Meetings & Conferences of the AMS

IMPORTANT INFORMATION REGARDING MEETINGS PROGRAMS: AMS Sectional Meeting programs do not appear in the print version of the *Notices.* However, comprehensive and continually updated meeting and program information with links to the abstract for each talk can be found on the AMS website. See `http://www.ams.org/meetings/`. Final programs for Sectional Meetings will be archived on the AMS website accessible from the stated URL and in an electronic issue of the *Notices* as noted below for each meeting.

Eau Claire, Wisconsin

University of Wisconsin-Eau Claire

September 20–21, 2014

Saturday – Sunday

Meeting #1102

Central Section
Associate secretary: Georgia Benkart
Announcement issue of *Notices*: June 2014
Program first available on AMS website: August 7, 2014
Program issue of electronic *Notices*: September 2014
Issue of *Abstracts*: Volume 35, Issue 3

Deadlines

For organizers: Expired
For abstracts: Expired

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

Matthew Kahle, The Ohio State University, *Recent progress in random topology.*

Markus Keel, University of Minnesota, *To be announced.*

Svitlana Mayboroda, University of Minnesota, *Elliptic PDEs and localization of eigenfunctions in rough media.*

Dylan P. Thurston, Indiana University, Bloomington, *Rubber bands, square tilings, and rational maps.*

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at `http://www.ams.org/cgi-bin/abstracts/abstract.pl`.

Algebraic Combinatorics, **Pavlo Pylyavskyy**, **Victor Reiner**, and **Dennis Stanton**, University of Minnesota.

Algorithms in Arithmetic Geometry, **Adriana Salerno**, Bates College, and **Ursula Whitcher**, University of Wisconsin-Eau Claire.

Analysis and Geometry on Lie Groups, **Chal Benson** and **Gail Ratcliff**, East Carolina University.

Cohomology and Representation Theory of Groups and Related Structures, **Christopher Bendel**, University of Wisconsin-Stout, and **Christopher Drupieski**, De Paul University.

Commutative Ring Theory, **Michael Axtell**, University of St. Thomas, and **Joe Stickles**, Millikin University.

Directions in Commutative Algebra: Past, Present, Future. Dedicated to the memory of H.-B. Foxby, **Joseph P. Brennan**, University of Central Florida, and **Robert M. Fossum**, University of Illinois at Urbana-Champaign.

Graph and Hypergraph Theory, **Sergei Bezrukov**, University of Wisconsin-Superior, **Dalibor Froncek**, University of Minnesota Duluth, and **Xiaofeng Gu**, **Uwe Leck**, and **Steven Rosenberg**, University of Wisconsin-Superior.

Knot Concordance and 4-Manifolds, **Christopher W. Davis**, University of Wisconsin-Eau Claire, **Taylor Martin**, Sam Houston State University, and **Carolyn Otto**, University of Wisconsin-Eau Claire.

Lie Algebras and Representation Theory, **Michael Lau**, Université Laval, **Ian Musson**, University of Wisconsin-Milwaukee, and **Matthew Ondrus**, Weber State University.

New Trends in Toric Varieties, **Christine Berkesch Zamaere**, University of Minnesota, **Daniel Erman**, University of Wisconsin-Madison, and **Hal Schenck**, University of Illinois Urbana-Champaign.

Number Theory, **Colleen Duffy**, University of Wisconsin-Eau Claire, and **Rafe Jones**, Carleton College.

Patterns in Permutations and Words, and Applications, **Manda Riehl**, University of Wisconsin-Eau Claire, and **Alex Woo**, University of Idaho.

Problem Solving in Extremal Combinatorics and Combinatorial Geometry, **Jeremy Alm**, Illinois College, and **Jacob Manske**, Epic.

Random Spaces, **Matthew Kahle**, Ohio State University, and **Dylan Thurston**, Indiana University.

The Mathematical Education of Future K-12 Teachers, **Charles Bingen** and **Ryan Harrison**, University of Wisconsin-Eau Claire.

Wavelets, Frames, and Time-Frequency Analysis, **Patrick Van Fleet**, University of St. Thomas, and **James S. Walker**, University of Wisconsin-Eau Claire.

von Neumann Algebras and Related Fields, **Stephen Avsec** and **Ken Dykema**, Texas A&M University.

Halifax, Canada

Dalhousie University

October 18–19, 2014

Saturday – Sunday

Meeting #1103

Eastern Section
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: August 2014
Program first available on AMS website: September 5, 2014
Program issue of electronic *Notices*: October 2014
Issue of *Abstracts*: Volume 35, Issue 3

Deadlines

For organizers: Expired
For abstracts: Expired

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

François Bergeron, Université du Québec à Montréal, *Algebraic combinatorics and finite reflection groups.*

Sourav Chatterjee, Stanford University, *Nonlinear large deviations.*

William M. Goldman, Department of Mathematics, University of Maryland, *Moduli spaces and the classification of geometric structures on manifolds.*

Sujatha Ramdorai, University of British Columbia, *Galois representations and Iwasawa theory.*

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at `http://www.ams.org/cgi-bin/abstracts/abstract.pl`.

Advances in Harmonic Analysis and Partial Differential Equations, **David Cruz-Uribe**, Trinity College, and **Scott Rodney**, Cape Breton University.

Combinatorial Representation Theory, **Cristina Ballantine**, College of the Holy Cross, **Rosa Orellana**, Dartmouth College, and **Mercedes Rosas**, Universidad de Sevilla.

Commutative Algebra and Its Interactions with Algebraic Geometry, **Susan Marie Cooper**, North Dakota State University, **Sara Faridi**, Dalhousie University, and **William Traves**, U.S. Naval Academy.

Differential Geometry and Mathematical Physics, **Virginie Charette**, Université de Sherbrooke, and **Karin Melnick**, University of Maryland.

Experimental Mathematics in Number Theory, Analysis, and Combinatorics, **Marc Chamberland**, Grinnell College, and **Karl Dilcher**, Dalhousie University.

Games on Graphs, **Jason Brown** and **Jeannette Janssen**, Dalhousie University.

General Relativity, **Jack Gegenberg**, University of New Brunswick.

Generalized Catalan Algebraic Combinatorics, **François Bergeron** and **Franco Saliola**, Université du Québec à Montréal, **Hugh Thomas**, University of New Brunswick, and **Nathan Williams**, Université du Québec à Montréal.

Hopf Algebras, **Yuri Bahturin**, Memorial University of New Foundland, **Margaret Beattie**, Mount Allison University, and **Mitja Mastnak**, Saint Mary's University.

New Directions in Category Theory, **Pieter Hofstra**, University of Ottawa, and **Dorette Pronk**, Dalhousie University.

Sampling Theory, **John J. Benedetto**, University of Maryland, **Jean-Pierre Gabardo**, McMaster University, and **Ozgur Yilmaz**, University of British Columbia.

Special Functions and Their Applications., **Mourad E. H. Ismail**, University of Central Florida, and **Nasser Saad**, University of Prince Edward Island.

Symbolic Dynamics and Combinatorics on Words, **Srecko Brlek**, Université du Québec à Montréal, and **Reem Yassawi**, Trent University.

p-adic Methods in Arithmetic, **Henri Darmon**, McGill University, **Adrian Iovita**, Concordia University, and **Sujatha Ramdorai**, University of British Columbia.

San Francisco, California

San Francisco State University

October 25–26, 2014
Saturday – Sunday

Meeting #1104
Western Section
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: August 2014
Program first available on AMS website: September 11, 2014
Program issue of electronic *Notices*: October 2014
Issue of *Abstracts*: Volume 35, Issue 4

Deadlines

For organizers: Expired
For abstracts: Expired

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

Kai Behrend, University of British Columbia, Vancouver, Canada, *The virtual fundamental class and "derived" symplectic geometry*.

Kiran S. Kedlaya, University of California, San Diego, *A brief history of perfectoid spaces*.

Julia Pevtsova, University of Washington, Seattle, *Applications of geometry to modular representation theory*.

Jim Simons, Euclidean Capital, *Mathematics, common sense, and good luck*.

Burt Totaro, University of California, Los Angeles, *The fundamental group of an algebraic variety, and hyperbolic complex manifolds*.

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at `http://www.ams.org/cgi-bin/abstracts/abstract.pl`.

Algebraic Geometry, **Renzo Cavalieri**, Colorado State University, **Noah Giansiracusa**, University of California, Berkeley, and **Burt Totaro**, University of California, Los Angeles.

Algebraic Statistics, **Elizabeth Gross**, San Jose State University, and **Kaie Kubjas**, Aalto University.

Applications of Knot Theory to the Entanglement of Biopolymers, **Javier Arsuaga**, San Francisco State University, **Michael Szafron**, University of Saskatchewan, and **Mariel Vazquez**, San Francisco State University.

Categorical Methods in Representation Theory, **Eric Friedlander**, University of Southern California, **Srikanth Iyengar**, University of Utah, and **Julia Pevtsova**, University of Washington.

Combinatorics and Algebraic Geometry, **Madhusudan Manjunath**, University of California, Berkeley, and **Farbod Shokrieh**, Cornell University.

Computational Algebraic Geometry and Applications to Science and Engineering, **Daniel Brake** and **Dhagash Mehta**, North Carolina State University, Raleigh.

Developments from MSRI Programs in Commutative Algebra and Noncommutative Algebraic Geometry and Representation Theory, **Kenneth Chan**, University of Washington, and **Jack Jeries**, University of Utah.

Geometry of Submanifolds, **Yun Myung Oh**, Andrews University, **Bogdan D. Suceava**, California State University, Fullerton, and **Mihaela B. Vajiac**, Chapman University.

Hamiltonian Partial Differential Equations, **Marius Beceanu**, University of California, Berkeley, **Magdalena Czubak**, Binghamton University, **Dong Li**, University of British Columbia, and **Xiaoyi Zhang**, University of Iowa.

High-Dimensional Convexity and Applications, **Luis Rademacher**, Ohio State University, **Stanislaw Szarek**, Case Western Reserve University and Université Pierre et Marie Curie-Paris 6, and **Elisabeth Werner**, Case Western Reserve University, Université de Lille 1, UFR de Mathématique.

Homotopy Theory, **Julie Bergner**, University of California, Riverside, and **Angélica Osorno**, Reed College.

Interactions between Knots and Manifolds, **Stanislav Jabuka** and **Swatee Naik**, University of Nevada, Reno, and **Cornelia Van Cott**, University of San Francisco.

Nonlinear Partial Differential Equations, **Nathan Glatt-Holtz**, Virginia Tech, **Geordie Richards**, University of Rochester, and **Vlad Vicol**, Princeton University.

Polyhedral Number Theory, **Matthias Beck**, San Francisco State University, **Martin Henk**, Universität Magdeburg, and **Joseph Gubeladze**, San Francisco State University.

Probabilistic and Statistical Problems in Stochastic Dynamics, **Alexandra Piryatinska**, San Francisco State University.

Recent Progress in Geometric Analysis, **David Bao**, San Francisco State University, and **Ovidiu Munteanu**, University of Connecticut.

Recent Progress in Harmonic Analysis and Several Complex Variables, **Gustavo Hoepfner** and **Paulo Liboni**, Universidade Federal de São Carlos, and **Irina Mitrea**, Temple University.

Topological Combinatorics and Combinatorial Commutative Algebra, **Anton Dochtermann**, University of Miami, **Augustine O'Keefe**, University of Kentucky, and **Alexander Engstrom**, Aalto University.

Greensboro, North Carolina

University of North Carolina at Greensboro

November 8–9, 2014

Saturday – Sunday

Meeting #1105

Southeastern Section
Associate secretary: Brian D. Boe
Announcement issue of *Notices*: August 2014
Program first available on AMS website: September 25, 2014
Program issue of electronic *Notices*: November 2014
Issue of *Abstracts*: Volume 35, Issue 4

Deadlines

For organizers: Expired
For abstracts: September 23, 2014

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

Susanne C. Brenner, Louisiana State University, *Novel finite element methods for optimal control problems with PDE constraints*.

Skip Garibaldi, Emory University, *E_8 and other exceptional groups*.

Stavros Garoufalidis, Georgia Institute of Technology, *Knots and q-series*.

James Sneyd, University of Auckland, *The dynamics of calcium: Oscillations, waves, theories, and experiments* (AMS-NZMS Maclaurin Lecture).

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at `http://www.ams.org/cgi-bin/abstracts/abstract.pl`.

Algebraic Structures Motivated by Knot Theory (Code: SS 9A), **Jozef H. Przytycki**, George Washington University, and **Radmila Sazdanovic**, North Carolina State University.

Algorithms for Local Fields (Code: SS 14A), **Chad Awtrey**, Elon University, and **Sebastian Pauli**, University of North Carolina at Greensboro.

Automorphic Forms and Related Topics (Code: SS 11A), **Matthew Boylan**, University of South Carolina, **Jayce Getz**, Duke University, and **Dan Yasaki**, University of North Carolina at Greensboro.

Connections in Number Theory (Code: SS 20A), **Joseph Vandehey**, University of Georgia.

Difference Equations and Applications (Code: SS 1A), **Michael A. Radin**, Rochester Institute of Technology, and **Youssef Raffoul**, University of Dayton.

Discontinuous Galerkin Finite Element Methods (Code: SS 13A), **Susanne C. Brenner** and **Joscha Gedicke**, Louisiana State University, and **Thomas Lewis**, University of North Carolina at Greensboro.

Discrete Structures in Classical Geometries (Code: SS 4A), **Philip L. Bowers**, Florida State University.

Exceptional Groups in Physics, Algebra, and Geometry (Code: SS 17A), **Asher Auel**, Yale University, **Anthony Ruozzi**, Emory University, and **George McNinch**, Tufts University.

Galois Theory and Its Interactions with Algebra and Number Theory (Code: SS 12A), **Chad Awtrey**, Elon University, and **Michael Bush**, Washington and Lee University.

Geometric Analysis (Code: SS 6A), **Hubert Bray**, Duke University, and **Andrew Cooper**, North Carolina State University.

Geometry and Combinatorics on Homogeneous Spaces (Code: SS 10A), **Leonardo C. Mihalcea**, Virginia Tech University, and **Richard Rimanyi**, University of North Carolina Chapel Hill.

Knot Theory and Its Applications (Code: SS 7A), **Elizabeth Denne**, Washington & Lee University, and **Laura Taalman**, James Madison University.

Mirror Symmetry (Code: SS 18A), **Matthew Ballard**, University of South Carolina, and **David Favero**, University of Alberta.

Movement in Mathematical Biology (Code: SS 19A), **Jonathan T. Rowell** and **Jan Rychtar**, University of North Carolina at Greensboro.

Multiple Combinatorial Numbers and Associated Identities (Code: SS 16A), **Hasan Coskun**, Texas A&M University Commerce.

Nonlinear Boundary Value Problems (Code: SS 5A), **Maya Chhetri**, University of North Carolina at Greensboro, and **Stephen Robinson**, Wake Forest University.

Partial Differential Equations Related to Fluids (Code: SS 15A), **Dhanapati Adhikari**, Marywood University.

Recent Advances in Numerical Methods for Fluid Flow Problems (Code: SS 2A), **Leo Rebholz**, Clemson University, and **Zhu Wang**, University of South Carolina.

Recent Developments in Graph Theory and Hypergraph Theory (Code: SS 3A), **David Galvin**, University of Notre Dame, and **Clifford Smyth**, University of North Carolina at Greensboro.

Set Theoretic Topology (Code: SS 8A), **Peter J. Nyikos**, University of South Carolina, and **Jerry Vaughan**, University of North Carolina at Greensboro.

San Antonio, Texas

Henry B. Gonzalez Convention Center and Grand Hyatt San Antonio

January 10–13, 2015
Saturday – Tuesday

Meeting #1106
Joint Mathematics Meetings, including the 121st Annual Meeting of the AMS, 98th Annual Meeting of the Mathematical Association of America (MAA), annual meetings of the Association for Women in Mathematics (AWM) and the National Association of Mathematicians (NAM), and the winter meeting of the Association of Symbolic Logic (ASL), with sessions contributed by the Society for Industrial and Applied Mathematics (SIAM).
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: October 2014
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: January 2015
Issue of *Abstracts*: Volume 36, Issue 1

Deadlines

For organizers: Expired
For abstracts: Expired
The scientific information listed below may be dated. For the latest information, see www.ams.org/amsmtgs/national.html.

Joint Invited Addresses

Jordan Ellenberg, University of Wisconsin-Madison, Title to be announced. 11:10 a.m. (AMS-MAA).

Donald G. Saari, University of California, Irvine, *From voting paradoxes to the search for "dark matter"*; Saturday, 3:30 p.m. (MAA-AMS-SIAM Gerald and Judith Porter Public Lecture)

Richard Tapia, Rice University, Title to be announced. 11:10 a.m. (AMS-MAA**).**

Joint Prize Session

In order to showcase the achievements of the recipients of various prizes, the AMS and MAA are cosponsoring this event at 4:25 p.m. on Sunday. A cash bar reception will immediately follow. All participants are invited to attend. The AMS, ASA, MAA, and SIAM will announce the JPBM Communications Award winner. The AMS, MAA, and SIAM will award the Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student. The AMS will announce the winners of the George David Birkhoff Prize, Frank Nelson Cole Prize in Algebra, Levi L. Conant Prize, Ruth Lyttle Satter Prize, Leroy P. Steele Prizes, and the Albert Leon Whiteman Memorial Prize. The MAA will award the Beckenbach Book Prize, Chauvenet Prize, Euler Book Prize, Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics, Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics. The AWM will present the Louise Hay Award for Contributions to Mathematics Education, M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics,and the Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman.

121st Meeting of the AMS

AMS Invited Addresses

Ian Agol, University of California, Berkeley, Title to be announced; Tuesday, 9:00 a.m.

Henri Darmon, McGill University, *Elliptic curves and explicit class field theory*; Sunday, 2:15 p.m.

Susan Holmes, Stanford University, *Statistically relevant metrics for complex data*; Sunday, 3:20 p.m.

Michael Hopkins, Harvard University, *Title to be announced*. Saturday–Monday, 1:00 p.m. (Colloquium Lectures)

Russell Lyons, Indiana University, Bloomington, *Random orderings and unique ergodicity of automorphism groups*; Saturday, 10:05 a.m.

Irena Peeva, Cornell University, *Matrix factorizations and complete intersection rings*; Monday, 10:05 a.m.

Daniel A. Spielman, Yale University, *Graphs, vectors, and matrices*; Saturday, 8:30 p.m. (Josiah Willard Gibbs Lecture)

AMS Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at http://jointmathematicsmeetings.org/meetings/abstracts/abstract.pl?type=jmm.

Some sessions are cosponsored with other organizations. These are noted within the parenthesis at the end of each listing, where applicable.

Accelerated Advances in Multiobjective Optimal Control Problems and Mathematical Programming Based on Generalized Invexity Frameworks, **N. J. Huang**, Sichuan University, **R. N. Mohapatra**, University of Central Florida, **Ram Verma**, Texas State University, and **Alexander Zaslavski**, Israel Institute of Technology.

Advances in Coding Theory, **Felice Manganiello** and **Gretchen L. Matthews**, Clemson University, and **Judy L. Walker**, University of Nebraska.

Algebraic Combinatorics and Representation Theory, **Zajj Daugherty**, Dartmouth College, and **Ben Salisbury**, Central Michigan University.

Algebraic and Geometric Methods in Applied Discrete Mathematics (a Mathematics Research Communities Session), **Heather Harrington**, University of Oxford, **Mohamed Omar**, Harvey Mudd College, and **Matthew Wright**, Institute for Mathematics and its Applications, University of Minnesota.

Applications of Dynamical Systems to Biological Models, **Yu Jin**, University of Nebraska-Lincoln, and **Xiang-Sheng Wang**, Southeast Missouri State University.

Beyond First-Order Model Theory, **John T. Baldwin**, University of Illinois at Chicago, **Xavier Caicedo**, Universidad de los Andes, **Rami Grossberg**, Carnegie Mellon University, **Jose Iovino**, University of Texas at San Antonio, and **Boris Zilber**, Oxford University (AMS-ASL).

Classification Problems in Operator Algebras, **Arnaud Brothier**, Vanderbilt University, **Ionut Chifan**, The University of Iowa, **Darren Creutz**, Vanderbilt University, **Remus Nicoara**, University of Tennessee, and **David Penneys**, University of Toronto.

Cluster Algebras (a Mathematics Research Communities session), **Andrew T. Carroll**, DePaul University, **Ian T. Le**, University of Chicago, and **Greg Muller**, University of Michigan.

Computing Intensive Modeling in Mathematical and Computational Biology, **Timothy D. Comar**, Benedictine University, **Olcay Akman**, Illinois State University, and **Daniel Hrozencik**, Chicago State University.

Continued Fractions, **James Mc Laughlin**, West Chester University, and **Nancy J. Wyshinski**, Trinity College.

Creating Coherence in K–12 Mathematics, **Brigitte Lahme**, Sonoma State University, **William McCallum** and **Cody Patterson**, University of Arizona, **Kristin Umland**, University of New Mexico, and **Ellen Whitesides**, University of Arizona.

Current Trends in Classical Dynamical Systems, **Lennard Bakker** and **Skyler Simmons**, Brigham Young University.

Difference Equations and Applications, **Steven Miller**, Williams College, and **Michael A. Radin**, Rochester Institute of Technology.

Differential Geometry and Statistics, **Susan Holmes**, Stanford University.

Enumerative Combinatorics, **Brian K. Miceli**, Trinity University, and **Jay Pantone** and **Vince Vatter**, University of Florida.

Ergodic Theory and Dynamical Systems, **Mrinal Kanti Roychowdhury**, University of Texas-Pan American.

Factorization Theory and Its Applications, **Nicholas Baeth**, University of Central Missouri, **Scott Chapman**, Sam Houston State University, **Jim Coykendall**, Clemson University, and **Alfred Geroldinger**, Karl Franzens University.

Fixed Point Theory and Applications, **Clement Boateng Ampadu**.

Fractional, Stochastic, and Hybrid Dynamic Systems with Applications, **John R. Graef**, University of Tennessee at Chattanooga, **G. S. Ladde**, University of South Florida, and **A. S. Vatsala**, University of Louisiana at Lafayette.

Frames and Their Applications, **Radu Balan** and **Kasso Okoudjou**, University of Maryland, and **Rachel Ward**, University of Texas.

Geometries Defined by Differential Forms, **Sergey Grigorian**, University of Texas-Pan American, **Sema Salur**, University of Rochester, and **Albert J. Todd**, University of California, Riverside.

Geosystems Mathematics, **Willi Freeden**, University of Kaiserslautern, **Volker Michel**, University of Siegen, and **M. Zuhair Nashed**, University of Central Florida.

Graphs, Matrices, and Related Problems, **Cheryl Grood** and **Thomas Hunter**, Swarthmore College, and **Sharon McCathern**, Azusa Pacific University.

Groups, Algorithms, and Cryptography, **Bren Cavallo** and **Delaram Kahrobaei**, City University of New York Graduate Center.

Heavy-Tailed Distributions and Processes, **U. Tuncay Alparslan** and **John P. Nolan**, American University.

History of Mathematics, **Sloan Despeaux**, Western Carolina University, **Patti Hunter**, Westmont College, **Deborah Kent**, Drake University, and **Adrian Rice**, Randolph-Macon College (AMS-MAA).

Holomorphic Dynamics in One and Several Variables, **Tanya Firsova**, State University of New York at Stony Brook and Kansas State University, and **Thomas Sharland**, State University of New York at Stony Brook.

Hopf Algebras and Tensor Categories, **Susan Montgomery**, University of Southern California, **Siu-Hung Ng**, Louisiana State University and Iowa State University, and **Sarah Witherspoon**, Texas A&M University.

Inequalities and Quantitative Approximation, **Feng Dai**, University of Alberta, and **Mourad E. H. Ismail**, University of Central Florida.

Inverse Problems, **Peter Muller**, Rensselaer Polytechnic Institute, and **Kaitlyn Voccola**, Colorado State University.

Knot Theory, **Tim Cochran** and **Shelly Harvey**, Rice University.

Limits of Discrete Structures, **Peter Diao**, **Dominique Guillot**, **Apoorva Khare**, and **Bala Rajaratnam**, Stanford University.

Math Teachers Circles and the K–20 Continuum, **Brian Conrey**, American Institute of Mathematics, **Michael Nakamaye** and **Kristin Umland**, University of New Mexico, and **Diana White**, University of Colorado at Denver.

Mathematics in Natural Resource Modeling, **Shandelle M. Henson**, Andrews University, and **Catherine A. Roberts**, College of the Holy Cross.

Mathematics in Poland: Interbellum, World War II, and Immediate Post-War Developments, **Mohammad Javaheri** and **Emelie A. Kenney**, Siena College.

Model Theory and Applications, **David Marker**, University of Illinois at Chicago, **Sergei Starchenko**, University of Notre Dame, and **Carol Wood**, Wesleyan University.

Network Science (a Mathematics Research Communities session), **Bailey Fosdick**, Colorado State University, **Franklin Kenter**, Rice University, **Christine Klymko**, Lawrence Livermore National Laboratory, and **Johan Ugander**, Microsoft Research.

Noncommutative Function Theory, **Paul S. Muhly**, University of Iowa, and **Gelu F. Popescu**, University of Texas at San Antonio.

Operator Algebras and Their Applications: A Tribute to Richard V. Kadison, **Robert S. Doran** and **Efton Park**, Texas Christian University.

Partitions, q-Series, and Modular Forms, **Atul Dixit**, Tulane University, **Tim Huber**, University of Texas-Pan American, **Amita Malik**, University of Illinois, and **Ae Ja Yee**, Pennsylvania State University.

Positivity and Matrix Inequalities, **Dominique Guillot**, **Apoorva Khare**, and **Bala Rajaratnam**, Stanford University.

Probability and Applications, **Rick Kenyon**, Brown University, and **Russell Lyons**, Indiana University.

Progress in Multivariable Operator Theory, **Ron Douglas**, Texas A&M University, and **Constanze Liaw**, Baylor University.

Quantum Information and Fusion Categories (a Mathematics Research Communities session), **Paul Bruillard**, Pacific Northwest National Laboratory, **Henry J. Tucker**, University of Southern California, and **Amanda Young**, University of California, Davis.

Quantum Markov Chains, Quantum Walks, and Related Topics, **Chaobin Liu**, Bowie State University, **Takuya Machida**, University of California, Berkeley, **Salvador E. Venegas-Andraca**, Tecnologicó de Monterrey, Campus Estado de México, and **Nelson Petulante**, Bowie State University.

Recent Advances in Discrete and Intuitive Geometry, **Andras Bezdek**, Auburn University, **Ted Bisztriczky**, University of Calgary, and **Wlodek Kuperberg**, Auburn University.

Recent Advances in the Analysis and Applications of Modern Splitting Methods, **Abdul Q. M. Khaliq**, Middle Tennessee State University, **Qin Sheng**, Baylor University, and **Bruce Wade**, University of Wisconsin-Milwaukee.

Recent Developments in Algebraic Number Theory, **Wen-Ching Winnie Li**, Pennsylvania State University, **Tong Liu**, Purdue University, and **Ling Long**, Iowa State University and Louisiana State University (AMS-AWM).

Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs, **Darren A. Narayan**, Rochester Institute of Technology, **Tamas Forgacs**, California State University Fresno, and **Jobby Jacob**, **Carl V. Lutzer**, and **Tamas Wiandt**, Rochester Institute of Technology (AMS-MAA-SIAM).

Ricci Curvature for Homogeneous Spaces and Related Topics, **Megan Kerr**, Wellesley College, and **Tracy Payne**, Idaho State University.

Selmer Groups, **Mirela Ciperiani**, University of Texas, and **Henri Darmon**, McGill University.

Set-Valued Optimization and Variational Problems with Applications, **Akhtar A. Khan**, Rochester Institute of Technology, **Mau Nam Nguyen**, Portland State University, **Miguel Sama**, Universidad Nacional de Educacion a Distancia, Madrid, and **Christiane Tammer**, Martin Luther University of Halle-Wittenberg.

Studies in Interconnections among Parameters in Graph Theory, Combinatorics, and Discrete Geometry, **Cong X. Kang** and **Eunjeong Yi**, Texas A&M University at Galveston.

Successes and Challenges in Teaching Mathematics, **Ellina Grigorieva**, Texas Woman's University, and **Natali Hritonenko**, Prairie View A&M University.

Syzygies, **Giulio Caviglia**, Purdue University, **Jason McCullough**, Rider University, and **Irena Peeva**, Cornell University.

The Scottish Book, **Krystyna Kuperberg**, Auburn University, **R. Daniel Mauldin**, University of North Texas, and **Jan Mycielski**, University of Colorado.

Theory and Application of Reaction Diffusion Models, **Jerome Goddard II**, Auburn University Montgomery, and **Ratnasingham Shivaji**, University of North Carolina Greensboro.

Topological Measures of Complexity: Inverse Limits, Entropy, and Structure of Attractors, **Loribeth M. Alvin**, University of Denver, **Jan P. Boroński**, National Supercomputing Centre IT4Innovations, Ostrava, **James Keesling**, University of Florida, **Olga Lukina**, University of Illinois at Chicago, and **P. Oprocha**, AGH University of Science and Technology, Krakow.

What's New in Group Theory?, **Arturo Magidin**, University of Louisiana at Lafayette, and **Elizabeth Wilcox**, Oswego State University.

AMS Sessions for Contributed Papers

There will be sessions of ten-minute contributed talks. Although an individual may present only one contributed paper at a meeting, any combination of joint authorship may be accepted, provided no individual speaks more than once on the program. Contributed papers will be grouped together by related subject classifications into sessions.

Submission of Abstracts for AMS Sessions

Authors must submit abstracts of talks through `joint mathematicsmeetings.org/meetings/abstracts/abstact.pl?type=jmm`. Indicate the number of authors for the paper, click on the "New Abstract" button, and you will be taken to the submission form. Simply follow the step-by-step instructions (read them carefully) until you receive your unique abstract receipt number. No submission is complete until you are given this number. **The deadline for all submissions is September 16, 2014.** Late papers cannot be accommodated. Please email `abscoord@ams.org` if you have questions. If you make an inquiry about your specific abstract, please include your abstract receipt number.

Other AMS Sessions

AMS Committee on the Profession Panel Discussion, Saturday, 4:30 p.m.–6:00 p.m., title and panelists to be announced.

Counting from Infinity: Yitang Zhang and the Twin Primes Conjecture, Saturday, 6:20 p.m.–7:40 p.m. In April 2013, a lecturer at the University of New Hampshire submitted a paper to the *Annals of Mathematics*. Within weeks word spread—a little-known mathematician, with no permanent job, working in complete isolation had made an important breakthrough towards solving the Twin Primes Conjecture. Yitang Zhang's techniques for bounding the gaps between primes soon led to rapid progress by the Polymath Group, and a further innovation by James Maynard. The film is a study of Yitang Zhang's rise from obscurity and a disadvantaged youth to mathematical celebrity. The story of Zhang's quiet perseverance amidst adversity, and his preference for thinking and working in solitude, is interwoven with a history of the Twin Primes Conjecture as told by several mathematicians, many of whom have wrestled with this enormously challenging problem in Number Theory—Daniel Goldston, Kannan

Soundararajan, Andrew Granville, Peter Sarnak, Enrico Bombieri, James Maynard, Nicholas Katz, David Eisenbud, Ken Ribet, and Terry Tao. This film was directed by **George Csicsery**, and produced by MSRI. Cosponsored by the AMS and MAA.

Conversation on Nonacademic Employment, Sunday, 10:30 a.m.–noon. This session will concentrate on how to find nonacademic positions, types of jobs, the interview process, work environments, and advancement opportunities. The discussion will be led by a panel of mathematical scientists working in government and industry.

Active Learning Strategies for Mathematics, Sunday, 1:00 p.m.–2:30 p.m., organized by **David Bressoud**, Macalester College; **Ruth Charney**, Brandeis University; **Jesus Antonio DeLoera**, University of California, Davis; and **Douglas Mupasiri**, University of Northern Iowa. The AMS recognizes the importance of active learning strategies and is working with organizations such as Transforming Post-Secondary Education in Mathematics (TPSE Math) to clarify what this means for our community and to promote best practices in teaching the mathematical sciences. This panel will highlight some of the active learning strategies for which we have evidence of effectiveness. Sponsored by the AMS Committee on Education.

Concept Inventories beyond Differential Calculus: An Invitation, Sunday, 3:00 p.m.–4:00 p.m., organized by **Stephen DeBacker**, University of Michigan; and **Gavin LaRose**, University of Michigan. We are interested in developing tools to assess student learning in mathematics that are environment-independent; that is, tools that can be used to assess learning outcomes independent of teaching style, school, future courses of the students, instructor, etc. As far as we know, the only such tool available to the math community is the Calculus Concept Inventory (CCI), which focuses on differential calculus. (For more information, see, for example, Esptein, Jerome, "The Calculus Concept Inventory—Measurement of the effect of teaching methodology in mathematics," *Notices* of the AMS, vol. 60, No. 10 (September 2013), pp. 1018-1026.)

We would like the community to develop environment-independent tools that will address other mathematical subjects including: precalculus, integral calculus, sequences and series, multivariable calculus, differential equations, and linear algebra. We invite others who might be interested in such tools to join us for an informal discussion. Sponsored by the Committee on Education.

The Mathematics of Being Human, Sunday, 6:00 p.m.–7:20 p.m. In the not-too-distant future, English professor Naomi Kessler and mathematics professor Mike Pearson are forced to co-teach a course by a university bent on promoting interdisciplinarity at any cost. Battle lines are drawn as they jockey not only over the syllabus but also the different intellectual cultures and modes of inquiry favored by the humanities vs. mathematics. To win over the class, they must bridge their own preconceptions and prejudices and explore common ground. Only through the effort of two of their students do they catch a glimpse of true synthesis. Come see this live performance, co-written by **Michele Osherow**, professor of English and Director of Judaic Studies at the University of Maryland Baltimore County, and **Manil Suri**, professor of mathematics, University of Maryland Baltimore County. There will be ample time after the performance for discussion and questions. Cosponsored by AMS and MAA.

Grad School Fair, Monday, 8:30 a.m.–10:30 a.m. Here is the opportunity for undergrads to meet representatives from mathematical sciences graduate programs from universities all over the country. January is a great time for juniors to learn more, and college seniors may still be able to refine their search. This is your chance for one-stop shopping in the graduate school market. At last year's meeting about 300 students met with representatives from 50 graduate programs. If your school has a graduate program and you are interested in participating, a table will be provided for your posters and printed materials for US$75 (registration for this event must be made by a person already registered for the JMM), and you are welcome to personally speak to interested students. Complimentary coffee will be served. Cosponsored by the the AMS and MAA.

Who Wants to Be a Mathematician—National Contest, organized by **Michael A. Breen**, AMS, and **William T. Butterworth**, DePaul University; Monday, 9:30 a.m.–11:00 a.m. This event features a special performance by **Tim Chartier**, Davidson College. See ten of the nation's best high school students compete for a US$5,000 first prize for themselves and US$5,000 for their school's math department. Semifinals are at 9:30 a.m. and finals at 10:30 a.m. You are invited to come and match wits with the contestants.

Current Events Bulletin, organized by **David Eisenbud**, Mathematical Sciences Research Institute; Monday, 1:00 p.m.–5:00 p.m. Speakers in this session follow the model of the Bourbaki Seminars in that mathematicians with strong expository skills speak on work not their own. Written versions of the talks will be distributed at the meeting and will also be available online at `www.ams.org/ams/current-events-bulletin.html` after the conclusion of the meeting.

Committee on Science Policy Panel Discussion, Monday, 2:30 p.m.–4:00 p.m.

Congressional Fellowship Session, organized by **Samuel M. Rankin III, AMS**; Monday, 4:30 p.m.–6:30 p.m. This fellowship provides a public policy learning experience, demonstrates the value of science-government interaction and brings a technical background and external perspective to the decision-making process in Congress. Learn more about this program and speak with current and former AMS Fellows. Application deadline for the 2015–16 AMS Congressional Fellowship is February 15, 2015.

Other AMS Events

Council, Friday, 2:30 p.m.

Business Meeting, Tuesday, 11:45 a.m. The secretary notes the following resolution of the Council: Each person who attends a business meeting of the Society shall be willing and able to identify himself as a member of the Society. In further explanation, it is noted that each person who is to vote at a meeting is thereby identifying himself as and claiming to be a member of

the American Mathematical Society. The Society has a Committee on the Agenda for Business Meetings. The purpose is to make business meetings orderly and effective. The committee does not have legal or administrative power. It is intended that the committee consider what may be called "quasipolitical" motions. The committee has several possible courses of action on a proposed motion, including but not restricted to:

(a) doing nothing,

(b) conferring with supporters and opponents to arrive at a mutually accepted amended version to be circulated in advance of the meeting,

(c) recommending and planning a format for debate to suggest to a business meeting,

(d) recommending referral to a committee, and

(e) recommending debate followed by referral to a committee.

There is no mechanism that requires automatic submission of a motion to the committee. However, if a motion has not been submitted through the committee, it may be thought reasonable by a business meeting to refer it rather than to act on it without benefit of the advice of the committee.

In order that a motion for this business meeting receive the service offered by the committee in the most effective manner, it should be in the hands of the AMS Secretary by **December 13, 2014**.

AMS Short Course on Finite Frame Theory: A Complete Introduction to Overcompleteness

This two-day course will take place on Thursday and Friday before the meeting actually begins. It is organized by **Kasso A. Okoudjou**, Norbert Wiener Center, Department of Mathematics, University of Maryland, College Park, who will give a talk on *Preconditioning techniques in frame theory and probabilistic frames,* and also features these talks by **Radu Balan**, Department of Mathematics, University of Maryland, College Park, *Frames and phaseless reconstruction;* **John Benedetto**, Norbert Wiener Center, Department of Mathematics, University of Maryland, College Park, *Construction of finite frames with optimal ambiguity function behavior*; **Peter G. Casazza**, Frame Research Center, University of Missouri, *An introduction to finite frame theory;* **Dustin G. Mixon**, Air Force Institute of Technology, *A primer on finite unit norm tight frames;* **Guangliang Chen**, San Jose State University and **Deanna Needell**, Claremont Mckenna College, *Compressed sensing and dictionary learning*; **Nate Strawn**, Duke University, *Algebro-geometric techniques and geometric insights for finite frames*.

There are separate registration fees to participate in this course. Advance registration (before December 23): Member, $108; Nonmember, $155; Student, unemployed, or emeritus, $54. Onsite registration: Member, $140; Nonmember, $185; Student, unemployed, or emeritus, $75. Please see the complete article on page 1123 in this issue or at http://www.ams.org/meetings/short-courses/short-course-general.

NSF-EHR Grant Proposal Writing Workshop

Developing a Competitive Proposal for NSF-EHR, Thursday, 3:00 p.m.–6:00 p.m. Workshop goals are to familiarize participants with current direction/priorities in EHR, familiarize participants with key EHR education research and development programs, consider common issues of competitive proposals, and prepare participants to write a competitive proposal. There is no registration fee for this workshop, but attendees must register separately in advance. Please contact the AMS Washington Office at 401-455-4116 or amsdc@ams.org for further information.

Department Chairs Workshop

This annual one-day workshop for department chairs and leaders is held on Friday, 8:00 a.m.–6:00 p.m., the day before the JMM actually begins, and is designed to stimulate discussion on a wide range of issues facing departments today, including personnel issues (staff and faculty), long-range planning, hiring, promotion and tenure, budget management, assessments, outreach, stewardship, junior faculty development, communication, and departmental leadership. There is a separate registration and fee to participate. Interested attendees should also consider attending the NSF-EHR Grant Proposal Writing Workshop to be held on Thursday, January 8. For further information, please contact the AMS Washington Office at 401-455-4116 or amsdc@ams.org.

98th Meeting of the MAA

MAA Invited Addresses

Robert Devaney, Boston University, *Cantor and Sierpinski, Julia and Fatou: Crazy Topology in Complex Dynamics* (MAA Retiring Presidential Address); Tuesday, 10:05 a.m.

Catherine O'Neil, Johnson Research Labs, *Making the case for data journalism*; Monday, 4:00 p.m.

Ken Ono, Emory University, *Golden numbers and identities: The legacy of Rogers and Ramanujan*; Sunday, 9:00 a.m.

Christiane Rousseau, University of Montreal, *Divergent series and differential equations: past, present, future…*; Monday, 9:00 a.m.

Diana Thomas, Montclair State University, *Dispelling obesity myths through mathematical modeling*; Saturday, 2:15 p.m.

Presentations by MAA Teaching Award Recipients

Monday, 2:00 p.m.–3:20 p.m., organized by MAA Secretary **Barbara Faires**, Westminster College, and MAA President **Robert Devaney**, Boston University. Winners of the Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching will give presentations on the secrets of their success.

MAA Invited Paper Sessions

Fractal Geometry and Dynamics, **Michel L. Lapidus**, University of California Riverside, and **Robert G. Niemeyer**, University of New Mexico; Saturday, morning and

afternoon. This session brings together a number of researchers interested in the intricate relationship between fractal geometry and dynamics. It will highlight the many ways fractal geometry is present in a variety of subfields of dynamical systems, especially complex dynamics. The talks will be mostly of an expository nature and therefore be accessible to a broad cross-section of the participants in the Joint Mathematics Meetings. This session accompanies the MAA Retiring Presidential Address by Robert Devaney.

The Mathematics of Rogers and Ramanujan, organized by **Ken Ono**, Emory University; Monday morning. Over 100 years ago, Rogers and Ramanujan independently derived two strange power series identities. We now know that these identities are related to so much beautiful mathematics: golden ratio, partitions in number theory, representation theory, conformal field theory, and so on. This session will include lectures by world experts on the history of these identities, and the beautiful theories that have been inspired by their simplicity and deeper meaning. This MAA Invited Paper Session accompanies the MAA Invited Address by Ken Ono.

The Mathematics of Planet Earth, **Hans Kaper,** Georgetown University and Mathematics and Climate Research Network, and **Christiane Rousseau**, University of Montreal; Sunday morning and afternoon. This session will explore several topics related to Mathematics of Planet Earth (MPE). They are chosen from celestial mechanics, ecology, and geophysics to illustrate the wide range of challenging mathematical problems encountered in MPE.

Mathematics and Voting Theory, **Michael Jones**, *Mathematical Reviews*; **Tommy Ratliff**, Wheaton College; and **Russel Caflisch**, UCLA; Tuesday morning. Election procedures may be viewed as functions from voters' preferences to an ordering of the candidates and can be used to elect a single winner or a subset of the candidates. The study of the properties and behavior of election procedures applies ideas from combinatorics, algebra, and geometry. Recent work has also focused on issues related to computational complexity and probability. The talks in this session will highlight the application of mathematics to voting theory at an accessible level. This session accompanies the MAA-AMS-SIAM Gerald and Judith Porter Public Lecture by Donald Saari.

Mathematical Techniques for Signature Discovery, **Emilie Hogan** and **Paul Bruillard**, Pacific Northwest National Laboratory; Saturday afternoon. A signature is a distinguishing measurement, pattern, or collection of data that identifies a phenomenon of interest. Signatures are ubiquitous in the sciences, for example: acoustic signals distinguish types of boats, biomarkers identify diseases, and fingerprints distinguish individuals. In this invited paper session we will survey various approaches to the signature discovery process. For example, manifold learning techniques are being used to identify bone and brain abnormalities in humans to aid in the diagnostic process. Sparse data representations are used to analyze and decompose hyperspectral images. Tensor decomposition techniques are being applied to gain insight into protein function and phylogeny. And genetic algorithms are being coupled with abstract algebra to extract features from arbitrary discrete data.

Recent Advances in Mathematical Modeling of the Environment and Infectious Diseases, **Linda J. S. Allen,** Texas Tech University; Saturday morning. The impact of environmental variation that accurately reflects the impact of changes on an ecological or epidemiological system has always been a challenge in mathematical modeling. Heterogeneity and variability of the environment has been incorporated in models in a variety of ways, through differential and difference equations that account for spatial patterns or temporal variation or through stochastic differential equations that account for random variation. In this session, some recent advances in model formulations and analyses that study environmental effects in unique ways in either deterministic or stochastic settings will be presented. Speakers will discuss, for example, models that include the impact of the environment on disease outbreaks, link the environment to disease dynamics at multiple scales, relate population extinction to stage-structure and the environment, and incorporate both demographic and environmental variability.

Making the Case for Faculty Relevance: Case Studies in Best Practices for Classroom Teaching, **Martha Abell**, Georgia Southern University; Monday morning. The MAA Committee on the Teaching of Undergraduate Mathematics (CTUM) is creating the first ever pedagogy guide for mathematical instruction at the post-secondary level in an effort to address the "how to teach" questions encountered in the development process for the CUPM Curriculum Guide. The purpose of this session is to highlight several areas that will be included in the Pedagogy Guide.

MAA Minicourses

MAA Minicourses are open only to persons who register for the Joint Meetings and pay the Joint Meetings registration fee in addition to the appropriate minicourse fee. The MAA reserves the right to cancel any minicourse that is undersubscribed. Participants should read the descriptions of each minicourse thoroughly as some require participants to bring their own laptops and special software; laptops will not be provided in any minicourse. The enrollment in each minicourse is limited to 50; the cost is US$85.

Minicourse #1. ***Introductory Proposal Writing for Grant Applications to the NSF EHR/Division of Undergraduate Education***, presented by **John Haddock** and **Lee Zia**, Division of Undergraduate Education, National Science Foundation; Part A., Friday, 9:00 a.m.–11:00 a.m., and Part B, Friday, 2:00 p.m.–4:00 p.m. The presenters will describe the general NSF grant proposal process and consider particular details relevant to programs in the Division of Undergraduate Education. This course is geared toward those who have not submitted a proposal to NSF and are unfamiliar with the organization. If you believe you have an idea, project, or program worthy of Federal support that will positively impact undergraduate education in mathematics, you should attend this session. This two-part minicourse will provide information on the specific components of a NSF proposal, demonstrate the NSF

peer review process, provide access to previously funded proposals, and explicate the NSF merit review criteria by which proposals are reviewed. Participants should leave this course with a draft of a project summary.

N.B. This course is offered on Friday, January 9, the day before the Joint Mathematics Meetings officially begin.

Minicourse #2. ***Developing Departmental Self-Studies,*** presented by **Donna Beers**, Simmons College, and **Rick Gillman**, Valparaiso University; Part A, Sunday, 1:00 p.m.–3:00 p.m., and Part B, Tuesday, 1:00 p.m.–3:00 p.m. Self-study is a critical component of departmental program review. It is retrospective, engaging department members and other interested parties (e.g., other departments and the administration) in examining all aspects of departmental programs. It is also forward-looking, anticipating new areas for growth and contribution. Self-study entails discussion of issues confronting a department; as such, it is both a process of reflection and a report. The goal of this minicourse is to help faculty from mathematical science departments plan and lay the groundwork for undertaking an effective self-study of their departments. It will enable participants to determine how a self-study, an administrative mandate, can be a positive opportunity for departmental renewal.

Minicourse #3. ***Introduction to Process Oriented Guided Inquiry Learning (POGIL) in Mathematics Courses***, presented by **Catherine Beneteau**, University of South Florida; **Zdeňka Guadarrama**, Rockhurst University; **Jill E. Guerra**, University of Arkansas Fort Smith; and **Laurie Lenz**, Marymount University; Part A, Saturday, 9:00 a.m.–11:00 a.m., and Part B, Monday, 9:00 a.m.–11:00 a.m. This minicourse will introduce faculty to the guided inquiry instructional method called POGIL (Process Oriented Guided Inquiry Learning). Participants will use hands-on activities to learn the crucial elements in a successful guided inquiry classroom. The workshop will provide participants with a basic introduction to facilitation techniques and an opportunity to reflect on how facilitation can enhance or interfere with student learning as well as how facilitation strategies can be critical in the development of student process skills. By the end of the minicourse, participants will be trained to begin implementing guided inquiry activities in their own mathematics classrooms.

Minicourse #4. ***A Dynamical Systems Approach to the Differential Equations Course***, presented by **Paul Blanchard**, Boston University; Part A, Saturday,4:45 p.m.–6:45 p.m., and Part B. Monday, 3:30 p.m.–5:30 p.m. This minicourse will give an overview of the Boston University Differential Equations Project, originally funded by the National Science Foundation. The BU project involves a complete redesign of the sophomore-level ODE course. It includes more emphasis on qualitative and geometric methods as well as the incorporation of technology and numerical methods throughout. This minicourse will be useful to college instructors wishing to restructure their ODE courses.

Although the minicourse will include technology demonstrations, the BU project is independent of any particular type of technology. Students must have some access to technology, however.

Minicourse #5. ***Visual Topics Using Undergraduate Complex Analysis***, presented by **Mike Brilleslyper,** U.S. Air Force Academy, and **Michael Dorff**, Brigham Young University; Part A, Saturday, 9:00 a.m.–11:00 a.m., and Part B, Monday, 9:00 a.m.–11:00 a.m. An introduction to two visual topics using complex analysis. The first topic is an overview of minimal surfaces including generating models soap films on wire frames and the mathematics needed for 3D printing of minimal surface models. The second is the dynamics of the set of zeros for a family of polynomials. Using technology, we generate animations that reveal surprising patterns and generate numerous questions concerning the localization of zeros. The goal is to expose participants to these interesting areas, provide ideas and materials for incorporating these topics into various undergraduate courses, and plant the seeds for possible undergraduate research projects.

Participants must bring their own computers with a current version of Mathematica, Maple, Matlab, Sage, or some other CAS.

Minicourse #6. ***Public- and Private-key Cryptography***, presented by **Chris Christensen**, Northern Kentucky University; Part A, Sunday, 1:00 p.m.–3:00 p.m., and Part B, Tuesday, 1:00 p.m.–3:00 p.m. The interesting mathematical aspects of public-key ciphers have sparked interest by mathematics faculty in these ciphers as applications of mathematics that can be presented in undergraduate courses. Often ignored, however, are the modern private-key ciphers, "the workhorses of cryptography." Modern private-key ciphers are equally mathematically interesting. In this minicourse, we will explore both modern public-key and private-key ciphers and their mathematical foundations. We will also briefly explore the historical evolution of both types of ciphers. No previous experience with these topics is assumed.

Minicourse #7. ***Teaching Introductory Statistics*** (for instructors new to teaching statistics), presented by **Carolyn Cuff**, Westminster College, and **Leigh Lunsford** Longwood University; Part A, Sunday, 9:00 a.m.–11:00 a.m., and Part B, Tuesday, 9:00 a.m.–11:00 a.m. This minicourse is intended for instructors new to teaching statistics or those seeking to move from a lecture-based course to an interactive course. Material for the course is drawn from the big ideas of introductory statistics and the ASA-endorsed Guidelines for Assessment and Instruction in Statistics Education (GAISE) report. The course considers ways to engage students in statistical literacy and thinking, and contrasts conceptual and procedural understanding in the first statistics course. Participants will work through many of the classic activities that all statistics instructors should know. Internet sources of real data, activities, and best practices articles will be examined. Participants will find out how they can continue to learn about the best practices for the first course in statistics by becoming involved in statistics education related conferences, newsletters, and groups.

Minicourse #8. ***Doing the Scholarship of Teaching and Learning in Mathematic***s, presented by **Jackie**

Dewar, Loyola Marymount University, and **Pam Crawford**, Jacksonville University; Part A, Sunday, 9:00 a.m.–11:00 a.m., and Part B, Tuesday, 9:00 a.m.–11:00 a.m. 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.

Minicourse #9. ***Teaching College Mathematics*** (for instructors new to teaching at the collegiate level and for instructors who prepare GTA's for their first teaching experience); presented by **Ann Humes**, Michigan Technological University; Part A, Saturday, 2:15 p.m.–4:15 p.m., and Part B, Monday, 1:00 p.m.–3:00 p.m. This minicourse presents a model for a comprehensive program for preparing GTA's to teach at the collegiate level. Participants will be engaged in a lesson cycle used in the semester-long training. Participants will also learn about how to navigate the blended learning course, handle online management systems, prepare assessments, and deal with student conflicts as required at Michigan Technological University.

Minicourse #10. ***Humanistic Mathematics***, presented by **Gizem Karaali**, Pomona College, and **Eric Marland**, Appalachian State University; Part A, Saturday, 2:15 p.m.–4:15 p.m., and Part B, Monday, 1:00 p.m.–3:00 p.m. As a scholarly stance, humanistic mathematics describes an approach to mathematics that views it as a human endeavor and focuses on its aesthetic, cultural, historical, literary, pedagogical, philosophical, psychological, and sociological aspects. As a pedagogical framework, humanistic mathematics explores and builds on the relationship of mathematics with its nontraditional partners in the humanities, the fine arts, and social sciences, providing additional perspective for the role of mathematics in a liberal arts education. This minicourse exposes participants to both facets of humanistic mathematics.

In the first session, participants will learn about the implications of a humanistic approach to teaching and explore how it can contribute to a more sophisticated understanding of mathematics, for all students. Also included will be a discussion of common implementation issues and an overview of a spectrum of materials available to use in the classroom. In the second session, participants will engage with the scholarship of humanistic mathematics, a body of literature that eschews disciplinary jargon in favor of reaching a more diverse audience. After a thorough introduction, participants will, through guided group work, initiate their own scholarly projects. Possible venues of communication, collaboration, and dissemination of work in humanistic mathematics will be discussed.

Minicourse #11. ***Healthcare Applications and Projects for Introductory College Mathematics Courses***, presented by **Theresa Laurent,** St. Louis College of Pharmacy; Part A, Sunday, 1:00 p.m.–3:00 p.m., and Part B, Tuesday, 1:00 p.m.–3:00 p.m. Mathematics teachers continuously face the challenge of getting students to recognize the relevance of the concepts learned in class to "real life" situations. This minicourse provides the background knowledge necessary to introduce healthcare applications into precalculus and introductory calculus courses. Applications and projects will include calculating blood alcohol content, determining proper dosing for drugs, analyzing results of drug trials, comparing different contraceptive methods, analyzing the dosing of Zithromax Z-Pak, and serving as a consultant in a malpractice lawsuit. Participants will leave the minicourse with problems and projects ready to use in the classroom, complete with all background information needed.

Minicourse #12. ***Introducing Matroids to Undergraduates***, presented by **Jenny McNulty**, University of Montana, and **Gary Gordon**, Lafayette College; Part A, Saturday, 4:45 p.m.–6:45 p.m., and Part B, Monday, 3:30 p.m.–5:30 p.m. Matroids offer a unique way to incorporate and unify several topics typically studied at the undergraduate level. Matroid Theory is an ideal topic for a capstone-type course; an introduction to the subject includes connections to linear algebra (through bases, independent sets, determinants, etc.), abstract algebra (matroid representations over finite and infinite fields, field extensions), finite geometry (affine and projective planes), graph theory (the prototypical examples of matroids), and combinatorics (matchings in bipartite graphs, counting various classes of subsets). Participants will learn how matroids demonstrate the power of generalization in mathematics: proving one theorem for matroids automatically gives a corresponding result in graph theory, linear algebra, geometry, and matching theory.

Our goal is to share the beauty of matroids and the interconnectedness of mathematics with undergraduate teachers so they in turn can share this with their students. This workshop will be structured in the same manner as our classrooms; interactive sessions with hands-on activities using examples and questions to motivate the concepts. In addition, materials with numerous exercises will be provided for classroom use, including research projects for students.

Minicourse #13. ***WeBWorK: An Open Source Alternative for Generating and Delivering Online Homework Problems***, presented by **Paul Pearson**, Hope College; **Geoff Goehle**, Western Carolina University; and **Peter Staab**, Fitchburg State University; Part A, Saturday, 4:45 p.m.–6:45 p.m., and Part B, Monday, 3:30 p.m.–5:30 p.m. This minicourse introduces participants to the WeBWorK online homework system. Supported by grants from NSF, WeBWorK has been adopted by well over 700 colleges, universities, and secondary schools and is a popular open-source alternative to commercial products. WeBWorK can handle problems in college algebra, calculus, linear algebra, ODEs, and more and comes with an extensive library of over 25,000 problems across the mathematics curriculum. WeBWorK recognizes a multitude of mathematical objects and allows for elegant solution checking. This minicourse will introduce participants to WeBWorK

and equip participants with the knowledge and skills to use WeBWorK in a course.

Minicourse #14. ***Teaching Statistics using R and RStudio***, presented by **Randall Pruim**, Calvin College; **Daniel Kaplan**, Macalester College; and **Nicholas Horton**, Amherst College; Part A, Saturday, 9:00 a.m.–11:00 a.m., and Part B, Monday, 9:00 a.m.–11:00 a.m. R is a freely available language and environment for statistical computing and graphics that has become popular in academia and in many industries. But can it be used with students? This mini-course will introduce participants to teaching applied statistics courses using computing in an integrated way. The presenters have been using R to teach statistics to undergraduates at all levels for the last decade and will share their approach and some of their favorite examples. Topics will include workflow in the RStudio environment, providing novices with a powerful but manageable set of tools, data visualization, basic statistical inference using R, and resampling. Much of this will be facilitated using the mosaic package.

The minicourse is designed to be accessible to those with little or no experience teaching with R, and will provide participants with skills, examples, and resources that they can use in their own teaching.

Minicourse #15. ***How to Run a Successful Math Circle,*** presented by **Amanda Katharine Serenevy**, Riverbend Community Math Center; **Philip B. Yasskin**, Texas A&M University; and **Paul Zeitz**, University of San Francisco; Part A, Saturday, 2:15 p.m.–4:15 p.m., and Part B, Monday, 1:00 p.m.–3:00 p.m. A math circle brings together K–12 students and professional mathematicians on a regular basis to explore engaging topics. This course will focus on the logistics involved in organizing and sustaining a math circle as well as the fine art of conducting lively sessions. Facilitators will discuss how to adapt a promising topic for math circle use, provide tips for keeping a circle running smoothly, and address issues such as publicity and funding. Participants will craft a math circle lesson plan and take away a variety of materials including sample topics and a list of book and Web resources.

Minicourse #16. ***Using Games in an Introductory Statistics Course***, presented by **Rod Sturdivant**, Ohio State University, and **Shonda Kuiper**, Grinnell College. Part A, Sunday, 9:00 a.m.–11:00 a.m., and Part B, Tuesday, 9:00 a.m.–11:00 a.m. Participants experience Web-based games and corresponding class activities that effectively teach statistical thinking and the process of scientific inquiry. By grappling with intriguing real-world problems, these labs encourage students to experience the role of research scientist as they conduct hypothesis tests and regression analysis. Our games are designed to 1) engage students, 2) have a low threat of failure early on with optional additional challenges, 3) create realistic, adaptable, and straightforward models representing current research in a variety of disciplines, 4) provide an intrinsic motivation for students to want to learn, and 5) provide teacher instructions for easy, successful implementation.

MAA Contributed Papers

The MAA Committee on Contributed Paper Sessions solicits papers pertinent to the sessions listed below. Contributed Paper Session presentations are limited to fifteen minutes, except in the general session where they are limited to ten minutes. Each session room is equipped with a computer projector, an overhead projector, and a screen. Please note that the days and times scheduled for these sessions remain tentative. Several of these sessions have specific suggestions for the appropriateness of submissions. Potential submitters are advised to read the full descriptions of these sessions at `jointmathematics meetings.org/meeting/national/jmm2015/2168_maacall`.

The deadline for submission of abstracts is Tuesday, September 16, 2014.

Contributed Paper Sessions with Themes

Activities, Demonstrations, and Projects that Enhance the Study of Undergraduate Geometry, organized by **Sarah Mabrouk**, Framingham State University; Sunday afternoon.

Best Practices for Teaching the Introductory Statistics Course; organized by **Randall Pruim**, Calvin College; **Scott Alberts**, Truman State University; and **Patti Frazer Lock**, St. Lawrence University; Saturday afternoon.

Cartography and Mathematics: Imaging the World Around Us, organized by **Emek Kose** and **Casey Douglas**, St. Mary's College of Maryland; Monday morning.

Collaborations between Two-Year and Four-Year Institutions that Create Pathways to a Math Major, organized by **Nancy Sattler**, Terra State Community College; **Judy Ackerman**, Montgomery College Rockville Campus; and **Elizabeth Teles**, National Science Foundation; Monday morning.

Cryptology for Undergraduates, organized by **Robert Lewand**, Goucher College, and **Chris Christensen**, Northern Kentucky University; Saturday morning.

Discovery and Insight in Mathematics, organized by **Dan Sloughter**, Furman University, and **Bonnie Gold**, Monmouth University; Tuesday afternoon. Sponsored by the SIGMAA on the Philosophy of Mathematics.

Ethnomathematics: A Tribute to Marcia Ascher, organized by **Ximena Catepillan**, Millersville University; **Amy Shell-Gellasch**, Montgomery College; and **Janet Beery**, University of Redlands; Monday morning.

First-Year Calculus: Fresh Approaches for Jaded Students, organized by **Bob Sachs**, George Mason University, and **Caren Diefenderfer**, Hollins University; Tuesday afternoon.

Helping Students See Beyond Calculus, organized by **David Strong**, Pepperdine University; **Courtney Davis**, Pepperdine University; **Angela Spalsbury**, Youngstown State University; and **James Tanton**, MAA; Sunday afternoon.

Humor and Teaching Mathematics, organized by **Semra Kilic-Bahi**, Colby-Sawyer College; **Gizem Karaali**, Pomona College; and **Debra Borkovitz**, Wheelock College; Saturday morning.

Incorporating Formal Symbolic Reasoning into Mathematics Courses, organized by **Christopher Shaw** and **Daniel Jordan**, Columbia College Chicago; Sunday morning.

Infusing Quantitative Literacy into Mathematics and Nonmathematics Courses, organized by **Andrew Miller**, Belmont University; **Aaron Montgomery**, Central Washington University; and **Gary Franchy**, Mott Community College; Tuesday afternoon.

Innovative and Effective Ways to Teach Linear Algebra, organized by **David Strong**, Pepperdine University; **Gilbert Strang**, MIT; and **Megan Wawro**, Virginia Tech; Sunday morning.

Inquiry-Based Learning in First-Year and Second-Year Courses, organized by **Dana Ernst**, Northern Arizona University; **Angie Hodge**, University of Nebraska at Omaha; and **Theron Hitchman**, University of Northern Iowa; Sunday morning.

Mathematics and the Arts, organized by **Douglas Norton**, Villanova University; Saturday morning and afternoon. Sponsored by the SIGMAA on Mathematics and the Arts.

Mathematics and Sports, organized by **R. Drew Pasteur**, College of Wooster, and **John David**, Virginia Military Institute; Saturday afternoon.

Mathematics Experiences in Business, Industry, and Government, organized by **Carla Martin**, Department of Defense; **Phil Gustafson**, Mesa State University; and **Michael Monticino**, University of North Texas; Sunday afternoon.

Original Sources and Archives in the Classroom, organized by **Amy Shell-Gellasch**, Montgomery College, and **Dominic Klyve**, Central Washington University; Tuesday morning.

Perspectives and Experiences on Mentoring Undergraduate Students in Research, organized by **Aihua Li**, Montclair State University; **Thomas Hagedorn**, College of New Jersey; and **Jan Rychtar**, The University of North Carolina at Greensboro; Saturday morning.

Program and Assessment Implications of Common Core State Standards Implementation, organized by **William Martin**, North Dakota State University; **Bonnie Gold**, Monmouth University; and **John Carter**, Westlake High School; Monday afternoon.

Research on the Teaching and Learning of Undergraduate Mathematics, organized by **Karen Keene**, North Carolina State University; **Timothy Fukawa-Connelly**, Drexel University; and **Michelle Zandieh**, Arizona State University; Sunday morning and afternoon.

Revitalizing Complex Analysis at the Undergraduate Level, organized by **Russell Howell**, Westmont College; **Paul Zorn**, St. Olaf College; and **Alan Noell**, Oklahoma State University; Saturday afternoon.

The Scholarship of Teaching and Learning in Collegiate Mathematics, organized by **Jackie Dewar**, Loyola Marymount University; **Thomas Banchoff**, Brown University; **Curtis Bennett**, Loyola Marymount University; **Pam Crawford**, Jacksonville University; and **Edwin Herman**, University of Wisconsin-Stevens Point; Saturday morning and afternoon.

Statistics Education beyond the Introductory Statistics Course, organized by **Randall Pruim**, Calvin College; **Scott Alberts**, Truman State University; and **Patti Frazer Lock**, St. Lawrence University; Sunday afternoon.

Teaching Inquiry, organized by **Brian Katz**, Augustana College, and **Elizabeth Thoren**, University of California Santa Barbara; Tuesday afternoon.

Teaching Proof Writing Techniques within a Content-Based Mathematics Course, organized by **Kristi Meyer**, Wisconsin Lutheran College, and **Jessie Lenarz**, St. Catherine University; Tuesday morning.

Technology, the Next Generation: Integrating Tablets into the Mathematics Classroom, organized by **Kevin Charlwood** and **Janet Sharp**, Washburn University; Saturday afternoon.

The Times They are a Changin': Successful Innovations in Developmental Mathematics Curricula and Pedagogy, organized by **Suzanne Dorée**, Augsburg College; **Joanne Peeples**, El Paso Community College; **Donald Small**, USMA; **Bruce Yoshiwara**, Los Angeles Pierce College; and **Chris Oehrlein**, Oklahoma City Community College; Monday morning.

Trends in Undergraduate Mathematical Biology Education, organized by **Timothy Comar**, Benedictine University; Monday afternoon.

USE Math: Undergraduate Sustainability Experiences in the Mathematics Classroom, organized by **Ben Galluzzo**, Shippensburg University, and **Corrine Taylor**, Wellesley College; Tuesday morning.

Using Flipping Pedagogy to Engage Students in Learning Mathematics, organized by **Jean McGivney-Burelle**, **Larissa Schroeder**, **Fei Xue**, and **John Williams**, University of Hartford; Tuesday morning.

Wavelets in Undergraduate Education, organized by **Caroline Haddad**, SUNY Geneseo; **John Merkel**, Ogle-thorpe University; and **Edward Aboufadel**, Grand Valley State University; Monday afternoon.

Well-Designed Online Assessment: Well-Formed Questions, Discovery-Based Explorations, and Their Success in Improving Student Learning, organized by **Paul Seeburger**, Monroe Community College, and **Matthew Leingang**, New York University; Monday afternoon.

What Makes a Successful Math Circle: Organization and Problems, organized by **Philip Yasskin**, Texas A&M University; **Tatiana Shubin**, San Jose State University; **Paul Zeitz**, University of San Francisco; and **Katherine Morrison**, University of Northern Colorado; Sunday morning.

General Contributed Paper Sessions, organized by **Kristen Meyer**, Wisconsin Lutheran College; **Bem Cayco**, San Jose State University; and **Kimberly Presser**, Shippensburg University of Pennsylvania; Saturday, Sunday, Monday, and Tuesday mornings and afternoons. These sessions of 10-,minute talks accept contributions in all areas of mathematics, curriculum, and pedagogy. When you submit your abstract you will be asked to classify it under one of the following areas: *Assessment*, *History or Philosophy of Mathematics*, *Interdisciplinary Topics in Mathematics*, *Mathematics and Technology*, *Mentoring*, *Modeling or Applications*, *Outreach*, *Probability or Statistics*, *Research in Algebra, Research in Analysis*, *Research*

in Applied Mathematics, *Research in Geometry, Research in Graph Theory, Research in Linear Algebra*, *Research in Logic or Foundations*, *Research in Number Theory, Research in Topology, Teaching or Learning Advanced Mathematics*, *Teaching or Learning Calculus*, *Teaching or Learning Developmental Mathematics*, *Teaching or Learning Introductory Mathematics*, or *Assorted Topics*.

Submission Procedures for MAA Contributed Paper Abstracts

Abstracts may be submitted electronically at `http://jointmathematicsmeetings.org/meetings/abstracts/abstract.pl?type=jmm`. Simply fill in the number of authors, click "New Abstract," and then follow the step-by-step instructions. **The deadline for abstracts is Tuesday, September 16, 2014.**

Each participant may give at most one talk in any one themed contributed paper session or the general contributed paper session. If your paper cannot be accommodated in the session in which it is submitted, it will automatically be considered for one of the general sessions.

The organizer(s) of your session will automatically receive a copy of the abstract, so it is not necessary for you to send it directly to the organizer. All accepted abstracts are published in a book that is available to registered participants at the meeting. Questions concerning the submission of abstracts should be addressed to `abs-coord@ams.org`.

MAA Panels, Posters, Workshops, and Other Sessions

NSF Funding Opportunities for the Learning and Teaching of the Mathematical Sciences, organized by **John Haddock** and **Lee Zia,** Division of Undergraduate Education, NSF; **Karen King**, Division of Research on Learning, NSF; **Tasha Inniss**, Division of Human Resource Development, NSF: **Jennifer Slimowitz Pear**l, Division of Mathematical Sciences, NSF. A number of NSF divisions offer a variety of grant programs that support innovations in learning and teaching in the mathematical sciences. These programs will be discussed along with examples of successful projects in two sessions. Anticipated budget highlights and other new initiatives for the next fiscal year, as appropriate, will also be presented. Sponsored by the MAA Committee on Professional Development.

Part I: Undergraduate/Graduate Education Programs, Workforce, and Broadening Participation (DUE/DGE/DMS, HRD) Saturday, 8:00 a.m.– 9:20 a.m., and

Part II: The K–16 Continuum: Learning Science & Research and Pre- and In-Service Teachers (DUE/DRL) Saturday, 9:35 a.m.–10:55 a.m.

Freeman A. Hrabowski, Sylvester James Gates, and Richard A. Tapia Lecture Series, co-chaired by **Carlos Castillo-Chavez**, Arizona State University, and **Lloyd Douglas**, chair of the MAA Committee on Minority Participation in Mathematics; Saturday, 9:30 a.m.–11:00 a.m. Presentations by F. A. Hrabowski, S. J. Gates, and R. A. Tapia at the 2014 JMM provided the impetus and motivation for the establishment of this lecture series. This year, the research and trajectories of two past recent recipients of the David Blackwell and Richard Tapia Award will be highlighted.

Through multiple mechanisms, the series expects to facilitate and accelerate the participation of mathematical scientists in the building of sustainable communities of mathematicians and mathematical scientists. In particular, the intention is to systematically recruit, welcome, encourage, mentor, and support individuals from underrepresented groups in the USA. The speakers for this meeting are **Richard Tapia**, Rice University, *Introductory remarks on the inaugural Freeman A. Hrabowski, Sylvester James Gates, and Richard A Tapia Lecture*; **Ricardo Cortez**, Tulane University, *Advances in computational modeling of microorganism motility*; and **Trachette Jackson**, University of Michigan, *Mathematical models of tumor vessel formation and targeted therapies that attack the vascular supply*.

This activity was first conceived by the MAA Committee on Minority Participation in Mathematics and is jointly supported by the MAA, AMS, and SIAM.

MOOCs and Me: Massive Online Materials for My Students, organized by **John Travis**, Mississippi College; Saturday, 9:35 a.m.–10:55 a.m. This panel will include several creators of mathematics MOOCs to discuss the opportunities realized and challenges encountered through developing and presenting one of these large online courses. Ideas for how MOOC course materials can be used for independent study as well as incorporated into standard university classes will be presented. Each of the panelists, including **Jim Fowler**, Ohio State University; **Petra Bonfert-Taylor**, Wesleyan University; **Tom Morley**, Georgia Tech University; and **Grace Lyo**, Stanford University, will focus on special features of their courses and on advantages and disadvantages related to their course environment provider. Costs—both financial and personal—will be considered and compared to those normally associated with teaching an online course. Philosophical reasons for supporting MOOCs will be addressed. Significant time will be reserved for questions from the audience and between the panelists. Sponsored by the MAA Committee on Technologies in Mathematics Education and WebSIGMAA.

Recommendations for the 21st Century Mathematical Sciences Major, organized by **Martha J. Siegel**, Towson University, and Carol Schumacher, Kenyon College; Saturday, 2:15 p.m.–3:35 p.m. At these Joint Mathematics Meetings, the MAA Committee on the Undergraduate Program (CUPM) is announcing the release of the *2015 Curriculum Guide to Majors in the Mathematical Sciences*. The Society for Industrial and Applied Mathematics (SIAM) and the American Statistical Association (ASA) have recently prepared their own recommendations for undergraduate majors in applied mathematics and statistics, respectively. The MET II report gave recommendations for the preparation of future mathematics secondary school teachers. Representatives of the MAA, SIAM, ASA, and MAA's Committee on the Mathematical Education of Teachers (COMET), including **Rachel Levy**, Harvey Mudd College; **Nicholas J. Horton**, Amherst College; and **Elizabeth A. Burroughs**, Montana State University, will discuss the highlights of their reports and the 21st century

challenges to mathematics departments offering undergraduate degrees. Sponsored by the MAA Committee on the Undergraduate Program in Mathematics (CUPM) and the MAA Committee on the Mathematical Education of Teachers (COMET)

What Every Student Should Know about the JMM, organized by **Pamela Richardson**, Westminster College; Saturday, 2:15 p.m.–3:35 p.m. Navigating a large conference can be overwhelming, even for those who have previously attended such an event. Panelists **Jennifer Bowen**, College of Wooster; **Frank Morgan**, Williams College; and **George Yates**, Youngstown College, will provide guidance for students attending the Joint Mathematics Meetings, including answers to some common questions: How do I get the most out of the program? What sessions are especially for students? What other events should I be on the lookout for? Will I understand any of the invited addresses or should I not bother attending them? If I am presenting a poster, where do I go to set it up? How can I get some cool, free math stuff? Students and their faculty mentors are encouraged to attend. Sponsored by the MAA Committee for Undergraduate Student Activities and Chapters

YMN/Project NExT Poster Session, organized by **Jonathan Needleman**, Le Moyne College, and **Kim Roth**, Juniata College, Saturday, 2:15 p.m.–4:15 p.m. This session is intended to highlight the research activities, both mathematical and pedagogical, of recent or future Master's/Ph.D.'s in mathematics and related fields. The organizers seek to provide an open venue for people who are near completion, or have finished their graduate studies in the last five years, to present their work and make connections with other same-stage professionals, in much the same spirit as YMN and Project NExT. The poster size will be 48" wide by 36" high. Poster boards and materials for posting pages on the posters will be provided on site. We expect to accept about forty posters from different areas within the mathematical sciences. To apply, send a poster abstract, when and where you have or will receive your Ph.D. or master's degree, and your current college or university affiliation to the organizers. Potential applicants should send a poster abstract to one of the organizers, Kim Roth, roth@juniata.edu, or Jonathan Needleman, needlejs@lemoyne.edu, to apply for the session. The deadline for submissions is December 15, 2014. Sponsored by the Young Mathematicians' Network and Project NExT.

Recruiting, Retaining, Mentoring, and Evaluating "Contract Faculty," organized by **Amy Cohen**, Rutgers University; **Judy Walker**, University of Nebraska Lincoln; and **David Manderscheid,** The Ohio State University; Saturday, 3:50 p.m.– 5:10 p.m. Many institutions of higher education are developing career tracks for full-time instructional staff for whom active research in mathematics is not the primary job criterion. These are not tenure-track positions. They carry a variety of titles including "Professor of the Practice," "Clinical Professor," "Lecturer," "Teaching Professor," and "Instructor," sometimes with modifiers like "Assistant," "Associate," or "Senior." There has been little formal discussion within our profession of such topics as the purposes of such positions; criteria for hiring, retention, and promotion; mentoring such colleagues, and evaluating their impact of our students and our departments. Panelists **David Manderscheid**, The Ohio State University; **Sue Geller**, Texas A&M University; and **Ellen Kirkman**, Wake Forest University, have experience and concerns about this change in faculty structure. A moderator will lead a discussion after the presentations. Cosponsored by the MAA and AMS.

Graduate School: Choosing One, Getting In, Staying In, organized by **Nick Scoville**, Ursinus College, and **Kristine Roinestad**, Georgetown College; Saturday, 3:50 p.m.–5:10 p.m. You've made the decision to apply to graduate school. Now you must sift through all the available information, match schools to your academic and research interests, narrow down your list to a handful of schools, and submit outstanding applications. How do you accomplish all this and hopefully increase the likelihood of getting into your first- or second-choice program? Then, once accepted, how do you successfully complete the program and earn your degree? How do you use your time in graduate school to better prepare for your postgraduate goals? Panelists **Bill Velez**, University of Arizona; **Annalisa Crannell**, Franklin & Marshall College; **Peter Howard**, Texas A&M University; and **Brian Miceli**, Trinity University, will discuss these and other important issues for those considering graduate school, transferring to a different graduate school, or switching graduate programs. Sponsored by the Young Mathematicians' Network.

Managing Your Own Course, organized by **Ralucca Gera**, Naval Postgraduate School; **Timothy Goldberg**, Lenoir-Rhyne University; and **Gwyneth Whieldon**, Hood College*;* Saturday, 5:00 p.m.–6:00 p.m. One of the many challenges facing new faculty members (and sometimes advanced teaching assistants) is managing their own courses. This event will consist of small group discussions based on types of courses and perhaps types of institutions, with the goal of sharing ideas and experiences about managing one's own course. This may also include discussions on creating a new course. Sponsored by the Young Mathematicians' Network.

Counting from Infinity: Yitang Zhang and the Twin Primes Conjecture, Saturday, 6:20 p.m.–7:40 p.m. In April 2013, a lecturer at the University of New Hampshire submitted a paper to the *Annals of Mathematics*. Within weeks word spread—a little-known mathematician, with no permanent job, working in complete isolation had made an important breakthrough towards solving the Twin Primes Conjecture. Yitang Zhang's techniques for bounding the gaps between primes soon led to rapid progress by the Polymath Group, and a further innovation by James Maynard. The film is a study of Yitang Zhang's rise from obscurity and a disadvantaged youth to mathematical celebrity. The story of Zhang's quiet perseverance amidst adversity, and his preference for thinking and working in solitude, is interwoven with a history of the Twin Primes Conjecture as told by several mathematicians, many of whom have wrestled with this enormously challenging problem in Number Theory—Daniel Goldston, Kannan Soundararajan, Andrew Granville, Peter Sarnak, Enrico Bombieri, James Maynard, Nicholas Katz, David Eisenbud, Ken Ribet, and Terry Tao. This film was directed by

George Csicsery, and produced by MSRI. Cosponsored by the MAA and AMS.

Panel Discussions by NSF-DUE Principal Investigators, organized by **John Haddock** and **Lee Zia**, Division of Undergraduate Education, National Science Foundation.

Presenters will describe their experiences with the general NSF grant proposal process and share their expertise in putting together proposals for specific programs.

Part 1: Panel of successful PIs talking about their experiences (CCLI/TUES/IUSE); Sunday, 8:00 a.m.–8:50 a.m.;

Part 2: Panel of successful PIs talking about their experiences (DRK-12, Noyce, STEM-CP & MSP); Sunday, 9:00 a.m.–9:50 a.m.

Part 3: General session; audience shares potential ideas, PIs and NSF staff are available for feedback; Sunday, 10:00 a.m.–11:20 a.m.

Sponsored by the MAA Committee on Professional Development.

MAA Session for Chairs: Program Assessment: Making it Easier and Better, organized by **Catherine M. Murphy**, Purdue University Calumet, and **Daniel Maki**, Indiana University; Sunday, 8:00 a.m.–9:20 a.m. The results of assessment of Student Learning Outcomes are used to inform curriculum decisions as well as provide data for departmental reviews, and regional accreditation documents. Panelists **Barbara Loud**, Regis College; **William O. Martin**, North Dakota State University; **Deborah Pace**, Stephen F. Austin State University; and **Elizabeth C. Yanik**, Emporia State University, will address organizational principles that may ease the transition from data to information. In particular, the following topics—focused goals and objectives, management of data, rubrics, and the feedback loop—will be discussed. Sessions for Chairs are designed to encourage attendees' interaction with panelists. Please share your successes and concerns with assessment during the Session.

Mathematical Outreach Programs, organized by **Elizabeth Yanik**, Emporia State University; Sunday, 9:00 a.m.–11:00 a.m. This poster session is designed to highlight special programs that have been developed to encourage students to maintain an interest in and commitment to succeeding in mathematics. These programs might include such activities as after-school clubs, weekend activities, one-day conferences, mentoring opportunities, summer camps, etc. This poster session encompasses a wide variety of outreach efforts for a variety of age groups. For example, programs might be designed to reach out to underrepresented groups. The projects supported by MAA Tensor and Summa grants will find this an ideal venue in which to share the progress of their funded projects. Another possible type of outreach might involve mathematical enrichment programs. For example recipients of Dolciani Mathematics Enrichment Grants might wish to highlight their programs. Other examples might include innovative programs to motivate undergraduates to study mathematics. We encourage everyone involved with offering mathematical outreach activities to consider submitting an abstract to the session organizer, Betsy Yanik, eyanik@emporia.edu.

Undergraduate Research: Viewpoints from the Student Side, organized by **Herbert A. Medina**, Loyola Marymount University, and **Angel R. Pineda**, California State University, Fullerton; Sunday, 10:35 a.m.–11:55 a.m. The number of undergraduates engaging in mathematical sciences research has increased dramatically the past few years. Indicators of this growth are the size of the undergraduate poster session at the Joint Mathematics Meetings (e.g., over 300 posters at the 2014 meeting), the number of mathematics Research Experiences for Undergraduates (now close to 70), and the recent creation of journals devoted to mathematics undergraduate research (e.g., *Involve* at UC Berkeley). Undergraduate research is now a major factor in preparing students for graduate school and industrial careers.

The panel will ask current undergraduate and graduate students who have engaged in undergraduate research to share some of their experiences and what they view as the "dos" and "don'ts" of undergraduate research, both from the student side and their perception of the faculty mentor side. Their viewpoints should prove useful to both fellow undergraduates and current and future faculty mentors of undergraduate research. Sponsored by the MAA Subcommittee on Research by Undergraduates.

On-Campus Interview Survival Guide, organized by **Thomas Wakefield**, Youngstown State University, and **Jacob A. White**, Texas A&M University; Sunday, 1:00 p.m.–2:20 p.m. Applying for an academic position can be a daunting task! In this session, panelists will offer their perspective on the academic job search, and specifically provide advice and tips regarding the on-campus interview. Panelists **Antonia Cardwell**, Millersville University of Pennsylvania; **Greta Panova**, UCLA; and **Frank Sottile**, Texas A&M University, represent faculty and recent PhD.'s on the job market. Learn some tips to help prepare for the next step in the job application process. Sponsored by the Young Mathematicians' Network.

Writing Competitive Grant Applications, organized by **Semra Kilic-Bahi**, Colby-Sawyer College, and **Kimberly A. Roth**, Juniata College; Sunday, 1:00 p.m.–2:20 p.m. Panelists **Florence Fasanelli**, MAA; **Elizabeth Teles**, Division of Undergraduate Education, NSF; **Jennifer Slimowitz Pearl**, Division of Mathematical Sciences, NSF; and **Roselyn E. Williams**, Florida Agricultural and Mechanical University, will discuss process and give tips for writing successful grant proposals with a focus on proposals that target underrepresented groups, especially women. Each panelist will give a 15–18 minute presentation addressing key points and the common features of competitive grant applications. The presentations will be followed by questions from the audience. Sponsored by the MAA Committee on Participation of Women in Mathematics

Out in Mathematics: LGBTQ Mathematicians in the Workplace, organized by **David Crombecque**, University of Southern California, and **Ron Buckmire**, Occidental College; Tuesday, 8:35 a.m.–10:55 a.m. We will discuss questions such as: Should I be out to my Ph.D. advisor? Should I mention anything on my CV, or during a job interview, for a postdoc, for a tenure-track position, etc.? And if so, what are the ways to be out in these circumstances?

Panelists **Andrew Bernoff**, Harvey Mudd College; **Mike Hill**, University of Virginia; and **Lily Khadjavi**, Loyola Marymount University, will discuss these and many more questions relevant to the well-being and inclusion of future successful LGBTQ mathematicians.

Projects Supported by the NSF Division of Undergraduate Education, organized by **Jon Scott**, Montgomery College; Sunday, 2:00 p.m.–4:00 p.m. This session will feature principal investigators (PIs) presenting progress and outcomes from various NSF funded projects in the Division of Undergraduate Education. The poster session format will permit ample opportunity for attendees to engage in small group discussions with the PIs and to network with each other. Information about presenters and their projects will appear in the program.

Mathematicians Write: Publishing Options and Outlets Beyond the Standard Research Journal, organized by **Gizem Karaali**, Pomona College; Sunday, 2:35 p.m.–3:55 p.m. Mathematicians are trained to write research papers and are often comfortable with the norms and expectations of a standard research journal. However many find that they have other things to say, other ideas to explore. This leads to an unfamiliar territory. How does one get an expository piece published? Can a pedagogical innovation idea develop into a publishable article? What kinds of different audiences can I address with my writing? Panelists **Brian Hopkins**, Saint Peter's University (*College Mathematics Journal*); **Marjorie Senechal**, Smith College (*The Mathematical Intelligencer*); **Janet Beery**, University of Redlands (*Convergence*); **Jo Ellis-Monaghan**, Saint Michael's College (PRIMUS); and **Gizem Karaali**, Pomona College (*Journal of Humanistic Mathematics*), all editors of prominent journals and magazines that populate the mathematical publishing universe and enrich its offerings, will provide some concrete answers to such questions. Besides these, the panelists will respond to the following questions: What does it take to get published in your journal? What differentiates manuscripts you publish from those you don't? What else do you recommend for prospective authors? The panel will conclude with an interactive Q&A session.

Find a Research Collaborator, organized by **Ralucca Gera**, Naval Postgraduate School; **Timothy Goldberg**, Lenoir-Rhyne University; and **Gwyneth Whieldon**, Hood College; Sunday, 5:30 p.m.– 6:30 p.m. As freshly graduated PhD.'s will start their research career at a new institution, one of the obstacles observed is finding (1) collaborators in other departments or institutions, and (2) finding topics to work on. This event will consist of small group discussions based on research interests, with the goal of sharing ideas of how to find collaborators and topics, as well as possibly finding a collaborator during the event. Sponsored by the Young Mathematicians' Network.

Poetry Reading, Sunday, 5:30 p.m.–7:00 p.m. All mathematical poets and those interested in mathematical poetry are invited. Share your poetry or simply enjoy the company of like-minded poetic-math people! The reading is sponsored by the *Journal of Humanistic Mathematics* (`http://scholarship.claremont.edu/jhm`) and will be hosted by **Gizem Karaali** and **Larry Lesser**. Though we do not discourage last-minute decisions to participate, we invite and encourage poets to submit poetry (≤ 3 poems, ≤ 5 minutes) and a bio in advance, and, as a result, be listed on our printed program. Inquiries and submissions (by December 1, 2014) may be made to Gizem Karaali (`gizem.karaali@pomona.edu`).

The Mathematics of Being Human, Sunday, 6:00 p.m.–7:20 p.m. In the not-too-distant future, English professor Naomi Kessler and mathematics professor Mike Pearson are forced to co-teach a course by a university bent on promoting interdisciplinarity at any cost. Battle lines are drawn as they jockey not only over the syllabus but also the different intellectual cultures and modes of inquiry favored by the humanities vs. mathematics. To win over the class, they must bridge their own preconceptions and prejudices and explore common ground. Only through the effort of two of their students do they catch a glimpse of true synthesis. Come to see tense situation unfold during this live performance, cowritten by **Michele Osherow**, professor of English and Director of Judaic Studies at the University of Maryland Baltimore County, and **Manil Suri**, professor of mathematics, University of Maryland Baltimore County. There will be ample time after the performance for discussion and questions. Cosponsored by the MAA and AMS.

Benefits and Challenges of Introducing Multivariate Topics Earlier in the Calculus Sequence, organized by **Mark Gruenwald**, University of Evansville, and **Ken Luther**, Valparaiso University; Monday, 9:35 a.m.–10:55 a.m. Many voices within STEM disciplines have recommended that (some) multivariate topics be introduced earlier in the calculus sequence. Thus far, attempts to restructure the calculus sequence with this goal in mind have not gained widespread adoption, though several recent initiatives show promise. Panelists **Dave Dwyer**, University of Evansville; **Stephen Davis,** Davidson College; and **Jim Fowler**, The Ohio State University, will share experiences with introducing multivariate calculus topics earlier in the curriculum—in both traditional courses and in MOOCs—and the challenges of swimming against the calculus current.

Mathematics and the Sciences: Necessary Dialogue, organized by **Martha J. Siegel**, Towson University, and **Peter Turner**, Clarkson University*;* Monday, 1:00 p.m.–2:20 p.m. Recent reports and meetings (e.g., the 2012 PCAST report Engage to Excel; activities of the TPSE Math (Transforming Post-Secondary Education in Mathematics) group) have raised important questions. How creatively and effectively does the mathematics community support undergraduate scientific and STEM education? How can we attract more, and more diverse, students? How well informed are the mathematics and science communities about each other's efforts and innovations? What new (and old) mathematics do our scientific siblings want our students to know, and when should they know it? Such questions are especially timely now, when MAA, SIAM, and the American Statistical Association have all produced reports and recommendations for undergraduate education. (MAA's *2015 Curriculum Guide*, historically published about once each decade, is one example.) We should hear

each other's views and perspectives. Sponsored by the MAA Committee on the Undergraduate Program in Mathematics (CUPM).

Actuarial Science: What Faculty Need to Know, organized by **Kevin Charlwood**, Washburn University; **Robert Buck**, Slippery Rock University; **Patrick Brewer**, Lebanon Valley College; **Bettye Anne Case**, Florida State University; **Michelle Guan**, Indiana University Northwest; and **Steve Paris**, Florida State University; Monday, 5:00 p.m.–7:00 p.m. The panel features a diverse group of actuaries, publishers, and actuarial educators. The pace of change in actuarial science is faster than in most academic areas, and this session aims to help faculty adjust curriculum and activities to meet student needs and expectations. A member representing actuarial science from the MAA Committee on the Undergraduate Program (CUPM) will present the group's forthcoming recommendations. Another panel speaker will address the unique challenges of meeting the needs of international students in actuarial programs. A speaker from an actuarial firm will focus on the changing landscape of actuarial internships. These are a few of the topics for discussion for our panelists, **Michelle Guan**, Indiana University Northwest; **Mike Boa**, Casualty Actuarial Society; **Bettye Anne Case,** Florida State University; **Catherine Taylor**, USAA P&C Casualty; and **Susan Staples**, Texas Christian University

Mathematically Bent Theater, featuring **Colin Adams** and the **Mobiusbandaid Players**; Monday, 6:00 p.m.–7:00 p.m. Why is it that math and humor are considered synonymous? Why do students laugh maniacally when they see their score on the calculus final? How did the Bernoulli Brothers bring down the house in their first comedy appearance? Who came up with the word "functor"? Who dented the bumper of my car at the Joint Meetings in Baltimore? These are just a few of the questions we will not answer in this theatrical presentation of several short mathematically inclined humorous pieces.

A Positive Feedback Loop? Impact of Mathematics Education Research and K–12 Instructional Changes on Our Teaching of Undergraduate Mathematics, organized by **Ben Ford**, Sonoma State University, and **Klay Kruczek**, Southern Connecticut State University; Tuesday, 8:00 a.m.–9:20 a.m. The field of mathematics education research (K–12 and undergraduate) is developing rapidly, at the same time as K–12 mathematics instruction is experiencing major change. What do these forces imply for our teaching of undergraduate mathematics, especially for future teachers? What research findings hold across all ages; which are age-specific? Will our incoming students have different mindsets, skills, and understanding? What will be required (mathematically) of our graduates who become teachers, and how can they develop those abilities while in our classes? Panelists include **Chris Rasmussen**, San Diego State University; **Klay Kruczek**, Southern Connecticut State University; and **Elise Lockwood**, Oregon State University. Sponsored by the MAA Committee on the Mathematical Education of Teachers (COMET)

Creating a Course in Mathematical Modeling, organizeed by **Dan Teague**, North Carolina School of Science and Mathematics; Tuesday, 8:00 a.m.–10:00 a.m. Applied mathematics, with mathematical modeling at its core, is growing in importance in the mathematics curriculum. Modeling offers student a vision of mathematics and an opportunity to engage in mathematical creativity that is largely absent from the standard mathematics major coursework. A modeling course invites creative students into the major who currently choose other disciplines which offer more interesting challenges to their creativity and ingenuity, particularly early in their college career. This workshop will discuss the structure and share materials from a modeling course taught at the NC School of Science and Mathematics since 1985. Students in the course have written eleven Outstanding Winner papers in the Mathematical Contest in Modeling (MCM and ICM), capturing two INFORMS Prize papers, two SIAM Prize papers, and this year's MAA Prize paper in the process. Information on the mathematical modeling competitions available to university students (MCM, ICM) and to high school students (HiMCM, Moody's) will also be shared. Sponsored by SIGMAA TAHSM and the MAA Council on Outreach.

"Poster Plus 5" Session on Open Source Resources in Mathematics, organized by **Stan Yoshinobu**, Cal Poly San Luis Obispo; Tuesday, 8:00 a.m.–10:55 a.m. and 1:00–5:00 p.m. The availability of high-quality, open source resources that support teaching and research in mathematics is changing opportunities and pedagogical options for mathematics educators. In this hybrid contributed paper/poster session, we invite presentations on the effective use of available open-source resources in the classroom. Each speaker will present for 5 minutes on his/her topic, and then the session will break into an interactive poster session in which speakers enter into active dialogues with session attendees to provide additional details and information. Applicants should send a poster abstract to the organizer, Stan Yoshinobu, `styoshin@calpoly.edu`. The deadline for receiving applications is December 15, 2014. Sponsored by the MAA Committee on Professional Development.

The New Mathways Project's STEM Prep Initiative: A Re-Conceptualized Pathway to Calculus, organized by **Frank Savina**, University of Texas at Austin, and **Stuart Boersma**, Central Washington University; Tuesday, 1:00 p.m.–2:20 p.m. 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 year two teams of leading researchers and educators have been gleaning promising practices from the field and synthesizing them to determine the content and structure of this re-conceptualized pathway to calculus. The goal of this workshop is to share the work of the design teams in a manner that will be useful to mathematics faculty and departments. In this hands-on workshop participants will be given an overview of the guiding principles of the curriculum at the New Mathways Project, will join in an interactive discussion on the challenges of preparing students for calculus, will have the opportunity to look over drafts of the curriculum, and be provided an overview of the findings from the research on promising practices from the design teams.

Special Interest Groups of the MAA (SIGMAAs)

SIGMAAs will be hosting a number of activities, sessions, and guest lectures. There are currently twelve such focus groups in the MAA offering members opportunities to interact, not only at meetings, but throughout the year, via newsletters and email-based communications. For more information visit www.maa.org/community/sigmaas.

SIGMAA Officers Meeting, Sunday, 10:30 a.m. to noon

SIGMAA on Mathematics and the Arts (SIGMAA ARTS)

Mathematics and the Arts, Saturday morning and afternoon (see MAA Contributed Paper Sessions)

SIGMAA on Business, Industry, and Government (BIG SIGMAA)

Mathematics Experiences in Business, Industry, and Government (see MAA Contributed Paper Sessions)

Guest Lecture, Sunday, 5:30 p.m.–6:20 p.m., **Kyle Myers**, Division of Imaging and Applied Mathematics, Office of Science and Engineering Laboratories, Center for Devices and Radiological Health, US FDA, *Mathematical challenges in the evaluation of medical imaging.*

Business Meeting, Sunday, 7:00 p.m.–7:30 p.m.

SIGMAA on Mathematical and Computational Biology (BIO SIGMAA)

Reception, Sunday, 6:00 p.m.–6:20 p.m.

Business Meeting, Sunday, 6:30 p.m.–6:50 p.m.

Guest Lecture, Sunday, 7:00 p.m.–7:50 p.m. **Jim Cushing**, University of Arizona, title to be announced.

Trends in Undergraduate Mathematical Biology Education (see MAA Contributed Papers Section)

SIGMAA on Environmental Mathematics (SIGMAA EM)

USE Math: Undergraduate Sustainability Experiences in the Mathematics Classroom (see MAA Contributed Paper Sessions)

SIGMAA on the History of Mathematics (HOM SIGMAA)

Ethnomathematics (see MAA Contributed Paper Sessions)

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

What Makes a Successful Math Circle: Organization and Problems (see MAA Contributed Paper Sessions)

SIGMAA on the Philosophy of Mathematics (POM SIGMAA)

Discovery and Insight in Mathematics (see MAA Contributed Paper Sessions)

Reception, Monday, 5:30 p.m.–5:50 p.m.

Business Meeting, Monday, 6:00 p.m.–6:20 p.m.

Guest Lecture, Monday, 6:30 p.m.–7:20 p.m., **Matt Jones**, California State University Dominguez Hills, *Mathematical authority and inquiry-based learning*.

SIGMAA on Quantitative Literacy (SIGMAA QL)

Infusing Quantitative Literacy into Mathematics and Nonmathematics Courses (see MAA Contributed Paper Sessions)

SIGMAA on Research in Undergraduate Mathematics Education (SIGMAA RUME)

Research on the Teaching and Learning of Undergraduate Mathematics (see MAA Contributed Paper Sessions)

SIGMAA on Statistics Education (SIGMAA Stat Ed)

Statistics Education beyond the Introductory Statistics Course (see MAA Contributed Paper Sessions)

Reception, Sunday, 5:30 p.m.–5:50 p.m.

Business Meeting, Sunday, 6:00 p.m.–6:20 p.m.

Guest Lecture, Sunday, 6:30 p.m.–7:20 p.m., **Hadley Wickham**, RStudio and Rice University, *Reactive documents for teaching.*

Best Practices for Teaching the Introductory Statistics Course (see MAA Contributed Paper Sessions)

SIGMAA on the Teaching of Advanced High School Mathematics (SIGMAA TAHSM)

Creating a Course in Mathematical Modeling (see MAA panels, etc.)

First-Year Calculus: Fresh Approaches for Jaded Students (see MAA Contributed Paper Sessions)

***S*IGMAA on Mathematics Instruction Using the Web (WEB SIGMAA)**

Well-Designed Online Assessment: Well-formed Questions, Discovery-based Explorations, and their Success in Improving Student Learning (see MAA Contributed Paper Sessions)

Business Meeting, Monday, 5:30 p.m.–5:50 p.m.

Guest Lecture, Monday, 6:00 p.m.–6:50 p.m., **William Stein**, University of Washington, *SageMathCloud—integrated mathematical tools in the cloud.*

MOOCs and Me: Massive Online Materials for My Students (see MAA Panels, etc.)

MAA Sessions for Students

Speed Interviewing Marathon for Students, organized by **Jenna Carpenter**, Louisiana Tech University, and **Michael Dorff**, Brigham Young University; Sunday, 1:00 p.m.– 2:15 p.m. Employers suggest that communication skills are a critical component when considering a mathematics major for a job. An important time to demonstrate good communication skills is during the job interview. This session for undergraduate students, graduate students, and early career mathematicians will start with an overview of best practices and tips on job interviewing, then guide participants in several speed interviewing sessions of 10 minutes each, where they can practice what they have learned and hone their interviewing skills. Speed interviewing sessions will include individual feedback for participants, as well as opportunities to network with fellow interviewees. Sponsored by the MAA Committee on Professional Development, MAA Committee on Graduate

Students, and the MAA Committee on Undergraduate Student Activities and Chapters

Grad School Fair, Monday, 8:30 a.m.–10:30 a.m. Here is the opportunity for undergrads to meet representatives from mathematical sciences graduate programs from universities all over the country. January is a great time for juniors to learn more, and college seniors may still be able to refine their search. This is your chance for one-stop shopping in the graduate school market. At last year's meeting about 300 students met with representatives from 50 graduate programs. If your school has a graduate program and you are interested in participating, a table will be provided for your posters and printed materials for US$75 (registration for this event must be made by a person already registered for the JMM), and you are welcome to personally speak to interested students. Complimentary coffee will be served. Cosponsored by the MAA and AMS.

MAA Lecture for Students, Monday, 1:00 p.m.–1:50 p.m., will be given by **George Hart**, Stony Brook University, on *Math is cool!*

MAA Student Poster Session, organized by **Joyati Debnath**, Winona State University; Monday, 4:30 p.m.–6:00 p.m. This session features research done by undergraduate students. First-year graduate students are eligible to present if the research was done while they were still undergraduates. Research done by high school students can be accepted if the research was conducted under the supervision of a faculty member at a post-secondary institution.

Appropriate poster material includes, but is not limited to: a new result, a new proof of a known result, a new mathematical model, an innovative solution to a Putnam problem, or a method of solution to an applied problem. Purely expository material is not appropriate for this session.

Students should submit an abstract describing their research in 250 words or less by midnight, October 11, 2014. Notification of acceptance or rejection will be sent by November 1, 2014. See http://www.maa.org/students/undergrad/jmmposterindex.html for further details and a link to the abstract submission form. See http://www.maa.org/students/writing%20abstracts.pdf for "A Guide to Writing an Abstract." See http://www.ncsu.edu/project/posters/NewSite/CreatePosterOverview.html for "Creating an Effective Poster." See http://www.maa.org/programs/students/undergraduate-research/jmm-poster-session/examples-of-outstanding-student-posters for exemplary posters from past years.

Posters will be judged during the session and award certificates will be mailed to presenters with the highest scores. Trifold, self-standing 48" by 36" tabletop poster boards will be provided. Additional materials and equipment are the responsibility of the presenters. Participants must set up posters between 2:30 and 3:30 p.m. and must be available from 3:30 to 6:00 p.m. for judging and public viewing. Judges' results will be available at the MAA Pavilion in the Exhibit Hall the following day until the exhibits close.

Questions regarding this session should be directed to Joyati Debnath at jdebnath@winona.edu. A list of frequently asked questions and other information can be found at http://www.maa.org/programs/students/undergraduate-research/jmm-poster-session/student-poster-session-faqs.

Some more advanced students might be interested in these sessions listed elsewhere in this announcement: ***What Every Student Should Know about the JMM***, Saturday at 2:15 p.m.; ***YMN/Project NExT Poster Session***, Saturday at 2:15 p.m.; ***Graduate School: Choosing One, Getting In, Staying In***, Saturday at 3:50 p.m.; ***Undergraduate Research: Viewpoints from the Student Side***, Sunday at 10:35 a.m. See the full descriptions in the "MAA Panels..." section. You may also be interested in the ***AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs,*** Saturday morning, Sunday afternoon, and Tuesday all day; see the listing under AMS Special Sessions.

Other MAA Events

Board of Governors, Friday, 9:00 a.m.–5:00 p.m.

Department Liaisons Meeting, Saturday, 9:30 a.m.–11:00 a.m.

MAA Section Officers Meeting, Saturday, 4:00 p.m.–5:00 p.m., chaired by **Rick Gillman**, Valparaiso University.

SIGMAA Officers Meeting, Sunday, 10:30 a.m.–12:00 noon, chaired by **Karen A Marrongelle**, Portland State University.

MAA Business Meeting, Tuesday, 11:10 a.m.–11:40 a.m., chaired by MAA President **Robert Devaney**, Boston University.

MAA Ancillary Workshops (these take place on Friday, January 9, before the JMM actually begins)

National Research Experiences for Undergraduates Workshop, organized by **Dennis Davenport**, Howard University; Friday, 9:00 a.m.–4:30 p.m. This workshop will teach participants how to write a competitive grant proposal. This workshop is a hands-on experience where participants write a summary of a proposal and rate an NSF awarded proposal in a mock panel review. Participants will also learn many helpful hints and fatal flaws to proposal writing. This workshop is appropriate for current PIs of MAA's NREUP grants and for those who were denied funding for an MAA grant.

Embedding Undergraduate Research into a Living-Learning Community, organized by **Mark Daniel Ward**, Purdue University; Friday, 9:00 a.m.–4:00 p.m. The goal is to enable participants to incorporate their undergraduate research programs into a living-learning community. This is especially appropriate for courses in calculus, linear algebra, combinatorics, mathematical modeling, and introductory proof-based courses, or for early statistics courses such as exploratory data analysis, probability, or introduction to statistics. We will discusses best-practices for going far beyond the curriculum in training students, e.g., having a holistic program that integrates the student (1) curriculum, (2) research, (3) residential life, and (4) professional development experiences. We will share examples,

activities, projects, syllabi, calendars, and research topics from Purdue's NSF-funded Living-Learning Community. We will discuss how to integrate computational aspects of the curriculum and research into a living-learning community, using software such as Maple, Mathematica, Matlab, Sage, and/or R or SAS. The workshop is an outreach activity of NSF grant DMS-1246818.

Advanced registration is required. Send an email to the organizer at mdw@purdue.edu to register for the workshop. Space in the workshop is limited. Participants are encouraged to bring a laptop to the workshop.

Activities of Other Organizations

This section includes scientific sessions. Several organizations or special groups are having receptions or other social events. Please see the "Social Events" section of this announcement for those details.

Association for Symbolic Logic (ASL)

This two-day program on Monday and Tuesday will include sessions of contributed papers as well as Invited Addresses by **Ekaterina Fokina**, University of Vienna; **Menachem Magidor**, Einstein Institute of Mathematics; **Rehana Patel**, Franklin W. Olin College of Engineering; **Anand Pillay**, University of Leeds; **Robin Tuckerdrob**, Rutgers University; **Richard A. Shore**, Cornell University; and **Trevor Wilson**, University of California, Irvine.

See also the session cosponsored by the ASL on *Beyond First-Order Model Theory* on Saturday and Sunday in the "AMS Special Sessions" listings.

Association for Women in Mathematics (AWM)

Thirty-Sixth Annual Noether Lecture, Sunday, 10:05 a.m., will be given by **Wen-Ching Winnie Li,** Pennsylvania State University, title to be announced.

Also see the session on **Recent Developments in Algebraic Number Theory**, jointly sponsored by the AWM, in the "AMS Special Sessions" listings.

Breaking the Glass Ceiling Permanently, organized by **Bettye Anne Case**, Florida State University; **Deleram Kahrobaei**, City University of New York, Graduate Center and New York City College of Technology; **Kathryn Leonard,** California State Channel Islands; and **Christina Sormani,** City University of New York, Graduate Center and Lehman College; Saturday, 2:15 p.m.–3:40 p.m. Over the past century, women mathematicians have achieved unprecedented success. Universities that never hired women before, now have women faculty in their ranks. Departments that rarely promoted women before, now have women who are tenured full professors. Institutes that didn't exist before are now being directed by women mathematicians. In every field of mathematics, there are key results, cited daily, that were proven by women. Despite these great strides, young women today encounter many of the same hurdles that the women before them had to face. In this panel we will discuss how successful women mathematicians, at all levels, can work to break through the glass ceiling and bring the next generation of women through with them. Panelists include **Lenore Blum,** Carnegie Mellon University; **Estela Gavosto,** Kansas University; **Susan Hermiller,** University of Nebraska; **Megan Kerr,** Wellesley College; **Joan Leitzel,** University of New Hampshire; and **Jill Pipher,** Director of ICERM. See https://sites.google.com/site/awmpanel2015/ for the latest information.

Business Meeting, Saturday, 3:45 p.m.–4:15 p.m.

Workshop Poster Presentations and Reception, Monday, 6:00 p.m.–7:15 p.m. With funding from the National Science Foundation, AWM will conduct its workshop poster presentations by women graduate students. Organizers for these presentations are **Gizem Karaali**, Pomona College; **Lerna Pehlivan**, York University; and **Brooke Shipley**, University of Illinois at Chicago.

AWM Workshop on Homotopy Theory, Tuesday, 8:00 a.m.–5:00 p.m. With funding from the National Science Foundation, AWM will conduct its workshop with presentations by senior and junior women researchers. All mathematicians (female and male) are invited to attend the entire program. Departments are urged to help graduate students and recent Ph.D.'s who do not receive funding to obtain some institutional support to attend the workshop and other meeting sessions. Updated information about the workshop is available at www.awm-math.org/workshops.html. AWM seeks volunteers to serve as mentors for workshop participants. If you are interested, please contact the AWM office; inquiries regarding future workshops may be made to the office at awm@awm-math.org.

Reception, Saturday, 9:30 p.m.–11:00 p.m. See the listing in the "Social Events," section of the announcement.

National Association of Mathematicians (NAM)

Granville-Brown-Hayes Session of Presentations by Recent Doctoral Recipients in the Mathematical Sciences, Monday, 1:00 p.m.–4:00 p.m.

Cox-Talbot Address, to be given Monday after the banquet, speaker and title to be announced.

Panel Discussion, Tuesday, 9:00 a.m.–9:50 a.m.

Business Meeting, Tuesday, 10:00 a.m.–10:50 a.m.

Claytor-Woodward Lecture, Tuesday, 1:00 p.m., speaker and title to be announced.

See details about the banquet on Monday in the "Social Events" section.

National Science Foundation (NSF)

The NSF will be represented at a booth in the exhibit area. NSF staff members will be available to provide counsel and information on NSF programs of interest to mathematicians. The booth is open the same days as the exhibitis. Times that staff will be available will be posted at the booth.

Pi Mu Epsilon (PME)

Council Meeting, Sunday, 8:00 a.m.–11:00 a.m.

Society for Industrial and Applied Mathematics (SIAM)

This program consists of an Invited Address at 11:10 a.m. on Sunday given by a speaker to be announced, and a series of Minisymposia to include ***Modeling Across the***

Curriculum, **Rachel Levy**, Harvey Mudd College; and **Peter Turner**, Clarkson University; and several others to be announced.

Others

Mathematical Art Exhibition, organized by **Robert Fathauer**, Tessellations Company; **Nathaniel A. Friedman**, ISAMA and SUNY Albany, **Anne Burns**, Long Island University C. W. Post Campus, **Reza Sarhangi**, Towson University, and **Nathan Selikoff**, Digital Awakening Studios. A popular feature at the Joint Mathematics Meetings, this exhibition provides a break in your day. On display are works in various media by artists who are inspired by mathematics and by mathematicians who use visual art to express their findings. Topology, fractals, polyhedra, and tiling are some of the ideas at play here. Don't miss this unique opportunity for a different perspective on mathematics. The exhibition will be located inside the Joint Mathematics Exhibits and open during the same exhibit hours.

Summer Program for Women in Mathematics (SPWM) Reunion, organized by **Murli M. Gupta,** George Washington University; Sunday, 1:00 p.m.–3:00 p.m. This is a reunion of the summer program participants from the past 19 years (1995-2013) who are in various states of their mathematical careers: some are students (undergraduate or graduate), others are in various jobs, both in academia as well as government and industry. The participants will describe their experiences relating to all aspects of their careers. There will also be a presentation on the increasing participation of women in mathematics over the past two decades and the impact of SPWM and similar programs. See `http://www.gwu.edu/~spwm`.

Effective Self-Promotion to Advance Your Career in Mathematics, organized by **Christine Guenther**, Pacific University; **Patricia Hale,** California State Polytechnic University, Pomona; and **Tanya Leise**, Amherst College; Sunday,1:00 p.m.–2:30 p.m. Panelists **Pam Cook** , University of Delaware; **Deborah Lockhardt** , National Science Foundation; **Dana Randall**, Georgia Institute of Technology; and **Sara Y. Del Valle**, Los Alamos National Labs, will focus on how women (and men) pursuing mathematical careers can and should "lean in," while recognizing that current cultural norms can pose obstacles that we must find ways to overcome. A persistent gender wage gap has been linked to, among other things, the greater competitiveness and confidence of men compared to women on average. A recent US Department of Education survey found that at doctoral universities women's salaries are only 80% of men's salaries. We will discuss how mathematicians can promote themselves: avoiding self-deprecation, actively applying for grants, pursuing opportunities for giving talks and getting nominated for prizes, and persisting past initial failures by resubmitting revised grants and papers. Issues of how to choose a mentor and how to be a good mentor will also be addressed, particularly with reference to learning how to successfully self-promote. The panelists' advice will be beneficial to both men and women seeking to advance their mathematical careers. Sponsored by the Joint Committee on Women in the Mathematical Sciences.

Expeditions in Training, Research, and Education for Mathematics and Statistics through Quantitative Explorations of Data (EXTREEMS-QED), organized by **Tor A. Kwembe**, Jackson State University; Sunday, 2:00 p.m.–4:00 p.m. Presenters in this poster session will share their experiences under this new NSF program designed to promote the integration of computational and data-enabled science (CDS&E) in undergraduate mathematics and statistics curricula. Funded activities are expected to provide opportunities for undergraduate research and hands-on experiences centered on CDS&E, result in significant changes to the undergraduate mathematics and statistics curriculum, have broad institutional support and department-wide commitment that encourage collaborations within and across disciplines, and include professional development activities for faculty or for K–12 teachers.

Pure and Applied Talks by Women Math Warriors presented by EDGE (Enhancing Diversity in Graduate Education), organized by **Amy Buchmann**, University of Notre Dame; and **Candice Price**, United States Military Academy, West Point; Tuesday, 1:00 p.m.–5:50 p.m. Since its beginning in 1998 nearly two hundred women have participated in the EDGE program. Approximately seventy are currently working towards a Ph.D., over one hundred have earned Masters and fifty-four have gone on to successfully complete Ph.D's. This session will be comprised of research talks in a variety of different subdisciplines given by women involved with the EDGE program. For more information on the EDGE program see `http://www.edgeforwomen.org/`.

Social Events

All events listed are open to all registered participants. It is strongly recommended that for any event requiring a ticket, tickets should be purchased through advance registration. Only a very limited number of tickets, if any, will be available for sale on site. If you must cancel your participation in a ticketed event, you may request a 50% refund by returning your tickets to the Mathematics Meetings Service Bureau (MMSB) by **January 6, 2015.** After that date no refunds can be made. Special meals are available at banquets upon advance request, but this must be indicated on the Advanced Registration/Housing Form.

2015 AMS Dinner Celebration: Attend the AMS Dinner for an evening of celebrating the spirit of connection and collaboration which is found throughout the mathematical community. Reconnect with colleagues and friends while enjoying a delicious meal from gourmet food stations, listening to music, and entering to win fun prizes at our raffle table. Experience a special program which will honor long-term members of the AMS and highlight new developments within the Society. It will be held on Tuesday evening with a reception at 6:30 p.m. and dinner will be served at 7:30 p.m. Tickets are US$67 including tax and gratuity. The student ticket price is US$25.

Association of Christians in the Mathematical Sciences (ACMS) Reception and Lecture, Sunday, 5:30 p.m.–7:30 p.m. The reception will take place between

5:30 p.m. and 6:30 p.m. and will be followed by a lecture given by **Anthony Tongen** of James Madison University. An opportunity will be provided afterwards for delegates to go to dinner at local restaurants in small groups.

Association of Lesbian, Gay, Bisexual, and Transgendered Mathematicians Reception, Sunday, 6:00 p.m.–8:00 p.m. This annual reception is for lesbian, gay, bisexual, and transgender mathematicians, as well as their allies. We are affiliated with NOGLSTP, the National Organization of Gay and Lesbian Scientists and Technical Professionals, Inc.

AWM Reception: This open reception takes place on Saturday at 9:30 p.m. after the AMS Gibbs Lecture and has been a popular, well-attended event in the past. At 10:00 p.m. the AWM President will recognize all of the honorees of the AWM Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman, the recipient of the AWM-Joan & Joseph Birman Research Prize in Topology and Geometry, and the AWM Service Awards.

Backgammon! organized by **Arthur Benjamin**, Harvey Mudd College; Monday, 8:00 p.m.–10:00 p.m. Learn to play backgammon from expert players. It's a fun and exciting game where players with a good mathematics background have a decisive advantage. Boards and free lessons will be provided by members of the US Backgammon Federation. Stop by anytime on Monday evening.

Budapest Semesters in Mathematics Annual Alumni Reunion, Sunday, 5:30 p.m.–7:00 p.m.

University of Chicago, Mathematics Alumni Reception, Sunday, 6:00 p.m.–7:00 p.m.

Reception for Graduate Students and First-Time Participants, Saturday, 5:30 p.m.–6:30 p.m. The AMS and MAA cosponsor this social hour. Graduate students and first-timers are especially encouraged to come and meet some old-timers to pick up a few tips on how to survive the environment of a large meeting. Light refreshments will be served.

Knitting Circle, Sunday, 8:15 p.m.–9:45 p.m. Bring a project (knitting/crochet/tatting/beading/etc.) and chat with other mathematical crafters!

MAA/Project NExT Reception, Monday, 8:00 p.m.–10:00 p.m., organized by **Julia Barnes**, Western Carolina University; **Alissa Crans**, Loyolla Marymount University; **Matt DeLong,** Taylor University; **Dave Kung**, St. Mary's College of Maryland; and **Anthony Tongen**, James Madison University. All Project NExT Fellows, consultants, and other friends of Project NExT are invited.

MAA Two-Year College Reception, Saturday, 5:45 p.m.–7:00 p.m., is open to all meeting participants, particularly two-year faculty members. This is a great opportunity to meet old friends and make some new ones. There will be hot and cold refreshments and a cash bar.

***Mathematical Reviews* Reception**, Monday, 6:00 p.m.–7:00 p.m. All friends of the *Mathematical Reviews* (MR) are invited to join reviewers and MR editors and staff (past and present) for a special reception in honor of the 75th anniversary of MR (1940–2015), and to acknowledge all of the efforts that go into the creation and publication of the Mathematical Reviews Database. Refreshments will be served.

Mathematical Institutes Open House, Saturday, 5:30 p.m.–8:00 p.m. Participants are warmly invited to attend this open house which is cosponsored by several of the mathematical science institutes in North America. This reception precedes the Gibbs Lecture. Come find out about the latest activities and programs at each of the institutes that may be suited to your own research. We hope to see you there! `http://www.msri.org/openhouse/2015`.

National Association of Mathematicians Banquet, Monday, 6:00 p.m.–8:40 p.m. A cash bar reception will be held at 6:00 p.m., and dinner will be served at 6:30 p.m. Tickets are US$63 each, including tax and gratuity. The Cox-Talbot Invited Address will be given after the dinner.

NSA Women in Mathematics Society Networking Session, Sunday, 6:00 p.m.–8:00 p.m. All participants are welcome to this annual event. Please stop by the NSA booth in the exhibit hall for information and the location of the event.

Pennsylvania State University Mathematics Alumni Reception, Sunday, 5:30 p.m.–7:30 p.m. Please join us for hors d'oeuvres and beverages and mingle with math alumni, faculty, and College of Science representatives.

Project NExT Reception, Monday, Monday, 8:00 p.m.–10:00 p.m. All Project NExT Fellows, consultants, and other friends of Project NExT are invited.

Student Hospitality Center, Saturday–Monday, 9:00 a.m.–5:00 p.m., and Tuesday, 9:00 a.m.–3:00 p.m., organized by **Richard** and **Araceli Neal**, American Society for the Communication of Mathematics, and sponsored by the MAA Committee for Undergraduate Student Activities.

University of Tennessee, Math Alumni and Friends Reception, Sunday, 5:30 p.m.–7:00 p.m. Anyone who has ever been a part of the UT Math Department, or is considering joining our department as a new graduate student or faculty, is invited to gather for some friendly conversation.

Reception for Undergraduates, Saturday, 4:00 p.m.–5:00 p.m.

Registering in Advance

The importance of registering for the meeting cannot be overemphasized. Advanced registration fees are considerably lower than on-site registration fees. The AMS and the MAA encourage all participants to register for the meeting as the importance of JMM registration cannot be overemphasized. When a participant pays the registration fee, he or she is helping to support a wide range of activities associated with planning, organizing, and execution of the meetings.

All participants who wish to attend sessions are expected to register and should be prepared to show their badges if so requested. Badges are required to enter the JMM Exhibits, the Employment Center, or to obtain discounts at the AMS and MAA Book Sales and to cash a check with the Joint Meetings cashier.

All JMM registrations are processed by the MMSB. Participants who register by **November 18, 2014**, may receive their badges, programs, and tickets (where applicable) in advance by U.S. mail approximately three weeks before the

meetings. Those who do not want their materials mailed should check the appropriate box on the Registration and Housing Form. Materials cannot be mailed to Canada, Mexico, or other countries outside of the U.S. Participants from these countries must pick up their materials at the Joint Meeting Registration Desk, which will be located on the first floor of the Henry B. Gonzales Convention Center. Please note that a US$5 replacement fee will be charged for programs and badges that were mailed but not brought to the meeting.

Online Registration: The form to register for the meeting and to reserve a hotel room online is located at `www.jointmathematicsmeetings.org/meetreg?meetnum=2168`. VISA, MasterCard, Discover, and American Express are the only methods of payment accepted for online registrations, and charges to credit cards will be made in U.S. funds. All registration acknowledgments will be sent by email to all email addresses provided.

Paper Form Registration: The form to register for the meeting and to reserve a hotel room by paper is located at `www.jointmathematicsmeetings.org/meetings/national/jmm2015/jmm15_regform.pdf`. Forms must be mailed or faxed to the MMSB at MMSB, P.O. Box 6887, Providence, RI 02940 or 401-455-4004. For security reasons, credit card numbers by email or fax cannot be accepted. If a participant is registering by paper form and would like to pay for the registration or guarantee your hotel reservation by credit card, he or she should indicate this on the form and someone from the MMSB will call that person.

Participant Lists and Mailing Lists: If any participant would like to opt-out of any mailing lists or participant lists that are generated for the meeting, he or she should check the appropriate box on the Registration and Housing Form. All participants who do not opt-out will be included in all mailing lists and participant lists that are generated for the meeting and distributed.

Cancellation Policy: Participants who cancel their registration for the meetings, minicourses, or short course by **January 6, 2015**, will be eligible to receive a 50% refund of fees paid. Participants who cancel their banquet tickets by **January 5, 2015**, will be eligible to receive a 50% refund of monies paid. No refunds will be issued after these deadlines.

Joint Mathematics Meetings Registration Fees

	Advance (by Dec. 23)	at meeting
Member of AMS, ASL, CMS, MAA, SIAM	US$252	US$331
Nonmember	400	510
Graduate Student Member of AMS, MAA	56	66
Graduate Student Nonmember	90	100
Undergraduate Student	56	66
Temporarily Employed	205	235
Emeritus Member of AMS, MAA; Unemployed; High School Teacher; Developing Countries; Librarian	56	66
High School Student	5	11
One-Day Member of AMS, ASL, CMS, MAA, SIAM	N/A	180
One-Day Nonmember	N/A	281
Non-mathematician Guest	16	16
Commercial Exhibitor	0	0
MAA Minicourses	85	85
Grad School Fair Table	75	75
AMS Short Course		
Member of AMS	108	142
Nonmember	160	190
Student/Unemployed/Emeritus	56	77

Registration Category Definitions

Full-Time Students: Any person who is currently working toward a degree or diploma is eligible for this category. Students are asked to determine whether their status can be described as a graduate (working toward a degree beyond the bachelor's), an undergraduate (working toward a bachelor's degree), or high school (working toward a high school diploma) and to mark the Registration and Housing Form accordingly.

Graduate Student Member: Any graduate student who is a member of the AMS or MAA is eligible for this category. Students should check with their department administrator to check their membership status.

Emeritus: Any person who has been a member of the AMS for twenty years or more and who retired because of age or long-term disability from his or her latest position is eligible for this category. Any person who has been a member of the MAA for 25 years and who is 70+ years of age is eligible for this category.

Librarian: Any librarian who is not a professional mathematician is eligible for this category.

Unemployed: Any person who is currently unemployed, actively seeking employment, and is not a student is eligible for this category. This category is not intended to include any person who has voluntarily resigned or retired from his or her latest position.

Developing Country Participant: Any person employed in developing countries where salary levels are radically not commensurate with those in the U.S. is eligible for this category.

Temporarily Employed: Any person currently employed but who will become unemployed by June 1, 2015, and who is actively seeking employment is eligible for this category.

Nonmathematician Guest: Any family member or friend, who is not a mathematician, and who is accompanied by a participant in the meetings is eligible for this category. Guests will receive a badge and may accompany a mathematician to a session or talk and may also enter the exhibit area.

How to Obtain Hotel Accommodations – 2015 Joint Mathematics Meetings

Importance of Staying in an Official Joint Mathematics Meetings Hotel

The importance of reserving a hotel room at one of the official Joint Mathematics Meetings (JMM) hotels cannot be stressed enough. The AMS and the MAA make every effort to keep participants expenses at the meeting, registration fees, and hotel rooms for the meeting as low as possible. They work hard to negotiate the best hotel rates and to make the best use of your registration dollars to keep the meetings affordable. The AMS and MAA encourage all participants to register for the meeting. When anyone pays the registration fee and reserves a room with an official JMM hotel, he or she is helping to support not only the JMM in 2015, but also future meetings.

General

Participants are encouraged to register for the JMM in order to reserve hotel rooms at the contracted JMM rates. If a participant needs to reserve a hotel room before they are registered for the JMM, he or she must contact the MMSB at mmsb@ams.org or 1-800-321-4267 ext. 4137 or ext. 4144 for further instructions.

Special rates have been negotiated exclusively for this meeting at the following hotels: Grand Hyatt San Antonio (headquarters), San Antonio Marriott Rivercenter, San Antonio Marriott Riverwalk, Hilton Palacio del Rio, Hyatt Regency San Antonio, LaQuinta Inn and Suites, Westin Riverwalk, Hotel Contessa, Crockett Hotel, SpringHill Suites by Marriott San Antonio Downtown/Alamo Plaza, Fairfield Inn & Suites by Marriott San Antonio Downtown/Alamo Plaza, and Red Roof Plus San Antonio Downtown. (See details on these hotels below.)

To receive the JMM rates, reservations for these hotels must be made through the Mathematics Meetings Service Bureau (MMSB). The hotels will not be able to accept reservations directly until after **December 19, 2014** and at that time, rooms and rates will be based on availability. Any rooms reserved directly with the hotels before **December 19, 2014** are subject to rates higher than the JMM rates.

A link to the 2015 JMM housing site will be included at the end of the online registration form. It will also be included in the email confirmation that will be sent for registration for the meeting. If anyone needs to have the link emailed to him or her, please send the request to mmsb@ams.org. If anyone cannot reserve a room online, please complete the housing section of the Registration and Housing Form and send it by email to the MMSB at mmsb@ams.org or to them by fax at 401-455-4004 before **December 17.** Sorry, reservations cannot be accepted over the phone

All reservations must be guaranteed by either a credit card or check deposit in an amount equivalent to the first night's stay. Only a credit card guarantee can be accepted for any reservation made online. If a paper form is used to reserve a room, a credit card or a check maybe given for the guarantee. For security reasons, credit card numbers will not be accepted by postal mail, email, or fax. If anyone who is reserving a room by paper form wants to guarantee his or her room by credit card, he or she should call the MMSB at 1-800-321-4267, ext. 4137 or 4144. Note that the paper version of the registration form is located at the end of this announcement.

ADA Accessibility

We strive to take the appropriate steps required to ensure that no individual with a disability is excluded, denied services, segregated, or otherwise treated differently. If special assistance, auxiliary aids, or other reasonable accommodations to fully participate in this meeting is required, it should be indicated in the appropriate section on the Registration and Housing Form or emailed to the MMSB at mmsb@ams.org. Requests for ADA-accessible rooms should also be clearly indicated when making hotel reservations. All requests for special accommodations under the Americans with Disabilities Act of 1990 (ADA) must be made allowing enough time for evaluation and appropriate action by the AMS and MAA. Any information obtained about any disability will remain confidential.

Cancellation Policies

· The Hyatt Regency San Antonio, LaQuinta Inn Suites, Crockett Hotel, SpringHill Suites, and Fairfield Inn & Suites have a 24-hour cancellation policy prior to check-in.

· The Grand Hyatt, Marriott Rivercenter, Marriott Riverwalk, Westin Riverwalk, and Hotel Contessa have a 48-hour cancellation policy prior to check-in.

· The Hilton Palacio del Rio and Red Roof Plus have a 72-hour cancellation policy prior to check-in.

Check-in/Check-out

· Check-in at the Hilton Palacio del Rio, Hyatt Regency, LaQuinta Inn & Suites, Westin Riverwalk, Crockett, and Red Roof Inn is 3:00 p.m.

· Check-in at the Grand Hyatt, Marriott Rivercenter, Marriott Riverwalk, Hotel Contessa, SpringHill Suites, and Fairfield Inn & Suites is 4:00 p.m.

· Check-out at the Grand Hyatt, Hotel Contessa, and Red Roof Plus is 11:00 a.m. Check-out at all of the other hotels is noon.

Complimentary Room Drawing

Participants who register and reserve a hotel room by **November 3, 2014,** will be included in a lottery for complimentary hotel room nights during the meeting. Rooms with multiple occupants will be included. The winners will be notified by phone and/or email prior to **December 23, 2014**.

Confirmations

An immediate and real-time email confirmation number will be provided for each hotel reservation made online. This confirmation number will provide participants with direct access to edit reservations up to **December 17, 2014**. After this date, a second email confirmation for the hotel reservation will be sent from the hotel, with the exception of the Hotel Contessa, which will send a second confirmation only if contacted directly. Those who did not receive a confirmation number from their hotels or who have any questions about the reservation process should contact the MMSB at mmsb@ams.org or 1-800-321-4267, ext. 4137 or 4144.

Deadlines

· Complimentary Room Drawing: **November 3**
· Badge/Program Mailed: **November 18**
· Reservations, Changes, and Cancellations through the MMSB: **December 17**

Environmental Policies

All of the hotels listed have environmental-friendly programs in place.

Internet Access/Wireless

· The Hyatt Regency, Hotel Contessa, Crockett, La Quinta Inn & Suites, SpringHill Suites, Fairfield Inn & Suites, and Red Roof Plus offer complimentary wireless in the guest rooms and all public areas, including the lobby.

· The Grand Hyatt offers complimentary wireless in all public areas, and wired or wireless Internet connections in the guest rooms for a daily usage fee of US$14.95 per day.

· The Marriott Rivercenter, Marriott Riverwalk, and Hilton Palacio del Rio offer complimentary wireless in the lobby and public areas and wired or wireless Internet in the guest rooms for a daily usage fee of US$12.95.

· The Westin Riverwalk offers complimentary wireless Internet in all public areas and wireless access in the guest rooms for a daily usage fee of US$13.95.

Looking for a Roommate?

For participants looking for a roommate, an interactive search board is available at: http://bboards.jointmathematicsmeetings.org.

Rates

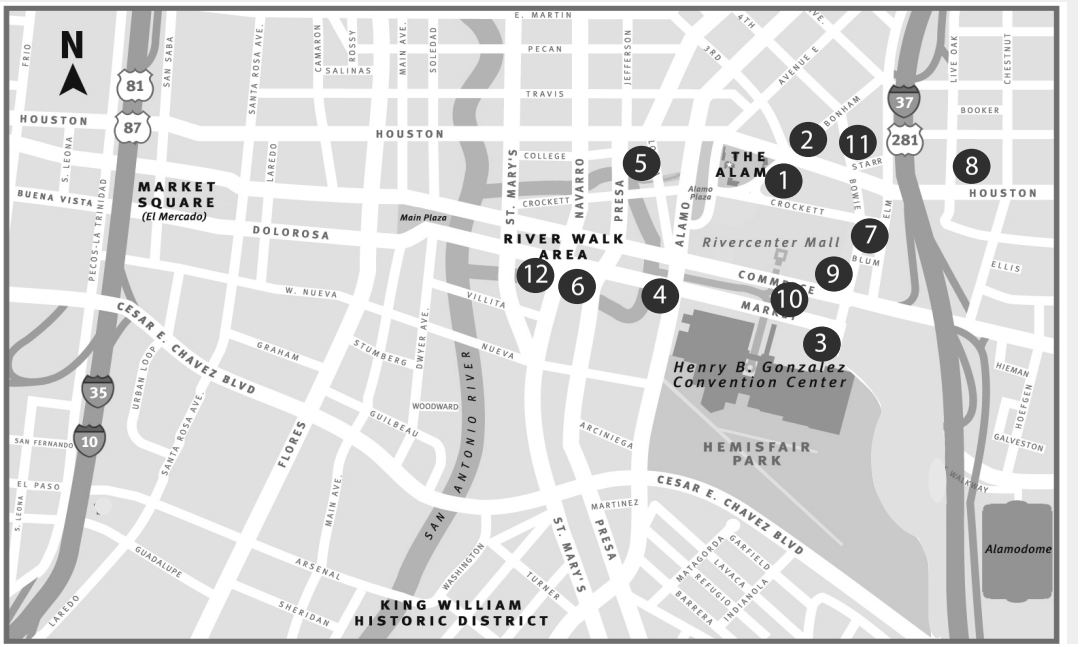
All rates are subject to applicable local and state taxes in effect at the time of check-in; currently 16.75% state tax.

Parking Options

Please see the Parking section under "Travel" for additional parking options.

JMM JOINT MATHEMATICS MEETINGS
SAN ANTONIO • JAN 10-13, 2015
AMERICAN MATHEMATICAL SOCIETY
MATHEMATICAL ASSOCIATION OF AMERICA

	Hotels	Address	Distance to Conv Center (in blocks)	Walk to Conv Center (in minutes)
1	The Crockett	320 Bonham Street	2.5	7
2	Fairfield Inn & Suites San Antonio Downtown / Alamo Plaza	422 Bonham Street	4	9
3	Grand Hyatt San Antonio (Headquarters)	600 E Market Street	Adjacent	2
4	Hilton Palacio del Rio	200 S Alamo Street	1	4
5	Hyatt Regency San Antonio	123 Losoya Street	3	5
6	Hotel Contessa	306 W Market Street	2	5
7	La Quinta Inn & Suites Convention Center	303 Blum	2	6
8	Red Roof Plus San Antonio Downtown	1011 E Houston Street	5	14
9	San Antonio Marriott Rivercenter	101 Bowie Street	1.5	4
10	San Antonio Marriott Riverwalk	889 E Market Street	Across street	2
11	SpringHill Suites San Antonio Downtown / Alamo Plaza	411 Bowie Street	4	11
12	The Westin Riverwalk San Antonio	420 W Market Street	3	5



Map courtesy of the San Antonio Convention and Visitor's Bureau

Grand Hyatt San Antonio (Headquarters)	San Antonio Marriott Rivercenter	San Antonio Marriott Riverwalk
456 feet (next door) to the Henry B. Gonzalez Convention Center 600 East Market Street San Antonio, TX 78205 Single Rate: US$189 Double Rate: $209 Student Single/Double Rate: US$159 Smoke-free hotel. Restaurants: Ruth's Chris Steak House, Perk Coffee & More, Bar Rojo; Fitness center; Heated outdoor lap pool; Whirlpool sun deck; 24-hour business center available to registered guests; Full amenities in guest rooms; Laptop-sized safes in guest rooms; Windows do not open; Children under 18 free in room with an adult; Cribs available upon request at no charge; Rollaways available in king-bedded rooms only at no charge; Dogs under 50 pounds only allowed for an additional charge; Valet parking US$37 per day with in/out privileges; Self-parking US$27 per day with in/out privileges; Parking rates are subject to change. The hotel does not provide airport shuttle transportation. Confirmations sent by email only.	**0.2 miles from the Henry B. Gonzalez Convention Center** 101 Bowie Street San Antonio, TX 78205 Single/Double Rate: US$185 Student Single/Double Rate: US$175 Smoke-free hotel. Restaurants: Sazo's, The Bar, Starbucks Coffee; Fitness center; Indoor/Outdoor pool; UPS Store/Business center, 24-hour access for registered guests; Full amenities in guest rooms; Laptop-sized safes in guest rooms; Windows do not open; Children under 18 free in room with an adult; Cribs available upon request at no charge; Rollaways - US$15 one-time charge in king-bedded rooms only; Pets are not allowed except for service animals; Valet parking US$35 per day with in/out privileges; Self-parking US$25 per day with in/out privileges; Parking rates are subject to change. This hotel does not provide airport shuttle service. Confirmations sent by email only.	**292 feet (across the street) from the Henry B. Gonzalez Convention Center** 889 East Market Street San Antonio, TX 78205 Single/Double Rate: US$185 Student Single/Double Rate: US$175 Smoke-free hotel. Restaurants: The Cactus Flower, The Bar, Starbucks Coffee; Fitness center; Indoor/Outdoor pool; Business center with 24-hour access for registered guests; Full amenities in guest rooms; Windows do not open; Children under 18 free in room with an adult; Cribs available upon request at no charge; Rollaways - US$15 one-time charge in king-bedded rooms only; Pets are not allowed except for service animals; Valet parking US$35 per day with in/out privileges; Self-parking US$25 per day with in/out privileges; Parking rates are subject to change. This hotel does not provide an airport shuttle. Confirmations sent by email only.
Hilton Palacio del Rio	**Hyatt Regency San Antonio**	**Hotel Contessa**
0.3 miles from the Henry B. Gonzalez Convention Center 200 South Alamo Street San Antonio, TX 78205 Single/Double Rate: US$179 Student Single/Double Rate: US$159 Smoke-free hotel. Restaurants: Ricon Alegre Lobby Bar, Durty Nelly's Irish Pub, Texas Riverwalk Sports Bar, The River's Edge Cafe; Fitness center; Outdoor pool; UPS Store/Business center; Full amenities in guest rooms; Laptop-sized safes in guest rooms; Windows do not open; Children under 18 free in room with an adult; Cribs available upon request at no charge; Air mattresses (no rollaways) - US$25 one-time charge in king-bedded rooms only; Pets not allowed except for service animals; Valet parking US$39 per day with in/out privileges; Self-parking US$27 per day with in/out privileges; Parking rates are subject to change. This hotel does not provide an airport shuttle. Confirmations sent by email only.	**0.3 miles from the Henry B. Gonzalez Convention Center** 123 Losoya Street San Antonio, TX 78205 Single/Double Rate: US$159 Student Single/Double Rate: US$135 Smoke-free hotel. Restaurants: Q Restaurant, Starbucks Coffee, Einstein Bros Bagels; Fitness center; Heated rooftop pool; Fedex Business center with 24-hour access to registered guests; Safe deposit boxes at front desk; Full amenities in guest rooms; Windows do not open; Children under 12 free in room with an adult; Cribs available upon request at no charge; Rollaways US$25 daily charge in king-bedded rooms only; Pets not allowed except for service animals; Valet parking US$35 per day with in/out privileges; Self-parking US$25 per day with in/out privileges; Parking rates are subject to change. Airport shuttle reservations can be made online through SATRANS Airport Shuttle. Confirmations sent by email only.	**0.3 miles from the Henry B. Gonzalez Convention Center** 306 West Market Street San Antonio, TX 78205 Single/Double Rate: US$140 Student Single/Double Rate: US$130 Smoke-free hotel. Restaurants: Cork Bar, Las Ramblas, and Cafe Contessa; Fitness center; Heated rooftop pool; 24-hour business center available to registered guests; Full amenities in guest rooms; Laptop-sized safes in guest rooms; Windows do not open; Children under 17 free in room with an adult; Cribs available upon request at no charge; No rollaways; All rooms have sleeper sofas; Small dogs are allowed, call for details; Self-parking only for US$30 per day with in/out privileges; Limited parking spaces available for oversized vehicles, guests must call in advance to reserve. The hotel does not provide an airport shuttle. 2nd confirmation sent from hotel by request only.

La Quinta Inn & Suites	The Westin Riverwalk, San Antonio	The Crockett
0.3 miles from the Henry B. Gonzalez Convention Center 303 Blum Street San Antonio, TX 78205 Single/Double Rate: US$135 Student Single/Double Rate: US$125 Smoke-free hotel. A complimentary hot breakfast is served daily and a full-service lounge offers food service daily after 5:00 p.m. Fitness center; Outdoor pool; 24-hour business center available to registered guests; Full amenities in guest rooms; Safety deposit boxes available in the front office; Children under 18 free in room with an adult; Cribs available upon request at no charge; No rollaways; Pets are allowed at no charge; Valet parking US$25 per day with in/out privileges; Self-parking US$21 per day with in/out privileges; Parking rates are subject to change. This hotel does not provide an airport shuttle. Confirmations sent by email only.	**0.2 miles from the Henry B. Gonzalez Convention Center** 420 West Market Street San Antonio, TX 78205 Single/Double Rate: US$135 Smoke-free hotel. Restaurants: Cafecito Café, Zocca Restaurant & Bar; Fitness center; Heated outdoor pool; Spa; 24-hour business center available to registered guests; Full amenities in guest rooms; Laptop-sized safes in guest rooms; Windows do not open; Children under 17 free in room with an adult; Cribs available upon request at no charge; Rollaways available in king-bedded rooms only at no charge; Dogs up to 40 lbs. allowed; Valet parking for US$35 per day with in/out privileges; Self-parking US$16 per day without in/out privileges; Parking rates are subject to change. This hotel does not provide an airport shuttle. Confirmations sent by email only.	**0.4 miles from the Henry B. Gonzalez Convention Center** 320 Bonham Street San Antonio, TX 78205 Single/Double Rate: US$130 Student Single/Double Rate: US$120 Historic hotel, wheelchair entry access is limited. Smoke-free hotel. This hotel offers complimentary breakfast daily and room service; 24-hour business center available to registered guests; Full amenities in guest rooms; Safe deposit boxes at front desk; Windows do not open. Children under 18 free in room with an adult; Cribs available upon request at no charge; Rollaways-US$25 one-time charge in king-bedded rooms only; Pets are allowed with a US$60 nonrefundable deposit; Valet parking only for US$25 per day with in/out privileges; Parking rates are subject to change. This hotel does not offer an airport shuttle. Confirmations sent by email only.
SpringHill Suites by Marriott Downtown/Alamo Plaza	**Fairfield Inn & Suites by Marriott Downtown/Alamo Plaza**	**Red Roof Plus San Antonio Downtown**
0.4 miles from the Henry B. Gonzalez Convention Center 411 Bowie Street San Antonio, TX 78205 Single/Double Rate: US$94 Student Single/Double Rate: US$84 Smoke-free hotel. The hotel offers a complimentary hot breakfast daily. Fitness center; Outdoor heated pool; 24-hour business center available to registered guests; Full amenities in guest rooms; Windows do not open; Children under 17 free in room with an adult; Cribs available upon request at no charge; No rollaways; Pets are not allowed except for service animals; Valet parking only for US$21 per day with in/out privileges; Parking rates are subject to change. This hotel does not provide an airport shuttle. Confirmations sent by email only.	**0.5 miles from the Henry B. Gonzalez Convention Center** 422 Bonham Street San Antonio, TX 78205 Single/Double Rate: US$94 Student Single/Double Rate: US$84 Smoke-free hotel. The hotel offers a complimentary hot breakfast daily. Fitness center; Outdoor pool; 24-hour business center available to registered guests; Full amenities in guest rooms; Windows do not open; Children under 17 free in room with an adult; Cribs available upon request at no charge; No rollaways; Pets are not allowed except for service animals; Valet parking only for US$21 per day with in/out privileges; Parking rates are subject to change. This hotel does not provide an airport shuttle. Confirmations sent by email only.	**0.5 miles from the Henry B. Gonzalez Convention Center** 1011 East Houston Street San Antonio, TX 78205 Single/Double Rate: US$83 Student Single/Double Rate: US$73 Smoke-free hotel. There are no restaurants on property, but complimentary continental breakfast is served each morning. Outdoor pool; 24-hour business center available to registered guests; Full amenities in guest rooms; Laptop-sized safes in guest rooms for US$1.50 daily; Windows do not open; Children under 17 free in room with an adult; Portable cribs available upon request at no charge; No rollaways; Pets allowed; Self-parking only for US$10 per night with in/out privileges; Parking rates are subject to change. This hotel does not provide an airport shuttle. Confirmations sent by email only.

Registration Deadlines

There are three separate registration deadlines, each with its own benefits:

EARLY meetings registration (free room drawing) is **November 3**;

ORDINARY meeting registration (badge materials mailed) is **November 18**;

FINAL meeting registration (advanced registration, short course, minicourses, and banquets) is **December 23**;

Early Registration: Participants who **register by the early deadline of November 3** will be included in a random drawing to select winners of complimentary hotel room nights during the meeting. Rooms with multiple occupants will be included in the drawing. The location of these rooms will be based on the number of complimentary room nights earned in the various hotels. Therefore, a free room will not necessarily be in winner's first-choice hotel. All winners will be notified by phone and email prior to December 23, so register early!

Ordinary Registration: Participants who register **after November 3 and by the ordinary deadline of November 18** are encouraged to reserve a hotel room to ensure that they receive their preferred hotel of choice. However, those who register by this date are not eligible for the room drawing. They may also elect to receive their badges and programs by mail in advance of the meeting.

Final Registration: Participants who register **after November 18 and by the final deadline of December 23** must pick up their badges, programs, and any tickets for social events at the meeting. Unfortunately it is sometimes not possible to provide final participants with housing, so everyone is strongly urged to make their hotel reservations by November 18. Please note that the final deadline of December 23 is firm. Any forms received after that date will be returned with full refunds. Registration materials may be picked up at the Meetings Registration Desk located on the first floor of the Henry B. Gonzalez Convention Center.

Miscellaneous Information

Audio-Visual Equipment: Standard equipment in all session rooms is one overhead projector and screen. Invited 50-minute speakers are automatically provided with an ELMO visual presenter (document camera/projector), one overhead projector, and a laptop projector; AMS Special Sessions and Contributed Papers, and MAA Invited and Contributed Paper Sessions, are provided with the standard equipment and a laptop projector. Blackboards are not available, nor are Internet hookups in session rooms. Any request for additional equipment should be sent to meet@ams.org and **received by November 1**.

Equipment requests made at the meetings most likely will not be granted because of budgetary restrictions. Unfortunately no audiovisual equipment can be provided for committee meetings or other meetings or gatherings not on the scientific program.

Childcare: The AMS and the MAA will provide reimbursement grants of US$250 per family to help with the cost of child care for a number of registered participants at JMM2015. The funds may be used for child care that frees a parent to participate more fully in JMM.

Information about and deadlines for requesting support for child care will be available prior to the opening of advance registration in September; watch the website at jointmathematicsmeetings.org/meetings/national/jmm2015/2168_intro.

Email Services: Limited email access for all Joint Meetings participants will be available in an email center located near the JMM Registration Desk, East Lobby, on the first level in the Henry B. Gonzales Convention Center. The hours of operation will be published in the program. Participants should be aware that **complimentary Internet access** will be available in the networking center located in Bridge Hall, first level of the convention center.

Information Distribution: Tables are set up in the exhibit area for dissemination of general information of possible interest to the members and for the dissemination of information of a mathematical nature not promoting a product or program for sale. Information must be approved by the director of meetings prior to being placed on these tables.

If a person or group wishes to display information of a mathematical nature promoting a product or program for sale, they may do so in the exhibit area at the Joint Books, Journals, and Promotional Materials exhibit for a fee of US$50 (posters are slightly higher) per item. Please contact the exhibits manager, MMSB, P.O. Box 6887, Providence, RI 02940, or by email at cpd@ams.org for further details.

The administration of these tables is in the hands of the AMS-MAA Joint Meetings Committee, as are all arrangements for Joint Mathematics Meetings.

Local Information: For information about the city see visitsanantonio.com.

Photograph and Video Policy: The videotaping of any AMS or joint sponsored events, talks, and sessions is strictly forbidden without the explicit written permission of the AMS Director of Meetings and Conferences. The policy for videotaping of any MAA events, talks, and sessions is posted at http://www.maa.org/about-maa/policies-and-procedures/recording-or-broadcasting-of-maa-events. Photographs and videos of meeting interactions will be taken by professional photographers hired by the Joint Mathematics Meetings or by AMS and MAA staff. These photographs and videos may occasionally be used for publicity purposes. By participating in the Joint Mathematics Meetings, attendees acknowledge that their photograph or a video that includes them may be published in material produced by the Joint Meetings, AMS or MAA. AMS and MAA are not responsible for unauthorized photographs or other images not taken by professional photographers hired by the Joint Mathematics Meetings or AMS and MAA staff.

Telephone Messages: It will be possible to leave a message for any registered participant at the meetings registration desk from January 10 through 13 during the hours that the desk is open. These messages will be posted on the Mathematics Meetings Message Board in the networking center; however, staff at the desk will try to locate a participant in the event of a bona fide emergency.

The telephone number will be published in the program and daily newsletter.

Travel/Transportation

San Antonio is on Central Standard Time. The principal airport is the San Antonio International Airport (SAT), http://www.sanantonio.gov/SAT/, which is served by all major airlines, and is located nine miles north of downtown San Antonio. The street address of the airport is 9800 Airport Boulevard, San Antonio, Texas 78216. The 2015 Joint Mathematics Meetings will be held in the Henry B. Gonzalez Convention Center, located at 200 Market Street, San Antonio, TX 78205.

Airline: The official airline for this meeting is Delta. Participants are encouraged to book their flights for the meeting, if possible, with Delta and receive special pricing (in most cases a 5% discount) on scheduled service to San Antonio. Discounts are applicable to U.S. and Canada originating passengers. The discount is not valid with other discounts, certificates, coupons, or promotional offers. To make a reservation, go to www.delta.com, and click on the box that says "Book a Trip." At the bottom of the drop-down, click on "More Search Options" (includes Flexible Airport and Meeting Event Code). On the reservation screen, please enter the **Meeting Event Code NMJYY**. It will be to the right of "Number of Passengers." Reservations can also be made by calling Delta Meeting Network reservations at 1-800-328-1111 and citing the meeting event code. A direct ticketing charge will apply for booking by phone.

Ground Transportation: Options are located curbside in front of Terminal A and B baggage claim areas. Uniformed transportation agents (wearing red shirts) can provide assistance. A terminal map is located at http://www.sanantonio.gov/SAT/IntheAirport/TerminalMaps.aspx.

Airport Shuttle: GO Airport Shuttle, www.citytoursinc.com, 210-281-9900, is San Antonio Airport's authorized airport shuttle service. Shuttles depart every 15 minutes from 7:00 a.m. to 1:30 a.m. daily to the downtown hotels. The fare is US$19 per person one way, or US$34 for a round trip. There is currently a fuel surcharge of US$1.25 each way. Tickets may be purchased in the baggage claim area. You may also book a shuttle online at https://citytoursinc.com/reservations.

Car Rental: All major car rental services are available at the San Antonio International Airport. Car rental counters are located on the lower level of Terminal A. If the rental counters are closed, passengers can use the courtesy phones provided in the baggage claim area to request shuttle transport to the car rental company of their choice.

Hertz is the official car rental company for the meeting. A brochure with the information on this meeting is located at http://jointmathematicsmeetings.org/meetings/national/jmm2015/Hertz-info-SanAntonio.pdf. To access the JMM special meeting rates at www.hertz.com, please click the box that says "Enter a discount or promo code" and enter **04N30005** as the convention number (CV#). Reservations can also be made by calling Hertz directly at 800-654-2240 (U.S. and Canada) or 405-749-4434. Meeting rates include unlimited mileage and are subject to availability. Advance reservations are recommended and blackout dates may apply. Government surcharges, taxes, tax reimbursement, airport-related fees, vehicle licensing fees and optional items are extra. Standard rental conditions and qualifications apply. Minimum rental age is 20 (age differential charge for 20–24 applies). At the time of your reservation, the meeting rates will be automatically compared to other Hertz rates and you will be quoted the best comparable rate available.

Driving directions from the airport to the Convention Center: Take Highway 281 South toward downtown San Antonio. Take the Commerce Street exit, 141A, toward downtown. Keep right to take the ramp toward Downtown/The Alamo. Merge onto East Commerce Street. Turn left onto Losoya Street. Turn left onto East Market Street. The Convention Center is located on your right.

Taxi: Taxis are available at the lower level curbside outside the baggage claim area. Fares to downtown San Antonio start at US$29.

Public Transportation: VIA Metropolitan Transport (http://www.viainfo.net), 210-362-2020 or 866-362-2020, is San Antonio's public transportation agency. To take public transportation downtown from the airport, exit the baggage claim area in Terminals A and B and go to the Lower Roadway across the marked crosswalk to the outer curb. The VIA bus stop is halfway between Terminals A and B.

Take VIA bus 5-McCullough (South) to the St. Mary's and Commerce stop. To get to the Convention Center, walk down St. Mary's Street one block to the intersection of St. Mary's and Market Street, and take the 22-Hayes (East) bus down Market. The second stop after Market and St. Mary's is the Convention Center. Note: 5-McCullough continues as 30-Rigsby (South) after St. Mary's and Pecan; you do not have to change buses. The stop after St. Mary's and Commerce is St. Mary's and Villita, where you can pick up the 301 Streetcar as an alternative for some destinations.

The trip from the airport to the Convention Center takes approximately 50 minutes. The 5-McCullough runs from 5:30 a.m. to 9:40 p.m. every day, approximately every 30 minutes until 7:30 p.m. The last two buses are 60 minutes apart.

Please call VIA directly and ask to speak to an agent, or check the route finder at http://www.viainfo.net/BusService/RiderTool.aspx?ToolChoice=Schedules if you would like directions to other locations. Prices and schedules are subject to change. The fare is currently US$1.20 per ride; US$2.50 for Express. A VIA day pass is US$4, and can be obtained at the San Antonio Visitor Center at 317 Alamo Plaza.

Two VIA Streetcar routes, Red (301) and Blue (305), serve many of the popular destinations in downtown San Antonio. The streetcars circulate every 10 minutes, seven days a week. Hours of operation are 7:00 a.m. to 10:30 p.m., Monday through Friday, and 9:00 a.m. to 10:30 p.m. on weekends. Information and a map of the routes can be found at www.viainfo.net/BusService/Docs/StreetcarBrochure.pdf.

Note that the VIA 7-Sightseer Special bus travels to the San Antonio Children's Museum, the San Antonio Museum of Art, Brackenridge Park, the San Antonio Zoo, Witte Museum, and the Botanical Garden. See http://www.viainfo.net/BusService/Schedules.aspx.

Parking: The city of San Antonio has a parking page at http://downtownsanantonio.org/park/parkingoverview, which has an interactive map and a pdf map of parking locations. The Henry B. Gonzalez Convention Center lists the following parking garages as being the closest available. Prices are subject to change.

Grand Hyatt Parking Garage, (210-451-6464), Bowie and Market Streets; flat rates are US$9 for up to 3 hours, US$16 for 3–4 hours, US$21 for 4–5 hours, and US$27 for 5+ hours or overnight (per day).

Marina Garage, (210-207-8266), Bowie and Commerce Streets; daily flat rate is US$9.

Riverbend Garage, (877-717-0004), Alamo and Market Streets; daily flat rate is US$12, overnight rate is US$15.

Tower of the Americas Parking, (210-223-3101), 801 Cesar Chavez Blvd.; daily flat rate is US$8.

Washington, District of Columbia

Georgetown University

March 7–8, 2015

Saturday – Sunday

Meeting #1107

Eastern Section
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: January 2015
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: March 2015
Issue of *Abstracts*: Volume 36, Issue 2

Deadlines

For organizers: Expired
For abstracts: January 20, 2015

The scientific information listed below may be dated. For the latest information, see www.ams.org/amsmtgs/sectional.html.

Invited Addresses

Frederico Rodriguez Hertz, Pennsylvania State University, *Title to be announced*.

Nancy Hingston, The College of New Jersey, *Title to be announced*.

Simon Tavaré, Cambridge University, *Title to be announced* (Einstein Public Lecture in Mathematics).

Yitang Zhang, University of New Hampshire, *Title to be announced*.

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at http://www.ams.org/cgi-bin/abstracts/abstract.pl.

Algebra and Representation Theory (Code: SS 13A), **Ela Celikbas** and **Olgur Celikbas**, University of Connecticut, and **Frank Moore**, Wake Forest University.

Algebraic Structures Motivated by and Applied to Knot Theory (Code: SS 18A), **Jozef H. Przytycki**, George Washington University, and **Radmilla Sazdanovic**.

Computable Structure Theory (Code: SS 8A), **Rumen Dimitrov**, Western Illinois University, **Valentina Harizanov**, George Washington University, and **Russell Miller**, Queens College and Graduate Center, City University of New York.

Conceptual Mathematical Models in Climate Science (Code: SS 5A), **Hans Engler** and **Hans Kaper**, Georgetown University.

Convexity and Combinatorics (Code: SS 9A), **Jim Lawrence** and **Valeriu Soltan**, George Mason University.

Crossing Numbers of Graphs (Code: SS 3A), **Paul Kainen**, Georgetown University.

History and Philosophy of Mathematics (Code: SS 15A), **V. Frederick Rickey**, West Point Military Academy, and **James J. Tattersall**, Providence College.

Iterated Integrals and Applications (Code: SS 12A), **Ivan Horozov**, Washington University in St. Louis.

Mathematical Fluid Dynamics and Turbulence (Code: SS 17A), **Zachary Bradshaw**, University of British Columbia, **Aseel Farhat**, Indiana University, and **Michele Coti Zelati**, University of Maryland.

Nonlinear Partial Differential Equations in Sciences and Engineering. (Code: SS 16A), **Lorena Bociu**, North Carolina State University, **Ciprian Gal**, Florida International University, and **Daniel Toundykov**, University of Nebraska.

Nonlinear Dispersive and Wave Equations with Applications to Fluids. (Code: SS 14A), **Pierre Germain** and **Zaher Hani**, New York University, and **Benoit Pausader**, Princeton University.

Operator Theory on Analytic Function Spaces (Code: SS 11A), **Robert F. Allen**, University of Wisconsin, La Cross, and **Flavia Colonna**, George Mason University.

Qualitative Behavior of Solutions of Partial Differential Equations (Code: SS 7A), **Junping Shi**, College of William and Mary, and **Jiuyi Zhu**, Johns Hopkins University.

Quantum Algebras, Representations, and Categorifications (Code: SS 2A), **Sean Clark** and **Weiqiang Wang**, University of Virginia.

Somos Sequences and Nonlinear Recurrences (Code: SS 10A), **Andrew Vogt**, Georgetown University.

Spatial Evolutionary Models and Biological Invasions (Code: SS 6A), **Judith Miller**, Georgetown University, and **Yuan Lou**, Ohio State University.

Topology in Biology (Code: SS 4A), **Paul Kainen**, Georgetown University.

Within-Host Disease Modeling (Code: SS 1A), **Stanca Ciupe**, Virginia Polytechnic Institute, and **Sivan Leviyang**, Georgetown University.

East Lansing, Michigan

Michigan State University

March 14–15, 2015
Saturday – Sunday

Meeting #1108
Central Section
Associate secretary: Georgia Benkart
Announcement issue of *Notices*: January 2015
Program first available on AMS website: January 29, 2015
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: Volume 36, Issue 2

Deadlines

For organizers: Expired
For abstracts: January 20, 2015

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

Philippe Di Francesco, University of Illinois, *Title to be announced*.

Alexander Furman, University of Illinois at Chicago, *Title to be announced*.

Vera Mikyoung Hur, University of Illinois at Urbana-Champaign, *Title to be announced*.

Mihnea Popa, University of Illinois at Chicago, *Title to be announced*.

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at `http://www.ams.org/cgi-bin/abstracts/abstract.pl`.

Algebraic Combinatorics (Code: SS 19A), **Carolina Benedetti**, **Peter Magyar**, and **Bruce Sagan**, Michigan State University.

Approximation Theory in Signal Processing and Computer Science (Code: SS 5A), **Mark Iwen**, Michigan State University, **Rayan Saab**, University of California San Diego, and **Aditya Viswanathan**, Michigan State University.

Arithmetic of Hyperelliptic Curves (Code: SS 3A), **Tony Shaska**, Oakland University.

Complex Analysis in Several Variables and its Applications (Code: SS 11A), **Debraj Chakrabarti**, Central Michigan University, and **Yunus Zeytuncu**, University of Michigan at Dearborn.

Conformal Geometry and Statistical Physics (Code: SS 20A), **Ilia Binder**, University of Toronto, and **Dapeng Zhan**, Michigan State University.

Fractals and Tilings (Code: SS 10A), **Sze-Man Ngai**, Georgia Southern University, **Erin Pearse**, California Polytechnic State University, **Yang Wang**, Hong Kong University of Science and Technology, and **Yimin Xiao**, Michigan State University.

Fractional Calculus and Nonlocal Operators (Code: SS 1A), **Mark M. Meerschaert** and **Russell Schwab**, Michigan State University.

Frames, Wavelets and Their Applications (Code: SS 16A), **Palle Jorgensen**, University of Iowa, **Darrin Speegle**, St. Louis University, and **Yang Wang**, Hong Kong University of Science and Technology.

Geometry and Invariants of 3-Manifolds (Code: SS 22A), **Oliver Dasbach**, Louisiana State University, and **Effie Kalfagianni**, Michigan State University.

Geometry of Manifolds, Singular Spaces, and Groups (Code: SS 18A), **Benjamin Schmidt**, Michigan State University, and **Meera Mainkar**, Central Michigan University.

Groups and Representations (Code: SS 9A), **Amanda Schaeffer Fry**, Metropolitan State University of Denver, **Jonathan Hall**, Michigan State University, and **Hung Nguyen**, University of Akron.

High-Frequency Problems (Code: SS 14A), **Shlomo Levental** and **Mark Schroder**, Michigan State University.

Homotopy Continuation Methods and Their Applications to Science and Engineering (Code: SS 6A), **Tianran Chen**, Michigan State University, and **Dhagash Mehta**, North Carolina State University.

Inverse Problems and Imaging (Code: SS 21A), **Yulia Hristova**, University of Michigan-Dearborn, and **Linh Nguyen**, University of Idaho.

Modeling, Numerics, and Analysis of Electro-Diffusion Phenomena (Code: SS 17A), **Peter W. Bates**, Michigan State University, **Weishi Liu**, University of Kansas, and **Mingji Zhang**, MIchigan State University.

New Developments in Actuarial Mathematics (Code: SS 15A), **Emiliano A. Valdez**, Michigan State University.

New Developments in Stochastic Analysis, Stochastic Control and Related Fields (Code: SS 7A), **Chao Zhu**, University of Wisconsin-Milwaukee.

Nonlinear Waves: Dynamics and Stability (Code: SS 23A), **Keith Promislow** and **Qiliang Wu**, Michigan State University.

Phase Retrieval in Theory and Practice (Code: SS 8A), **Matthew Fickus**, Air Force Institute of Technology, **Mark Iwen**, Michigan State University, and **Dustin Mixon**, Air Force Institute of Technology.

Random Fields and Long Range Dependence (Code: SS 2A), **Mark M. Meerschaert** and **Yimin Xiao**, Michigan State University.

Recent Advances in the Geometry of Submanifolds, Dedicated to the Memory of Franki Dillen (1963-2013) (Code: SS 12A), **Alfonso Carriazo Rubio**, University of Sevilla, **Yun Myung Oh**, Andrews University, **Bogdan D. Suceavă**, California State University, Fullerton, and **Joeri Van der Veken**, KU Leuven.

Stochastic Partial Differential Equations and Applications (Code: SS 4A), **Leszek Gawarecki**, Kettering University, and **Vidyadhar Mandrekar**, Michigan State University.

Survey of Biomathematics (Code: SS 13A), **Hannah Callender**, University of Portland, **Peter Hinow**, University of Wisconsin, Milwaukee, and **Deena Schmidt**, Case Western Reserve University.

Huntsville, Alabama

University of Alabama in Huntsville

March 27–29, 2015
Friday – Sunday

Meeting #1109
Southeastern Section
Associate secretary: Brian D. Boe
Announcement issue of *Notices*: January 2015
Program first available on AMS website: February 11, 2015
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: Volume 36, Issue 2

Deadlines
For organizers: Expired
For abstracts: February 4, 2015

The scientific information listed below may be dated. For the latest information, see www.ams.org/amsmtgs/sectional.html.

Invited Addresses

Eva Bayer-Fluckiger, EPFL, *Title to be announced.*

M. Gregory Forest, University of North Carolina at Chapel Hill, *Title to be announced.*

Dan Margalit, Georgia Institute of Technology, *Title to be announced.*

Paul Pollack, University of Georgia, *Title to be announced.*

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at http://www.ams.org/cgi-bin/abstracts/abstract.pl.

Fractal Geometry and Ergodic Theory (Code: SS 1A), **Mrinal Kanti Roychowdhury**, University of Texas-Pan American.

New Developments in Population Dynamics and Epidemiology (Code: SS 4A), **Jia Li**, University of Alabama in Huntsville, **Maia Martcheva**, University of Florida, and **Necibe Tuncer**, Florida Atlantic University.

Recent Trends in Mathematical Biology (Code: SS 3A), **Wandi Ding** and **Zachariah Sinkala**, Middle Tennessee State University.

Stochastic Processes and Related Topics (Code: SS 2A), **Paul Jung**, University of Alabama at Birmingham, **Erkan Nane**, Auburn University, and **Dongsheng Wu**, University of Alabama in Huntsville.

Topology and Topological Methods in Dynamical Systems (Code: SS 5A), **John Mayer** and **Lex Oversteegen**, University of Alabama at Birmingham.

Las Vegas, Nevada

University of Nevada, Las Vegas

April 18–19, 2015
Saturday – Sunday

Meeting #1110
Western Section
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: February 2015
Program first available on AMS website: March 5, 2015
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: Volume 36, Issue 2

Deadlines
For organizers: September 18, 2014
For abstracts: February 24, 2015

The scientific information listed below may be dated. For the latest information, see www.ams.org/amsmtgs/sectional.html.

Invited Addresses

Joel Hass, University of California, Davis, *Title to be announced.*

Ko Honda, University of California, Los Angeles, *Title to be announced.*

Brendon Rhoades, University of California, San Diego, *Title to be announced.*

Bianca Viray, Brown University, *Title to be announced.*

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at http://www.ams.org/cgi-bin/abstracts/abstract.pl.

Algebraic Structures in Knot Theory (Code: SS 7A), **Sam Nelson**, Claremont McKenna College, and **Radmila Sazdanović**, North Carolina State University.

Algebraic and Enumerative Combinatorics (Code: SS 8A), **Drew Armstrong**, University of Miami, and **Brendon Rhoades**, University of California, San Diego.

Cloaking and Metamaterials (Code: SS 9A), **Jichun Li**, University of Nevada, Las Vegas, and **Fernando Guevera Vasquez**, University of Utah.

Data Analysis and Physical Processes (Code: SS 4A), **Hanna Makaruk**, Los Alamos National Laboratory, and **Eric Machorro**, National Security Technologies.

Developments of Numerical Methods and Computations for Fluid Flow Problems (Code: SS 11A), **Monika Neda**, University of Nevada, Las Vegas.

Extremal and Structural Graph Theory (Code: SS 10A), **Bernard Lidický** and **Derrick Stolee**, Iowa State University.

Inverse Problems and Related Mathematical Methods in Physics (Code: SS 1A), **Hanna Makaruk**, Los Alamos National Laboratory, and **Robert Owczarek**, University of New Mexico, Albuquerque.

Nonlinear Conservation Laws and Applications (Code: SS 6A), **Matthias Youngs**, Indiana University-Purdue University Columbus, **Cheng Yu**, University of Texas at Austin, and **Kun Zhao**, Tulane University.

Stochastic Analysis and Rough Paths (Code: SS 2A), **Fabrice Baudoin**, Purdue University, **David Nualart**, University of Kansas, and **Cheng Ouyang**, University of Illinois at Chicago.

Topics in Graph Theory: Structural and Extremal Problems (Code: SS 3A), **Jie Ma**, Carnegie Mellon University, **Hehui Wu**, Simon Fraser Univerisy, and **Gexin Yu**, College of William & Mary.

Porto, Portugal

University of Porto

June 10–13, 2015

Wednesday – Saturday

Meeting #1111

First Joint International Meeting involving the American Mathematical Societry (AMS), the European Mathematical Society (EMS), and the Sociedade de Portuguesa Matematica (SPM).

Associate secretary: Georgia Benkart
Announcement issue of *Notices*: To be announced
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: Not applicable

Deadlines

For organizers: Expired
For abstracts: To be announced

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/internmtgs.html`.

Invited Addresses

Marcus du Sautoy, *The secret mathematicians* (Public Lecture, Wednesday evening, 8:30 p.m.)

Rui Loja Fernandes, University of Illinois at Urbana-Champaign, *Title to be announced*.

Irene Fonseca, Carnegie Mellon University, *Title to be announced*.

Annette Huber, Albert-Ludwigs-Universität, *Title to be announced*.

Mikhail Khovanov, Columbia University, *Title to be announced*.

André Neves, Imperial College London, *Title to be announced*.

Sylvia Serfaty, Université Pierre et Marie Curie Paris 6, *Title to be announced*.

Gigliola Staffilani, Massachusetts Institute of Technology, *Title to be announced*.

Marcelo Viana, Instituto de Matemática Pura e Aplicada, Brasil, *Title to be announced*.

Chicago, Illinois

Loyola University Chicago

October 3–4, 2015

Saturday – Sunday

Meeting #1112

Central Section
Associate secretary: Georgia Benkart
Announcement issue of *Notices*: June 2015
Program first available on AMS website: August 20, 2015
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: Volume 36, Issue 4

Deadlines

For organizers: March 10, 2015
For abstracts: August 11, 2015

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

Julia Chuzhoy, Toyota Technological Institute at Chicago, *Title to be announced*.

Andrew Neitzke, The University of Texas at Austin, *Title to be announced*.

Sebastien Roch, University of Wisconsin-Madison, *Title to be announced*.

Peter Sarnak, Princeton University, *Title to be announced* (Erdős Memorial Lecture).

Memphis, Tennessee

University of Memphis

October 17–18, 2015

Saturday – Sunday

Meeting #1113

Southeastern Section
Associate secretary: Brian D. Boe
Announcement issue of *Notices*: August 2015
Program first available on AMS website: September 3, 2015
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: Volume 36, Issue 3

Deadlines

For organizers: March 17, 2015
For abstracts: August 25, 2015

The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

Mark van Hoeij, Florida State University, *Title to be announced*.

Vaughan Jones, Vanderbilt University, *Title to be announced.*

Mette Olufsen, North Carolina State University, *Title to be announced.*

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at http://www.ams.org/cgi-bin/abstracts/abstract.pl.

Computational Analysis (Code: SS 1A), **George Anastassiou**, University of Memphis.

Fractal Geometry and Dynamical Systems (Code: SS 2A), **Mrinal Kanti Roychowdhury**, University of Texas-Pan American.

Fullerton, California

California State University, Fullerton

October 24–25, 2015

Saturday – Sunday

Meeting #1114

Western Section
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: August 2015
Program first available on AMS website: September 10, 2015
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: Volume 36, Issue 4

Deadlines

For organizers: March 27, 2015
For abstracts: September 1, 2015

The scientific information listed below may be dated. For the latest information, see www.ams.org/amsmtgs/sectional.html.

Invited Addresses

Mina Aganagic, University of California, Berkeley, *Title to be announced.*

John Lott, University of California, Berkeley, *Title to be announced.*

Eyal Lubetzky, Microsoft Research, Redmond, *Title to be announced.*

Zhiwei Yun, Stanford University, *Title to be announced.*

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at http://www.ams.org/cgi-bin/abstracts/abstract.pl.

Geometric Analysis (Code: SS 1A), **John Lott**, University of California, Berkeley, and **Aaron Naber**, Northwestern University.

New Brunswick, New Jersey

Rutgers University

November 14–15, 2015

Saturday – Sunday

Meeting #1115

Eastern Section
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: September 2015
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: November 2015
Issue of *Abstracts*: Volume 36, Issue 4

Deadlines

For organizers: April 14, 2015
For abstracts: September 22, 2015

The scientific information listed below may be dated. For the latest information, see www.ams.org/amsmtgs/sectional.html.

Invited Addresses

Lee Mosher, Rutgers University, *Title to be announced.*

Jill Pipher, Brown University, *Title to be announced.*

David Vogan, Massachusetts Institute of Technology, *Title to be announced.*

Wei Zhang, Columbia University, *Title to be announced.*

Special Sessions

If you are volunteering to speak in a Special Session, you should send your abstract as early as possible via the abstract submission form found at http://www.ams.org/cgi-bin/abstracts/abstract.pl.

Applications of CAT(0) Cube Complexes (Code: SS 1A), **Sean Cleary**, City College of New York and the City University of New York Graduate Center, and **Megan Owen**, Lehman College of the City University of New York.

Seattle, Washington

Washington State Convention Center and the Sheraton Seattle Hotel

January 6–9, 2016

Wednesday – Saturday

Joint Mathematics Meetings, including the 122nd Annual Meeting of the AMS, 99th Annual Meeting of the Mathematical Association of America (MAA), annual meetings of the Association for Women in Mathematics (AWM) and the National Association of Mathematicians (NAM), and the winter meeting of the Association of Symbolic Logic (ASL),

with sessions contributed by the Society for Industrial and Applied Mathematics (SIAM).
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: October 2015
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: January 2016
Issue of *Abstracts*: Volume 37, Issue 1

Deadlines

For organizers: April 1, 2015
For abstracts: To be announced

Salt Lake City, Utah

University of Utah

April 9–10, 2016

Saturday – Sunday
Western Section
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: To be announced
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: To be announced

Deadlines

For organizers: To be announced
For abstracts: To be announced

Fargo, North Dakota

North Dakota State University

April 16–17, 2016

Saturday – Sunday
Central Section
Associate secretary: Georgia Benkart
Announcement issue of *Notices*: To be announced
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: To be announced

Deadlines

For organizers: To be announced
For abstracts: To be announced

Atlanta, Georgia

Hyatt Regency Atlanta and Marriott Atlanta Marquis

January 4–7, 2017

Wednesday – Saturday
Joint Mathematics Meetings, including the 123rd Annual Meeting of the AMS, 100th Annual Meeting of the Mathematical Association of America, annual meetings of the Association for Women in Mathematics (AWM) and the National Association of Mathematicians (NAM), and the winter meeting of the Association of Symbolic Logic, with sessions contributed by the Society for Industrial and Applied Mathematics (SIAM).
Associate secretary: Brian D. Boe
Announcement issue of *Notices*: October 2016
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: January 2017
Issue of *Abstracts*: Volume 38, Issue 1

Deadlines

For organizers: April 1, 2016
For abstracts: To be announced

Charleston, South Carolina

College of Charleston

March 10–12, 2017

Friday – Sunday
Southeastern Section
Associate secretary: Brian D. Boe
Announcement issue of *Notices*: To be announced
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: To be announced

Deadlines

For organizers: November 10, 2016
For abstracts: To be announced

Bloomington, Indiana

Indiana University

April 1–2, 2017

Saturday – Sunday
Central Section
Associate secretary: Georgia Benkart
Announcement issue of *Notices*: To be announced
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: To be announced

Deadlines

For organizers: To be announced
For abstracts: To be announced

Pullman, Washington

Washington State University

April 22–23, 2017
Saturday – Sunday
Western Section
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: To be announced
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: To be announced

Deadlines
For organizers: To be announced
For abstracts: To be announced

San Diego, California

San Diego Convention Center and San Diego Marriott Hotel and Marina

January 10–13, 2018
Wednesday – Saturday
Joint Mathematics Meetings, including the 124th Annual Meeting of the AMS, 101st Annual Meeting of the Mathematical Association of America (MAA), annual meetings of the Association for Women in Mathematics (AWM) and the National Association of Mathematicians (NAM), and the winter meeting of the Association of Symbolic Logic (ASL), with sessions contributed by the Society for Industrial and Applied Mathematics (SIAM).
Associate secretary: Georgia Benkart
Announcement issue of *Notices*: October 2017
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: To be announced

Deadlines
For organizers: April 1, 2017
For abstracts: To be announced

Baltimore, Maryland

Baltimore Convention Center, Hilton Baltimore, and Baltimore Marriott Inner Harbor Hotel

January 16–19, 2019
Wednesday – Saturday
Joint Mathematics Meetings, including the 125th Annual Meeting of the AMS, 102nd Annual Meeting of the Mathematical Association of America (MAA), annual meetings of the Association for Women in Mathematics (AWM)and the National Association of Mathematicians (NAM), and the winter meeting of the Association of Symbolic Logic (ASL), with sessions contributed by the Society for Industrial and Applied Mathematics (SIAM).
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: October 2018
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: To be announced
Issue of *Abstracts*: To be announced

Deadlines
For organizers: April 2, 2018
For abstracts: To be announced