of communication, and mathematical cognition. He has written 32 books and over 80 published research articles. Devlin is the Recipient of the Pythagoras Prize, the Peano Prize, the Carl Sagan Award, and the Joint Policy Board for Mathematics Communications Award. In 2003, he was recognized by the California State Assembly for his "innovative work and longtime service in the field of mathematics and its relation to logic and linguistics." He is "the Math Guy" on National Public Radio.

JAMES R. C. LEITZEL LECTURE

Research in Mathematics by Undergraduates: Past, Present, and Future

Saturday, August 9, 8:30 a.m. – 9:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom



Joseph Gallian, *University of Minnesota Duluth*

Although involving undergraduates in research has been a long standing practice in the experimental sciences, it has only been recently that undergraduates have been involved in research in mathematics in significant numbers. In this talk Gallian traces the evolution of research by undergraduates over the past 25 years and the reasons for it. He gives his opinion on what lies ahead over the next ten years.

Biography: Joe Gallian received a Ph.D. from Notre Dame in 1971. He has been at the University of Minnesota Duluth since 1972. He is the author of the book "Contemporary Abstract Algebra" (8th edition) and coauthor of the book "For All Practical Purposes" (9th edition). His research interests include groups, graphs and combinatorics. He has published more than 100 articles and given over 250 invited lectures at colleges, universities and conferences. He has directed summer research programs for undergraduate students since 1977. Over 200 papers written in the program have been published in professional-level research journals. Ten program alumni have received the AMS-MAA-SIAM Morgan Prize for research, 14 have won the Association for Women Alice Schafer Prize, and one hundred and fifteen have received a Ph.D. degree. He has received teaching awards from the Mathematical Association of America, the Carnegie Foundation, and the University of Minnesota. He is past President of the Mathematical Association of America and a Fellow of the American Mathematical Society.

Invited Addresses (continued)

AWM-MAA ETTA Z. FALCONER LECTURE

From Algebraic to Weak Subintegral Extensions in Algebra and Geometry

Friday, August 8, 8:30 a.m. – 9:20 a.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Marie A. Vitulli,
University of Oregon

As students of algebra we quickly learn that for the purpose of solving polynomial equations the field of rational numbers is inadequate. We soon become acquainted with algebraic extensions of the rationals and later in our studies meet the fields of algebraic numbers, real numbers, and complex numbers, the latter as the algebraic closure of the real field.

As students of commutative algebra we learn about integral extensions of rings and their properties and consequences in the study of algebraic varieties and schemes. Again, for some purposes, integral extensions do not accomplish all that we had hoped for. Much more recently geometers and algebraists introduced the twin theories of weak normality and seminormality for commutative rings and algebraic varieties to address some of these deficiencies.

In this talk we outline the history of the twin theories with an emphasis on the recent developments in the area over the past fifteen years. For clarity of exposition we will focus our attention on the characteristic 0 case where the theories merge into one.

Biography: Marie A. Vitulli is Professor Emerita of Mathematics at the University of Oregon. She received her B.A. degree with highest distinction from the University of Rochester and her M.A. and Ph.D. degrees from the University of Pennsylvania. Upon completing the Ph.D. degree Dr. Vitulli joined the faculty at the University of Oregon and remained there for her entire academic career. Dr. Vitulli has made original and important contributions to commutative algebra and its interactions with algebraic geometry. Over her long career she has worked tirelessly for the advancement of women in mathematics. Prof. Vitulli has published numerous research articles and book chapters and has lectured on her work throughout the United States, Europe, and South Africa.

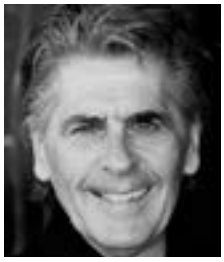
After her early work in deformation theory Vitulli turned her attention to the study of seminormality and weak normality for commutative rings and algebraic varieties. In a series of papers with her colleague John V. Leahy, she developed fundamental properties of seminormality and made connections to the theory of weakly normal complex analytic spaces. More recently Vitulli discovered an elegant new element-wise criterion for weak subintegrality. Along with her colleague D.K. Harrison, she developed a unified valuation theory for rings with zero divisors that generalized both Krull and Archimedean valuations.

While at Oregon, Dr. Vitulli worked in many ways to improve opportunities for women in mathematics. She was involved in the creation and administration of a scholarship program for undergraduate women in mathematics and the physical sciences. Professor Vitulli created and maintains the award-winning website Women in Math Web Project.

PI MU EPSILON J. SUTHERLAND FRAME LECTURE

Fibonacci and the First Personal Computing Revolution

Friday, August 8, 8:00 p.m. – 8:50 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom



Keith Devlin, *Stanford University*

The first personal computing revolution took place not in Silicon Valley in the 1980s but in Pisa in the 13th Century. The medieval counterpart to Steve Jobs was a young Italian called Leonardo, better known today by the nickname Fibonacci. Thanks to a recently discovered manuscript in a library in Florence, the story of how this genius, about whom we know so little, came to launch the modern commercial world can now be told.

Based on Devlin's book *The Man of Numbers: Fibonacci's Arithmetical Revolution* (Walker & Co, July 2011) and his co-published companion e-book *Leonardo and Steve: The Young Genius Who Beat Apple to Market by 800 Years*.

Biography: Keith Devlin is a co-founder and Executive Director of Stanford University's H-STAR institute, a co-founder of the Stanford Media X research network, and a Senior Researcher at CSLI. He is a World Economic Forum Fellow, a Fellow of the American Association for the Advancement of Science, and a Fellow of the American Mathematical Society. His current research is focused on the use of different media to teach and communicate mathematics to diverse audiences. In this connection, he is a co-founder and President of an educational video games company, InnerTube Games. He also works on the design of information/reasoning systems for intelligence analysis. Other research interests include:

Invited Addresses (continued)

theory of information, models of reasoning, applications of mathematical techniques in the study of communication, and mathematical cognition. He has written 32 books and over 80 published research articles. Recipient of the Pythagoras Prize, the Peano Prize, the Carl Sagan Award, and the Joint Policy Board for Mathematics Communications Award. In 2003, he was recognized by the California State Assembly for his "innovative work and longtime service in the field of mathematics and its relation to logic and linguistics." He is "the Math Guy" on National Public Radio.

THE JEAN BEE CHAN AND PETER STANEK LECTURE FOR STUDENTS

The Founding of Pi Mu Epsilon 100 Years Ago

Thursday, August 7, 1:00 p.m. – 1:50 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom I

Jack Graver, *Syracuse University*

On December 8, 1913, the Mathematical Club of Syracuse University met on the 10th anniversary of it's founding. Miss Florence Richert presented the paper 'The Evaluation and Transcendence of Pi.' Discussion followed the reading of the paper. There was a short business meeting before refreshments at which "Dr. Roe gave the report of committee appointed to consider changing the Club into a Mathematical Fraternity." The decision was made to proceed with this project and during the Spring semester of 1914 the details were worked out and PME was incorporated in New York State.

What did they want to accomplish by taking this action? What was the background against which the decision to found PME was made? Using the Archives of Syracuse University and the detailed notes left by the founders, I hope to answer these questions and to develop an understanding of the historical context in which PME was born.

NAM DAVID HAROLD BLACKWELL LECTURE

Markov Decision Processes, Turnpike Horizons and Blackwell Optimality

Friday, August 8, 1:00 p.m. – 1:50 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom I

Mark Lewis, *Cornell University*

A Markov decision process (MDP) is defined by the 5-tuple: the time horizon, a state space, a transition matrix (of a Markov chain), a control or action space, and a cost or reward function. Together, this constitutes a mathematical construct for optimizing dynamic decision-making under uncertainty. In this talk, we outline the components of an MDP, discuss classic results of Blackwell, then show how Blackwell's optimality criterion can be used in controlled queueing systems and for the development of turnpike horizons.

MARTIN GARDNER CENTENNIAL LECTURE

The Magic of Martin Gardner

Saturday, August 9, 2:30 p.m. – 3:20 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom

Persi Diaconis, *Stanford University*

Martin Gardner somehow managed to make mathematical ideas come alive to the broadest spectrum, from runaway teenagers to homemakers to professional mathematicians. The question is "How did he do it?" Along the way he exposed fake mediums, elucidated Alice in Wonderland, wrote awful poetry, and explained magic tricks. One recurrent theme in his writing:He thought that tricks, riddles, and jokes should be woven into our teaching. Neither the education establishment nor the upper crust of mathematicians seems to agree. I'll try to bring all of this to life. But, beware, as someone once wrote:

"Warning: Martin Gardner has caused dozens of innocent youngsters to become professional mathematicians and thousands of professional mathematicians to become innocent youngsters."

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Invited Paper Sessions

Mathematical Epidemiology

Thursday, August 7, 1:00 p.m. – 3:50 p.m.
Hilton Portland, Plaza Level, Pavilion East

Mathematical Epidemiology has grown at an accelerated pace over the last two decades through the integration of mathematical models, available data, computational methods and fieldwork. Successful epidemiological models are validated using parameters from particular epidemics, can predict likely outcomes of an epidemic, and can be used to propose specific interventions strategies. Modern epidemiological models involve temporal and spatial features, age structure, transmission across networks or patches, deterministic and stochastic elements, seasonality, ecological factors, and more. The inclusion of these features also calls for new mathematical analysis of the models. This session features expository presentations covering a variety of aspects of modern Mathematical Epidemiology.

Ricardo Cortez, *Tulane University*

Comparing Risk for Chikungunya and Dengue Emergence Using Mathematical Models
1:00 p.m. – 1:20 p.m.
Carrie Manore, *Tulane University*

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.
Paul Hurtado, *Mathematical Biosciences Institute*

Determining Causal Networks in Nonlinear Dynamical Systems: Ecosystem Applications
2:00 p.m. – 2:20 p.m.
Bree Cummins, *Montana State University*

Epidemic Forecasting and Monitoring using Modern Data Assimilation Methods
2:30 p.m. – 2:50 p.m.
Kyle Hickmann, *Los Alamos and Tulane University*

Qualitative Inverse Problems using Bifurcation Analysis in the Recurrent Neutral Network Model
3:00 p.m. – 3:20 p.m.
Stephen Wirkus, *Arizona State University*

Mathematics of Planet Earth 2013+: Management of Natural Resources
3:30 p.m. – 3:50 p.m.
Abdul-Aziz Yakubu, *Howard University*

Connections between Logic and Arithmetic Geometry

Thursday, August 7, 1:45 p.m. – 3:45 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom II

In the past few years, ideas from model theory and computability theory, branches of logic, have led to proofs of new results in arithmetic geometry. Sometimes these ideas from logic serve as inspiration by analogy; other times they are directly used in the proofs. The proposed session will consist of survey talks by experts, suitable for a broad audience.

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 Deept 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*

Computational Aspects of Algebra, Geometry and Combinatorics

Friday, August 8, 1:00 p.m. – 5:15 p.m.
Hilton Portland, Plaza Level, Pavilion West

This session will highlight recent advances in mathematics inspired by experimental and computational aspects of research. The talks will be in areas of combinatorics and probability related to algebra and geometry. This is a highly active area of research, which often lends itself to interesting talks accessible to a wide audience.

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*

Invited Paper Sessions (continued)

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*

The Mathematics of Biological Fluid Dynamics

Friday, August 8, 2:00 p.m. – 4:50 p.m.
Hilton Portland, Plaza Level, Pavilion East

One exciting area of mathematical research within Mathematical Biology is "biological fluid dynamics," which consists of explaining and understanding the interaction of fluids and living organisms. This includes the motion of microorganisms such as bacteria and algae, cell motion, the fluid flow in the respiratory and cardiovascular systems, flying and swimming, and much more. The research problems are inspired by the need to understand basic functions of life, such as reproduction, growth, feeding, and locomotion. The mathematics of biological fluid dynamics involves developing theory, creating models, and designing computational methods for numerical simulations of the systems being investigated. This is typically done in collaboration with experimentalists and other scientists. This expository session highlights a variety of applications of the mathematics behind biological fluid dynamics and identifies current research questions in this area.

Ricardo Cortez, *Tulane University*

Neuromechanics and Fluid Dynamics of an Undulatory Swimmer
2:00 p.m. – 2:20 p.m.
Lisa Fauci, *Tulane University*

Mathematical Modeling of Sperm Motility and Mucociliary Transport
2:30 p.m. – 2:50 p.m.
Robert Dillon, *Washington State University*

Modeling E. Coli Aspartate Chemotaxis in a Stokes Flow
3:00 p.m. – 3:20 p.m.
Hoa Nguyen, *Trinity University*

Modeling Interactions between Tumor Cells, Interstitial Fluid and Drug Particles
3:30 p.m. – 3:50 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. – 4:20 p.m.
Julie Simons, *Tulane University*

Swimming through Heterogeneous Viscoelastic Media
4:30 p.m. – 4:50 p.m.
Jacek Wrobel, *Tulane University*

The Eyes Have It: Mathematical Modeling of the Retina

Saturday, August 9, 1:00 p.m. – 2:50 p.m.
Hilton Portland, Plaza Level, Pavilion West

Models of the retina are crucial in understanding various retinal diseases and abnormalities that contribute to blindness such as myopia, glaucoma, retinitis pigmentosa, and others. In this session speakers will present mathematical models of retinal detachment, retinal blood flow, and melanopsin activation and inactivation. Utilizing a diverse set of mathematical techniques, analysis, and computer simulations from dynamical systems, numerical analysis, and stochastic processes these models investigate complex retinal process including elevated ocular pressure and forces from retinal adhesion, retinal pigment epithelium pumps, and retinal elasticity leading to retinal detachment, alterations in ocular curvature caused by a reduction retinal blood flow, and the chemical reaction associated with non-image forming process in the retina.

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*

Invited Paper Sessions (continued)

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*

Fast Algorithms on Large Graphs (and Matroids)

Saturday, August 9, 1:00 p.m. – 3:45 p.m.
Hilton Portland, Plaza Level, Pavilion East

Very large graphs, such as the internet, have become part of our daily routine. Quite naturally they pose new challenges for the mathematician. What are the methods and tools to find out something about a structure so large that we cannot know all of it? Being greedy seems a successful real life strategy familiar to most of us. Matroids are the most general structures on which the greedy algorithm finds a basis. Communications networks, such as the internet, organic molecules, quasicrystals, etc. are modeled by large graphs. The coarsest analysis uses the matroid structure only. However, in a general geometric setting many problems become hard. For example, connectivity augmentation can be solved efficiently on matroids, but becomes NP-hard for geometric planar graphs, even on trees. The purpose of this session is to identify graph properties relevant to current applications and their complexity behaviour as the setting is changed from matroid to graphs and geometric graphs. Speakers will direct their talks on this rapidly developing topic to a general audience.

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 Sessions

Undergraduate Research Activities in Mathematical and Computational Biology, Part I & II

Part I: Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, Plaza Level, Broadway I & II
Part II: Friday, August 8, 8:30 a.m. – 10:25 a.m.
Hilton Portland, Plaza Level, Broadway I & II

This session is dedicated to aspects of undergraduate research in mathematical and computational biology. First and foremost, this session would like to highlight research results of projects that either were conducted by undergraduates or were collaborations between undergraduates and their faculty mentors. Of particular interest are those collaborations that involve students and faculty from both mathematics and biology. Secondly, as many institutions have started undergraduate research programs in this area, frequently with the help of initial external funding, the session is interested in the process and logistics of starting a program and maintaining a program even after the initial funding expires. Important issues include faculty development and interdisciplinary collaboration, student preparation and selection, the structure of research programs, the acquisition of resources to support the program, and the subsequent achievements of students who participate in undergraduate research in mathematical and computational biology.

Timothy Comar, *Benedictine University*

Sponsored by SIGMAA on Mathematical and Computational Biology (BIO SIGMAA)

Mathematics in Honors Programs

Thursday, August 7, 1:00 p.m. – 3:55 p.m.
Hilton Portland, Plaza Level, Broadway I & II

Honors Colleges and Programs look for unique opportunities to reach out to bright and capable students who may not be mathematics majors. This session will focus on courses, strategies, or activities, that have been used for non major mathematics classes designed for honors students. Speakers should provide evidence of the success of and/or challenges involved with the courses they have taught.

Jacci White, *Saint Leo University*

Undergraduate Research in Mathematics: How, When, Why, Part I, II, & III

Part I: Thursday, August 7, 1:00 p.m. – 3:55 p.m.
Hilton Portland, Ballroom Level, Galleria II
Part II: Saturday, August 8, 8:30 a.m. – 11:25 a.m.
Hilton Portland, Ballroom Level, Galleria II
Part III: Saturday, August 9, 1:00 p.m. – 3:55 p.m.
Hilton Portland, Ballroom Level, Galleria II

Opportunities for undergraduate research have increased dramatically in recent years. There are many benefits of doing and guiding undergraduate research. We invite talks on a range of topics including, but not limited to: involving students in mathematics research, reports on successful programs, how to set up programs, and research results. We are especially interested in presentations from mentors and program directors about how programs are run and evidence of their effectiveness. We also welcome presentations from students focused on their experience and learning outcomes (talks about their research results should be submitted to other sessions). This session seeks to expand the network of undergraduate researchers and facilitators, exchange new ideas, and help make undergraduate research more accessible.

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

Embodied Activities in the Teaching and Learning of Mathematics

Thursday, August 7, 1:00 p.m. – 4:55 p.m.
Hilton Portland, Ballroom Level, Parlor AB

In layman's terms we might describe embodied activities as events that connect cognition with action. In other words, these are tasks, where a student is physically and mentally engaged in a cognitive task designed to result in learning. These tasks are created so that students are the mathematics. Many hypothesize that manipulatives "work" because they provide an atmosphere where students are engaged in actions that assist in constructing mathematical concepts. Similarly, incorporating embodied activities into the classroom has proved fruitful not only with prospective teachers but with undergraduate mathematics majors who are learning related rates, geometric concepts, and proof constructions. Furthermore, they can serve as an entry point to inquiry-based learning because embodied activities go beyond communicating, writing, reading, and reflecting. The purpose of this session is to share activities that require students to be physically engaged in learning all levels of mathematics, particularly undergraduate mathematics.

Themed Contributed Paper Sessions (continued)

Submitted abstracts should include the goals of the activity, description of the activity with details connecting the mathematics with the actions, and strengths and weaknesses of the activity. We encourage presentations that are audience-interactive, so that they may experience the activity in action. Talks that focus on general active learning strategies with little or no connections between cognition and physical action should submit talk proposals to the Active Learning in Mathematics contributed session.

Hortensia Soto-Johnson, *University of Northern Colorado*

Sponsored by MAA Committee on Professional Development

Recreational Mathematics: New Problems and New Solutions, Part I & II

Part I: Thursday, August 7, 1:00 p.m. – 4:55 p.m.
Hilton Portland, Plaza Level, Pavilion West
Part II: Friday, August 8, 1:00 p.m. – 4:55 p.m.
Hilton Portland, Ballroom Level, Galleria I

As with all mathematics, recreational mathematics continues to expand through the solution of new problems and the development of novel solutions to old problems. For the purposes of this session, the definition of recreational mathematics will be a broad one. The primary guideline used to determine the suitability of a paper will be the understandability of the mathematics. Papers submitted to this session should be accessible to undergraduate students. Novel applications as well as new approaches to old problems are welcome. Examples of use of the material in the undergraduate classroom are encouraged.

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

Flipping Pedagogy in College Mathematics Courses, Part I & II

Part I: Thursday, August 7, 1:00 p.m. – 5:35 p.m.
Hilton Portland, Plaza Level, Broadway III & IV
Part II: Friday, August 8, 8:30 a.m. – 11:45 a.m.
Hilton Portland, Ballroom Level, Parlor AB

While the expression "flipping a course" is relatively new, this pedagogical strategy has been around for a number of years. Some tenets that underlie this type of pedagogy are that: (1) out-of-class time should be highly structured to best prepare students for in-class activities; (2) it is useful to evaluate students' pre-class preparation and for instructors to have access to this information; (3) class time is better spent having students engage in cooperative problem solving and discussions rather than listening and taking notes; and, (4) students benefit from more frequent structured practice and feedback in the classroom from a knowledgeable teacher. In this session participants will present and discuss examples of flipped mathematics courses and share the benefits and challenges of this type of pedagogy. Descriptions of unique models of flipped classes are welcome as are results of research on flipping pedagogy.

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*

Active Learning in Mathematics, Part I & II

Part I: Friday, August 8, 8:30 a.m. – 11:25 a.m.
Hilton Portland, Ballroom Level, Galleria II
Part II: Friday, August 8, 1:00 p.m. – 4:55 p.m.
Hilton Portland, Ballroom Level, Galleria II

Active learning is the process where students engage in activities such as reading, writing, or problem solving that encourage analysis, synthesis, and evaluation of class content. It has been well-known that active learning strategies increase student learning and have long- lasting effects on student success (Braxton, et al, 2008). For this session, we invite instructors of mathematics to discuss ways to promote this hands-on learning in the classroom. In particular, techniques that involve short reading, writing, or problem-solving prompts and exercises that are designed to reinforce classroom material are encouraged. Both examples of individual student active learning strategies and successful uses of group- related strategies (such as "think, pair, share" ideas) are welcome. The session is designed for instructors to share their experiences and provide useful tips and tricks on implementing these strategies and overcoming obstacles to active learning in general. Examples and ideas can come from any type of course, from undergraduate non-major service courses and early- major mathematics courses to late-major and even graduate-level classes. Speakers are encouraged to include assessment data on the effectiveness of their active learning strategies or empirical feedback from students and/or faculty about their strategies. Talks that focus on embodied activities that connect cognition with physical action in the classroom should submit talk proposals to the Embodied Activities in the Teaching and Learning of Mathematics session.

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

Themed Contributed Paper Sessions (continued)

Project-Based Curriculum, Part I & II

Part I: Friday, August 8, 8:50 a.m. – 11:25 a.m.
Hilton Portland, Plaza Level, Broadway III & IV
Part II: Friday, August 8, 1:00 p.m. – 3:55 p.m.
Hilton Portland, Plaza Level, Broadway III & IV

One of the goals of mathematics teaching is enabling the learner to apply their mathematical knowledge to other disciplines and to real-world problems. One method to achieve this goal is project-based learning, which involves students attempting to solve interdisciplinary problems arising outside of the traditional classroom. The problems may arise from general social concerns or from within business, non-profit, or government organizations. Project-based learning can encourage inquiry, problem solving, collaboration, reasoning, and communication skills. We invite papers that address how project-based learning is facilitated at any level and the content of such projects. Evidence should be included as to the effectiveness of such projects and/or the system by which students engage in such projects.

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

Open and Accessible Problems in Real or Complex and Analysis

Friday, August 8, 1:00 p.m. – 2:55 p.m.
Hilton Portland, Plaza Level, Broadway I & II

Undergraduate research is more popular than ever, and there is a high demand for open and accessible problems for students to tackle. Analysis is an area particularly suited for this research because it builds off of the foundational material that students learn in calculus. In addition, analysis is rich with problems that are easily stated, but more difficult to solve, and often lead to further questions for investigation. We invite presentations about open problems in real or complex analysis suitable for undergraduate research or joint faculty and undergraduate research. Presentations concerning results about these types of problems, preferably with open questions remaining, are also welcome.

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

Curriculum Development to Support First Year Mathematics Students, Part I, II & III

Part I: Friday, August 8, 1:00 p.m. – 4:55 p.m.
Hilton Portland, Ballroom Level, Parlor AB
Part II: Saturday, August 9, 8:30 a.m. – 11:45 a.m.
Hilton Portland, Ballroom Level, Parlor AB
Part III: Saturday, August 9, 1:00 p.m. – 2:35 p.m.
Hilton Portland, Ballroom Level, Parlor AB

A common focus of university administration is student retention and graduation. First year mathematics courses, both general education and major specific, have comparatively high drop/fail/withdraw rates. This means that they are often scrutinized in regard to their effect on retention and graduation rates. In this session, we would like to hear what you have been doing to respond to this scrutiny. We hope to focus on departmental-wide efforts, rather than specific classroom approaches. Presentations could include complete course redesign, co-requisite support courses, restructure of curriculum, departmental efforts to standardize, etc. Note that we would like to hear about successful, in process, and unsuccessful initiatives. Presentations that include a description of the initiative along with data supporting the success or failure of these initiatives are especially encouraged.

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

More Favorite Geometry Proofs

Saturday, August 9, 1:00 p.m. – 4:15 p.m.
Hilton Portland, Ballroom Level, Galleria I

This session invites presenters to share their favorite undergraduate geometry proofs. These proofs should be suitable for Euclidean and non-Euclidean geometry courses as well as for courses frequently referred to as "modern" or "higher" geometry but not those related to differential geometry or (low-level) graduate courses. Proofs must be for theorems other than the Pythagorean Theorem and should be different from those presented during the MAA MathFest 2013 paper session (see http://www.framingham.edu/~smabrouk/Maa/mathfest2013/ for more information). Presenters must do the full proof, discuss how the proof fits into the course, provide information regarding prerequisite topics for the proof, and discuss associated areas with which students have difficulty and how such concerns are addressed so that students understand the proof. Presenters are invited to discuss how they have modified the proof over time as well as to share historical information for "classic" proofs and explorations/demonstrations that they use to help students understand the associated theorem. Abstracts should include the theorem to be proved/discussed as well as brief background information.

Sarah Mabrouk, *Framingham State University*

Come by Thursday, August 7 at 2:30 p.m. and enjoy a sweet treat with us.

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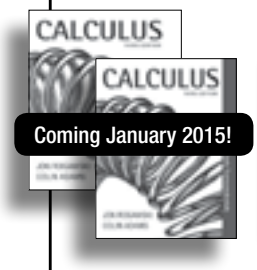

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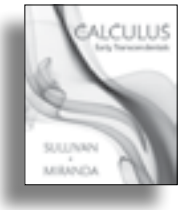

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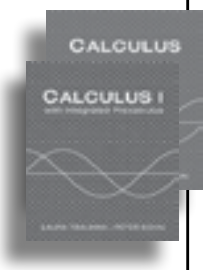

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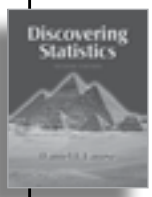

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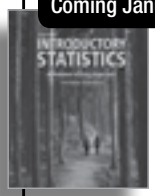

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General Contributed Paper Sessions

Organized by **Lynette Boos**, *Providence College* and **Susan Callahan**, *Cottey College*

Probability or Statistics

Thursday, August 7, 8:30 a.m. – 9:55 a.m.
Hilton Portland, Ballroom Level, Galleria III

Assorted Teaching Topics

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, Ballroom Level, Parlor AB

Interdisciplinary Topics in Mathematics

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, Ballroom Level, Parlor C

Modeling or Applications

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, Plaza Level, Broadway III & IV

Assorted Mathematics Research Topics

Thursday, August 7, 1:00 p.m. – 4:25 p.m.
Hilton Portland, Ballroom Level, Parlor C

Teaching or Learning Introductory Mathematics

Thursday, August 7, 1:00 p.m. – 5:25 p.m.
Hilton Portland, Ballroom Level, Galleria III

Mathematics and Technology

Friday, August 8, 8:30 a.m. – 11:40 a.m.
Hilton Portland, Ballroom Level, Galleria III

Teaching or Learning Calculus

Friday, August 8, 8:30 a.m. – 11:55 a.m.
Hilton Portland, Ballroom Level, Parlor C

Mentoring

Friday, August 8, 1:00 p.m. – 2:25 p.m.
Hilton Portland, Ballroom Level, Galleria III

Outreach

Friday, August 8, 1:00 p.m. – 2:25 p.m.
Hilton Portland, Ballroom Level, Parlor C

Research in Applied Mathematics

Friday, August 8, 3:00 p.m. – 4:55 p.m.
Hilton Portland, Ballroom Level, Parlor C

Research in Graph Theory or Combinatorics

Friday, August 8, 3:00 p.m. – 5:10 p.m.
Hilton Portland, Ballroom Level, Galleria III

Research in Analysis

Saturday, August 9, 8:30 a.m. – 9:25 a.m.
Hilton Portland, Ballroom Level, Parlor C

Teaching or Learning Developmental Mathematics

Saturday, August 9, 8:30 a.m. – 9:25 a.m.
Hilton Portland, Ballroom Level, Galleria III

Research in Algebra

Saturday, August 9, 8:30 a.m. – 11:10 a.m.
Hilton Portland, Plaza Level, Broadway I & II

Research in Number Theory

Saturday, August 9, 8:30 a.m. – 11:10 a.m.
Hilton Portland, Ballroom Level, Galleria I

Research in Geometry

Saturday, August 9, 10:00 a.m. – 11:10 a.m.
Hilton Portland, Ballroom Level, Parlor C

Assessment

Saturday, August 9, 10:30 a.m. – 11:25 a.m.
Hilton Portland, Ballroom Level, Galleria III

History or Philosophy of Mathematics

Saturday, August 9, 1:00 p.m. – 2:55 p.m.
Hilton Portland, Ballroom Level, Galleria III

Teaching or Learning Advanced Mathemathics

Saturday, August 9, 1:00 p.m. – 3:55 p.m.
Hilton Portland, Ballroom Level, Parlor C

SIGMAA Activities

The following is a list of activities at MathFest 2014 that are sponsored by SIGMAAs. Full descriptions of the sessions may be found elsewhere in the program or online at http://maa.org/meetings/mathfest/program-details/2014/sigmaa-activities

SIGMAA QL: SIGMAA on Quantitative Literacy

Reception

Thursday, August 7, 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

Thursday, August 7, 6:00 p.m. – 7:00 p.m.
Hilton Portland, Plaza Level, Broadway I & II

POM SIGMAA: SIGMAA on the Philosophy of Mathematics

Reception

Thursday, August 7, 5:30 – 6:00 p.m.
Hilton Portland, Ballroom Level, Galleria I

Guest Lecture: Math-Speak: Syntax, Semantics, and Pragmatics

Thursday, August 7, 6:00 p.m. – 6:50 p.m.
Hilton Portland, Ballroom Level, Galleria I

SIGMAA MCST: SIGMAA on Math Circles for Students and Teachers

Math Circle Demonstration

Saturday, August 9, 9:00 a.m. – 9:55 a.m.
Hilton Portland, Plaza Level, Pavilion East

Math Wrangle

Saturday, August 9, 10:30 a.m. – 11:25 a.m.
Hilton Portland, Plaza Level, Pavilion East

PANEL SESSION

Problems Well-Suited for Math Circles

Friday, August 8, 2:35 p.m. – 3:55 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom II

BIO SIGMAA: SIGMAA on Mathematical and Computational Biology

CONTRIBUTED PAPER SESSION

Undergraduate Research Activities in Mathematical and Computational Biology, Part I and Part II

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, Plaza Level, Broadway 1 & II

Friday, August 8, 8:30 a.m. – 10:25 a.m.
Hilton Portland, Plaza Level, Broadway 1 & II

WEB SIGMAA: SIGMAA on Mathematics Instruction using the Web

PANEL DISCUSSION

Open Source Resources for Mathematics: Benefits and Costs

Friday August 8, 1:00 p.m. – 2:20 p.m.
Hilton Portland, 23rd Floor, Skyline 2

Business Meeting

Friday, August 8, 5:30 p.m. – 5:50 p.m.
Hilton Portland, Ballroom Level, Parlor AB

Discussion

What Are Effective Online Homework Problems in Mathematics?

Friday, August 8, 6:00 p.m. – 7:00 p.m.
Hilton Portland, Ballroom Level, Parlor AB

Undergraduate Student Activities

MAA-PME Student Reception

Wednesday, August 6, 4:30 p.m. – 5:30 p.m.
Hilton Portland, Plaza Level, Pavilion East

Math Jeopardy

Wednesday, August 6, 5:30 p.m. – 6:15 p.m.
Hilton Portland, Plaza Level, Pavilion East

Answer: A fun undergraduate mathematics contest to lead off MathFest.

Question: What is Mathematics Jeopardy?

Four teams of students will provide the questions to go with the mathematical answers in many categories.

New Format This Year: All interested students in the audience can enter their names to be chosen to play on one of the four teams of four players. There will be prizes for all the participants.

Come cheer for your favorite team. The session will be emceed by Michael Berry.

Organizers:
Robert Vallin, *Lamar University*
Michael Berry, *University of Tennessee*

MAA Student Paper Sessions

MAA Student Paper Session #1

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, 3rd Floor, Forum Suite

MAA Student Paper Session #2

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, 3rd Floor, Council Suite

MAA Student Paper Session #3

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, 3rd Floor, Directors Suite

MAA Student Paper Session #4

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, 3rd Floor, Studio Suite

MAA Student Paper Session #5

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, 3rd Floor, Executive Suite

MAA Student Paper Session #6

Thursday, August 7, 8:30 a.m. – 10:25 a.m.
Hilton Portland, 3rd Floor, Senate Suite

MAA Student Paper Session #7

Thursday, August 7, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Forum Suite

MAA Student Paper Session #8

Thursday, August 7, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Council Suite

MAA Student Paper Session #9

Thursday, August 7, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Directors Suite

MAA Student Paper Session #10

Thursday, August 7, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Studio Suite

MAA Student Paper Session #11

Thursday, August 7, 4:00 p.m. – 6:15 p.m.
Hilton Portland, 3rd Floor, Forum Suite

MAA Student Paper Session #12

Thursday, August 7, 4:00 p.m. – 6:15 p.m.
Hilton Portland, 3rd Floor, Council Suite

MAA Student Paper Session #13

Thursday, August 7, 4:00 p.m. – 6:15 p.m.
Hilton Portland, 3rd Floor, Directors Suite

MAA Student Paper Session #14

Thursday, August 7, 4:00 p.m. – 6:15 p.m.
Hilton Portland, 3rd Floor, Studio Suite

MAA Student Paper Session #15

Friday, August 8, 8:30 a.m. – 11:45 a.m.
Hilton Portland, 3rd Floor, Forum Suite

MAA Student Paper Session #16

Friday, August 8, 8:30 a.m. – 11:45 a.m.
Hilton Portland, 3rd Floor, Council Suite

MAA Student Paper Session #17

Friday, August 8, 8:30 a.m. – 11:45 a.m.
Hilton Portland, 3rd Floor, Directors Suite

MAA Student Paper Session #18

Friday, August 8, 8:30 a.m. – 11:45 a.m.
Hilton Portland, 3rd Floor, Studio Suite

Organizers:
Theron J. Hitchman, *University of Northern Iowa*
Jennifer Bergner, *Salisbury University*

Pi Mu Epsilon Student Paper Sessions

PME Student Paper Session #1

Thursday, August 7, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Executive Suite

PME Student Paper Session #2

Thursday, August 7, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Senate Suite

PME Student Paper Session #3

Thursday, August 7, 4:00 p.m. – 6:15 p.m.
Hilton Portland, 3rd Floor, Executive Suite

PME Student Paper Session #4

Thursday, August 7, 4:00 p.m. – 6:15 p.m.
Hilton Portland, 3rd Floor, Senate Suite

PME Student Paper Session #5

Friday, August 8, 8:30 a.m. – 11:45 a.m.
Hilton Portland, 3rd Floor, Executive Suite

PME Student Paper Session #6

Friday, August 8, 8:30 a.m. – 11:45 a.m.
Hilton Portland, 3rd Floor, Senate Suite

PME Student Paper Session #7

Friday, August 8, 8:30 a.m. – 12:05 p.m.
Hilton Portland, 23rd Floor, Skyline 2

PME Student Paper Session #8

Friday, August 8, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Executive Suite

PME Student Paper Session #9

Friday, August 8, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Senate Suite

PME Student Paper Session #10

Friday, August 8, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Forum Suite

PME Student Paper Session #11

Friday, August 8, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Council Suite

Undergraduate Student Activities (continued)

PME Student Paper Session #12

Friday, August 8, 2:00 p.m. – 3:55 p.m.
Hilton Portland, 3rd Floor, Directors Suite

Organizer:
Angela Spalsbury, *Youngstown State University*

Student Hospitality Center

Thursday, August 7, 9:00 a.m. – 5:00 p.m.
Hilton Portland, Exhibit Hall

Friday, August 8, 9:00 a.m. – 5:00 p.m.
Hilton Portland, Exhibit Hall

Saturday, August 9, 9:00 a.m. – 12:30 p.m.
Hilton Portland, Exhibit Hall

The Student Hospitality Center provides a place for students and other MAA MathFest attendees to meet for informal conversation, refreshments, and mathematical diversions.

Organizers:
Richard Neal, *American Society for the Communication of Mathematics*
Araceli Neal, *American Society for the Communication of Mathematics*

THE JEAN BEE CHAN AND PETER STANEK LECTURE FOR STUDENTS

The Founding of Pi Mu Epsilon 100 Years Ago

Thursday, August 7, 1:00 p.m. – 1:50 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom I

Jack Graver, *Syracuse University*

On December 8, 1913, the Mathematical Club of Syracuse University met on the 10th anniversary of it's founding. Miss Florence Richert presented the paper 'The Evaluation and Transcendence of Pi.' Discussion followed the reading of the paper. There was a short business meeting before refreshments at which "Dr. Roe gave the report of committee appointed to consider changing the Club into a Mathematical Fraternity." The decision was made to proceed with this project and during the Spring semester of 1914 the details were worked out and PME was incorporated in New York State.

What did they want to accomplish by taking this action? What was the background against which the decision to found PME was made? Using the Archives of Syracuse University and the detailed notes left by the founders, I hope to answer these questions and to develop an understanding of the historical context in which PME was born.

Estimathon!

Thursday, August 7, 5:00 p.m. – 7:00 p.m.
Hilton Portland, Plaza Level, Pavilion West

They're called Fermi problems…

- How many stop signs are in New York City?
- How many babies were born in 1900?
- How many Social Security Numbers are prime?

If you're looking for a mindbending mixture of math and trivia, look no further! Jane Street Capital presents The Estimathon contest: attempt 13 Fermi problems in 30 minutes, ranging from totally trivial to positively Putnamesque. Work in teams (of up to 5 people per team) to come up with the best set of confidence intervals. The top teams will receive prizes!

Contest rules can be found here. If you are interested in participating, sign up here. If you have further questions, feel free to contact the organizers at estimathon@janestreet.com.

Organizer:
Andy Niedermaier, *Jane Street Capital*

MAA UNDERGRADUATE STUDENT ACTIVITY

Mathematical Research, It's Knot What You Think!

Friday, August 8, 1:00 p.m. – 1:50 p.m.
Hilton Portland, Plaza Level, Pavilion East

Take a piece of string, tie a knot into it and glue the ends of the string together into a closed loop, and you have a mathematical knot. This simple process demonstrates the appeal of knot theory — it is very hands-on and accessible to undergraduate research. In this student activity, we will work with two representations of knots: knot mosaics and cubic lattice knots. Using knot kits that participants can keep, we will explore the very new area of knot mosaics (2008, Lomonaco and Kauffman) and look at open problems that you can try to solve. We will also try to construct cubic lattice knots. Very little is known about these three-dimensional knots, so participants will be conducting on-the-spot mathematical research. This activity is open to everyone; no prior knowledge of knots is required.

Activity Leader:
Lew Ludwig, *Denison University*

MAA UNDERGRADUATE STUDENT ACTIVITY

Using Puzzles to Illuminate Mathematics

Friday, August 8, 1:00 p.m. – 1:50 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom II

Solving a puzzle is a lot like solving a challenging problem in a math class. The "aha!" moment that is experienced in both circumstances is nearly identical, so it is natural that mathematicians enjoy puzzles and find engaging applications for them. Come explore a class of puzzles and their applications in courses such as discrete math. Participants will build their own version of an ancient Chinese linking puzzle to take with them.

Undergraduate Student Activities (continued)

Activity Leader:
Jonathan D. Stadler, *Capital University*

PANEL SESSION

Non-Academic Career Paths for Students Who Like Mathematics

Friday, August 8, 2:35 p.m. – 3:55 p.m.
Hilton Portland, 23rd Floor, Skyline 2

With events like recent super typhoon Haiyan and super storm Sandy occurring more frequently, many companies have come to realize that there is a greater need to hire those who can measure risk. The need to employ those with quantitative skills will continue to be in high demand. What kinds of jobs are available to those with these analytic and quantitative skill sets? Come to this panel to find out! You'll see that there are jobs in risk management, but also jobs in the tech field as well, Moreover, there are places for mathematicians in non-profits and the government sector too! During this panel we will hear from mathematicians from these various fields. Each panelist will be given the opportunity to describe their non-academic career and how their mathematical coursework prepared them best. Then we will open the floor to questions.

Organizers:
Lisa Marano, *West Chester University of Pennsylvania*
Karen Marrongelle, *the Oregon University System*
Ben Galluzzo, *Shippensburg University*

Panelists:
Mike Schumacher, *Portland Trail Blazers*
Kenton White, *Nike*
Matthew Sottile, *Galois*
Stephen Grieco, *Nike*
Andy Niedermaier, *Jane Street Capital*

Pi Mu Epsilon Student Centennial Celebration Banquet

Friday, August 8, 6:00 p.m. – 7:45 p.m.
Hilton Portland, Plaza Level, Broadway I, II, III, & IV

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

PI MU EPSILON J. SUTHERLAND FRAME LECTURE

Fibonacci and the First Personal Computing Revolution

Friday, August 8, 8:00 p.m. – 8:50 p.m., Hilton Portland, Ballroom Level, Grand Ballroom I & II

Keith Devlin, Stanford University

The first personal computing revolution took place not in Silicon Valley in the 1980s but in Pisa in the 13th Century. The medieval counterpart to Steve Jobs was a young Italian called Leonardo, better known today by the nickname Fibonacci. Thanks to a recently discovered manuscript in a library in Florence, the story of how this genius, about whom we know so little, came to launch the modern commercial world can now be told.

Based on Devlin's book *The Man of Numbers: Fibonacci's Arithmetical Revolution* (Walker & Co, July 2011) and his co-published companion e-book *Leonardo and Steve: The Young Genius Who Beat Apple to Market by 800 Years.*

Biography: Keith Devlin is a co-founder and Executive Director of Stanford University's H-STAR institute, a co-founder of the Stanford Media X research network, and a Senior Researcher at CSLI. He is a World Economic Forum Fellow, a Fellow of the American Association for the Advancement of Science, and a Fellow of the American Mathematical Society. His current research is focused on the use of different media to teach and communicate mathematics to diverse audiences. In this connection, he is a co-founder and President of an educational video games company, InnerTube Games. He also works on the design of information/reasoning systems for intelligence analysis. Other research interests include: theory of information, models of reasoning, applications of mathematical techniques in the study of communication, and mathematical cognition. He has written 32 books and over 80 published research articles. Recipient of the Pythagoras Prize, the Peano Prize, the Carl Sagan Award, and the Joint Policy Board for Mathematics Communications Award. In 2003, he was recognized by the California State Assembly for his "innovative work and longtime service in the field of mathematics and its relation to logic and linguistics." He is "the Math Guy" on National Public Radio.

MAA Ice Cream Social and Undergraduates Awards Ceremony

Friday, August 8, 9:00 p.m. – 10:00 p.m.
Hilton Portland, Plaza Level, Broadway

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

Undergraduate Student Activities (continued)

MAA Mathematical Competition In Modeling (MCM) Winners

Saturday, August 9, 9:00 a.m. – 10:30 a.m.
Hilton Portland, Plaza Level, Broadway III & IV

About 400 American teams, each consisting of three undergraduates, entered the 2014 Mathematical Contest in Modeling in February. Teams choose one of two real(istic) problems. The first problem requires a model for analyzing the performance of the Keep-Right-Except-To-Pass rule for drivers. The second requires a model for choosing the best 20th century coach for a sport such as football, basketball, etc. Teams have four days to deal with the MCM challenge and may use or access any inanimate source — computers, libraries, the Web, etc. MAA judges choose a winner for each problem. The two MAA winning teams of students will present their results of the MCM four-day challenge.

Ben Fusaro, *Florida State University*

Student Problem Solving Competition

Saturday, August 9, 1:00 p.m. – 2:15 p.m.
Hilton Portland, Plaza Level, Broadway III & IV

This event is the finals of the Problem Solving Competition. Universities and colleges that participate monthly on their own campuses by holding problem solving contests are invited to send a contestant. Each contestant will be required to solve a series of mathematical problems. Based on the outcome, a champion along with 2nd through 6th place winners will be named.

Richard Neal, *American Society for the Communication of Mathematics*

Great Talks for a General Audience: Coached Presentations by Graduate Students

Saturday, August 9, 1:00 p.m. – 5:30 p.m.
Portland Hilton, Plaza Level, Broadway I & II

Presenters in this session must be graduate students. While many graduate students will be asked to give a lecture to a general audience, which includes undergraduates and non-mathematicians as part of a job interview, most students do not have experience talking to a non-research audience. This session gives graduate students the opportunity to give a 20-minute talk aimed at an undergraduate audience which has been exposed to calculus and some linear algebra. Both the talks and abstracts should be designed to excite a wide range of undergraduates about mathematics. All participants in this session will receive private feedback on their presentations from an established faculty member and an undergraduate student. Time permitting, a discussion of effective techniques for delivering great general-audience talks will occur at the end of the session. Graduate student participants in this session should also attend the graduate student workshop (What's the Story?) on mathematical presentations.

Organizers:
Jim Freeman, *Cornell College*
Rachel Schwell, *Central Connecticut State University*

Sponsor:
Committee on Graduate Students

Graduate Student Activities

WORKSHOP

What's the Story? A Graduate Student Workshop on Formulating a Research Presentation for a General Audience

Thursday, August 7, 1:00 p.m. – 2:20 p.m.
Hilton Portland, Ballroom Level, Galleria I

Presenting our research to undergraduate students can be both fun and rewarding. It can also be difficult, however, since the gory details of our results often require a great deal of specific jargon and background. Nonetheless, the big ideas can almost always be presented at a variety of levels, and this workshop is designed to interactively help participants develop the skills needed to formulate a presentation on their research that is appropriate for an audience of undergraduate students. Since many colleges and universities require giving such a talk as part of a job interview, almost any graduate student will have the opportunity to do so, and the ability to communicate complex mathematical ideas to students is a valued trait in a candidate. This workshop will consist of hands-on activities and audience interaction aimed toward developing and improving the necessary skills for creating an engaging and accessible presentation for undergraduates. Participants should be prepared to discuss in groups a potential presentation on their research or other related topic.

Organizer:
Rachel Schwell, *Central Connecticut State University*

Sponsors:
MAA Committee on Graduate Students
Young Mathematicians Network

PANEL SESSION

How to Apply for Non-Academic Jobs

Thursday, August 7, 2:35 p.m. – 3:55 p.m.
Hilton Portland, 23rd Floor, Skyline 2

Many mathematics graduates seek academic jobs, but there are a vast number of opportunities for mathematicians outside of academia. Panelists in this session will discuss the non-academic job search process from where to find job postings to interviewing. Panelists with experience in a variety of non-academic positions in business, industry and government will speak about their own experiences and what they look for in potential new hires and future colleagues.

Organizer:
Jessica Deshler, *West Virginia University*

Panelists:
Allen Butler, *Daniel H. Wagner Associates, Inc.*
Thomas Grandine, *The Boeing Company*
Kim Sacra, *National Security Agency*

Sponsor:
Committee on Professional Development

Graduate Student Reception

Thursday, August 7, 5:30 p.m. – 6:30 p.m.,
Hilton Portland, Executive Tower, Salon Ballroom II

Graduate students are invited for some refreshments and to meet several of the invited speakers.

Organizers:
Estela A. Gavosto, *University of Kansas*
James Freeman, *Cornell College*

PANEL SESSION

Non-Academic Career Paths for Students who Like Mathematics

Friday, August 8, 2:35 p.m. – 3:55 p.m.
Hilton Portland, 23rd Floor, Skyline 2

With events like recent super typhoon Haiyan and super storm Sandy occurring more frequently, many companies have come to realize that there is a greater need to hire those who can measure risk. The need to employ those with quantitative skills will continue to be in high demand. What kinds of jobs are available to those with these analytic and quantitative skill sets? Come to this panel to find out! You'll see that there are jobs in risk management, but also jobs in the tech field as well, Moreover, there are places for mathematicians in non-profits and the government sector too! During this panel we will hear from mathematicians from these various fields. Each panelist will be given the opportunity to describe their non-academic career and how their mathematical coursework prepared them best. Then we will open the floor to questions.

Organizers:
Lisa Marano, *West Chester University of Pennsylvania*
Karen Marrongelle, *Oregon University System*
Ben Galluzzo, *Shippensburg University*

Panelists:
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Kenton White, *Nike*
Matthew Sottile, *Galois*
Stephen Grieco, *Nike*
Andy Niedermaier, *Jane Street Capital*

Graduate Student Activities (continued)

POSTER SESSION

PosterFest 2014: A Poster Session of Scholarship by Early Career Mathematicians and Graduate Students

Friday, August 8, 3:30 p.m. – 5:00 p.m.
Hilton Portland, Exhibit Hall

This poster session will allow early career mathematicians, including untenured faculty and graduate students, to present and discuss their scholarly activities with other attendees in an informal atmosphere. Examples of scholarly activities suitable for this poster session include expository work, preliminary reports, scholarship of teaching and learning, and research reports. Presenters should have their materials prepared in advance and will be provided with a self-standing, trifold tabletop poster approximately 48 in wide by 36 in high.

Organizers:
Doug Ensley, *Shippensburg University*
Audrey Malagon, *Virginia Wesleyan College*

Sponsors:
MAA Committee on Early Career Mathematicians
Young Mathematician's Network
MAA Committee on Graduate Students

Great Talks for a General Audience: Coached Presentations by Graduate Students

Saturday, August 9, 1:00 p.m. – 5:30 p.m.
Hilton Portland, Plaza Level, Broadway I & II

Presenters in this session must be graduate students. While many graduate students will be asked to give a lecture to a general audience, which includes undergraduates and non-mathematicians as part of a job interview, most students do not have experience talking to a non-research audience. This session gives graduate students the opportunity to give a 20-minute talk aimed at an undergraduate audience which has been exposed to calculus and some linear algebra. Both the talks and abstracts should be designed to excite a wide range of undergraduates about mathematics. All participants in this session will receive private feedback on their presentations from an established faculty member and an undergraduate student. Time permitting, a discussion of effective techniques for delivering great general-audience talks will occur at the end of the session. Graduate student participants in this session should also attend the graduate student workshop (What's the Story?) on mathematical presentations.

Organizers:
Jim Freeman, *Cornell College*
Rachel Schwell, *Central Connecticut State University*

Sponsor:
Committee on Graduate Students

IN A FASTER FORWARD WORLD

"Shaping the future of the Internet" could be your job description.

The Boston Globe TOP PLACES TO WORK 2012

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Founded in the halls of MIT Akamai sits at the heart of the Internet, helping the most innovative companies like Facebook, Apple and Salesforce remove the complexities of delivering any experience, to any device, anywhere. Akamai is dedicated to problem solving through intellectual curiosity, collaboration and commitment. And we're growing quickly. If you'd like to work in a culture where hard work and innovative ideas are consistently rewarded, join us and help shape the future of the hyperconnected world.

Ready to create an exciting future? Then join us at www.akamai.com/careers

Akamai
FASTER FORWARD

Workshops

What's the Story? A Graduate Student Workshop on Formulating a Research Presentation for a General Audience

Thursday, August 7, 1:00 p.m. – 2:20 p.m.
Hilton Portland, Ballroom Level, Galleria I

Presenting our research to undergraduate students can be both fun and rewarding. It can also be difficult, however, since the gory details of our results often require a great deal of specific jargon and background. Nonetheless, the big ideas can almost always be presented at a variety of levels, and this workshop is designed to interactively help participants develop the skills needed to formulate a presentation on their research that is appropriate for an audience of undergraduate students. Since many colleges and universities require giving such a talk as part of a job interview, almost any graduate student will have the opportunity to do so, and the ability to communicate complex mathematical ideas to students is a valued trait in a candidate. This workshop will consist of hands-on activities and audience interaction aimed toward developing and improving the necessary skills for creating an engaging and accessible presentation for undergraduates. Participants should be prepared to discuss in groups a potential presentation on their research or other related topic.

Organizer:
Rachel Schwell, *Central Connecticut State University*

Sponsors:
MAA Committee on Graduate Students
Young Mathematicians Network

Workshop on Gaming in Mathematics

Thursday, August 7, 2:35 p.m. – 3:55 p.m.
Hilton Portland, Ballroom Level, Galleria I

New 3-D gaming technology allows for much more depth for playing, experimenting, and learning with mathematics. This workshop will investigate the different ways mathematics can be expressed and enjoyed through 3-D environments.

Organizer:
Charlie Van Norman, Imaginary Number Company

Workshop on Revitalizing Algebra in Remedial Courses While Preparing Instructors

Friday, August 8, 10:00 a.m. – 11:20 a.m.
Hilton Portland, Ballroom Level, Galleria I

In a typical elementary algebra class at the college level, students sit watching as the instructor presents a sequence of examples of the exercises and an occasional direct application. A few appear attentive, some are taking notes, some not. Some are covertly texting or listening to music, and others are doing work for other classes. Too many others did not come to class. The REvitalizing ALgebra Project (REAL) has created a two-semester sequence that includes problems that enable students to reveal and build on their prior knowledge and that engage small groups in the mathematical discourse necessary to understanding mathematical concepts. These materials are based on approaches to teaching and learning that have been affirmed by past research. The instructors for the new courses are primarily mathematics graduate students. The graduate students are required to take a course in mathematics pedagogy in conjunction with the first time they teach the course. During the workshop participants will learn about the key components in the remedial courses and in the mathematics pedagogy course. They will engage in activities from the courses, and will look at the evaluation data about students who completed the remedial courses.

Organizers:
Diane Resek, *San Francisco State University*
Judy Kysh, *San Francisco State University*

Poster Sessions

Poster Session on IBL Best Practices

Thursday, August 7, 3:30 p.m. – 5:00 p.m.
Hilton Portland, Exhibit Hall

New and experienced instructors implementing inquiry-based learning methods are invited to share their experiences, resources, and insights in this poster session. The posters in this session will focus on IBL best practices. We seek both novel ideas and effective approaches to IBL. Claims made should be supported by data (student responses, sample work, test scores, survey results, etc.). This session will be of interest to instructors new to IBL, as well as experienced practitioners looking for new ideas. Presenters should have their materials prepared in advance and will be provided with a self-standing, trifold tabletop poster approximately 48 in wide by 36 in high.

Organizers:
Angie Hodge, *University of Nebraska at Omaha*
Dana Ernst, *Northern Arizona University*
Stan Yoshinobu, *Cal Poly San Luis Obispo*

PosterFest 2014: A Poster Session of Scholarship by Early Career Mathematicians and Graduate Students

Friday, August 8, 3:30 p.m. – 5:00 p.m.
Hilton Portland, Exhibit Hall

This poster session will allow early career mathematicians, including untenured faculty and graduate students, to present and discuss their scholarly activities with other attendees in an informal atmosphere. Examples of scholarly activities suitable for this poster session include expository work, preliminary reports, scholarship of teaching and learning, and research reports.

Organizers:
Doug Ensley, *Shippensburg University*
Audrey Malagon, *Virginia Wesleyan College*

Sponsors:
MAA Committee on Early Career Mathematicians
Young Mathematician's Network
MAA Committee on Graduate Students

Panel Sessions

Mentoring Matters

Thursday, August 7, 1:00 p.m. – 2:20 p.m.
Hilton Portland, 23rd Floor, Skyline 2

The initiation of mentoring programs for all faculty is supported not just anecdotally, but also by data-driven recommendations that appeared in publications such as 2010's "*Gender Differences in Critical Transitions in the Careers of Science, Engineering, and Mathematics Faculty*" and 2006's "*Report of the Banff International Research Station's Workshop on Women in Mathematics.*" This panel offers several perspectives on mentoring, from individual experiences to programs supported by organizations such as the Association for Women in Mathematics and the National Science Foundation. Additionally, the panel addresses the process of finding the right mentor and having multiple mentors; and best practices for institutions interested in developing and training mentors.

Organizers:
Magnhild Lien, *California State University Northridge*
Maura Mast, *University of Massachusetts Boston*
Jacqueline *Jensen, Slippery Rock University*

Panelists:
Stan Yoshinobu, *Cal Poly San Luis Obispo*
Carol Schumacher, *Kenyon College*
Helen Wong, *Carleton College*
Courtney Gibbons, *Hamilton College*

Sponsor:
Association for Women in Mathematics

How to Apply for Non-Academic Jobs

Thursday, August 7, 2:35 p.m. – 3:55 p.m.
Hilton Portland, 23rd Floor, Skyline 2

Many mathematics graduates seek academic jobs, but there are a vast number of opportunities for mathematicians outside of academia. Panelists in this session will discuss the non-academic job search process from where to find job postings to interviewing. Panelists with experience in a variety of non-academic positions in business, industry and government will speak about their own experiences and what they look for in potential new hires and future colleagues.

Organizer:
Jessica Deshler, *West Virginia University*

Panelists:
Allen Butler, *Daniel H. Wagner Associates, Inc*
Thomas Grandine, *The Boeing Company*
Kim Sacra, *National Security Agency*

Sponsor:
Committee on Professional Development

Lessons from Successful Calculus Programs

Thursday, August 7, 4:10 p.m. – 5:30 p.m.
Hilton Portland, 23rd Floor, Skyline 2

In 2012, the MAA's National Calculus Study, Characteristics of Successful Programs in College Calculus, visited seventeen colleges and universities that had been identified as exhibiting some measure of success in Calculus I. This panel will present some of the findings of what makes for a successful program, reported by category of institution: research universities, regional universities, undergraduate colleges, and two-year colleges.

Organizer:
David Bressoud, *Macalester College*

Panelists:
Eric Hsu, *San Francisco State University*
Nina White, *University of Michigan*
Jess Ellis, *San Diego State University*
Kate Melhuish, *Portland State University*

Open Source Resources for Mathematics: Benefits and Costs

Friday August 8, 1:00 p.m. – 2:20 p.m.
Hilton Portland, 23rd Floor, Skyline 2

This panel will include innovators in the development and use of open source resources for mathematics. A variety of options will be represented ranging from computer software to online homework and Open Textbooks. Significant time will be reserved for questions from the audience and between the panelists.

Each of the panelists will focus on the use of open source systems and how each can successfully enable end users to do and teach mathematics. Costs — both tangible and intangible — will be considered and compared to those normally associated with commercial products. Each panelist will address the advantages and disadvantages of these systems when compared to commercial products — and include any research on the efficacy of using their system for teaching purposes. Philosophical reasons for supporting open source products will be addressed. Additionally, avenues regarding how the audience can get involved in contributing to product development will be provided.

Organizers:
John Travis, *Mississippi College*
Karl-Dieter Crisman, *Gordon College*

Panelists:
Davide Cervone, *Union University (MathJax)*
Jane Long, *Stephen F. Austin State University (Sage)*
Albert Kim, *Reed College (R)*
Rob Beezer, *University of Puget Sound (Open Textbooks)*
Robin Cruz, *College of Idaho (WeBWorK)*

Sponsors:
Committee on Technologies in Mathematics Education
Professional Development Committee WEB SIGMAA

Panel Sessions (continued)

Non-Academic Career Paths for Students who Like Mathematics

Friday, August 8, 2:35 p.m. – 3:55 p.m.
Hilton Portland, 23rd Floor, Skyline 2

With events like recent super typhoon Haiyan and super storm Sandy occurring more frequently, many companies have come to realize that there is a greater need to hire those who can measure risk. The need to employ those with quantitative skills will continue to be in high demand. What kinds of jobs are available to those with these analytic and quantitative skill sets? Come to this panel to find out! You'll see that there are jobs in risk management, but also jobs in the tech field as well, Moreover, there are places for mathematicians in non-profits and the government sector too! During this panel we will hear from mathematicians from these various fields. Each panelist will be given the opportunity to describe their non-academic career and how their mathematical coursework prepared them best. Then we will open the floor to questions.

Organizers:
Lisa Marano, *West Chester University of Pennsylvania*
Karen Marrongelle, *Oregon University System*
Ben Galluzzo, *Shippensburg University*

Panelists:
Representatives of NBA Portland Trailblazers, Nike, and Galois

Problems Well-Suited for Math Circles

Friday, August 8, 2:35 p.m. – 3:55 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom II

Choosing a problem which is suitable for a math circle session is arguably the most important task for a circle leader. Good problems are crucial not only for a single session — the success or a failure of a math circle depends on problems presented to participants. But what makes a problem good? Which problems and topics are suitable and why? At the session, a sequence of experienced math circle leaders will present their ideas and share handouts that describe how to run a math circle on a particular topic. A general discussion will follow these presentations.

Organizers:
Tatiana Shubin, *San Jose State University*
Phil Yasskin, *Texas A&M University*

Panelists:
Brian Conrey, *American Institute of Mathematics*
Elgin Johnston, *Iowa State University*
Amanda Serenevy, *Riverbend Community Math Center*
James Tanton, *Mathematical Association of America*
Paul Zeitz, *University of San Francisco*

Sponsor:
SIGMAA on Math Circles for Students and Teachers (SIGMAA MCST)

The New Mathways STEM Prep Initiative: Results from the Design Team

Friday, August 8, 3:10 p.m. – 4:30 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom I

The Charles A Dana Center's New Mathways Project has begun the work of designing a STEM Prep Pathway serving students from developmental math to calculus. For the past eight months two teams of leading researchers and educators have been gleaning promising practices from the field and synthesizing them in order to determine the Content and Structure of this re-conceptualized pathway to calculus. This panel of representatives from both teams will lead an interactive discussion on challenges of preparing students for calculus, a presentation of their findings, and an overview of the course design. The panel is interested to respond to questions and receive feedback from the audience with respect to their findings and the subsequent proposed design.

Organizer:
Frank Savina, *University of Texas at Austin*

Panelists:
David Bressoud, *Macalester College*
Susanne Doree, *Augsburg College*
Michael Oertman, *University of Northern Colorado*
Jim Roznowski, *Delta College Emeritus*

Chairing the Academic Department: Advice and Perspectives from the Pros

Friday, August 8, 4:10 p.m. – 5:30 p.m.
Hilton Portland, Ballroom Level, Grand Ballroom II

Department chairs are called upon to deal with courses, schedules, curricula, research, grants, prospective and current students and faculty, alumni and employers, to name a few. The specific duties and range of activities can vary between different types and sizes of institutions, as well as departments with different organizational structures and missions. Nevertheless, successfully chairing a mathematics department uniformly requires the cultivation of new skills, knowledge, and perspectives, along with the collaboration of faculty, staff, students and the administration. For those who have been a chair for a while, are about to embark on their first term as chair, or are thinking about it for the future, this panel session will feature some great advice and reflections on chairing the mathematics department from faculty who have been there.

Organizer:
Jenna Carpenter, *Louisiana Tech University*

Panelists:
Mark Gockenbach, *Michigan Technological University*
Charlotte Simmons, *University of Central Oklahoma*
Linda McGuire, *Muhlenberg College*

Sponsor:
Committee on Professional Development

Panel Sessions (continued)

Integrating Mathematical Software into Lower-Division Mathematics Courses

Friday, August 8, 4:10 p.m. – 5:30 p.m.
Hilton Portland, 23rd Floor, Skyline 2

This panel session will discuss the use of mathematical software as a teaching tool in math courses and techniques for successful adoption. In this panel, we will specifically focus on using mathematical software in calculus and calculus-related lower-division courses. With the growing integration of technology into peoples' working lives, teaching students to use technology to do mathematics can be instrumental in allowing mathematics to become a tool students can apply throughout their lives. It also provides an additional avenue for students to enhance their understanding of the concepts underlying the calculations, by providing visualizations, or by allowing them to work with large, real-world data sets. The speakers will be content creators and teaching practitioners who will address not only the capabilities of the technology, but also proven best practices for using this technology in post-secondary education. This panel has been organized by the MAA Committee on Technology in Mathematics Education.

Organizers:
Natalie Linnell, *Santa Clara University*
Wade Ellis, *Texas Instruments*

Panelists:
Tom Dick, *Oregon State University*
Bill Bauldry, *Appalachian State University*
Doug Ensley, *Shippensburg University*

Sponsor:
Committee on Technology in Mathematics Education

Writing for MAA Journals and Magazines

Saturday, August 9, 1:00 p.m. – 2:20 p.m.
Hilton Portland, 23rd Floor, Skyline 2

Would you like to write an article for an MAA journal or magazine? In this informal presentation, mainly for prospective authors, the editors of MAA periodicals discuss the types of articles wanted, the mechanics of preparation, and the qualities of writing that they wish to encourage. The editors of the online publication *Loci* will join the editors of *Math Horizons, MAA Focus, College Mathematics Journal, Mathematics Magazine,* and *American Mathematical Monthly* in this interactive conversation.

Organizers:
Ivars Peterson, *Mathematical Association of America*
Scott Chapman, *Sam Houston State University*

Panelists:
Scott Chapman, Sam Houston State University *(Editor, American Mathematical Monthly)*
Walter Stromquist, *(Editor, Mathematics Magazine)*
Michael Jones, *Mathematical Reviews (Editor-Elect, Mathematics Magazine)*
Brian Hopkins, *St. Peter's University (Editor, College Mathematics Journal)*
David Richeson, *Dickinson College (Editor, Math Horizons)*
Janet Beery, *University of Redlands (Editor, MAA Convergence)*

Sponsors:
Council on Publications
Communications and the Committee on Journals

Innovative Curricula for Developmental Mathematics

Saturday, August 9, 2:35 p.m. – 3:55 p.m.
Hilton Portland, Plaza Level, Broadway III & IV

Last November there was a National Math Summit, which concentrated on new innovations in developmental math courses. These courses aim to help students understand mathematics and progress to a credit level math course as fast as possible. Most of these courses are being piloted in two-year colleges, and, with the increasing number of students transferring from two-year to four-year colleges, the goal of this panel is to acquaint the audience with some of the new initiatives.

Organizer:
Joanne Peeples, *El Paso Community College*

Moderator:
Wade Ellis, *Texas Instruments*

Panelists:
Amy Getz, *University of Texas at Austin*
Karon Klipple, *Carnegie Foundation*
Linda Zientek, *Sam Houston State University*
Paul Nolting, *State College of Florida*

Sponsors:
Committee on Two Year Colleges (CUTM)
Subcommittee on Calculus Reform and the First Two Years (CRAFTY)

Panel Sessions (continued)

Open Access Publishing in Mathematics: Who?, What?, Where?, Why?, and How?

Saturday, August 9, 2:35 p.m. – 3:55 p.m.
Hilton Portland, 23rd Floor, Skyline 2

This panel is intended to provide both current information and a forum for discussion about open access models of scholarly publishing in mathematics and mathematics education. Panelists will address how such publishing venues can effectively serve authors and readers, then the session will provide an opportunity for discussion between speakers and session attendees.

Organizer:
Linda McGuire, *Muhlenberg College*

Panelists:
James Crowley, *Executive Director, SIAM*
Gizem Karaali, *Pomona College*
Ted Mahavier, *Lamar University*
Allegra Swift, *Claremont Colleges Library*

Sponsor:
Committee on Professional Development

Minicourses

1. A Beginner's Guide to the Scholarship of Teaching and Learning in Mathematics

Part A:
Friday, August 8, 3:30 p.m. – 5:30 p.m.
Hilton Portland Executive Tower, Salon Ballroom I

Part B:
Saturday, August 9, 3:30 p.m. – 5:30 p.m.
Hilton Portland Executive Tower, Salon Ballroom I

This course will introduce participants to the scholarship of teaching and learning (SoTL) in mathematics and help them begin projects of their own. We describe a taxonomy of SoTL questions, provide examples of SoTL projects in mathematics, and discuss methods for investigation. Participants will learn about collecting and analyzing different types of evidence, conducting literature searches, dealing with human subjects' requirements, and selecting venues for presenting or publishing their work. With the presenters' guidance, participants interactively select and transform a teaching problem of their own into a question for scholarly investigation and identify several types of evidence to gather.

Jacqueline M. Dewar, *Loyola Marymount University*
Curtis D. Bennett, *Loyola Marymount University*

2. Boolean Network Models: A Non-Calculus Introduction to Mathematical Modeling for Biology

Part A:
Thursday, August 7, 1:00 p.m. – 3:00 p.m.
Hilton Portland Executive Tower, Salon Ballroom I

Part B:
Friday, August 8, 1:00 p.m. – 3:00 p.m.
Hilton Portland Executive Tower, Salon Ballroom I

Participants will be introduced to the importance of Boolean network models in modern biology. They will learn how to build Boolean models and will work in small groups to experience how to use such models to describe, simulate, and control the dynamics of complex biological systems. Participants will learn how to work with the web-based software systems DVD and ADAM for visualization and analysis of Boolean models and how to utilize the materials in courses that do not require Calculus. We will conclude with a discussion on the advantages of Boolean models as tools for an early introduction to modeling.

Raina Robeva, *Sweet Briar College*
Robin Davies, *Sweet Briar College*

3. Enhancing Conceptual Understanding of Multivariable Calculus Using CalcPlot3D for Visualization and Exploration

Part A:
Thursday, August 7, 3:30 p.m. – 5:30 p.m.
Hilton Portland Executive Tower, Salon Ballroom I

Part B:
Saturday, August 9, 1:00 p.m. – 3:00 p.m.
Hilton Portland Executive Tower, Salon Ballroom I

It is difficult for students to develop an accurate and intuitive understanding of the geometric relationships of calculus from static diagrams alone. This is especially true for the 3D concepts of multivariable calculus. In this course, we will explore ways to help students make these connections by visualizing multivariable calculus using CalcPlot3D, a versatile applet developed with NSF funding (NSF-DUE-0736968). Participants will learn how to customize this applet to create demonstrations and guided exploration activities for student use. Images created in this applet can be pasted into participants' documents. See http://web.monroecc.edu/calcNSF/. Basic HTML experience is helpful. Bring a Java-enabled laptop.

Paul Seeburger, *Monroe Community College*

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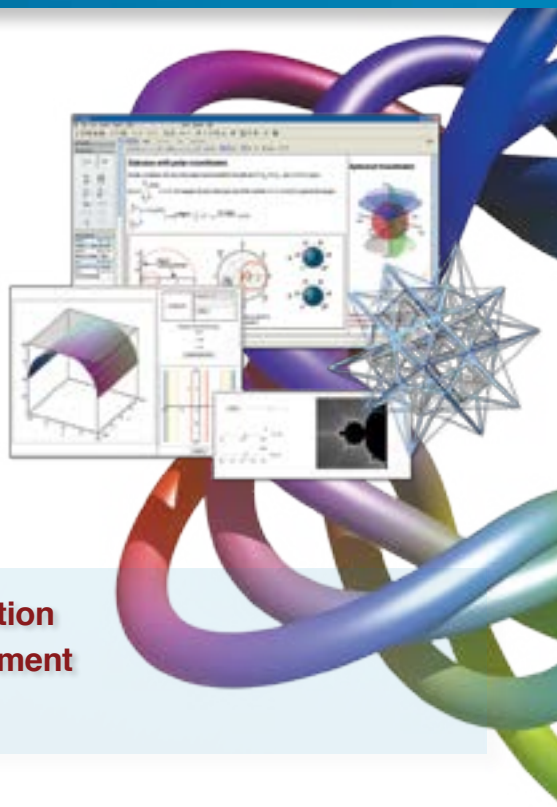

Maplesoft Booth #52

Stop by Maplesoft Booth #52 and get a demonstration of the newest version of the Maple T.A. MAA Placement Test Suite and a sneak peak of Maple T.A. 10!

Maplesoft Presentations at MATHFEST 2014

Take Control of your Placement Testing with the Maple T.A. MAA Placement Test Suite

Thursday August 7 from 9:00 a.m. to 10:30 a.m.
in the Hilton Portland, Plaza Level, Pavilion East

The newest version of the Maple T.A. MAA Placement Test Suite (PTS) combines tests based on current research in education with a powerful, online testing platform to provide the next generation of placement testing. PTS provides a completely flexible platform giving you control over not only what tests you use, but how and when your tests are run. Come to this session to see the difference PTS can make in your placement testing program. In addition we will be giving you a sneak peak of Maple T.A. 10! This soon-to-be released version includes a completely redesigned interface for a more streamlined workflow, support for graph sketching, free-body diagrams, scoring rubrics, and much more!

Leverage the Latest Advancements in Online STEM Education

Friday August 8 from 9:00 a.m. to 10:30 a.m.
in the Hilton Portland, Plaza Level, Pavilion West

How we present and flow course material to students is changing dramatically. As textbook prices continue to rise and easy access to online materials become commonplace, more and more academic institutions are moving course delivery online. Moving a STEM-based course online, however, comes with many challenges. Maplesoft is revolutionizing how STEM-based courses can be brought online using technology that improves student comprehension, retention, and success. Attend this presentation to better understand the challenges that exist today when moving a STEM based course online and explore Maplesoft's easy-to-use technology solutions.

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Minicourses (continued)

4. Instructional Supports for Implementing Inquiry-Oriented Curricula for Linear Algebra, Differential Equations, and Abstract Algebra

Part A:
Friday, August 8, 3:30 p.m. – 5:30 p.m.
Hilton Portland Executive Tower, Salon Ballroom III

Part B:
Saturday, August 9, 3:30 p.m. – 5:30 p.m.
Hilton Portland Executive Tower, Salon Ballroom III

This session is designed to support mathematicians interested in implementing an inquiry oriented curriculum. By inquiry-oriented we mean that the students are engaging in authentic mathematical inquiry and the teachers are actively involved in inquiring into students' mathematical thinking. This mini-course will have two components. In the first component participants will engage with mathematical tasks from three different research-based inquiry oriented curricula that have been developed for Linear Algebra, Differential Equations, and Abstract Algebra. The goals of this component are to familiarize participants with the curricular tasks, the nature of the instruction, and common ways of student thinking. The second component will focus on high-leverage teaching practices that can be used in any inquiry-oriented setting. Examples of such practices include leading whole class discussions and launching instructional tasks. The goal of this component is to provide instructors with opportunities to develop some of the necessary teaching practices needed to implement inquiry-oriented curricula.

Estrella Johnson, *Virginia Tech*
Karen Keene, *North Carolina State University*
Christine Andrews-Larson, *Florida State University*

5. Teaching Linear Algebra with GeoGebra: Making Connections between Algebra and Geometry

Part A:
Thursday, August 7, 3:30 p.m. – 5:30 p.m.
Hilton Portland Executive Tower, Salon Ballroom III

Part B:
Saturday, August 9, 1:00 p.m. – 3:00 p.m.
Hilton Portland Executive Tower, Salon Ballroom III

Participants will work with GeoGebra applets supporting instruction in elementary Linear Algebra. The workshop will consist of a) an overview of the topics and design, incorporating activities fostering connections between algebra and geometry; b) participant work with selected applets, including a very short introduction to GeoGebra; c) discussion of possible pedagogical approaches incorporating the applets; d) a look at some related application problems; e) summary of preliminary evaluation results; f) wrap-up, including remarks and suggestions by participants. Links to further freely available resources will be provided.

James D. Factor, *Alverno College*
Susan F. Pustejovsky, *Alverno College*

6. SIMIODE – Teaching Differential Equations through Modeling and Technology

Part A:
Thursday, August 7, 1:00 p.m. – 3:00 p.m.
Hilton Portland Executive Tower, Salon Ballroom III

Part B:
Friday, August 8, 1:00 p.m. – 3:00 p.m.
Hilton Portland Executive Tower, Salon Ballroom III

This minicourse will permit participants to experience SIMIODE - Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations, an online community of teachers and learners of differential equations who use modeling and technology throughout the learning process. Participants will share several learning opportunities using SIMIODE materials; develop models from the student perspective; engage in collegial activities about uses of SIMIODE modeling scenarios; and initiate the creation of their own teaching scenario contributions to SIMIODE through partnering with other participants in and after the minicourse. The web home for SIMIODE is at www.simiode.org.

Brian Winkel, *United States Military Academy*

Alder Award Session

Friday, August 8, 2:00 p.m. – 2:50 p.m., Hilton Portland, Ballroom Level, Grand Ballroom I

In January 2003 the MAA established the Henry L. Alder Award for Distinguished Teaching by a Beginning College or University Mathematics Faculty Member to honor beginning college or university faculty whose teaching has been extraordinarily successful and whose effectiveness in teaching undergraduate mathematics is shown to have influence beyond their own classrooms. Each year, at most three college or university teachers are honored with this national award. The awardees are invited to make a presentation at MathFest on their work. Presentations by the Alder Award honorees.

Moderator: Robert Devaney, *Boston University, MAA President*

The Joy of Discovery

2:00 p.m. – 2:20 p.m.

Arguably, one of the highlights of mathematics research is the joy of finally completing the proof of a new result after a long period of work. On the other hand, this feeling of happiness in mathematics is foreign to many students who view mathematics as rigid computation or who give up on a problem if it cannot be solved within five minutes. In this talk, I will discuss my endeavors to share the joy of discovery with undergraduates at a variety of levels, including in calculus classes, an experimental mathematics course, and various undergraduate research programs.

Lara Pudwell, *Valparaiso University*

There's Treasure Everywhere: When Student Work Matters

2:30 p.m. – 2:50 p.m.

No one wants to believe that the work they do is unappreciated or unnoticed. All of us want our efforts to matter -- and this includes our students. Traditional grading of homework and tests helps their work matter (since it determines their grade), but perhaps we can help students become more invested in their coursework by making their work important to other people as well. In this talk, we describe some efforts by the author and others to guide students to invest deeply in their work, by helping them build real connections between the classroom and the larger world.

Dominic Klyve, *Central Washington University*

Congratulations

to our MAA members celebrating 25 or more years of membership. Please stop by the MAA Pavilion to pick up your recognition sticker.

25 Years
Paul Coe
Annalisa Crannell
Afshin Ghoreishi
Geoffrey Hagopian
Crystal Lorch
John Lorch
David Manderscheid
Susan Pustejovsky
Tommy Ratliff
Robert Roe
Dipa Sarkar-Dey
Hortensia Soto-Johnson
Barry Tesman
Linda Van Niewaal
John Wierman
Maria Zack

26 Years
Edward Aboufadel
Jenna Carpenter
Jim Grabenstetter
Michael Jones
Ed Lamagna
Sarah Mabrouk
Dale Oliver
Steven Schlicker
Mazen Shahin
Paul Sisson
Uri Treisman
John Williams

27 Years
William Abrams
Frank Farris
Deanna Haunsperger
Cynthia Huffman
Ivars Peterson
Scott Peterson
Gary Raduns
John Thoo
Joe Yanik

28 Years
R. Michael Beals
Pam Crawford
Daniel Cunningham
Barbara D'Ambrosia
Eileen Donoghue
Paul Fishback
Aparna Higgins
Jeff Ibbotson
Michael McDaniel
Colm Mulcahy
Jeanette Palmiter
Vicki Powers
Karen Saxe
Lee Seitelman
Daniel Teague
Colleen Vachuska
Ken Wiggins
Betsy Yanik
Doron Zeilberger

29 Years
Yungchen Cheng
Benjamin Collins
Michael Pearson
Theresa Rahikka

30 Years
Keith Devlin
Doug Ensley
Edward Keppelmann
Jeff Knisley
Judy Kysh
Michael O'Reilly
Lynn Reed
Therese Shelton
Timothy Tiffin

31 Years
Mark Bowron
Rick Gillman
Russ Gordon
David Gurney
Allen Hibbard
Bill Higgins
Stephen Kennedy
Jay Schiffman
Cheri Shakiban
Nora Strasser
V. Lee Turner
Peter Vachuska

32 Years
Diane Beres
Stephen Davis
Suzanne Doree
Solomon Garfunkel
Fernando Gouvêa
Dan Hrozencik
Emelie Kenney
Tom Linton
Mark Schwartz
T Christine Stevens
Jeffrey Stuart

33 Years
Robert Devaney
Jim Freeman
John Frohliger
Kenneth Gittelson
Carol Schumacher
Robert Sefton Smith
Kathryn Weld

34 Years
Ann Brackebusch
Caren Diefenderfer
David Dorman
John Fink
Paul Flasch
David Housman
Robert Megginson
David Sutherland

35 Years
Dan Callon
Jeffrey Clark
Ruth Favro
Bonnie Gold
John Ingram
David Scott

36 Years
Robert Beezer
Ralph Carr
Susan Jane Colley
Thomas Drucker

Bill Emerson
Gary Gordon
Shlomo Libeskind
Russell Petricka
Stephen Sedory
Michael Ward

37 Years
David Bressoud
Carolyn Connell
Jim Daniel
Barbara Faires
Walter Meyer
Frank Morgan
Stephen Scarborough
Alan Schoenfeld
Edward Silver
J. Paul Vicknair
Bruce Yoshiwara

38 Years
Steven Blasberg
Thomas Dick
John Holte
Michael Starbird
Gerard Venema
Joan Weiss

39 Years
John Brian Conrey
Jacqueline Dewar
Steven Dunbar
Joseph Gallian
Doug Girvan
Liz McMahon
Diane Resek
Larry Riddle
Thomas Q Sibley
Michael Thibodeaux
Paul Zorn

40 Years
Donna Beers
Tom Craven
Lloyd Douglas
Russell Howell
Jon Johnson
Herb Kasube
Kay Somers
Charles Toll
William Velez

41 Years
Jean Bee Chan
Sue Geller
Roger Nelsen
Roger Simons
Peter Stanek

42 Years
Steven Bellenot
Thomas Bengtson
Ken Berg
Patrick Gardner
Jonathan Kane
David Knee
Robert Lover
Rochelle Meyer
Christine Shannon
Cal Van Niewaal
Jan Verster

43 Years
Susanna Epp
Kumar Joag-dev
John T. Sieben
Philip Yasskin

44 Years
Karl Beres
Ben Cole
Michael Gage
Samuel Graff
David Hayes
Lewis Lum
Harriet Pollatsek
Doris Schattschneider
Philip Straffin

45 Years
Joel Cohen
Joel Cunningham
Richard Guy
Thomas Hern
Elgin Johnston
Fred Rickey
Martha Siegel
Robert Stein
David Stone
Roger Waggoner

46 Years
Eric Nummela
John Reiser

47 Years
Francis Ford
Jennifer Galovich
Carl Leinbach
Eileen Poiani

48 Years
Daniel Adams
Jerrold Grossman
Richard Poss

49 Years
Monte Boisen
Jonathan Gerhard
Dan Kemp
Walter Stromquist
Brian Winkel

50 Years
Don Albers
Donald Cohn
Paul Cull
Bernard Madison
Donald Quiring

51 Years
Joanne Peeples

52 Years
Charlotte Chell
Virginia Knight
Stephen Meskin
Nancy Rodgers
Subhash Saxena
John Selden

53 Years
Lowell Beineke
Catherine Murphy
Carroll Webber

54 Years
Alvin Swimmer

56 Years
Florence Fasanelli
Jack Graver
Annie Selden

57 Years
Abdulalim Shabazz

58 Years
Kenneth Ross

59 Years
Ben Fusaro

Please join your colleagues at the Closing Banquet on Saturday, August 9 in the Pavilion, Plaza Level, of the Hilton Portland Hotel at 6pm. Those members celebrating 25 or 50 years will receive a special pin presented by Bob Devaney. Stop by the Registration Desk for ticket information.

Come by Thursday, August 7 at 2:30 p.m. and enjoy a sweet treat with us.

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Committee Meetings

Monday, August 4

Meetings Management Committee Meeting
1:00 p.m. – 3:00 p.m., Hilton Portland, 22nd Floor, MAA Suite I

Executive Committee Meeting
3:00 p.m. – 7:00 p.m., Hilton Portland, 23rd Floor, Skyline III

Tuesday, August 5

Executive Committee Meeting
8:00 a.m. – 1:00 p.m., Hilton Portland, 23rd Floor, Skyline III

New Governors Orientation
3:00 p.m. – 7:00 p.m., Hilton Portland, 23rd Floor, Skyline II

Wednesday, August 6

Board of Governors Meeting
9:00 a.m. – 5:00 p.m., Hilton Portland, Plaza Level, Pavilion West

Committee on Undergraduate Student Activities and Chapters
2:00 p.m. – 4:30 p.m., Hilton Portland, 3rd Floor, Executive Suite

Thursday, August 7

Committee on Sections Meeting
8:00 a.m. – 10:00 a.m., Hilton Portland, Executive Tower, Salon Ballroom II

Professional Development Committee Meeting
8:00 a.m. – 10:00 a.m., Hilton Portland, 3rd Floor, Cabinet Suite

Pi Mu Epsilon Council Meeting
8:30 a.m. – 11:30 a.m., Hilton Portland, Ballroom Level, Parlor A

Committee on Journals Meeting
9:00 a.m. – 10:00 a.m., Hilton Portland, 3rd Floor, Boardroom West

Committee on the Status of the Profession
9:00 a.m. – 10:00 a.m., Hilton Portland, Executive Tower, Boardroom

MAA Committee on Departmental Review Meeting
9:00 a.m. – 10:30 a.m., Hilton Portland, 3rd Floor, Boardroom East

Science Policy Committee Meeting
12:30 p.m. – 2:00 p.m., Hilton Portland, Plaza Level, Plaza Suite

Committee on Early Career Mathematicians
1:00 p.m. – 2:00 p.m., Hilton Portland, 3rd Floor, Cabinet Suite

Council on Members and Communities Meeting
1:00 p.m. – 2:30 p.m., Hilton Portland, Executive Tower, Salon Ballroom II

Council on Publications and Communications
1:30 p.m. – 2:30 p.m., Hilton Portland, 3rd Floor, Boardroom East

MAA Centennial Planning Committee Meeting
2:00 p.m. – 4:00 p.m., Hilton Portland, Executive Tower, Boardroom

MAA Council on the Profession Committee Meeting
3:00 p.m. – 4:00 p.m., Hilton Portland, 3rd Floor, Boardroom West

Membership Committee Meeting
3:00 p.m. – 4:30 p.m., Hilton Portland, 3rd Floor, Boardroom East

Committee on the Teaching of Undergraduate Mathematics Meeting
5:00 p.m. – 6:30 p.m., Hilton Portland, Plaza Level, Plaza Suite

Friday, August 8

Pi Mu Epsilon Advisors Breakfast
7:30 a.m. – 8:30 a.m., Hilton Portland, Ballroom Level, Parlor A

Committee on Technologies in Mathematics Education Meeting
8:00 a.m. – 9:15 a.m., Hilton Portland, Executive Tower, Boardroom

Council on Outreach Programs Meeting
8:30 a.m. – 10:00 a.m., Hilton Portland, 3rd Floor, Boardroom West

MAA Convergence Editorial Board Meeting and Training Session
9:00 a.m. – 11:00 a.m., Hilton Portland, 22nd Floor, MAA Suite II

Committee on MAA/Department Liaisons Meeting
10:00 a.m. – 11:30 a.m., Hilton Portland, 3rd Floor, Cabinet Suite

Council on Programs and Students in the Mathematical Science Meeting
10:30 a.m. – 12:00 p.m., Hilton Portland, 3rd Floor, Boardroom West

Minicourse Committee Meeting
11:00 a.m. – 12:00 p.m., Hilton Portland, Plaza Level, Plaza Suite

CUPM Committee Meeting
1:00 p.m. – 2:30 p.m., Hilton Portland, Plaza Level, Plaza Suite

Committee on Early Career Mathematics Meeting
1:30 p.m. – 3:00 p.m., Hilton Portland, 3rd Floor, Boardroom West

Anneli Lax Board Meeting
2:00 p.m. – 3:00 p.m., Hilton Portland, 3rd Floor, Cabinet Suite

Council on Meetings and Professional Development Meeting
2:00 p.m. – 3:30 p.m., Hilton Portland, Executive Tower, Salon Ballroom II

Council on Prizes and Awards Meeting
2:30 p.m. – 4:30 p.m., Hilton Portland, 3rd Floor, Boardroom East

SIGMAA TAHSM
3:30 p.m. – 4:30 p.m., Hilton Portland, Plaza Level, Plaza Suite

Math Horizons Board Meeting
4:30 p.m. – 5:30 p.m., Hilton Portland, 3rd Floor, Cabinet Suite

CRAFTY
4:30 p.m. – 6:00 p.m., Hilton Portland, 3rd Floor, Boardroom West

Saturday, August 9

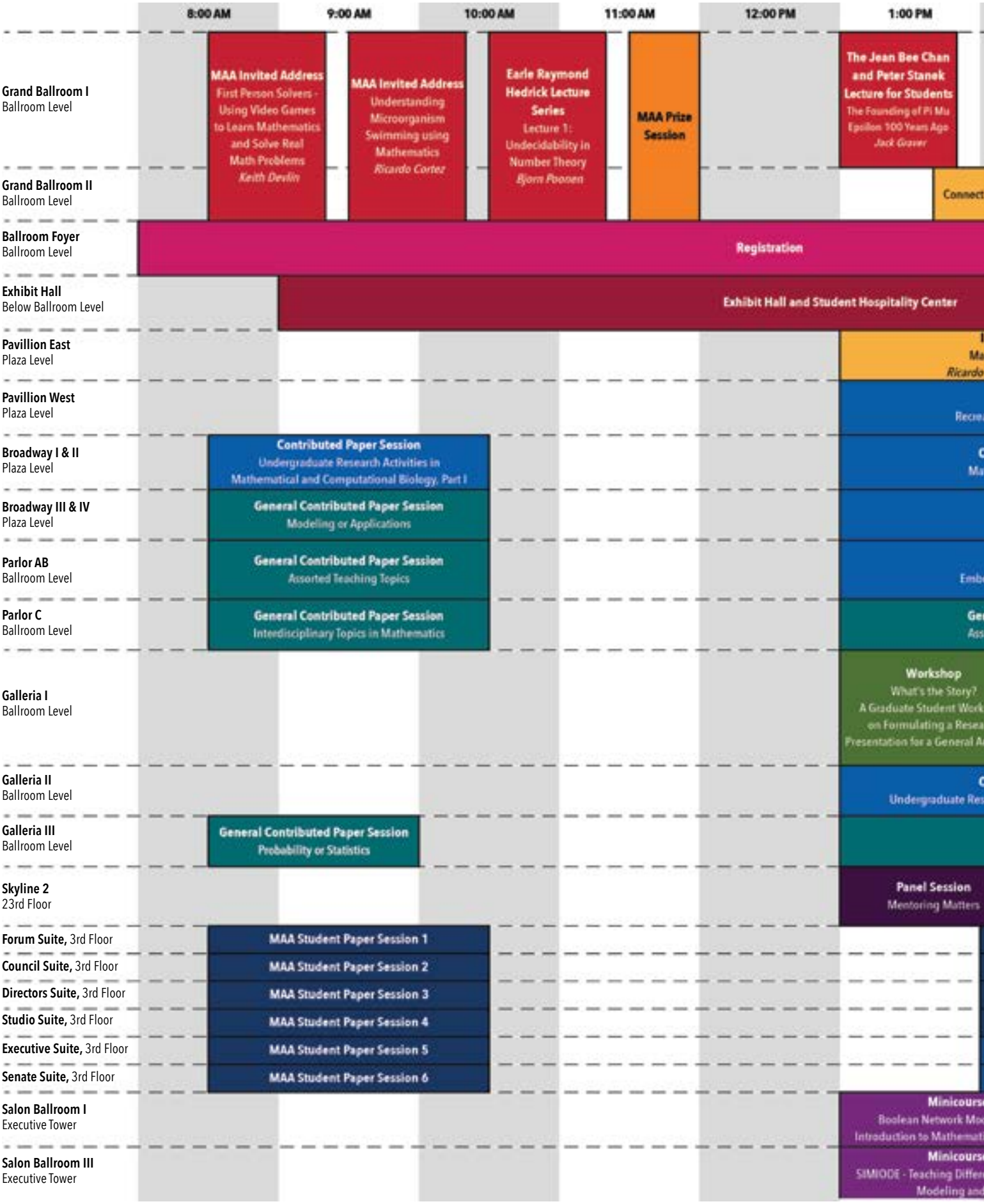
Committee on Committees and Councils Meeting
12:00 p.m. – 2:00 p.m., Hilton Portland, 22nd Floor, MAA Suite I

CUPM Steering Committee Meeting
1:00 p.m. – 2:30 p.m., Hilton Portland, Plaza Level, Plaza Suite

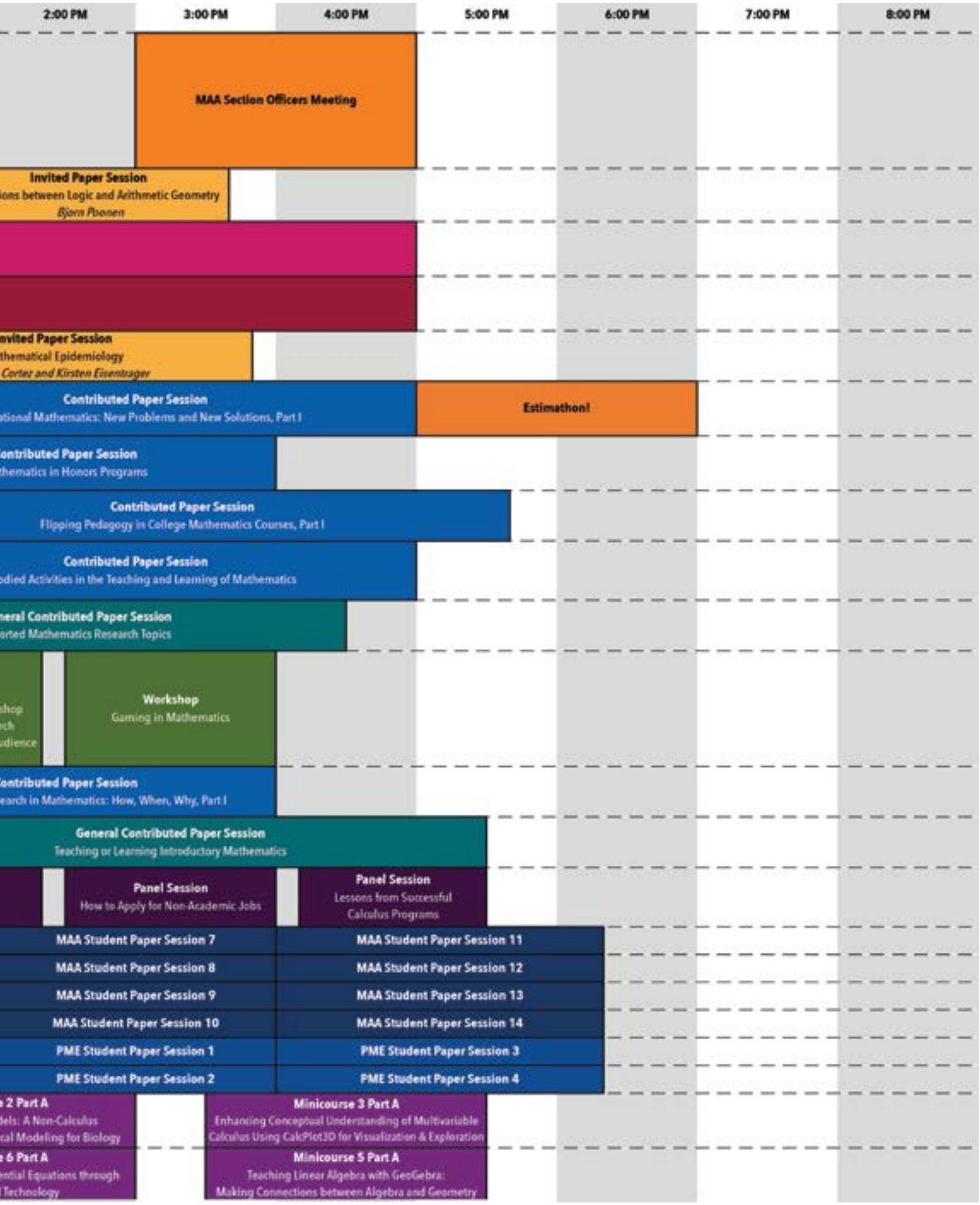
Project NExT Director Meeting
1:00 p.m. – 2:30 p.m., Hilton Portland, 3rd Floor, Boardroom West

SIMIODE Board of Contributing Advisors Meeting
1:00 p.m. – 3:00 p.m., Hilton Portland, 3rd Floor, Cabinet Suite

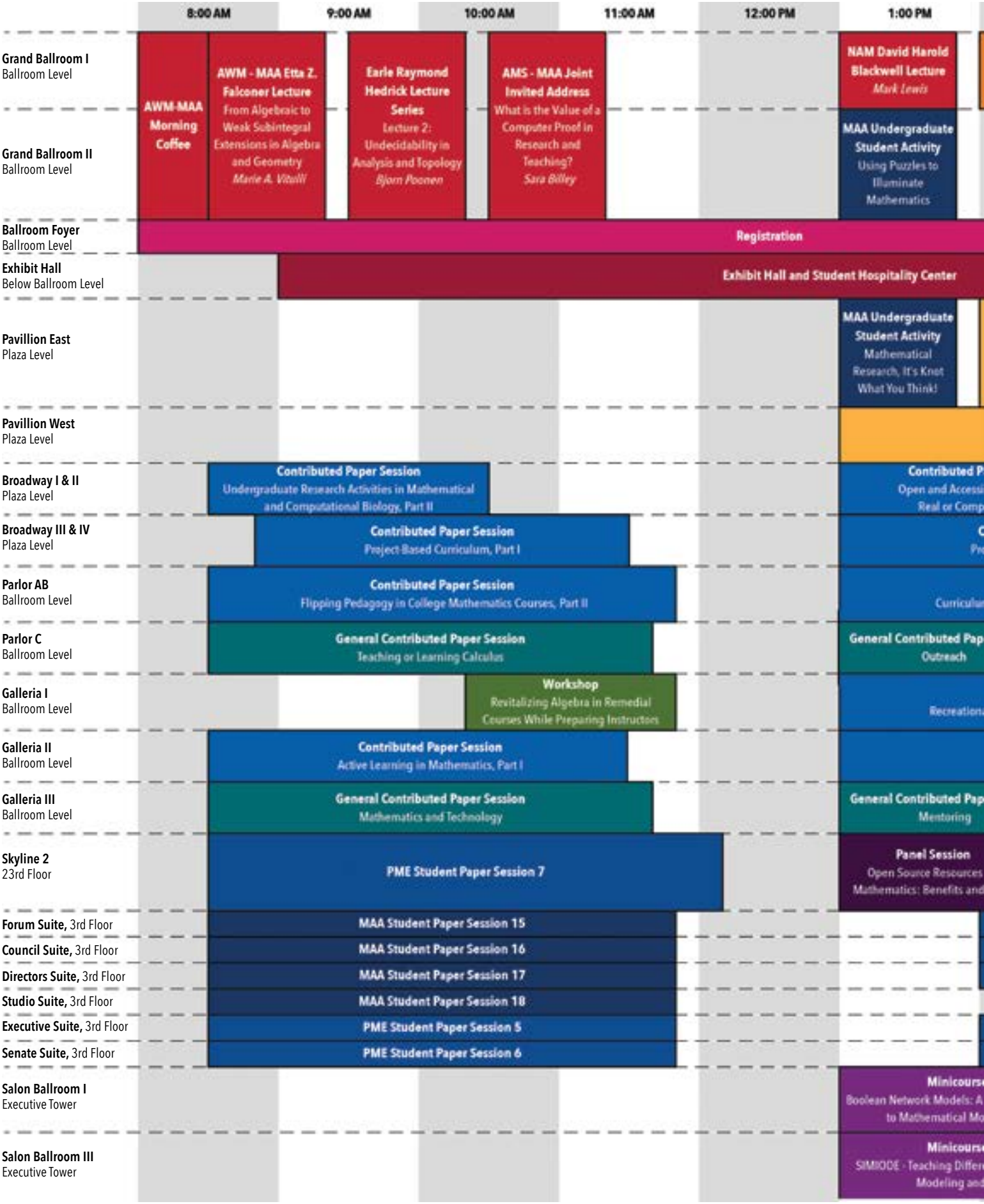
Schedule At A Glance



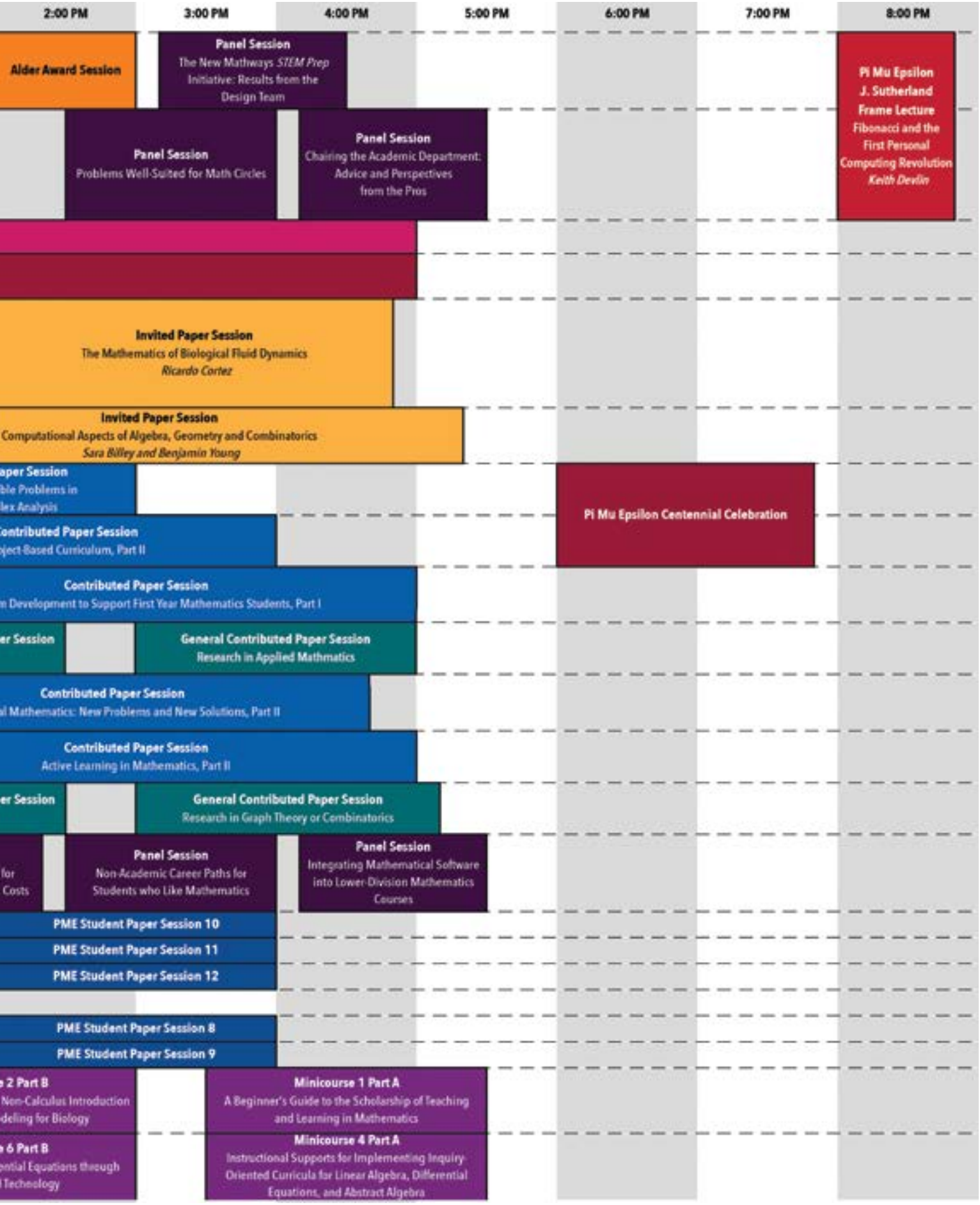
Thursday, August 7



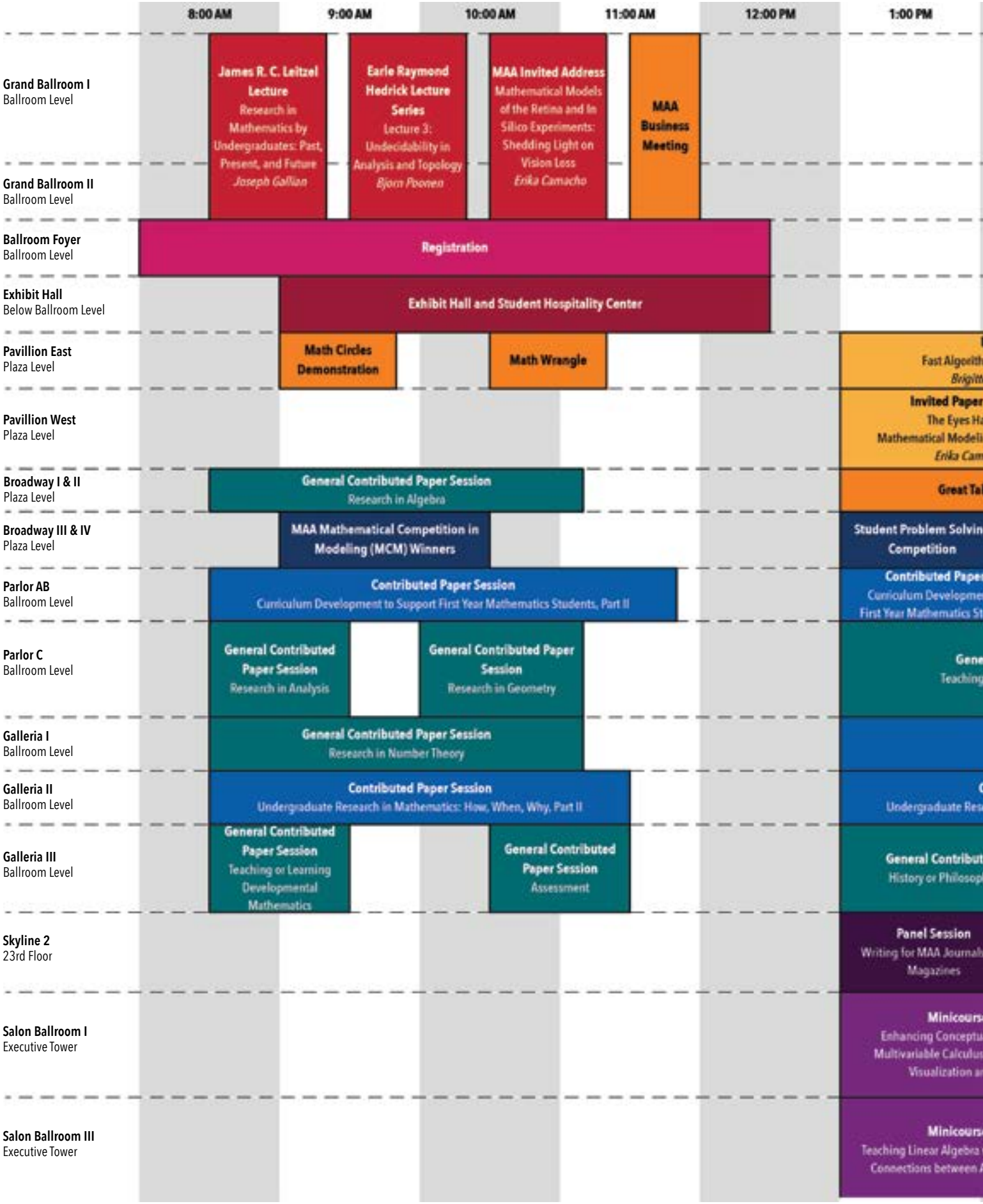
Schedule At A Glance



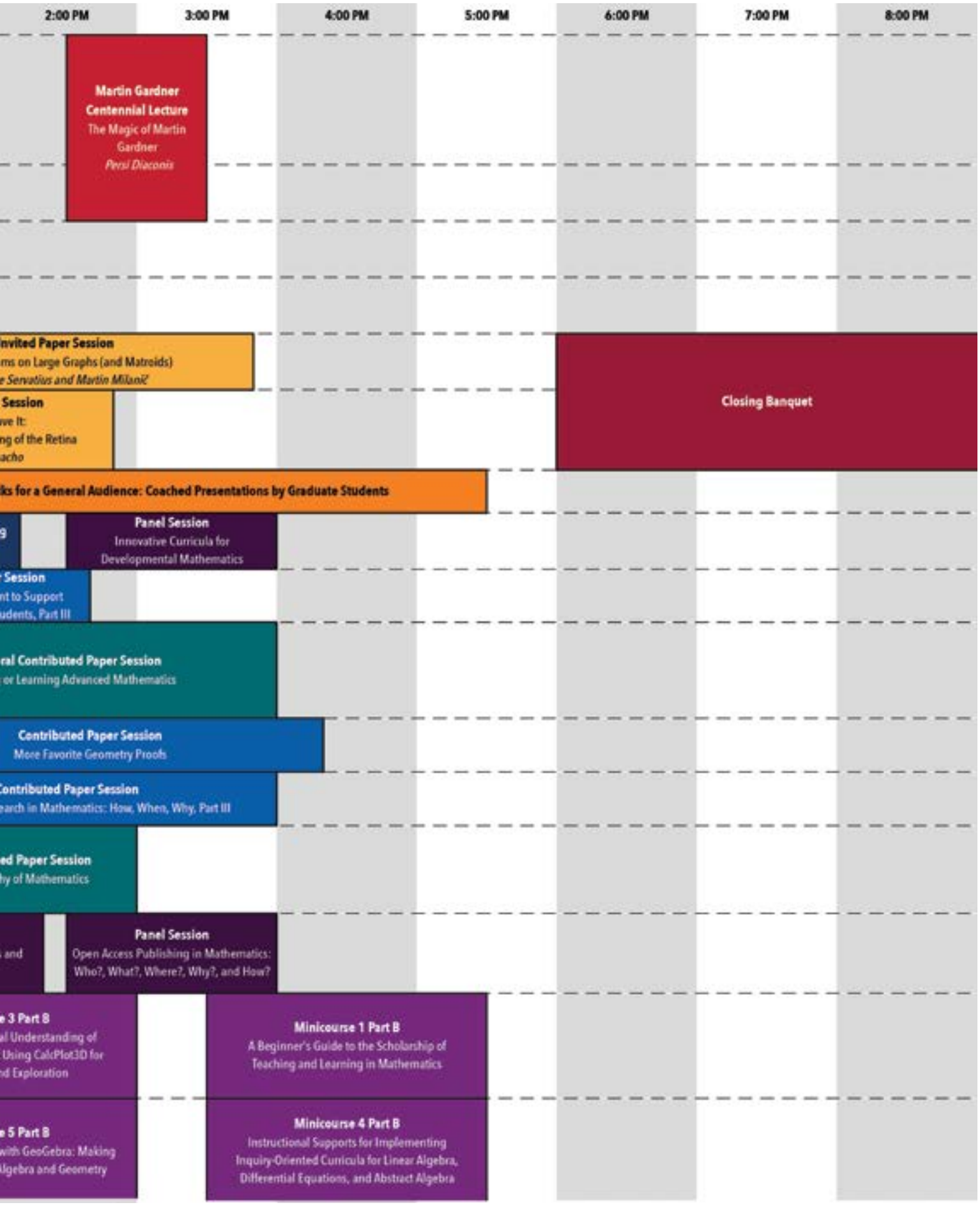
Friday, August 8



Schedule At A Glance



Saturday, August 9



Social Events

WEDNESDAY, AUGUST 6

Columbia Gorge National Scenic Area Tour

12:30 p.m. – 4:00 p.m.
Departs from Hilton Portland Lobby
(Broadway Street Entrance)

Explore the Columbia River Gorge and stand in awe of the second highest year-round waterfall in the United States! You will enjoy spectacular views of many waterfalls along the Historic Columbia River Highway. We will also be touring many of the other wonderful sites along the Columbia Gorge including Crown Point Vista House, a unique visitor's facility that was built in 1916.

MAA-PME Student Reception

4:30 p.m. – 5:30 p.m.
Hilton Portland, Plaza Level, Pavilion East

Math Jeopardy

5:30 p.m. – 6:30 p.m.
Hilton Portland, Plaza Level, Pavilion East

Grand Opening Reception

6:00 p.m. – 8:00 p.m.
Hilton Portland, Exhibit Hall

The MAA MathFest Grand Opening Reception will launch this year's MAA MathFest on a high note. This event, intended to draw attendees together in a spirit of camaraderie, replaces the opening banquet. While scientific sessions will still commence on Thursday, we warmly invite you to enjoy complimentary light hors d'oeuvres and a cash bar while you mix and mingle in the Exhibit Hall with other registered participants and guests, sponsors, and exhibitors.

THURSDAY, AUGUST 7

Wellness Strand - Thursday

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

Take care of the body as well as the mind by participating in guided walks and group runs each day prior to scheduled meetings at MAA MathFest. Registration required; see form for details. Please complete the Participation Waiver, and email it to meetings@maa.org or turn it into the registration desk onsite.

Group 1: Guided 2.5 mile walk

Group 2: Group runs - 3 miles (one group approximately 9:30/mi pace; another group 8:45/mi pace)

Sponsor:
Pearson

Graduate Student Reception

5:30 p.m. – 6:30 p.m.
Hilton Portland, Plaza Level, Pavilion East

Graduate students are invited for some refreshments and to meet several of the invited speakers.

FRIDAY, AUGUST 8

Wellness Strand - Friday

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

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Group 1: Guided 2.5 mile walk

Group 2: Group runs - 3 miles (one group approximately 9:30/mi pace; another group 8:45/mi pace)

Sponsor:
Pearson

AWM-MAA Morning Coffee

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

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

Pi Mu Epsilon Centennial Celebration Banquet

6:00 p.m. – 7:45 p.m.
Hilton Portland, Plaza Level, Broadway

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

MAA Ice Cream Social and Undergraduate Awards Ceremony

9:00 p.m. – 10:00 p.m.
Hilton Portland, Plaza Level, Broadway

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

SATURDAY, AUGUST 9

Wellness Strand - Saturday

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

Take care of the body as well as the mind by participating in guided walks and group runs each day prior to scheduled meetings at MAA MathFest. Registration required; see form for details. Please complete the Participation Waiver, and email it to meetings@maa.org or turn it into the registration desk onsite.

Group 1: Guided 2.5 mile walk

Group 2: Group runs - 5 miles (one group approximately 9:30/mi pace; another group 8:45/mi pace)

Sponsor:
Pearson

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

Willamette Valley Wine Tour

12:30 p.m. – 4:00 p.m.
Departs from Hilton Portland Lobby
(Broadway Street Entrance)

Visit the renowned Willamette Valley in Oregon's premier wine country for an afternoon of wine tasting and education known around the world for exquisite sparkling and still wines.

3 Books. 3 Days.

Returning to MAA MathFest 2014!

Huge Discounts on Special Titles!

August 7 @ 3:14 P.M.: Special Sale Title for $4!
August 8 @ 2:30 P.M.: Special Sale Title for $5!
August 9 @ 10:00 A.M.: Special Sale Title for $6!

***Retail value ranges from $30-$60, so don't miss out! Limited copies available.**

Follow us on Facebook & Twitter (#MAAthFest) daily at the times above and be the first to find out our special sale titles!

MAA
MATHEMATICAL ASSOCIATION OF AMERICA

Meeting Price:
$45.50

Pick up your copy at the MAA Pavilion in the Exhibit Hall.

Teaching a Modern ODE Course

Hilton Portland & Executive Tower
22nd Floor
Mount St. Helens Suite
Friday, August 8
3:30pm

The differential equations course has changed radically over the last quarter century. Easy access to powerful computation has enabled visualization to play a much larger role. The increasing mathematization of the life sciences has greatly expanded the kinds of models available for investigation. The advent of dynamical systems has made new kinds of questions imaginable and accessible. A modern ODE course has to take all this progress into account, though it is perhaps not clear exactly how to do so. Anne Noonburg–University of Hartford and author of *Ordinary Differential Equations from Calculus to Dynamical Systems*–and Steve Kennedy–Carleton College and MAA Books Sr. Acquisitions Editor–will lead a discussion focused on how best to react to these changes in your ODE course.

MAA

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

SOCIAL EVENT
Math Jeopardy
5:30 p.m. – 6:30 p.m., Hilton Portland, Plaza Level, Pavilion East

SOCIAL EVENT
Grand Opening Reception
6:00 p.m. – 8:00 p.m., Hilton Portland, Exhibit Hall

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 Chiacago;*
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*

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

Zombie Models: A Sexy Approach to Improving Mathematics One Brain at a Time
9:30 a.m. – 9:40 a.m. Matthew Lewis, Utah State University

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*

How Admissions Cutoff Scores Favor Affluent Students and Act as a Barrier for Many Minority Students
10:15 a.m. – 10:25 a.m.
Bryan Nankervis, *Texas State 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. McCreary, *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*

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

Modeling or Applications

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

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*

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)

INVITED PAPER SESSION

Mathematical Epidemiology

1:00 p.m. – 3:50 p.m., Hilton Portland, Plaza Level, Pavilion East

Ricardo Cortez, *Tulane University*

Comparing Risk for Chikungunya and Dengue Emergence Using Mathematical Models
1:00 p.m. – 1:20 p.m.
Carrie Manore, *Tulane University*

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.
Paul Hurtado, *Mathematical Biosciences Institute*

Determining Causal Networks in Nonlinear Dynamical Systems: Ecosystem Applications
2:00 p.m. – 2:20 p.m.
Bree Cummins, *Montana State University*

Epidemic Forecasting and Monitoring using Modern Data Assimilation Methods
2:30 p.m. – 2:50 p.m.
Kyle Hickmann, *Los Alamos and Tulane University*

Qualitative Inverse Problems using Bifurcation Analysis in the Recurrent Neutral Network Model
3:00 p.m. – 3:20 p.m.
Stephen Wirkus, *Arizona State University*

Mathematics of Planet Earth 2013+: Management of Natural Resources
3:30 p.m. – 3:50 p.m.
Abdul-Aziz Yakubu, *Howard University*

THEMED CONTRIBUTED PAPER SESSION

Mathematics in Honors Programs

1:00 p.m. – 3:55 p.m., Hilton Portland, Plaza Level, Broadway I & II

Jacci White, *Saint Leo University*

Applying Calculus Techniques to Analyze the Motion of Single and Double Ferris Wheels
1:00 p.m. – 1:15 p.m.
Paul E. Seeburger, *Monroe Community College*

Creating a Freshman Honors Mathematics Course (for Non-Majors)
1:20 p.m. – 1:35 p.m.
Brian Camp, *Saint Leo University*

Dimension and Direction: A Journey Through Mathematical Space
1:40 p.m. – 1:55 p.m.
David Clark, *Randolph-Macon College*

Honors Calculus at South Dakota State University
2:00 p.m. – 2:15 p.m.
Dan C Kemp, *South Dakota State University*

Searching For Great Issues In Mathematics
2:20 p.m. – 2:35 p.m.
Mark Bollman, *Albion College*

Maple in Honors Calculus
2:40 p.m. – 2:55 p.m.
Philip B. Yasskin, *Texas A&M University;*
Douglas B Meade, *University of South Carolina*

Honors Elementary Statistics
3:00 p.m. – 3:15 p.m.
Jacqueline Jensen-Vallin, *Lamar University*

Why Statistics??? An Opportunity for Exploration and Reflection
3:20 p.m. – 3:35 p.m.
Sarah L Mabrouk, *Framingham State University*

"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.
Lisa Marano, *West Chester University*

GENERAL CONTRIBUTED PAPER SESSION

Assorted Mathematics Research Topics

1:00 p.m. – 4:25 p.m., Hilton Portland, Ballroom Level, Parlor C

Interesting Matrix Problems from Quantum Information Theory: Locally Distinguishing Quantum States
1:00 p.m. – 1:10 p.m.
Michael Nathanson, *Saint Mary's College of California*

The Rank of a Recurrence Matrix
1:15 p.m. – 1:25 p.m.
Christopher R Lee, *University of Portland;*
Valerie J. Peterson, *University of Portland*

A Busy Beaver Problem for Infinite-Time Turing Machines
1:30 p.m. – 1:40 p.m.
James Long, *Lehigh University;*
Lee Stanley, *Lehigh University*

A Simplified Approach to the Cubic Formula
1:45 p.m. – 1:55 p.m.
Akhilan Boopathy, *Lakeside School*

On the Other Side of the World, or Right Next Door?
2:00 p.m. – 2:10 p.m.
Jeff Johannes, *SUNY Geneseo*

Exact Values of Trigonmentric Functions
2:15 p.m. – 2:25 p.m.
Jeremiah Bartz, *Francis Marion University*

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;*
Naiomi 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

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

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*

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*

Thursday, August 7 (continued)

THEMED CONTRIBUTED PAPER SESSION

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*

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*

Flipping the Integral Calculus Classroom with Multiple Instructors
5:40 p.m. – 5:55 p.m.
Jim Rolf, *Yale University;*
Yu-Wen Hsu, *Yale University;*
Susie Kimport, *Yale University;*
Jennifer Frederick, *Yale University*

Thursday, August 7 (continued)

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*

Sponsored by MAA Committee on Professional Development

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 Deept 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*

UNDERGRADUATE STUDENT ACTIVITIES

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

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

OTHER MATHEMATICAL SESSION

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

POM SIGMAA: Guest Lecture: Math-Speak: Syntax, Semantics, and Pragmatics

6:00 p.m. – 6:50 p.m., Hilton Portland, Ballroom Level, Galleria I

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, *Augustana 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*

UNDERGRADUATE STUDENT ACTIVITY
Pi Mu Epsilon Student Paper Session

8:30 a.m. – 12:05 p.m. Hilton Portland, 23rd Floor

PME Student Paper Session #7
8:30 a.m. – 12:05 p.m. Hilton Portland, 23rd Floor, Skyline 2

THEMED CONTRIBUTED PAPER SESSION
Project-Based Curriculum, Part I

8:50 a.m. – 11:25 a.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*

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
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 Hitzl, *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, S*t. 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&M 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*

The James Function
4:00 p.m. – 4:15 p.m.
Christopher N. B. Hammond, *Connecticut College;*
Warren Johnson, *Connecticut College;*
Steven J. Miller, *Williams College*

Exploring Five Integer Sequences Related to the Collatz Problem
4:20 p.m. – 4:35 p.m.
Jay Lawrence Schiffman, *Rowan 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 Combinatronics

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. – 2:20 p.m.
Lara Pudwell, *Valparaiso University*

There's Treasure Everywhere: When Student Work Matters
2:30 p.m. – 2:50 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. – 2:20 p.m.
Lisa Fauci, *Tulane University*

Mathematical Modeling of Sperm Motility and Mucociliary Transport
2:30 p.m. – 2:50 p.m.
Robert Dillon, *Washington State University*

Modeling E. Coli Aspartate Chemotaxis in a Stokes Flow
3:00 p.m. – 3:20 p.m.
Hoa Nguyen, *Trinity University*

Modeling Interactions between Tumor Cells, Interstitial Fluid and Drug Particles
3:30 p.m. – 3:50 p.m.
Katarzyna A. Rejniak, *H. Lee Moffitt Cancer Center & Research Institute and University of South Florida*

Sperm Motility and Cooperativity in Epithelial Detatchment
4:00 p.m. – 4:20 p.m.
Julie Simons, *Tulane University*

Swimming through Heterogeneous Viscoelastic Media
4:30 p.m. – 4:50 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;*
Shiying 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*

Friday, August 8 (continued)

PANEL SESSION

The New Mathways STEM Prep Initiative: Results from the Design Team

3:10 p.m. – 4:30 p.m., Hilton Portland, Ballroom Level, Grand Ballroom I

MINICOURSE

1. A Beginner's Guide to the Scholarship of Teaching and Learning in Mathematics (Part A)

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 A)

3:30 p.m. – 5:30 p.m., Hilton Portland Executive Tower, Salon Ballroom III

POSTER SESSION

PosterFest 2014: A Poster Session of Scholarship by Early Career Mathematicians and Graduate Students

3:30 p.m. – 5:00 p.m., Hilton Portland, Exhibit Hall

PANEL SESSION

Chairing the Academic Department: Advice and Perspectives from the Pros

4:10 p.m. – 5:30 p.m., Hilton Portland, Ballroom Level, Ballroom I

PANEL SESSION

Integrating Mathematical Software into Lower-Division Mathematics Courses

4:10 p.m. – 5:30 p.m., Hilton Portland, 23rd Floor, Skyline 2

SIGMAA ACTIVITY

WEB SIGMAA: Business Meeting

5:30 p.m. – 5:50 p.m., Hilton Portland, Ballroom Level, Parlor AB

SIGMAA ACTIVITY

WEB SIGMAA: Discussion: What Are Effective Online Homework Problems in Mathematics?

6:00 p.m. – 7:00 p.m., Hilton Portland, Ballroom Level, Parlor AB

SOCIAL EVENT

Pi Mu Epsilon Centennial Celebration Banquet

6:00 p.m. – 7:45 p.m., Hilton Portland, Plaza Level, Broadway

INVITED ADDRESS

Pi Mu Epsilon J. Sutherland Frame Lecture

Fibonacci and the First Personal Computing Revolution

8:00 p.m. – 8:50 p.m., Hilton Portland, Ballroom Level, Grand Ballroom

Keith Devlin, *Stanford University*

SOCIAL EVENT

MAA Ice Cream Social and Undergraduate Awards Ceremony

9:00 p.m. – 10:00 p.m., 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 Semiyari, *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 Traingulares 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*

τ-Factorizations, when τ 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 Politecnica de Valencia;*
Nestor Thome, *Universitat Politecnica de Valencia;*
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

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

Ensuring Engagement in Math Research
8:30 a.m. – 8:45 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 in Quantum Information Science
10:10 a.m. – 10:25 a.m.
David W. Lyons, *Lebanon Valley College*

Effective Undergraduate Research Using Questions Derived from Institutional Research and Computational Science
10:30 a.m. – 10:45 a.m.
Maria Zack, *Point Loma Nazarene University*

Undergraduate Research Projects with a Dozen or So Math, Physics, and CS Students Over the Past Decade
10:50 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*

Saturday, August 9 (continued)

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

GENERAL CONTRIBUTED PAPER SESSION

History or Philosophy of Mathematics

1:00 p.m. – 2:55 p.m., Hilton Portland, Ballroom Level, Galleria III

What is Algebra and Where Did it Come From?
1:00 p.m. – 1:10 p.m.
Meighan Irene Dillon, *Southern Polytechnic State University*

Venn-Euler-Leibniz Diagrams
1:15 p.m. – 1:25 p.m.
Deborah Bennett, *New Jersey City University*

Mechanical Solutions to the Three Construction Problems from Antiquity
1:30 p.m. – 1:40 p.m.
Keith M Dreiling, *Fort Hays State University*

The Toil and Moil in Proving the Describability of the Trigonometric Series
1:45 p.m. – 1:55 p.m.
Shigeru Masuda, *RIMS, Kyoto University*

Ming Antu's Influence on Chinese Mathematics in Qing Dynasty
2:00 p.m. – 2:10 p.m.
Weiping Li, *Walsh University*

Truman H. Safford: A Nineteenth Century Astronomer's Views on School Mathematics
2:15 p.m. – 2:25 p.m.
Eileen Donoghue, *City University of New York/CSI*

Was There Curricular Modernism Also?
2:30 p.m. – 2:40 p.m.
Walter Meyer, *Adelphi University*

Can a Mathematician Write a Proof So Complex Even He Cannot Believe It?
2:45 p.m. – 2:55 p.m.
Jeremy Sylvestre, *University of Alberta, Augustana Campus*

Saturday, August 9 (continued)

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.
Michelle Ghrist, *U.S. Air Force Academy;*
Dale Peterson, *U.S. Air Force Academy;*
Ralph Boedigheimer, *U.S. Air Force Academy;*
Benjamin Kallemyn, *Air Force Institute of Technology*

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*

Saturday, August 9 (continued)

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 Sloughter, *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
Open Access Publishing in Mathematics: Who?, What?, Where?, Why?, and How?
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)

Welcome to

Math Circles

http://mathcircles.org/

AMS/MSRI Math Circles Library

Collection of great books for Math Circle organizers including wonderful problem collections, discussions of experiences in math teaching, and practical books:

https://www.ams.org/bookstore/mclseries

Math Circle Events at MathFest

NAMC/ SIGMAA MCST Booth (Booths 37 & 38)
Visit the NAMC/SIGMAA MCST Booth for a chance to experience Math Circles sessions. Dave Auckly, James Tanton, Brandy Wiegers, Japheth Wood, and others will presenting.

For a complete schedule visit
https://www.mathcircles.org/content/math-fest-2014

Friday, August 8
Problems Well-Suited for Math Circles.
2:35-3:55. Ballroom Level, Grand Ballroom II

Saturday, August 9
SIGMAA MCST - Circle Demo for Math Fest
9:00 - 9:50am. Hilton, Plaza Level, Pavilion East
SIGMAA MCST -Math Wrangle.
10:30 - 11:25am. Hilton, Plaza Level, Pavilion East

Steps to getting started as a Math Circle Leader

(1) Sign up for your NAMC Account: http://mathcircles.org

(2) Register your new Math Circle:
https://www.mathcircles.org/node/add/mathcircle

(3) Find support, resources and ideas:
* SIGMAA on Circles – MCST: http://sigmaa.maa.org/mcst
* Circle of Circles Email Group
http://tech.groups.yahoo.com/group/circleofcircles/
* NAMC Facebook: http://www.facebook.com/MathCircles
* Math Teachers' Circle (MTC) Network:
http://mathteacherscircle.org
* Julia Robinson Math Festival:
http://juliarobinsonmathfestival.org/
* Thinking Mathematics! (Jim Tanton):
http://www.jamestanton.com/
* Math Pickle (Gordon Hamilton): http://www.mathpickle.com/
* Art of Problem Solving Foundation:
http://www.artofproblemsolving.org/programs.htm
* Natural Math (Maria Droujkova): http://www.naturalmath.com/
* Mathematical Circles Topics (Tom Davis):
http://www.geometer.org/mathcircles/

NAMC Resources

Problem Collection: https://www.mathcircles.org/content/math-circle-problem-collection
Math Circle Listing: https://www.mathcircles.org/Wiki_ExistingMathCirclePrograms_view
Summer Programs for Students: https://www.mathcircles.org/Summer-programs-list
Math Events Listing: https://www.mathcircles.org/content/math-competition-listing

Commercial Presentations

WebAssign

Powerful Resource for Your Classroom

Thursday, August 7, 11:30 a.m. – 1:00 p.m.
Hilton Portland, Plaza Level, Pavilion West

Are you new to WebAssign? See how easy it is to get started using this powerful tool for engaging students and enhancing learning for your class.

Are you already a WebAssign user? Explore the latest free math resources available, such as tutorial banks and Course Packs, and discuss what other resources and features you want to see in WebAssign to better enhance your student's learning.

Maplesoft

Take Control of Your Placement Testing with the Maple T.A. MAA Placement Test Suite

Thursday, August 7, 9:00 a.m. – 10:30 a.m.
Hilton Portland, Plaza Level, Pavilion East

The Maple T.A. MAA Placement Test Suite (PTS) combines tests based on current research in education with a powerful, online testing engine to provide the next generation of placement testing. PTS provides a completely flexible platform giving you control over not only what tests you use, but how and when your tests are run. Come to this session to see the difference PTS can make in your placement testing program. In addition we will be giving you a sneak peak of Maple T.A. 10! This soon-to-be released version includes; a completely redesigned interface for a more streamlined workflow, support for graph sketching, free-body diagrams, scoring rubrics, and also incorporates customer feedback.

Maplesoft

Leverage the Latest Advancements in Online STEM Education

Friday, August 8, 9:00 a.m. – 10:30 a.m.
Hilton Portland, Plaza Level, Pavilion West

How we present and flow course material to students is changing dramatically. As textbook prices continue to rise and easy access to online materials become commonplace, more and more academic institutions are moving course delivery online. Moving a STEM-based course online, however, comes with many challenges. Maplesoft is revolutionizing how STEM-based courses can be brought online using technology that improves student comprehension, retention, and success. Attend this presentation to better understand the challenges that exist today when moving a STEM based course online and explore Maplesoft's easy-to-use technology solutions.

Hawkes Learning Systems

What's New at Hawkes

Friday, August 8, 10:30 a.m. – 12:00 p.m.
Hilton Portland, Plaza Level, Pavilion East

Courseware Development Engineers at Hawkes Learning have designed an innovative, browser-based platform built specifically with the tablet in mind. Our Expert System offers a distinctive approach to mastery-based learning with instant and specific feedback when students make a mistake, thus improving learning outcomes and reducing anxiety. Plugins or installations are no longer required, allowing students to quickly jump into the material. See a preview of the updated question and curriculum builders. All attendees will be entered to win an iPad mini!

Sponsors & Exhibitors

Sponsors:

Hawkes Learning Systems
(BOOTHS 28-29)

With over 30 years of experience, Hawkes Learning Systems continues to expand its line of courseware, to constantly refine and improve its existing titles, and to pursue the use of new technology to provide the academic community with the best possible tools for effective mathematical instruction and comprehension. We understand what it takes to provide the best learning tools to help students succeed. Hawkes courseware motivates students through a unique approach to mastery learning by engaging them in the learning process. At Hawkes, we firmly believe: Students matter. Success counts.

Maplesoft (BOOTH 52)

Maplesoft, a trusted name in mathematics for over 20 years, combines the world's most advanced symbolic computation engine, Maple, with powerful numeric algorithms, advanced visualization tools, and intuitive interfaces, creating products essential for classroom and research. Maplesoft products also include Maple T.A., a web-based system for creating tests, assignments, and exercises; and the Maple T.A. MAA Placement Test Suite which offers the renowned Mathematical Association of America placement tests in an online environment.

The Möbius Project is Maplesoft's latest innovation for technical education. Create apps, share them with everyone, and grade them to assess understanding. This initiative is well underway! All elements of The Möbius Project are available today as part of a released product or as a technology preview, so you can begin developing and using content in your classroom today.

Maplesoft also introduced a fundamental shift in technical education through its Clickable Math™ initiatives which deliver powerful mathematics through visual, interactive point-and-click methods. The idea behind this shift is to create technology that will allow students and teachers to focus on the concepts, not the tool.

National Association of Math Circles (BOOTHS 37-38)

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

Pearson (BOOTHS 31-32)

A leader in mathematics and statistics educational solutions, Pearson provides course content from respected authors. Pearson's online courses within MyMathLab and MyStatLab have helped millions of students succeed since 2001. See us online at www.pearsonhighered.com.

Society of Actuaries

The Society of Actuaries (SOA) is the largest global professional actuarial organization. With unmatched research and education, and almost 25,000 of the highest skilled actuarial professionals, we prepare the individuals trusted to drive better business decisions and promote financial security in an ever-changing world. With an uncompromising emphasis on strength and quality of curriculum, the SOA provides a full range of rigorous pathways and distinguished credentials that are marks of distinction around the globe.

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Working to advance actuarial knowledge across disciplines, the SOA also conducts various events and professional development opportunities to ensure excellence in its actuaries' work in providing expert advice and relevant solutions for financial, business and societal problems. For more information, please visit www.soa.org.

WebAssign (BOOTH 49)

WebAssign is a flexible and fully customizable online instructional system that puts powerful tools in the hands of teachers, enabling them to deploy assignments, instantly assess individual student performance, and realize their teaching goals. Adopted by all major academic publishers, integrated with more than 900 science and math textbooks, and enhanced with a robust selection of independently developed original content, WebAssign makes it easy for faculty to enrich the teaching and learning experience. Join the more than 2,300 schools, 12,000 instructors, and 8 million students who have used WebAssign to submit over 1 billion answers to homework assignments, tests, and assessments.

Sponsors & Exhibitors (continued)

MAA gives a special thanks to our six sponsors of MAA MathFest 2014. Please be sure to visit the Exhibit Hall for information and fun activities.

Mathematical Association of America – MAA American Mathematics Competitions

The Mathematical Association of America (MAA) is the largest professional society that focuses on mathematics accessible at the undergraduate level.

Offerings available from the MAA include books, journals, DVDs, merchandise, an online homework source, professional development programs, and competitions.

Stop by the MAA Pavilion to learn how your institution can use the competitions as an outreach and recruitment opportunity, and browse our sales on selected titles and merchandise throughout the meeting.

MAA Pavilion
- Books
- Membership
- Competitions
- WeBWork - Online Homework Source
- Merchandise

Exhibitors

American Mathematical Association of Two Year Colleges (BOOTH 23)

American Mathematical Society (BOOTH 40-41)

Association for Women in Mathematics (BOOTH 24)

Be An Actuary (BOOTH 19)

Cambridge University Press (BOOTH 18)

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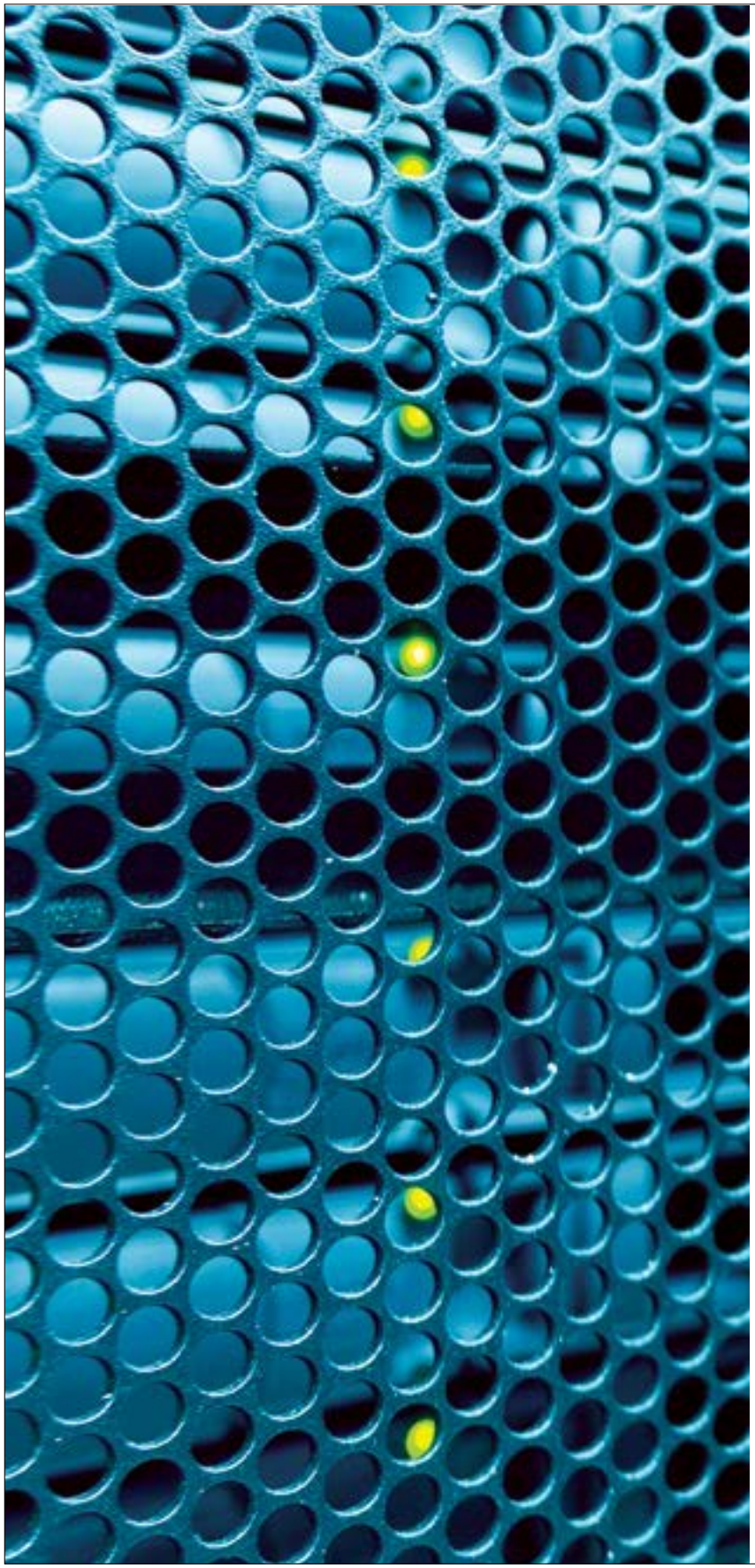
Worldwide Center of Mathematics (BOOTH 22)

xyAlgebra (BOOTH 42)

EXHIBIT HALL HOURS:

Wednesday, August 6:	6:00 p.m. – 8:00 p.m.
Thursday, August 7:	9:00 a.m. – 5:00 p.m.
Friday, August 8:	9:00 a.m. – 5:00 p.m.
Saturday, August 9:	9:00 a.m. – 12:30 p.m.



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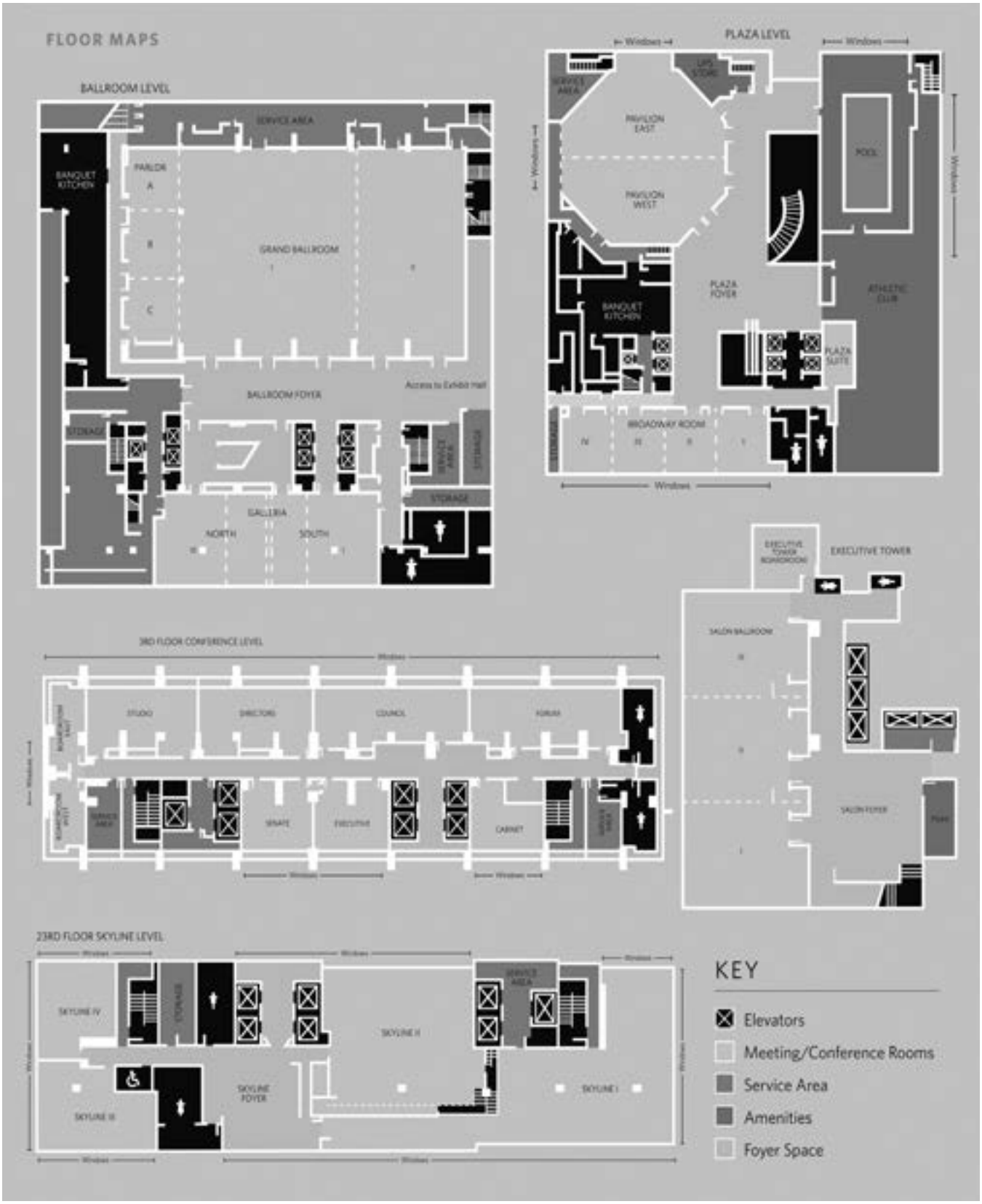

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MAA MATHFEST

August 5-8, 2015

Washington, D.C.

MAA 100

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