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.

Alba Iulia, Romania

University of Alba Iulia

June 27–30, 2013

Thursday – Sunday

Meeting #1091

First Joint International Meeting of the AMS and the Romanian Mathematical Society, in partnership with the "Simion Stoilow" Institute of Mathematics of the Romanian Academy.
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: January 2013
Program first available on AMS website: Not applicable
Program issue of electronic *Notices*: Not applicable
Issue of *Abstracts*: Not applicable

Deadlines

For organizers: Expired
For abstracts: Expired

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

Invited Addresses

Viorel Barbu, Universitatea Al. I. Cuza, *Stabilization of Navier-Stokes equations by boundary and point feedback controllers.*

Sergiu Klainerman, Princeton University, *Are black holes real?*

George Lusztig, Massachusetts Institute of Technology, *On conjugacy classes in the Lie group E8.*

Stefan Papadima, Institute of Mathematics of the Romanian Academy, *Geometry of homology jump loci and topology.*

Mihnea Popa, University of Illinois at Chicago, *Vanishing theorems and holomorphic one-forms.*

Dan Timotin, Institute of Mathematics of the Romanian Academy, *Horn inequalities: Finite and infinite dimensions.*

Special Sessions

Algebraic Geometry, **Marian Aprodu**, Institute of Mathematics of the Romanian Academy, **Mircea Mustata**, University of Michigan, Ann Arbor, and **Mihnea Popa**, University of Illinois, Chicago.

Articulated Systems: Combinatorics, Geometry and Kinematics, **Ciprian S. Borcea**, Rider University, and **Ileana Streinu**, Smith College.

Calculus of Variations and Partial Differential Equations, **Marian Bocea**, Loyola University, Chicago, **Liviu Ignat**, Institute of Mathematics of the Romanian Academy, **Mihai Mihailescu**, University of Craiova, and **Daniel Onofrei**, University of Houston.

Commutative Algebra, **Florian Enescu**, Georgia State University, and **Cristodor Ionescu**, Institute of Mathematics of the Romanian Academy.

Discrete Mathematics and Theoretical Computer Science, **Sebastian Cioaba**, University of Delaware, **Gabriel Istrate**, Universitatea de Vest, Timisoara, **Ioan Tomescu**, University of Bucharest, and **Marius Zimand**, Towson University.

Domain Decomposition Methods and their Applications in Mechanics and Engineering, **Lori Badea**, Institute of Mathematics of the Romanian Academy, and **Marcus Sarkis**, Worcester Polytechnic Institute.

Geometry and Topology of Arrangements of Hypersurfaces, **Daniel Matei**, Institute of Mathematics of the Romanian Academy, and **Alexandru I. Suciu**, Northeastern University.

Harmonic Analysis and Applications, **Ciprian Demeter**, Indiana University, Bloomington, and **Camil Muscalu**, Cornell University.

Hopf Algebras, Coalgebras, and their Categories of Representations, **Miodrag C. Iovanov**, University of Bucharest and University of Iowa, **Susan Montgomery**, University of Southern California, and **Siu-Hung Ng**, Iowa State University.

Local and Nonlocal Models in Wave Propagation and Diffusion, **Anca V. Ion**, Institute of Mathematical Statistics and Applied Mathematics of the Romanian Academy, **Petronela Radu**, University of Nebraska, Lincoln, and **Lorena Bociu**, North Carolina State University.

Mathematical Finance, Stochastic Analysis, and Partial Differential Equations, **Lucian Beznea**, Institute of Mathematics of the Romanian Academy, **Paul Feehan**, Rutgers University, **Victor Nistor**, Pennsylvania State University, **Camelia Pop**, University of Pennsylvania, and **Mihai Sirbu**, University of Texas, Austin.

Mathematical Models in Life and Environment, **Gabriela Marinoschi**, Institute of Mathematical Statistics and Applied Mathematics of the Romanian Academy, and **Fabio Augusto Milner**, Arizona State University.

Mathematical Models in Materials Science and Engineering, **Marian Bocea**, Loyola University, Chicago, and **Bogdan Vernescu**, Worcester Polytechnic Institute.

Noncommutative Ring Theory and Applications, **Toma Albu**, Institute of Mathematics of the Romanian Academy, and **Lance W. Small**, University of California, San Diego.

Nonlinear Evolution Equations, **Daniel Tataru**, University of California, Berkeley, and **Monica Visan**, University of California, Los Angeles.

Operator Algebra and Noncommutative Geometry, **Marius Dadarlat**, Purdue University, and **Florin Radulescu**, Institute of Mathematics of the Romanian Academy and University of Rome Tor Vergata.

Operator Theory and Function Spaces, **Aurelian Gheondea**, Institute of Mathematics of the Romanian Academy and Bilkent University, **Mihai Putinar**, University of California, Santa Barbara, and **Dan Timotin**, Institute of Mathematics of the Romanian Academy.

Probability and its Relation to Other Fields of Mathematics, **Krzysztof Burdzy**, University of Washington, and **Mihai N. Pascu**, Transilvania University of Braşov.

Random Matrices and Free Probability, **Ioana Dumitriu**, University of Washington, and **Ionel Popescu**, Georgia Institute of Technology and Institute of Mathematics of the Romanian Academy.

Several Complex Variables, Complex Geometry and Dynamics, **Dan Coman**, Syracuse University, and **Cezar Joita**, Institute of Mathematics of the Romanian Academy.

Topics in Geometric and Algebraic Topology, **Stefan Papadima**, Institute of Mathematics of the Romanian Academy, and **Alexandru I. Suciu**, Northeastern University.

Louisville, Kentucky

University of Louisville

October 5–6, 2013

Saturday – Sunday

Meeting #1092

Southeastern Section
Associate secretary: Brian D. Boe
Announcement issue of *Notices*: June/July 2013
Program first available on AMS website: August 22, 2013
Program issue of electronic *Notices*: October 2013
Issue of *Abstracts*: Volume 34, Issue 3

Deadlines

For organizers: Expired
For abstracts: August 13, 2013

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

Invited Addresses

Michael Hill, University of Virginia, *Framed manifolds and equivalent homotopy: A solution to the Kervaire Invariant One problem.*

Suzanne Lenhart, University of Tennessee and NIMBioS, *Using optimal control of PDEs to investigate population questions.*

Ralph McKenzie, Vanderbilt University, *A perspective on fifty years of work, delight and discovery in general algebra.*

Victor Moll, Tulane University, *2-adic valuations of classical sequences: A collection of examples.*

Special Sessions

Algebraic Coding Theory (Code: SS 5A), **Steve Szabo**, Eastern Kentucky University, and **Heide Gluesing-Luerssen**, University of Kentucky.

Algebraic Cryptography (Code: SS 12A), **Daniel Smith**, University of Louisville.

Applied Analysis and Inverse Problems (Code: SS 9A), **Peijun Li**, Purdue University, **Jiguang Sun**, Michigan Technological University, and **Yongzhi Steve Xu**, University of Louisville.

Combinatorial Commutative Algebra (Code: SS 4A), **Juan Migliore**, University of Notre Dame, and **Uwe Nagel**, University of Kentucky.

Commutative Rings, Ideals, and Modules (Code: SS 3A), **Ela Celikbas** and **Olgur Celikbas**, University of Missouri-Columbia.

Extremal Graph Theory (Code: SS 2A), **Jozsef Balogh**, University of Illinois at Urbana-Champaign, and **Louis DeBiasio** and **Tao Jiang**, Miami University, Oxford, OH.

Finite Universal Algebra (Code: SS 6A), **Ralph McKenzie**, Vanderbilt University, and **Matthew Valeriote**, McMaster University.

Fixed Point Theorems and Applications to Integral, Difference, and Differential Equations (Code: SS 8A), **Jeffrey W. Lyons**, Nova Southeastern University, and **Jeffrey T. Neugebauer**, Eastern Kentucky University.

Harmonic Analysis and Partial Differential Equations (Code: SS 10A), **Russell Brown** and **Katharine Ott**, University of Kentucky.

History of Mathematics and Its Use in Teaching (Code: SS 20A), **Daniel J. Curtin**, Northern Kentucky University, and **Daniel E. Otero**, Xavier University.

Homogenization of Partial Differential Equations (Code: SS 14A), **Zhongwei Shen**, University of Kentucky, and **Yifeng Yu**, University of California, Irvine.

Mathematical Analysis of Complex Fluids and Flows (Code: SS 15A), **Xiang Xu**, Carnegie Mellon University, and **Changyou Wang**, University of Kentucky.

Mathematical Issues in Ecological and Epidemiological Modeling (Code: SS 19A), **K. Renee Fister**, Murray State University, and **Suzanne Lenhart**, University of Tennessee.

Mathematical Models in Biology and Physiology (Code: SS 21A), **Yun Kang**, Arizona State University, and **Jiaxu Li**, University of Louisville.

Partial Differential Equations from Fluid Mechanics (Code: SS 16A), **Changbing Hu**, University of Louisville, and **Florentina Tone**, University of West Florida.

Partially Ordered Sets (Code: SS 18A), **Csaba Biro** and **Stephen J. Young**, University of Louisville.

Recent Advances on Commutative Algebra and Its Applications (Code: SS 11A), **Hamid Kulosman** and **Jinjia Li**, University of Louisville, and **Hamid Rahmati**, Miami University.

Set Theory and Its Applications (Code: SS 1A), **Paul Larson**, Miami University, **Justin Moore**, Cornell University, and **Grigor Sargsyan**, Rutgers University.

Spreading Speeds and Traveling Waves in Spatial-Temporal Evolution Systems (Code: SS 17A), **Bingtuan Li**, University of Louisville, and **Roger Lui**, Worcester Polytechnic Institute.

The Work of Mathematicians and Mathematics Departments in Mathematics Education (Code: SS 22A), **Benjamin Braun**, **Carl Lee**, and **David Royster**, University of Kentucky.

Topological Dynamics and Ergodic Theory (Code: SS 13A), **Alica Miller**, University of Louisville, and **Joe Rosenblatt**, University of Illinois at Urbana-Champaign.

Weak Convergence in Probability and Statistics (Code: SS 7A), **Cristina Tone**, **Ryan Gill**, and **Kiseop Lee**, University of Louisville.

Session for Contributed Talks

There also will be a session for 10-minute contributed talks. Please see the abstracts submission form at `http://www.ams.org/cgi-bin/abstracts/abstract.pl`. **The deadline for all submissions is August 13, 2013**.

Accommodations

Participants should make their own arrangements directly with the properties listed below. Special rates for the meeting have been negotiated and are available at the properties shown below for Friday and Saturday nights, October 4 and 5, 2013; rates may be extended to one day before or after these dates if rooms are available; please ask when you make your reservation. When making reservations **participants should state that they are with the American Mathematical Society (AMS) meeting on campus**, unless noted otherwise. Hotels have varying cancellation or early checkout penalties; be sure to ask for details when making your reservation. The room rates listed do not include applicable taxes; the current tax rate on hotel rooms is 15.01%. All properties are smoke free.

Downtown hotels:

The Seelbach Hilton, 500 Fourth St., Louisville, KY 40202; 502-585-3200 (phone), US$149 for single or double (king or two queen beds); special rate can be extended beyond the meetings dates. Onsite restaurants include The Oakroom (5-star), The Old Seelbach bar (featuring live jazz), Otto's Cafe, and Starbucks. Deluxe in-room amenities including complimentary high-speed or wireless Internet; fitness center access; business center with computer workstations; parking is US$22 (self) or US$26 (valet); lots nearby with 24-hour rates of US$3-6. Located about 2.5 miles from campus. **Deadline for reservations is September 5, 2013.** `www3.hilton.com/en/hotels/kentucky/the-seelbach-hilton-louisville-SDFSHHF/index.html?WT.srch=1`.

Galt House, 140 North Fourth St., Louisville, KY 40202 (on the Ohio river); 502-589-5200 or 800-843-4258; email `info@galthouse.com`. US$105/deluxe single or US$115/deluxe double in the Rivue Tower. US$125/single suite or US$135/double suite in the Suite Tower. Triple and quad rates are available. Complimentary wireless access in public areas, fee for in-room use; rooftop fitness center; business center; parking is US$12 (self) or US$18 (valet). Seven restaurants are on premises, including RIVUE Restaurant & Lounge, a rooftop restaurant with expansive views of downtown and the waterfront; Café Magnolia for breakfast, lunch, or dinner; Al J's at the Conservatory, with a 30-foot aquarium bar and pub menu, offers sweeping views of downtown and the waterfront; Jockey Silks Bourbon Bar is a place to relax; Thelma's at the Conservatory is a 24-hour deli. Located about 3.1 miles from campus. **Deadline for reservations is September 5, 2013**. `www.GaltHouse.com`.

Hampton Inn Louisville Downtown, 101 East Jefferson St., Louisville, KY 40202; 502-566-0205 (phone); US$134/single or double. Amenities include free parking, business center, complimentary in-room high-speed Internet access, free hot breakfast, indoor pool, and fitness center access. Free shuttle from and to airport, and within eight blocks of the hotel (pending availability). Located about 2.7 miles from campus. **Deadline for reservations is September 5, 2013.** `http://hamptoninn3.hilton.com/en/hotels/kentucky/hampton-inn-louisville-downtown-SDFDTHX/index.html`

Courtyard by Marriott Louisville Downtown, 100 South Second St., Louisville, KY 40202; 502-562-0200 (phone); US$119/single or double; in-room complimentary Internet, coffee maker, and refrigerator; fitness center;

business center; indoor pool; parking is US$1 per hour or US$6 overnight. The Bistro offers a variety of breakfast and dinner options, an evening bar, and specialty beverages made with Starbucks® coffee. Complimentary shuttle service from/to airport (SDF) only. Located about 2.7 miles from campus. **Deadline for reservations is September 13, 2013.** http://www.marriott.com/hotels/travel/sdfdt-courtyard-louisville-downtown.

Hotels near the airport:

Crowne Plaza Louisville Airport, 830 Phillips Lane, Louisville, KY 40209; 888-233-9527 (phone); US$99 single or double; in-room complimentary Internet; indoor/outdoor pool; business center, fitness center. At the hotel you will find The Blue Horse restaurant and lounge open for breakfast, lunch, and dinner. Free airport shuttle, as well as local shuttle service within three miles of the hotel (pending availability). Located about 2.8 miles from campus. **Deadline for reservations is September 18, 2013.** www.ihg.com/crowneplaza/hotels/us/en/louisville/sdfpl/hoteldetail.

LaQuinta Inn & Suites Louisville Airport Expo, 4125 Preston Highway, Louisville, KY 40213; 502-368-0007 or 866-477-0007. US$94.50/single or double. Amenities include complimentary hot breakfast, free in-room wireless and long distance (national) phone calls, microwave, refrigerator, and coffee maker. Onsite you will find a business center with computer workstations and a printer, fitness center, and seasonal outdoor pool. There is also complimentary airport shuttle service. Located about 3.2 miles from campus. **Deadline for reservations is September 13, 2013; please cite Group No. 1043 for special rates.** www.lqairport.com.

Best Western Plus Airport East/Expo Center; 1921 Bishop Lane, Louisville, KY 40218; 502-456-4411 (phone). The rate is US$79/single or double, and includes complimentary full hot breakfast, fitness center, and free high speed Internet throughout the hotel. Restaurant on site serves lunch and dinner. Free shuttle service from/to airport. Located about 5.9 miles from campus. **Deadline for reservations is September 6, 2013.** http://book.bestwestern.com/bestwestern/US/KY/Louisville-hotels/BEST-WESTERN-PLUS-Airport-East-Expo-Center/Hotel-Overview.do?propertyCode=18090.

Holiday Inn Lakeview (formerly the Holiday Inn Louisville-North), 505 Marriott Dr., Clarksville, IN 47129; 813-283-1618 (phone); the rate of US$79/single or double includes a coffee maker and complimentary Wi-Fi in guest rooms. Full service hotel including indoor and outdoor pools, fitness center, and 24-hour business center; the Quarter Pole Lounge and Champions Restaurant are located on the property. Free aiport shuttle service provided for guests. Located about 4.9 miles from campus, across the Ohio River in Indiana. **Deadline for reservations is September 20, 2013.** www.holidayinn.com/clarksvilleky.

Red Roof Inn Louisville Fair and Expo, 3322 Red Roof Inn Place, Louisville, KY 40218; 800-733-7663 or 502-456-2993 (phone). Rates are US$59.49/single in a standard room, and include free Wi-Fi. Coffee is available in the lobby on a 24-hour basis. Property is within walking distance of several restaurants, and is about 5.8 miles from campus. **Deadline for reservations is September 4, 2013. Please cite Block Code B134ULMATH for special rates.** www.redroof.com/property/Louisville/KY/40218/Hotels-close-to-Louisville-Airport-Churchill-Downs-I-264/RRI134.

Super 8 Louisville Airport, 4800 Preston Hwy., Louisville, KY 40213; 502-968-0088. The rate is US$55.25/single or double and includes an in-room coffee maker, free Internet access, complimentary continental breakfast, and a business center with printing services. **Deadline for reservations is September 4**. Located about 4.4 miles from campus. www.super8.com/hotels/kentucky/louisville/super-8-louisville-airport/hotel-overview.

Dining on Campus

Information about dining options on campus and in the surrounding area will be published on the meeting website at a later date.

Information for Students

The AMS, with support from a private gift, is accepting applications for partial support for full time doctoral students to participate in this meeting. To see more information and to submit an application, please visit www.ams.org/programs/travel-grants/grad-students/emp-student-JMM. **Applications will be accepted between June 6 and July 18, 2013 only.**

Local Information and Maps

The University of Louisville Department of Mathematics website is found at http://www.math.louisville.edu/. An area map showing the general location of the campus is found at http://louisville.edu/about/campuses.html#belknap.

A campus map is found at http://louisville.edu/registrar/registration-information/map2.html; the Department of Mathematics is in the Natural Sciences Building, #34 on this map.

Other Activities

AMS Book Sale: Stop by the onsite AMS bookstore and celebrate the AMS's 125th Anniversary. You can browse new titles, buy a new 125th t-shirt, enter to win a US$125 AMS Bookstore Gift Certificate, pick up some 125th giveaways, become an AMS member, or pay your dues. Not only will you receive a 25% discount from the list price on most AMS titles, you may also purchase any AMS title, even if it is not on display, at the exhibit discount.

Complimentary coffee will be served courtesy of AMS Membership Services.

AMS Editorial Activity: An acquisitions editor from the AMS book program will be present to speak with prospective authors. If you have a book project that you would like to discuss with the AMS, please stop by the book exhibit.

Parking

Please watch the AMS website at http://www.ams.org/meetings/sectional/sectional.html and follow the link for this meeting for information on regulations, fees, and locations to park near the buildings where sessions will be held.

Registration and Meeting Information

Louisville, Kentucky is in the Eastern Time Zone and Daylight Savings Time will be in effect during the course of the meeting.

The meeting will take place on the main campus (Belknap) of the University of Louisville. Sessions and Invited Addresses will be held in the Natural Sciences Building and the Bingham Humanities Building. The registration desk will be located in Bingham and will be open Saturday, 7:30 a.m.–4:00 p.m., and Sunday, 8:00 a.m.–noon. Fees are US$54 for AMS members, US$76 for nonmembers; and US$5 for students, unemployed mathematicians, and emeritus members. Fees are payable on-site by cash, check, or credit card.

Travel Information

The nearest large airport is Louisville International Airport (**SDF**), 911 Grade Ln # 2, Louisville, KY 40213; 502-367-4636. The airport is about 6.5 miles southeast of campus. Many hotels offer complimentary shuttles from the airport to the hotel. Taxi fare to campus would be about US $15.

Getting to the West Information Center on campus by car: The West Information Center, 2301 S. Third St., Louisville, KY 40292, is located very near the Department of Mathematics. If coming from I-265 (Gene Snyder) or I-264 (Watterson Expressway), you will want to head North on I-65. If coming from I-71 South or I-64 East or West, you will want to head south on I-65. The exits for the University of Louisville are directly off of I-65 North or South.

If coming from the North: Take I-65 South (toward Nashville) to the Arthur Street exit. If you reach the Fairgrounds/Watterson Expressway exits, you have gone too far. Continue to the first stop sign, at Arthur St. and Brandeis Ave. Turn right onto Brandeis Ave. which turns into Cardinal Boulevard. Continue on Cardinal Boulevard until Third Street. Turn left onto Third Street. Go approximately three blocks and the University of Louisville West Entrance will be on your left. Turn left into the West Entrance. The West Information Center is on your right; proceed to the drive-up window.

If coming from the South: Take I-65 North (toward Indianapolis) to the Warnock St. exit. Turn left onto Warnock St. Turn left onto Floyd St. at the first stop light. Turn right onto Central Avenue. Turn right onto Third Street at the stoplight. Turn right into the West Entrance. Information Center West is on the right; proceed to the drive-up window.

Car Rental

Hertz is the official car rental company for the meeting. To make a reservation accessing our special meeting rates online at www.hertz.com, click on the box "I have a discount", and type in our convention number **(CV): 04N30003**. You can also call Hertz directly at 800-654-2240 (U.S. and Canada) or 405-749-4434 (other countries). At the time this announcement was prepared, rates started at US$29.11 per day on the weekend. 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.

Weather

Early October weather is usually pleasant, with daytime temperatures ranging from 63º to 73º and dropping to 45º to 50º in the evenings, so dressing in layers is advised. Passing showers are a possibility.

Information for International Participants

Visa regulations are continually changing for travel to the United States. Visa applications may take from three to four months to process and require a personal interview, as well as specific personal information. International participants should view the important information about traveling to the U.S. found at http://sites.nationalacademies.org/pga/biso/visas/ and http://travel.state.gov/visa/visa_1750.html. If you need a preliminary conference invitation in order to secure a visa, please send your request to dls@ams.org.

If you discover you do need a visa, the National Academies website (see above) provides these tips for successful visa applications:

* Visa applicants are expected to provide evidence that they are intending to return to their country of residence. Therefore, applicants should provide proof of "binding" or sufficient ties to their home country or permanent residence abroad. This may include documentation of the following:

- family ties in home country or country of legal permanent residence
- property ownership
- bank accounts
- employment contract or statement from employer stating that the position will continue when the employee returns;

* Visa applications are more likely to be successful if done in a visitor's home country than in a third country;

* Applicants should present their entire trip itinerary, including travel to any countries other than the United States, at the time of their visa application;

* Include a letter of invitation from the meeting organizer or the U.S. host, specifying the subject, location and dates of the activity, and how travel and local expenses will be covered;

* If travel plans will depend on early approval of the visa application, specify this at the time of the application;

* Provide proof of professional scientific and/or educational status (students should provide a university transcript).

This list is not to be considered complete. Please visit the websites above for the most up-to-date information.

Philadelphia, Pennsylvania

Temple University

October 12–13, 2013

Saturday – Sunday

Meeting #1093

Eastern Section
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: June/July 2013
Program first available on AMS website: August 29, 2013
Program issue of electronic *Notices*: October 2013
Issue of *Abstracts*: Volume 34, Issue 3

Deadlines

For organizers: Expired
For abstracts: August 20, 2013

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

Invited Addresses

Patrick Brosnan, University of Maryland, *Normal functions.*

Xiaojun Huang, Rutgers University at New Brunswick, *Equivalence problems in several complex variables.*

Barry Mazur, Harvard University, *Arithmetic statistics: Elliptic curves and other mathematical objects* (Erdős Memorial Lecture).

Robert Strain, University of Pennsylvania, *On the Boltzmann equation without angular cut-off.*

Special Sessions

Analysis and Computing for Electromagnetic Waves (Code: SS 10A), **David Ambrose** and **Shari Moskow**, Drexel University.

Combinatorial Commutative Algebra (Code: SS 12A), **Tái Huy Há**, Tulane University, and **Fabrizio Zanello**, Massachusetts Institute of Technology and Michigan Technological University.

Contact and Symplectic Topology (Code: SS 5A), **Joshua M. Sabloff**, Haverford College, and **Lisa Traynor**, Bryn Mawr College.

Difference Equations and Applications (Code: SS 9A), **Michael Radin**, Rochester Polytechnic Institute, and **Faina Berezovskaya**, Howard University.

Geometric Aspects of Topology and Group Theory (Code: SS 17A), **David Futer**, Temple University, and **Ben McReynolds**, Purdue University.

Geometric Topology of Knots and 3-manifolds (Code: SS 16A), **Abhijit Champanerkar**, **Ilya Kofman**, and **Joseph Maher**, College of Staten Island and The Graduate Center, City University of New York.

Geometric and Spectral Analysis (Code: SS 3A), **Thomas Krainer**, Pennsylvania State Altoona, and **Gerardo A. Mendoza**, Temple University.

Higher Structures in Algebra, Geometry and Physics (Code: SS 2A), **Jonathan Block**, University of Pennsylvania, **Vasily Dolgushev**, Temple University, and **Tony Pantev**, University of Pennsylvania.

History of Mathematics in America (Code: SS 4A), **Thomas L. Bartlow**, Villanova University, **Paul R. Wolfson**, West Chester University, and **David E. Zitarelli**, Temple University.

Mathematical Biology (Code: SS 8A), **Isaac Klapper**, Temple University, and **Kathleen Hoffman**, University of Maryland, Baltimore County.

Meshfree, Particle, and Characteristic Methods for Partial Differential Equations (Code: SS 21A), **Toby Driscoll** and **Louis Rossi**, University of Delaware, and **Benjamin Seibold**, Temple University.

Modular Forms and Modular Integrals in Memory of Marvin Knopp (Code: SS 20A), **Helen Grundman**, Bryn Mawr College, and **Wladimir Pribitkin**, College of Staten Island and the Graduate Center, City University of New York.

Multiple Analogues of Combinatorial Special Numbers and Associated Identities (Code: SS 11A), **Hasan Coskun**, Texas A&M University Commerce.

Nonlinear Elliptic and Wave Equations and Applications (Code: SS 15A), **Nsoki Mavinga**, Swarthmore College, and **Doug Wright**, Drexel University.

Parabolic Evolution Equations of Geometric Type (Code: SS 18A), **Xiaodong Cao**, Cornell University, **Longzhi Lin**, Rutgers University, and **Peng Wu**, Cornell University.

Partial Differential Equations, Stochastic Analysis, and Applications to Mathematical Finance (Code: SS 14A), **Paul Feehan** and **Ruoting Gong**, Rutgers University, and **Camelia Pop**, University of Pennsylvania.

Recent Advances in Harmonic Analysis and Partial Differential Equations (Code: SS 1A), **Cristian Gutiérrez** and **Irina Mitrea**, Temple University.

Recent Developments in Noncommutative Algebra (Code: SS 6A), **Edward Letzter** and **Martin Lorenz**, Temple University.

Representation Theory, Combinatorics and Categorification (Code: SS 19A), **Corina Calinescu**, New York City College of Technology, City University of New York, **Andrew Douglas**, New York City College of Technology and Graduate Center, City University of New York, **Joshua Sussan**, Medgar Evers College, City University of New York, and **Bart Van Steirteghem**, Medgar Evers College,City University of New York.

Several Complex Variables and CR Geometry (Code: SS 7A), **Andrew Raich**, University of Arkansas, and **Yuan Zhang**, Indiana University-Purdue University Fort Wayne.

The Geometry of Algebraic Varieties (Code: SS 13A), **Karl Schwede**, Pennsylvania State University, and **Zsolt Patakfalvi**, Princeton University.

Session for Contributed Talks

There also will be a session for 10-minute contributed talks. Please see the abstracts submission form at

http://www.ams.org/cgi-bin/abstracts/abstract.pl. **The deadline for all submissions is August 13, 2013**.

Accommodations

Participants should make their own arrangements directly with the hotel of their choice. Special discounted rates were negotiated with the hotels listed below. Rates quoted do not include hotel tax. At the time of publication current Philadelphia sales tax per room per night was 15.2%. It is anticipated that effective July 1, 2013 this rate will increase to 15.5%. Participants must state that they are with the **American Mathematical Society (AMS) Meeting at Temple University** to receive the discounted rate. The AMS is not responsible for rate changes or for the quality of the accommodations. **Hotels have varying cancellation and early checkout penalties; be sure to ask for details.**

The Hampton Inn Center City Philadelphia Hotel, 1301 Race Street, Philadelphia, PA, (215) 665-9100; http://hamptoninn3.hilton.com/en/hotels/pennsylvania/hampton-inn-philadelphia-center-city-convention-center. Rates are US$139 per night for single/double occupancy. Amenities include complimentary full hot American breakfast buffet, complimentary wireless throughout the hotel, complimentary beverage area, business center on-site, fitness center and indoor pool. Secured parking provided by 3rd party vendor is available at the rates of US$25 for self-parking and US$35 valet parking per day. This property is located approximately 2.1 miles from the campus by car and approximately 16 minutes by public transportation (walking and subway). Check in time is 4:00 p.m.; check out time is 11:00 a.m. **The deadline for reservations at this rate is September 11, 2013.**

The Windsor Suites, 1700 Benjamin Franklin Parkway, Philadelphia, Pennsylvania 19103, (215) 981-5678; http://www.thewindsorsuites.com/philadelphia-hotel-suites.aspx. Rates are US$159 per night for single/double occupancy. Amenities include fully equipped kitchen, complimentary wireless Internet access, business center, 24-hour fitness center, two full-service restaurants, room service, complimentary newspaper, and parking on-site. Valet parking is available to hotel guests for a rate of US$34.80, inclusive of tax and this rate includes in/out privileges. This property is located approximately 2.4 miles from the campus by car and approximately 21 minutes by public transportation (walking and subway). Check in time is 3:00 p.m. and check out time is 11:00 a.m. **The deadline for reservations at this rate is September 11, 2013.**

Club Quarters, 1628 Chestnut St (at 17th St), Philadelphia, PA, 19103, (215) 282-5000; http://www.club-quarters.com/philadelphia. Rates are US$149 per night for single occupancy, with an extra US$15 charge per extra person, per room. **Please identify yourself as a participant at the American Mathematical Society (AMS) meeting at Temple University and use the group code TU1011**. Amenities include complimentary wireless Internet throughout the hotel; Private Club Living Room with complimentary coffee, tea, newspapers, magazines and games; complimentary purified bottled water; fitness center; and complimentary self-serve laundry facilities. Parking is available at the Parkway Garage at Liberty Place for US$24.00 for up to 24 hours, there are no in and out privileges. Please inquire for additional details about parking when reserving this property. This property is located approximately 2.7 miles from the campus by car and approximately 23 minutes by by public transportation (walking and subway). Check in time is 3:00 p.m. and check out time is 12:00 noon. **The deadline for reservations at this rate is September 11, 2013.**

The Embassy Suites, 1776 Benjamin Franklin Parkway, Philadelphia, Pennsylvania 19103, (215) 561-1776; http://embassysuites3.hilton.com. Rates are US$159 per night for single/double occupancy in a room with a king or two double beds. All suites include wet bar, refrigerator, microwave, and coffeemaker. Amenities include complimentary morning newspaper, complimentary cooked-to-order breakfast, complimentary beverage area, fitness center, wireless Internet access for a fee, business center, and parking on-site. Valet parking is available to hotel guests for a rate of US$45.60 inclusive of tax and this rate includes in/out privileges. This property is located approximately 2.5 miles from the campus by car and approximately 22 minutes by public transportation (walking and subway). Check in time is 3:00 p.m. and check out time is 12:00 noon. **The deadline for reservations at this rate is September 11, 2013.**

Doubletree by Hilton Philadelphia Center City, 237 South Broad Street, Philadelphia, Pennsylvania, 19107, (215) 893-1600; http://doubletree3.hilton.com/en/index.html. Rates are US$169 per night for single/double occupancy. Amenities include discounted Internet (US$5), business center, indoor pool, fitness room, and room service. There are two restaurants on property. Secured parking is available at the rates of US$25 for self-parking and US$38 for valet parking per day, with in/out privileges available. This property is located approximately 2.6 miles from the campus by car and approximately 17 minutes by by public transportation (walking and subway). Check in time is 3:00 p.m. and check out time is 12:00 p.m. **The deadline for reservations at this rate is September 11, 2013.**

Food Services

On Campus: At the time of publication it appears that there will not be any Temple-operated dining options open on weekends in the vicinity of the buildings hosting the meeting. As an urban campus, the neighborhoods surrounding the campus offer a multitude of dining options.
Off Campus: There are many choices for dining convenient to campus:

Jimmy Johns, 1601 N 15th St., (215) 765-8800, open Saturday and Sunday 10:30 a.m.–3 a.m., http://www.jimmyjohns.com; serving sandwiches, delivery available.

Cityview Pizza, 1434 Cecil B. Moore, (215) 769-7437, open Saturday11a.m.–11:30 p.m. and Sunday 12:00 p.m.–9:30 p.m., http://cityviewpizzaandgrill.com; serving pizza, sandwiches, and Italian specialities.

The Fresh Grocer, 1501 N. Broad St., (215) 531-9333, Saturday and Sunday 6 a.m.–12-a.m.; supermarket with prepared foods.

Koja Grille, 1600 N. Broad St., (215) 763-5652, open Saturday 12 p.m.–11 p.m. and Sunday 12 p.m.–9 p.m., `http://www.kojagrille.com/menu`; serving Korean and Japanese food for dine-in and take-out.

Noshery Gourmet Cafe, 1600 N. Broad St., Suite 7, (215) 769-1289, open Saturday and Sunday 11 a.m.–9 p.m.; serving sushi, sandwiches, and salads.

Qdoba, 1600 N. Broad St., Suite 12, (215) 763-4090, open Saturday 11 a.m.–10 p.m.; serving Mexican fast food options.

Draught Horse Pub, 1431 Cecil B. Moore Ave., (215) 235-1010, open Saturday 12 p.m.–11 p.m. and Sunday 12 p.m.–7 p.m., `http://www.draughthorse.com`; serving craft beer and pub food.

Eddie's Pizza, 1200 W. Berks St., (215) 763-8028, open Saturday 11:30 a.m.–4 p.m.; serving pizza.

Orient Express, 1835 N 12th St., (215) 236-5191, open Saturday 12:30 p.m.–4 p.m.; serving Asian cuisine.

Tai's Vietnamese Food, 1835 N. 12th St., (215) 232-3711, open Saturday 12:30 p.m.–4 p.m; serving Vietnamese cuisine

Subway, 1511 N. 15th St, (215) 769-7827, open Saturday 8 a.m.–10 p.m. and Sunday 9 a.m.–10 p.m.; national sandwich chain.

Registration and Meeting Information

Registration will be located in the lobby of Tuttleman Learning Center. The AMS book exhibit will be located in the same building on the fourth floor in the Tuttleman Owl's Nest Lounge, also know as room 409. Special Sessions will be held in Tuttleman Learning Center and in Barton Hall B. All Invited Addresses and the Erdős Memorial Lecture will be given in Beury Hall, Room 160. Please refer to the campus map for the Main Campus at `http://temple.edu/sites/temple/files/uploads/documents/TUMain_map.pdf` for specific locations. The registration desk will be open on Saturday, October 12, 7:30 a.m.–4:00 p.m. and Sunday, October 13, 8:00 a.m.–12:00 p.m. Fees are US$54 for AMS members, US$76 for nonmembers; and US$5 for students, unemployed mathematicians, and emeritus members. Fees are payable on-site via cash, check, or credit card; advance registration is not available.

Information for Students: The AMS, with support from a private gift, is accepting applications for partial support for full-time doctoral students to participate in this meeting. To see more information and to submit an application, please visit `www.ams.org/programs/travel-grants/grad-students/emp-student-JMM`. Applications will be accepted between June 6 and July 18, 2013, only.

Other Activities

AMS Book Sale: Stop by the onsite AMS bookstore and celebrate the AMS's 125th Anniversary. You can browse new titles, buy a new 125th t-shirt, enter to win a US$125 AMS Bookstore Gift Certificate, pick up some 125th giveaways, become an AMS member, or pay your dues. Not only will you receive a 25% discount from the list price on most AMS titles, you may also purchase any AMS title, even if it is not on display, at the exhibit discount.

Complimentary coffee will be served courtesy of AMS Membership Services.

AMS Editorial Activity: An acquisitions editor from the AMS book program will be present to speak with prospective authors. If you have a book project that you would like to discuss with the AMS, please stop by the book exhibit.

There will be an Erdős Memorial Lecture given by Barry Mazur on the topic of *Arithmetic statistics: Elliptic curves and other mathemtical objects*. This lecture will take place in Beury Hall, in Room 160 at 5:00 p.m. on Saturday.

There will be a **reception** for participants on Saturday evening immediately following the Erdős lecture, between 6:00 p.m. and 8:00 p.m. Please watch for more details on this event on the AMS website and at the registration desk on site at the meeting. The AMS thanks our hosts for their gracious hospitality.

Local Information and Maps

This meeting will take place on the Main Campus of Temple University. A campus map can be viewed at `http://temple.edu/sites/temple/files/uploads/documents/TUMain_map.pdf`. Information about the Temple University Department of Mathematics may be found at `https://math.temple.edu/`. Please watch the website available at `www.ams.org/meetings/sectional/sectional.html` for additional information on this meeting. Please visit the Temple University website at `www.temple.edu` for additional information on the campus.

Parking

Visitor parking on campus is only available in the garage on campus. If you're interested in parking, please use the Liacouras Garage, located at 1776 N. Broad Street. The rate at the time of publication is US$14 and is cash only.

Additional information on visitor parking can be found at `http://www.temple.edu/parking/`.

Travel

Temple University is located in the heart of Philadelphia, PA. The campus is approximately 2 miles away from the Center City area of Philadelphia and the heart of the city's historical landmarks and cultural treasures.

By Air: Philadelphia International Airport (PHL) is the closest airport to Temple University. It is located just 7.2 miles southwest of downtown Philadelphia and is conveniently accessible by I-95, I-76, and Route 291 as well as public transit.

The Airport Line Regional Rail train provides service to Philadelphia International Airport every 30 minutes from about 4 a.m. to 11:30 p.m. each day. To get to campus take SEPTA Airport Line (R1) to the Temple University stop. The fare is approximately US$6.50. Bus Routes 37 and 108 service Philadelphia International Airport as well.

Taxi services can be accessed at Zone 5 on the Commercial Transportation Roadway. All taxi rates are based per trip, not per person. There is a US$10.00 minimum fare from the airport to any destination and a US$28.50

flat rate from the airport to the central Philadelphia area. All taxis accept credit cards. For additional information, contact the Ground Transportation Hotline at 215-937-6958. The approximate cost for a taxi from the airport to Temple University Main Campus is at least US$30.00 plus tip.

Rental cars are available through a number of rental agencies at the airport and information phones are available at all baggage claim areas for each of the on-airport car rental agencies. To pick up your vehicle from the airport, please proceed to Zone 2 outside the baggage claim area.

Other options for ground transportation from the airport include shuttle and sedan services. Information on these service providers can be found at `http://www.phl.org/passengerinfo/transportationservices/Pages/shuttlesLimousines.aspx`. All hotel shuttles pick up in Zone 4, van services pick up in Zone 7, and charter buses pick up in Zone 8.

By Train: The Philadelphia region is served by Amtrak and Acela, reservations can be made at `www.amtrak.com`. If traveling by rail, you will arrive at 30th Street Station, located in Center City Philadelphia. At 30th Street Station you may take a SEPTA commuter train to Temple University. The ticket price is approximately US$5.00. Another option for transportation to campus is to take a taxi cab for approximately US$15.00, one way.

By Bus: The Philadelphia region is served by Greyhound Lines and Bolt Bus; reservations can be made at `www.greyhound.com`. Buses for these lines arrive at 1001 Filbert St, Philadelphia. Public transportation is available nearby to this station, and taxi service directly from the station to Temple costs approximately US$20. Megabus also serves the Philadelphia region; information on schedules of service and to purchase tickets online, please visit `www.megabus.com`. You will arrive at 30th St. Station; for ground transportation options please see the "by train", listing above.

By Car: If you are driving to campus and using a GPS, please note that Temple University's GPS Address is 1101 West Montgomery Avenue, Philadelphia, PA 19122 Once you arrive on campus, you may park in the Liacouras Garage, located at 1776 N. Broad Street. This garage is accessible from Norris Street and also from Broad Street , in both the northbound and southbound directions.

From the Pennsylvania Turnpike: Take Exit 326 (Philadelphia/Valley Forge). Follow I-76 East (Schuylkill Expy.) approx. 18 miles to Exit 344 (Central Philadelphia/I-676) Note: Exit is on left. Follow I-676 approximately 1 mile to Central Phila./Broad Street exit. Take Broad Street exit (stay to left). In one block go left onto Broad Street. Follow Broad Street to Cecil B. Moore (approx. 2 miles). Turn right onto Cecil B. Moore and right again onto Park Ave. Visitors Parking Lot 3 entrance is on right. You may also park at the Liacouras Center Parking Garage, located at 15th Street and Montgomery Avenue.

From the Northeast Extension Pennsylvania Turnpike: Take Exit 20 to I-476 South to I-76. Exit at I-76 East (approx. 5 miles). Take I-76 East approx. 15 miles to Exit 344 (Central Philadelphia/I-676) Note: Exit is on left. Follow directions from I-676 above. From I-95 North: Take Exit 22 (Central Philadelphia/I-676). Follow Central Philadelphia signs to Broad Street exit. At next intersection (Vine Street) turn left. In one block, turn left onto Broad Street. Follow Broad Street to Cecil B. Moore (approx. 2 miles). Turn right onto Cecil B. Moore and right again onto Park Ave. Visitors Parking Lot 3 is on right. You may also park at the Liacouras Center Parking Garage, located at 15th Street and Montgomery Avenue.

From I-95 South: Take Exit 22 (Central Philadelphia/I-676). Note: left lane exit. I-676 West to Broad Street exit. See above directions from Broad Street exit.

From the New Jersey Turnpike: Take Exit 4 to Route 73 North. Approx. 1 mile to Route 38 West. Follow for 5.5 miles to Benjamin Franklin Bridge. Take I-676 West to Broad Street exit. Follow above directions from Broad Street exit.

Car Rental: Hertz is the official car rental company for the meeting. To make a reservation accessing our special meeting rates online at `www.hertz.com`, click on the box "I have a discount", and type in our convention number **(CV): 04N30003**. You can also call Hertz directly at 800-654-2240 (U.S. and Canada) or 405-749-4434 (other countries). At the time this announcement was prepared, rates were US$23.00 to US$73.00 per day on the weekend. 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.

Local Transportation

Bus and Subway service: SEPTA's Broad Street Line is a convenient mode of transportation to Temple Main Campus by subway with its Cecil B. Moore stop. If you are taking public transportation, you can find more information at the Southeastern Pennsylvania Transportation Authority (SEPTA) website `http://septa.org/`. *Please note, you must take a local train on the Broad St. Line, not an express train to most easily access the Temple campus.*

SEPTA also operates bus and trolley routes throughout the city. For more information on utilizing these modes of transportation please visit the SEPTA website.

Customers have a variety of fare options to suit their travel needs. Paying the cash fare of US$2.00 on transit services is the simplest way to ride, however tickets, tokens, and passes offer additional savings. To ride aboard Regional Rail, cash, a ticket, or a pass are accepted forms of payment. The base cash fare for bus, trackless trolley, subway, and trolley service is US$2.00. Cash is accepted for travel on all services. Exact fare must be used. Tokens provide a discount off the base cash fare and cost US$1.55 each. A-one day convenience pass is also available and is valid for eight rides on any bus, trolley, or subway route in one calendar day by one person for US$7.00.

Taxi Service: Licensed, metered taxis are available throughout the Philadelphia metropolitan area.

Weather

The average high temperature for October is approximately 67 degrees Fahrenheit and the average low is approximately 48 degrees Fahrenheit. Visitors should

be prepared for inclement weather and check weather forecasts in advance of their arrival.

Information for International Participants

Visa regulations are continually changing for travel to the United States. Visa applications may take from three to four months to process and require a personal interview, as well as specific personal information. International participants should view the important information about traveling to the U.S. found at `http://sites.nationalacademies.org/pga/biso/visas/` and `http://travel.state.gov/visa/visa_1750.html`. If you need a preliminary conference invitation in order to secure a visa, please send your request to `mac@ams.org`.

If you discover you do need a visa, the National Academies website (see above) provides these tips for successful visa applications:

* Visa applicants are expected to provide evidence that they are intending to return to their country of residence. Therefore, applicants should provide proof of "binding" or sufficient ties to their home country or permanent residence abroad. This may include documentation of the following:

- family ties in home country or country of legal permanent residence
- property ownership
- bank accounts
- employment contract or statement from employer stating that the position will continue when the employee returns;

* Visa applications are more likely to be successful if done in a visitor's home country than in a third country;

* Applicants should present their entire trip itinerary, including travel to any countries other than the United States, at the time of their visa application;

* Include a letter of invitation from the meeting organizer or the U.S. host, specifying the subject, location and dates of the activity, and how travel and local expenses will be covered;

* If travel plans will depend on early approval of the visa application, specify this at the time of the application;

* Provide proof of professional scientific and/or educational status (students should provide a university transcript).

This list is not to be considered complete. Please visit the websites above for the most up-to-date information.

St. Louis, Missouri

Washington University

October 18–20, 2013

Friday – Sunday

Meeting #1094

Central Section
Associate secretary: Georgia M. Benkart
Announcement issue of *Notices*: August 2013
Program first available on AMS website: September 5, 2013
Program issue of electronic *Notices*: October 2013
Issue of *Abstracts*: Volume 34, Issue 4

Deadlines

For organizers: Expired
For abstracts: August 27, 2013
The scientific information listed below may be dated. For the latest information, see `www.ams.org/amsmtgs/sectional.html`.

Invited Addresses

Ronny Hadani, University of Texas at Austin, *Title to be announced.*

Effie Kalfagianni, Michigan State University, *Title to be announced.*

Jon Kleinberg, Cornell University, *Title to be announced.*

Vladimir Sverak, University of Minnesota, *Title to be announced.*

Special Sessions

Advances in Difference, Differential, and Dynamic Equations with Applications (Code: SS 12A), **Elvan Akin**, Missouri S&T University, **Youssef Raffoul**, University of Dayton, and **Agacik Zafer**, American University of the Middle East.

Advances in Mathematical Methods for Disease Modeling (Code: SS 21A), **Jimin Ding**, Washington University in St. Louis, **Necibe Tuncer**, University of Tulsa, and **Naveen K. Vaidya**, University of Missouri-Kansas City.

Algebraic Cycles and Coherent Sheaves (Code: SS 19A), **Roya Beheshti**, **Matt Kerr**, and **N. Mohan Kumar**, Washington University, St. Louis.

Algebraic and Combinatorial Invariants of Knots (Code: SS 1A), **Heather Dye**, McKendree University, **Allison Henrich**, Seattle University, **Aaron Kaestner**, North Park University, and **Louis Kauffman**, University of Illinois.

Automorphic Forms and Representation Theory (Code: SS 7A), **Dubravka Ban** and **Joe Hundley**, Southern Illinois University, and **Shuichiro Takeda**, University of Missouri, Columbia.

Commutative Algebra (Code: SS 11A), **Lianna Sega**, University of Missouri, Kansas City, and **Hema Srinivasan**, University of Missouri, Columbia.

Computability Across Mathematics (Code: SS 2A), **Wesley Calvert**, Southern Illinois University, and **Johanna Franklin**, University of Connecticut.

Convex Geometry and its Applications (Code: SS 16A), **Susanna Dann**, **Alexander Koldobsky**, and **Peter Pivovarov**, University of Missouri.

Geometric Aspects of 3-Manifold Invariants (Code: SS 10A), **Oliver Dasbach**, Louisiana State University, and **Effie Kalfagianni**, Michigan State University.

Geometric Topology in Low Dimensions (Code: SS 4A), **William H. Kazez**, University of Georgia, and **Rachel Roberts**, Washington University in St. Louis.

Groupoids in Analysis and Geometry (Code: SS 6A), **Alex Kumjian**, University of Nevada at Reno, **Markus Pflaum**, University of Colorado, and **Xiang Tang**, Washington University in St. Louis.

Interactions between Geometric and Harmonic Analysis (Code: SS 3A), **Leonid Kovalev**, Syracuse University, and **Jeremy Tyson**, University of Illinois, Urbana-Champaign.

Linear and Non-linear Geometry of Banach Spaces (Code: SS 13A), **Daniel Freeman** and **Nirina Lovasoa Randrianarivony**, St. Louis University.

Noncommutative Rings and Modules (Code: SS 5A), **Greg Marks** and **Ashish Srivastava**, St. Louis University.

Operator Theory (Code: SS 9A), **John McCarthy**, Washington University in St. Louis.

PDEs of Fluid Mechanics (Code: SS 17A), **Roman Shvydkoy**, University of Illinois Chicago, and **Vladimir Sverak**, University of Minnesota.

p-local Group Theory, Fusion Systems, and Representation Theory (Code: SS 18A), **Justin Lynd**, Rutgers University, and **Julianne Rainbolt**, Saint Louis University.

Spectral, Index, and Symplectic Geometry (Code: SS 15A), **Alvaro Pelayo** and **Xiang Tang**, Washington University, St. Louis.

Statistical Properties of Dynamical Systems (Code: SS 14A), **Timothy Chumley** and **Renato Feres**, Washington University in St. Louis, and **Hongkun Zhang**, University of Massachusetts, Amherst.

Topological Combinatorics (Code: SS 20A), **John Shareshian**, Washington University, St. Louis, and **Russ Woodroofe**, Mississippi State University.

Wavelets, Frames, and Related Expansions (Code: SS 8A), **Marcin Bownik**, University of Oregon, **Darrin Speegle**, Saint Louis University, and **Guido Weiss**, Washington University, St. Louis.

Riverside, California

University of California Riverside

November 2–3, 2013

Saturday – Sunday

Meeting #1095

Western Section
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: August 2013
Program first available on AMS website: September 19, 2013
Program issue of electronic *Notices*: November 2013
Issue of *Abstracts*: Volume 34, Issue 4

Deadlines

For organizers: Expired
For abstracts: September 10, 2013

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

Invited Addresses

Michael Christ, University of California, Berkeley, *Title to be announced.*

Mark Gross, University of California, San Diego, *Title to be announced.*

Matilde Marcolli, California Institute of Technology, *Title to be announced.*

Paul Vojta, University of California, Berkeley, *Title to be announced.*

Special Sessions

Algebraic Structures in Knot Theory (Code: SS 19A), **Allison Henrich**, Seattle University, and **Sam Nelson**, Claremont McKenna College.

Analysis and Geometry of Metric Spaces (Code: SS 12A), **Asuman G. Aksoy**, Claremont McKenna College, and **Zair Ibragimov**, California State University, Fullerton.

Categorification in Representation Theory (Code: SS 15A), **Aaron Lauda** and **David Rose**, University of Southern California.

Commutative Algebra and its Interaction with Algebraic Geometry and Combinatorics (Code: SS 10A), **Kuei-Nuan Lin** and **Paolo Mantero**, University of California, Riverside.

Computational Problems on Large Graphs and Applications (Code: SS 16A), **Kevin Costello** and **Laurent Thomas**, University of California, Riverside.

Computer, Mathematics, Imaging, Technology, Network, Health, Big Data, and Statistics (Code: SS 3A), **Subir Ghosh**, University of California, Riverside.

Developments in Markov Chain Theory and Methodology (Code: SS 2A), **Jason Fulman**, University of California, Riverside, and **Mark Huber**, Claremont McKenna College.

Diophantine Geometry and Nevanlinna Theory (Code: SS 14A), **Aaron Levin**, Michigan State University, **David McKinnon**, University of Waterloo, and **Paul Vojta**, University of California, Berkeley.

Dynamical Systems (Code: SS 13A), **Nicolai Haydn**, University of Southern California, and **Huyi Hu**, Michigan State University.

Fluids and Boundaries (Code: SS 5A), **James P. Kelliher**, **Juhi Jang**, and **Gung-Min Gie**, University of California, Riverside.

Fractal Geometry, Dynamical Systems, and Mathematical Physics (Code: SS 9A), **Michel L. Lapidus**, University of California, Riverside, **Erin P. J. Pearse**, California State Polytechnic University, San Luis Obispo, and **John A. Rock**, California State Polytechnic University, Pomona.

From Harmonic Analysis to Partial Differential Equations: in Memory of Victor Shapiro (Code: SS 11A), **Alfonso Castro**, Harvey Mudd College, **Michel L. Lapidus**, University of California, Riverside, and **Adolfo J. Rumbos**, Pomona College.

Geometric Analysis (Code: SS 4A), **Zhiqin Lu**, University of California, Irvine, **Bogdan D. Suceava**, California State University, Fullerton, and **Fred Wilhelm**, University of California, Riverside.

Geometric and Combinatorial Aspects of Representation Theory (Code: SS 8A), **Wee Liang Gan** and **Jacob Greenstein**, University of California, Riverside.

Geometry of Algebraic Varieties (Code: SS 6A), **Karl Fredrickson**, University of California, Riverside, **Mark Gross**, University of California, San Diego, and **Ziv Ran**, University of California, Riverside.

Heights, Diophantine Problems, and Lattices (Code: SS 17A), **Lenny Fukshansky**, Claremont McKenna College, and **David Krumm**, University of Georgia and Claremont McKenna College.

Homotopy Theory and K-Theory (Code: SS 7A), **Julie Bergner**, University of California, Riverside, and **Christian Haesemeyer**, University of California, Los Angeles.

Teaching ODEs: Best Practices from CODEE (Community of Ordinary Differential Equations Educators) (Code: SS 18A), **Nishu Lal**, Pomona College and Pitzer College, and **Ami Radunskaya**, Pomona College.

The Mathematics of Planet Earth (Code: SS 1A), **John Baez**, University of California, Riverside.

Baltimore, Maryland

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

January 15–18, 2014

Wednesday – Saturday

Meeting #1096

Joint Mathematics Meetings, including the 120th Annual Meeting of the AMS, 97th 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 for Symbolic Logic (ASL), with sessions contributed by the Society for Industrial and Applied Mathematics (SIAM).

Associate secretary: Georgia M. Benkart
Announcement issue of *Notices*: October 2013
Program first available on AMS website: November 1, 2013
Program issue of electronic *Notices*: January 2013
Issue of *Abstracts*: Volume 35, Issue 1

Deadlines

For organizers: Expired
For abstracts: September 17, 2013

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

Joint Invited Addresses

Eitan Grinspun, Columbia University, *Title to be announced* (MAA-AMS-SIAM Gerald and Judith Porter Public Lecture).

AMS Invited Addresses

Andrew Blake, Microsoft Research Cambridge, *Title to be announced* (AMS Josiah Willard Gibbs Lecture).

Emmanuel Candès, Stanford University, *Title to be announced*.

Christopher Hacon, University of Utah, *Title to be announced*.

Dusa McDuff, Columbia University, *Title to be announced* (AMS Colloquium Lectures).

H.-T. Yau, Harvard University, *Title to be announced*.

Call for MAA Contributed Papers

The MAA Committee on Contributed Paper Sessions solicits contributed 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 dates and times scheduled for these sessions remain tentative.

Contributed Paper Sessions with Themes

Assessing Quantitative Reasoning and Literacy, organized by **Semra Kilic-Bahi**, Colby-Sawyer College; **Eric Gaze**, Bowdoin College; **Andrew Miller**, Belmont University; and **Aaron Montgomery**, Central Washington University; Wednesday morning.

For more than a decade, the focus of introductory general education mathematics undergraduate courses has shifted towards quantitative literacy and reasoning at many academic institutions. The emphasis of these courses is to provide students the quantitative tools they will need for successful decision making in their personal, professional, and civic lives. Assessing and evaluating the impact of this curriculum change at the course, department, program, and campus-wide levels is crucial to dissemination of best practices at other institutions. Sponsored by the SIGMAA on Quantitative Literacy.

Assessing Student Learning: Alternative Approaches, organized by **Jane Butterfield**, University of Minnesota; **Robert Campbell III**, College of St. Benedict/St. John's University; **David Clark**, University of Minnesota; **John Peter**, Utica College; and **Cassie Williams**, James Madison University; Wednesday afternoon.

Classroom assessment is central to determining a student's level of mastery, yet traditional methods of assessment (such as exams, quizzes, and homework) may not accurately and robustly measure student understanding. With the recent increase in the popularity of non-lecture-based course structures, techniques that assess deeper learning have come to the forefront. This session invites presenters to describe innovative methods of assessment with which they have experimented in the attempt to accurately reflect the diversity of ways students learn and understand course material. Presenters should focus on practical issues of implementation and discuss the level of success of the method in the college classroom. Presenters may also consider sharing methods to determine validity of their assessments, advice for others looking to implement or create alternative assessment methods, or how these methods can help instructors evaluate the effectiveness of a non-traditional classroom.

Assessment of Proof Writing Throughout the Mathematics Major, organized by **Sarah Cook**, Washburn University, and **Miriam Harris-Botzum**, Lehigh Carbon Community College; Thursday morning.

Proof writing is a critical component of any mathematics major's academic career. Typically students develop these skills throughout their work in the major. How do you assess whether or not your students have successfully attained appropriate proof-writing skills? What are your proof-writing expectations for a beginning student versus an experienced student? Have you developed methods for assessing specific aspects of proof, such as logic, writing style, or critiquing of proofs? Do you assess proof writing with rubrics? Do you use portfolios? Is your assessment of proof writing course-specific or department-wide? This session invites presentations that include a description of the proof-writing objectives that are assessed, the assessment methods used, feedback received, and how student data has been used to improve student learning. Assessment in any level of proof course, not just introduction to proof, is appropriate for this session. Sponsored by the MAA Committee on Assessment.

At the Intersection of Mathematics and the Arts, organized by **Douglas Norton**, Villanova University; Thursday afternoon.

Practitioners and educators in the separate domains of mathematics and the arts continue to discover new territory to explore and to share, finding not a wall between disjoint sets but a fertile ground of intersection between the two. Participants are invited to share and learn of various areas of the traditional and newly-explored territories at the intersection of mathematics and the many visual, musical, dramatic, architectural, literary, and performing arts. Sponsored by the SIGMAA on Mathematics and the Arts.

Bridging the Gap: Designing an Introduction to Proofs Course, organized by **Sarah Mabrouk**, Framingham State University; Thursday morning.

This session invites papers regarding the creation of "bridge" and introductory proofs courses and the effects of such courses on students' abilities to read, analyze, and write proofs in subsequent courses such as number theory, abstract algebra, real/complex analysis, and applied mathematics. Information about textbook selection, assignments/projects, and activities that help students to read and analyze statements as well as to understand when it is appropriate to use, for example, the contrapositive or proof by contradiction are of particular interest; papers promoting or abasing particular textbooks will not be considered. Papers providing information about approaches that have not been successful are welcome as are those about how ineffective initial attempts were modified to help students to understand statement analysis, recognize/write equivalent statements, select appropriate rather than inappropriate methods of proof, realize when proofs are complete or incomplete, and use meaningful language and terminology in good proof writing while minimizing student-frustration and the student's view that the instructor is being picky about sentence structure and diction.

While papers providing evidence of course effectiveness in helping students to read, analyze, and write proofs are encouraged, the focus of this session is neither course assessment nor assessment of proof writing.

Data, Modeling, and Computing in the Introductory Statistics Course, organized by **Andrew Zieffler**, University of Minnesota; **Scott Alberts**, Truman State University; and **Randall Pruim**, Calvin College; Friday afternoon.

The prevalence and use of data, models, and computing have long been relevant in the introductory statistics course. Recently, media coverage of the use of data, models and computing for prediction has garnered an awareness that goes beyond the classroom. How can statistics instructors take advantage of this current popularity to engage students? We invite submissions that provide details about learning activities, technologies, resources, or teaching methods that have made use of current trends in data, modeling, and computing in teaching introductory statistics courses. We particularly encourage submissions related to teaching introductory statistics using non-conventional data, models and computing (e.g., 'big' data, web scraping, etc.). Presenters will be considered for the Dex Whittinghill Award for Best Contributed Paper. Sponsored by the SIGMAA on Statistics Education.

Flipping the Classroom, organized by **Krista Maxson**, Shawnee State University, and **Zsuzsanna Szaniszlo**, Valparaiso University; Saturday morning.

A flipped classroom is one where instruction is delivered outside of class (typically online) and class time is used for homework and activities to illustrate concepts with guidance from the instructor. This session invites presentations from faculty with experience in using flipped classroom instruction. We are interested in presentations that describe the effect of this teaching method on student learning while demonstrating the nuts and bolts of flipping a classroom. Presenters should describe goals, expectations, results, time commitment, technology used, and lessons learned from the experience. We are especially interested in descriptions and results of controlled studies, and the use of existing online material in the college classroom. The discussion of available appropriate technology is encouraged.

The History of Mathematical Communities, organized by **Amy Shell-Gellasch**, Hood College, and **Linda McGuire**, Muhlenberg College; Thursday afternoon.

The year 2015 marks the centennial of the MAA. Looking forward to that milestone, this session presents talks that highlight the history and contributions of not only the MAA, but the broad spectrum of mathematical communities. Talks may address the history of mathematical organizations such as the MAA, AMS, SIAM, AWM, CSHPM; institutions such as the Museum of Alexandria, the Universities of Chicago and Göttingen; mathematical communities such as the ICM; or any other community of mathematicians or mathematics educators that has been influential in affecting the direction and growth of mathematics. Sponsored by the SIGMAA on the History of Mathematics.

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

Linear algebra is one of the most interesting and useful areas of mathematics, because of its beautiful and

multifaceted theory, as well as the enormous importance it plays in understanding and solving many real world problems. Consequently, many valuable and creative ways to teach its rich theory and its many applications are continually being developed and refined. This session will serve as a forum in which to share and discuss new or improved teaching ideas and approaches. These innovative and effective ways to teach linear algebra include, but are not necessarily limited to (1) hands-on, in-class demos; (2) effective use of technology, such as Matlab, Maple, Mathematica, Java Applets or Flash; (3) interesting and enlightening connections between ideas that arise in linear algebra and ideas in other mathematical branches; (4) interesting and compelling examples and problems involving particular ideas being taught; (5) comparing and contrasting visual (geometric) and more abstract (algebraic) explanations of specific ideas; and (6) other novel and useful approaches or pedagogical tools.

Instructional Approaches to Increase Awareness of the Societal Value of Mathematics, organized by **Jessica Deshler**, West Virginia University, and **Elizabeth Burroughs**, Montana State University; Friday afternoon.

While students in undergraduate mathematics courses may be exposed to a breadth and depth of mathematical content, often absent from their mathematical experience is an awareness of how mathematics is exercised as a social endeavor. Undergraduate mathematics instructors can facilitate an awareness of the utility value of mathematics by choosing particular pedagogical strategies or content topics that illustrate mathematics in its social context.

We invite papers that address the development or implementation of such curriculum materials and pedagogical approaches. We envision papers that would fit one of two broad topics: (1) the introduction of topics into the mathematics curriculum that illustrate the societal uses of mathematics and (2) implementation of pedagogical changes that lead students towards understanding the social dimension of mathematics.

Papers should have a sound theoretical or empirical foundation and description of how the approach is intended to increase awareness of the societal impact of mathematics among students. Papers should describe the means used to evaluate whether the approach is successful. We are particularly interested in papers that address courses in the calculus sequence.

Is Mathematics the Language of Science?, organized by **Carl Behrens**, Alexandria, VA; **Thomas Drucker**, University of Wisconsin Whitewater; and **Dan Sloughter**, Furman University; Wednesday morning.

In 1960 physicist Eugene Wigner published an article titled: "The Unreasonable Effectiveness of Mathematics in the Natural Sciences", in which he raised the question of the relationship between mathematics and the empirical sciences. Discussions of Wigner's article often reflect the assumption that mathematics has relevance only as a means of exploring the physical world: as Wigner puts it, "in discovering the laws of inanimate nature." Many mathematicians would find this an unacceptable restriction on the definition of their pursuits and activities.

This session will explore the extent to which Wigner's approach defines the role of mathematics, and entertain alternative or additional functions and purposes. Other papers of a philosophical nature will be considered for inclusion as time permits. Sponsored by the SIGMAA for the Philosophy of Mathematics.

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

The expanding availability of play-by-play statistics and video-based spatial data, for professional and some collegiate sports, is leading to innovative kinds of research, using techniques from various areas of the mathematical sciences. By modeling the outcome distributions in certain situations, researchers can develop new metrics for player or team performance in various aspects of a sport, comparing actual results to expected values. Such work often has implications for strategic game management and personnel evaluation. Classic areas of study, such as tournament design, ranking methodology, forecasting future performance, insight into rare or record events, and physics-based analysis, also remain of interest. This session will include both presentations of original research and expository talks; topics related to the use of sports applications in curriculum are welcome. With a broad audience in mind, all talks are requested to be accessible to mathematics majors. Undergraduates and their mentors are particularly encouraged to submit abstracts for consideration.

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

The MAA Business, Industry and Government Special Interest Group (BIG SIGMAA) provides resources and a forum for mathematicians working in Business, Industry and Government (BIG) to help advance the mathematics profession by making connections, building partnerships, and sharing ideas. BIG SIGMAA consists of mathematicians in BIG as well as faculty and students in academia who are working on BIG problems.

Mathematicians, including those in academia, with BIG experience are invited to present papers or discuss projects involving the application of mathematics to BIG problems. The goal of this contributed paper session sponsored by BIG SIGMAA is to provide a venue for mathematicians with experience in business, industry, and government to share projects and mathematical ideas in this regard. Anyone interested in learning more about BIG practitioners, projects, and issues, will find this session of interest. Sponsored by the SIGMAA on MAA Business, Industry and Government.

Open Source Mathematics Textbooks, organized by **Albert Schueller**, Whitman College, and **Kent Morrison**, American Institute of Mathematics; Friday morning.

Open-source/open-access publishing is on the rise among academic mathematicians. We seek presentations on topics such as the promotion, evaluation, revision, preparation, technology, and public policy of open-source

texts. Talks that are directed towards potential authors and/or adopters of open-source texts are particularly encouraged. Also, talks about novel methods of integrating these texts with technology (e.g., Sage, WeBWorK) are encouraged. While it is appropriate to discuss the lessons learned from the development of individual textbooks, this session is not intended for the promotion of specific works.

Programs and Approaches for Mentoring Women and Minorities in Mathematics, organized by **Jenna Carpenter**, Louisiana Tech University, and **Brooke Shipley**, University of Chicago; Wednesday afternoon.

Women (~45%) and minorities (ranging from ~6% for African American and Hispanic students to 0.4% for Native American students) have long been underrepresented in mathematics, from the B.S. to the Ph.D. level, as well as in the faculty ranks. There are, however, examples of initiatives which do successfully mentor women and minorities to success at all levels. This session focuses on strategies and programs (from one-on-one mentoring to funded programs) that effectively mentor these students or faculty in mathematics. Papers should refer to relevant research and include assessment where possible, share lessons learned, as well as focus on aspects that could be adopted by others. Sharing of example materials, brochures, websites, etc., are also encouraged.

Projects, Demonstrations, and Activities that Engage Liberal Arts Mathematics Students, organized by **Sarah Mabrouk**, Framingham State University; Thursday afternoon.

Many colleges/universities offer liberal arts mathematics courses (lower-level courses other than statistics, college algebra, precalculus, and calculus) designed for students whose majors are in disciplines other than mathematics, science, social science, or business. Students taking such courses have a variety of backgrounds, strengths, and levels of interest/comfort with mathematics.

This session invites papers regarding projects, demonstrations, and activities that can be used to enhance the learning experience for students taking liberal arts mathematics courses. Papers should include information about the topic(s) related to the project/demonstration/activity, preliminary information that must be presented, and the goal(s)/outcome(s) for the project/demonstration/activity. Presenters discussing demonstrations and activities are encouraged to give the demonstration or perform the activity, if time and equipment allow, and to discuss the appropriateness of the demonstration/activity for the learning environment and the class size. Presenters discussing projects are encouraged to address how the project was conducted, presented, and evaluated, as well as grading issues, if any, and the rubric used to appraise the students' work. Each presenter is encouraged to discuss how the project/demonstration/activity fits into the course, the use of technology, if any, the students' reactions, and the effect of the project/demonstration/activity on the students' attitudes towards and understanding of mathematics.

Putting a Theme in a History of Mathematics Course, organized by **Eugene Boman**, Penn State Harrisburg, and **Robert Rogers**, SUNY Fredonia; Saturday morning.

Anyone who has taught a course in the history of mathematics has bumped up against this problem: the topic is far too vast to fit into one semester, or even two. What gets left out is always much more than what is put in, so an organizing theme must be imposed. The simplest such theme is linear time: Start in prehistory and move forward. Other themes (great theorems, famous mathematicians, history of analysis, etc.) can highlight other aspects. What themes do you use when organizing your course? How do you organize the topics, readings, and problems to tell the stories you want to tell? This session is about overarching course themes/goals and not individual topics of interest. Sponsored by the SIGMAA on the History of Mathematics.

Reinventing the Calculus Sequence, organized by **David Dwyer** and **Mark Gruenwald**, University of Evansville; Saturday afternoon.

This session showcases innovative approaches to the standard, three-semester calculus sequence as well as the development of alternative, discipline-specific calculus courses and sequences.

The standard calculus sequence was shaped largely by the demands of math, physics, and engineering curricula. But there is an emerging recognition that traditional three-semester calculus sequences are not a good fit for students in certain STEM disciplines. Some institutions have responded by creating discipline-specific calculus sequences (such as calculus for the life sciences), while others have attempted to make significant changes to the standard sequence (such as an early multivariate approach). In either case, challenges arise involving course prerequisites, transferability, and compatibility with the AP exams.

The organizers of this session invite submissions that provide information on efforts to reinvent the calculus sequence either by creating a customized sequence for specific disciplines or by making substantial changes to the choice of topics or the way in which they are ordered. The emphasis should be on modifications to content rather than pedagogical approach or method of delivery. Evidence as to the effectiveness of the changes should be included.

Research on the Teaching and Learning of Undergraduate Mathematics, organized by **Kyeong Hah Roh**, Arizona State University, **Mikael Oehrtman**, University of Northern Colorado; and **Timothy Fukawa-Connelly**, University of New Hampshire; Thursday morning and afternoon.

This session presents research reports on undergraduate mathematics education. The session will feature research in a number of mathematical areas including linear algebra, advanced calculus, abstract algebra, and mathematical proof. The goals of this session are to foster high quality research in undergraduate mathematics education, to disseminate well-designed educational studies to the greater mathematics community, and to transform theoretical work into practical consequences in college mathematics. Examples of such types of research

include rigorous and scientific studies about students' mathematical cognition and reasoning, teaching practice in inquiry-oriented mathematics classrooms, design of research-based curricular materials, and professional development of mathematics teachers, with intention to support and advance college students' mathematical thinking and activities. The presentation should report results of completed research that builds on the existing literature in mathematics education and employs contemporary educational theories of the teaching and learning of mathematics. The research should use well established or innovative methodologies (e.g., design experiment, classroom teaching experiment, and clinical interview, with rigorous analytic methods) as they pertain to the study of undergraduate mathematics education. We also welcome preliminary reports on research projects in early stages of development or execution. Sponsored by the SIGMAA on Research in Undergraduate Mathematics Education.

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

In the scholarship of teaching and learning, faculty bring disciplinary knowledge to bear on questions of teaching and learning and systematically gather evidence to support their conclusions. Work in this area includes investigations of the effectiveness of pedagogical methods, assignments, or technology, as well as probes of student understanding. The goals of this session are to (1) feature scholarly work focused on the teaching of postsecondary mathematics, (2) provide a venue for teaching mathematicians to make public their scholarly investigations into teaching/learning, and (3) highlight evidence-based arguments for the value of teaching innovations or in support of new insights into student learning. Appropriate for this session are preliminary or final reports of post-secondary classroom-based investigations of teaching methods, student learning difficulties, curricular assessment, or insights into student (mis)understandings. Abstract submissions should: (1) have a clearly stated question that was or is under investigation, and (2) indicate the type of evidence that has been gathered and will be presented. In particular, abstracts might reference any of the following types of evidence: student work, participation or retention data, pre/post tests, interviews, surveys, think-alouds, etc.

Student Activities, organized by **Lisa Marano**, West Chester University of Pennsylvania, and **Jennifer Bergner**, Salisbury State University; Thursday morning.

In an effort to encourage community amongst your math club members, what activities have you hosted? Integration Bee, Monthly Game Night? Presentations should discuss the activity, the specific challenges present in the logistics of hosting the activity (such as funding) and outline the way the club resolved these. Also include the impact the hosted activity had on the club and its membership. Sponsored by the MAA Committee on Undergraduate Student Activities and Chapters.

Teaching with Technology: Impact, Evaluation and Reflection, organized by **Peter Gavin LaRose**, University of Michigan; Saturday afternoon.

Technology in a wide range of forms has been introduced to enhance teaching in many places in the mathematics curriculum. Uses of technology with teaching include in-class labs, computer demonstrations, and lecture response systems; out-of-class online homework, peer-reviewed and edited documents, and use of social media communication; and many variations on these, including video lecture, mobile applications, and more. We invite papers describing uses of technology to enhance teaching that speak to the impact of the technology on student learning, evaluation of the nature of the success of the technology use, and careful reflection on how it changes the learning process. We specifically solicit papers that describe the use of technology and are able to assess its impact in quantitative and particularly reflective qualitative manners.

This session will not consider specific technologies, but instead seeks to explore the boundary between student learning and the technology being used: how it changes the amount students learn, what they learn, and how we are able to determine this. Reflection on the impact on teaching with similarly strong evaluation will also be considered.

Topics and Techniques for Teaching Real Analysis, organized by **Paul Musial**, Chicago State University; **Robert W. Vallin**, Slippery Rock University; **Erik Talvila**, University of the Fraser Valley; and **James Peterson**, Benedictine University; Wednesday morning.

Analysis of the real numbers and of functions of a real variable is an integral part of the mathematics curriculum. An instructor of a real analysis class must have deep content knowledge, but also must have ways of motivating the learning of this important but technically difficult subject. In this session, mathematicians will have the opportunity to share their ideas for teaching an undergraduate real analysis course.

The intended audience for the session is instructors teaching undergraduate real analysis courses at a college or university. Participants will find new ways of understanding the material taught in a real analysis course and new ways of presenting this material. It is assumed that the participants have taken at least one real analysis course and have a graduate degree in mathematics.

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

This session highlights successful implementations of biomathematics courses and content in the undergraduate curriculum, entire biomathematics curricula, efforts to recruit students into biomathematics courses, undergraduate research projects, preparation for graduate work in biomathematics and computational biology or for medical careers, and assessment of how these courses and activities impact the students.

Several recent reports emphasize that aspects of biological research are becoming more quantitative and that life science students, including pre-med students, should be

introduced to a greater array of mathematical, statistical, and computational techniques and to the integration of mathematics and biological content at the undergraduate level. Mathematics majors also benefit from coursework at the intersection of mathematics and biology because there are interesting, approachable research problems and mathematics students need to be trained to collaborate with scientists in other disciplines, particularly biology.

Topics may include scholarly work addressing the issues related to the design of effective biomathematics courses and curricula, how to gear content toward premed students, integration of biology into mathematics courses, collaborations between mathematicians and biologists that have led to new courses, course modules, or undergraduate research projects, effective use of t echnology in biomathematics courses, and assessment issues. Sponsored by the SIGMAA on Mathematics and Biology.

USE Math: Undergraduate Sustainability Experiences in the Introductory Mathematics Classroom, organized by **Ben Galluzzo**, Shippensburg University; **Monika Kiss**, Saint Leo University; and **Corrine Taylor**, Wellesley College; Saturday morning.

Humanity continually faces the task of how to balance human needs against the world's resources while operating within the constraints imposed by the laws of nature. Mathematics helps us better understand these complex issues that span disciplines: from measuring energy and other resources, to understanding variability in air and water quality, to modeling climate change. Moreover, these and other real-world-driven sustainability topics have the potential for motivating students to pursue STEM courses and fields of study more deeply. This session seeks proposals from faculty interested in integrating sustainability-focused activities, projects, and modules into the introductory college mathematics curriculum. Abstracts of accepted papers will be published on the SIGMAA EM website, and authors will be encouraged to submit classroom-ready materials for broader dissemination on the USE Math website hosted by SERC, the Science Education Resource Center at Carleton College. Sponsored by the SIGMAA on Environmental Mathematics.

Using Online Resources to Augment the Traditional Classroom, organized by **Mike May**, Saint Louis University, and **Paul Seeburger**, Monroe Community College; Friday morning.

Web-based resources used to teach and learn mathematics can be used in traditional face-to-face courses as well as in strictly online courses. However, since students do not usually use these resources during class time (in traditional courses), instructors often must require students to use these resources outside the classroom. This session provides an opportunity to report on efforts to use web resources in traditional classrooms, including both innovations in the resources used and in the method of incorporating these resources into students' learning experiences. Preference will be given to papers that use resources or methods that are easily adopted in a broad range of institutions and can be accessed by a wide range of devices (mobile phones, tablets, laptops, desktops, etc.). Sponsored by the SIGMAA on Mathematics Instruction Using the Web and the MAA Committee on Technology in Mathematics Education.

Wavelets in Undergraduate Education, organized by **Caroline Haddad**, SUNY Geneseo; **Edward Abouf-adel**, Grand Valley State University; and **John Merkel**, Oglethorpe University; Saturday afternoon.

Wavelets are functions that satisfy certain mathematical properties and are used to represent data or other functions. They work extremely well in analyzing data with finite domains having different scales or resolutions. Interesting applications include digital image processing, FBI fingerprint compression, signal processing, the design of medical equipment, and the detection of potholes. Wavelets have typically been studied at the graduate level, but are making their way into the undergraduate curriculum. We are interested in presentations that effectively incorporate wavelets in an innovative way at the undergraduate level. This may include an undergraduate course in wavelets; a topic on wavelets in some other course using, but not limited to, hands-on demonstrations, projects, labs that utilize technology such as Matlab, Mathematica, Maple, Java applets, etc.; or research opportunities for undergraduates.

We Did More with Less: Streamlining the Undergraduate Mathematics Curriculum, organized by **Wade Ellis**, West Valley College, and **Barbara Edwards**, Oregon State University; Wednesday afternoon.

Contributed papers in this session should describe and document how mathematics programs maintain and enhance the quality of student learning in original, creative, and innovative ways with less money or less time. Papers in this session may focus on new approaches to classroom teaching, use of technology in teaching, placement procedures, outside funding, or volunteers from industry that improve programs at lower cost. We also welcome papers on successful new approaches to structuring programs that allow students to complete programs more quickly. Sponsored by the MAA Subcommittee on Curriculum Reform Across the First Two Years and the MAA Committee on Two-Year Colleges.

General Contributed Paper Session, organized by **Jennifer Beineke**, Western New England University; **Bem Cayco**, San Jose State University; and **Kimberly Presser**, Shippensburg University of Pennsylvania; Wednesday, Thursday, Friday, and Saturday mornings and afternoons.

This session accepts contributions in all areas of mathematics, curriculum, and pedagogy. When you submit your abstract you will be asked to classify it according to the following scheme: Assessment and Outreach; Calculus; History and Philosophy of Mathematics; Interdisciplinary Topics; Mathematics Education; Mathematics and Technology; Modeling and Applications of Mathematics; Probability and Statistics; Research in Geometry and Linear Algebra; Research in Analysis; Research in Number Theory; Research in Graph Theory and Combinatorics; Research in Algebra and Topology; Research in Applied Mathematics; Teaching Introductory Mathematics; Teaching Mathematics Beyond the Calculus Sequence; or Other 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 17, 2013**.

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 for which it was submitted, it will automatically be considered for the general session.

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`.

Knoxville, Tennessee

University of Tennessee, Knoxville

March 21–23, 2014

Friday – Sunday

Meeting #1097

Southeastern Section
Associate secretary: Brian D. Boe
Announcement issue of *Notices*: January 2014
Program first available on AMS website: February 6, 2014
Program issue of electronic *Notices*: March 2014
Issue of *Abstracts*: Volume 35, Issue 2

Deadlines

For organizers: August 21, 2013
For abstracts: January 28, 2014

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

Special Sessions

Commutative Ring Theory (in honor of the retirement of David E. Dobbs) (Code: SS 1A), **David Anderson**, University of Tennessee, Knoxville, and **Jay Shapiro**, George Mason University.

Diversity of Modeling and Optimal Control: A Celebration of Suzanne Lenhart's 60th Birthday (Code: SS 3A), **Wandi Ding**, Middle Tennessee State University, and **Renee Fister**, Murrray State University.

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

Baltimore, Maryland

University of Maryland, Baltimore County

March 29–30, 2014

Saturday – Sunday

Meeting #1098

Eastern Section
Associate secretary: Steven H. Weintraub
Announcement issue of *Notices*: January 2014
Program first available on AMS website: February 6, 2014
Program issue of electronic *Notices*: March 2014
Issue of *Abstracts*: Volume 35, Issue 2

Deadlines

For organizers: August 29, 2013
For abstracts: January 28, 2014

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

Invited Addresses

Maria Gordina, University of Connecticut, *Title to be announced.*

L. Mahadevan, Harvard University, *Title to be announced.*

Nimish Shah, Ohio State University, *Title to be announced.*

Dani Wise, McGill University, *Title to be announced.*

Albuquerque, New Mexico

University of New Mexico

April 5–6, 2014

Saturday – Sunday

Meeting #1099

Western Section
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: January 2014
Program first available on AMS website: February 20, 2014
Program issue of electronic *Notices*: April 2014
Issue of *Abstracts*: Volume 35, Issue 2

Deadlines

For organizers: September 5, 2013
For abstracts: February 11, 2014

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

Special Sessions

The Inverse Problem and Other Mathematical Methods Applied in Physics and Related Sciences (Code: SS 1A), **Hanna Makaruk**, Los Alamos National Laboratory, and **Robert Owczarek**, University of New Mexico and Enfitek, Inc.

Lubbock, Texas

Texas Tech University

April 11–13, 2014

Friday – Sunday

Meeting #1100

Central Section
Associate secretary: Georgia M. Benkart
Announcement issue of *Notices*: February 2014
Program first available on AMS website: February 27, 2014
Program issue of electronic *Notices*: April 2014
Issue of *Abstracts*: Volume 35, Issue 2

Deadlines

For organizers: September 18, 2013
For abstracts: February 10, 2014

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

Special Sessions

Analysis and Applications of Dynamic Equations on Time Scales (Code: SS 2A), **Heidi Berger**, Simpson College, and **Raegan Higgins**, Texas Tech University.

Fractal Geometry and Dynamical Systems (Code: SS 3A), **Mrinal Kanti Roychowdhury**, The University of Texas-Pan American.

Issues Regarding the Recruitment and Retention of Women and Minorities in Mathematics (Code: SS 5A), **James Valles Jr.** and **Doug Scheib**, Saint Mary-of-the-Woods College.

Recent Advancements in Differential Geometry and Integrable PDEs, and Their Applications to Cell Biology and Mechanical Systems (Code: SS 4A), **Giorgio Bornia**, **Akif Ibragimov**, and **Magdalena Toda**, Texas Tech University.

Topology and Physics (Code: SS 1A), **Razvan Gelca** and **Alastair Hamilton**, Texas Tech University.

Tel Aviv, Israel

Bar-Ilan University, Ramat-Gan and Tel-Aviv University, Ramat-Aviv

June 16–19, 2014

Monday – Thursday

Meeting #1101

The Second Joint International Meeting between the AMS and the Israel Mathematical Union.
Associate secretary: Michel L. Lapidus
Announcement issue of *Notices*: January 2014
Program first available on AMS website: Not applicable
Program issue of electronic *Notices*: Not applicable
Issue of *Abstracts*: None

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`.

Special Sessions

Mirror Symmetry and Representation Theory, **David Kazhdan**, Hebrew University, and **Roman Bezrukavnikov**, Massachusetts Institute of Technology.

Nonlinear Analysis and Optimization, **Boris Mordukhovich**, Wayne State University, and **Simeon Reich** and **Alexander Zaslavski**, The Technion-Israel Institute of Technology.

Qualitative and Analytic Theory of ODEs, **Yosef Yomdin**, Weizmann Institute.

Eau Claire, Wisconsin

University of Wisconsin-Eau Claire

September 20–21, 2014

Saturday – Sunday

Meeting #1102

Central Section
Associate secretary: Georgia M. 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: March 20, 2014
For abstracts: July 29, 2014

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: March 18, 2014
For abstracts: August 19, 2014

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 17, 2014
Program issue of electronic *Notices*: October 2014
Issue of *Abstracts*: Volume 35, Issue 4

Deadlines
For organizers: March 25, 2014
For abstracts: September 3, 2014

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

Special Sessions

Algebraic Geometry (Code: SS 1A), **Renzo Cavalieri**, Colorado State University, **Noah Giansiracusa**, University of California, Berkeley, and **Burt Totaro**, University of California, Los Angeles.

Greensboro, North Carolina

University of North Carolina, 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: April 8, 2014
For abstracts: September 16, 2014

San Antonio, Texas

Henry B. Gonzalez Convention Center and Grand Hyatt San Antonio

January 10–13, 2015
Saturday – Tuesday
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: April 1, 2014
For abstracts: To be announced

Washington, District of Columbia

Georgetown University

March 7–8, 2015
Saturday – Sunday
Eastern Section
Associate secretary: Steven H. Weintraub
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: August 7, 2014
For abstracts: To be announced

Huntsville, Alabama

University of Alabama in Huntsville

March 20–22, 2015
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: August 20, 2014
For abstracts: To be announced

Las Vegas, Nevada

University of Nevada, Las Vegas

April 18–19, 2015
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: September 18, 2014
For abstracts: To be announced

Porto, Portugal

University of Porto

June 11–14, 2015
Thursday – Sunday
First Joint International Meeting involving the American Mathematical Society (AMS), the European Mathematical Society (EMS), and the Sociedade de Portuguesa Matematica (SPM).
Associate secretary: Georgia M. 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: To be announced
For abstracts: To be announced

Chicago, Illinois

Loyola University Chicago

October 3–4, 2015
Saturday – Sunday
Central Section
Associate secretary: Georgia M. Benkart
Announcement issue of *Notices*: To be announced
Program first available on AMS website: To be announced
Program issue of electronic *Notices*: October 2015
Issue of *Abstracts*: To be announced

Deadlines
For organizers: March 10, 2015
For abstracts: To be announced

Fullerton, California

California State University, Fullerton

October 24–25, 2015
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*: October 2015
Issue of *Abstracts*: To be announced

Deadlines
For organizers: March 27, 2015
For abstracts: To be announced

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

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

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 M. 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