
Program of the Sessions

San Antonio, Texas, January 12–15, 2006

Tuesday, January 10

AMS Short Course on Modeling and Simulation of Biological Networks, I

8:00 AM – 5:00 PM

Organizer: **Reinhard Laubenbacher**, Virginia Bioinformatics Institute

- 8:00AM Registration.
- 9:00AM *Introduction to the Short Course topics.*
(1) **Reinhard Laubenbacher**, Virginia Polytechnic Inst & State Univ
- 9:30AM *Reconstructing ancestral genomes.*
(2) **Lior Pachter**, University of California Berkeley
- 10:45AM Break.
- 11:15AM *Phylogenetics.*
(3) **Elizabeth Allman**, University of Southern Maine
- 2:00PM *Modeling and simulation of biochemical networks.*
(4) **Pedro Mendes**, Virginia Bioinformatics Institute
- 3:15PM Break.
- 3:30PM Panel Discussion: *The new face of computational biology.*

MAA Short Course: Experimental Mathematics in Action, I

9:00 AM – 5:00 PM

Organizer: **Jonathan M. Borwein**, Dalhousie University

- 8:00AM Registration.
- 9:00AM *What is experimental mathematics?*
(5) **Jonathan M. Borwein**, Dalhousie University
- 10:15AM Break.
- 10:45AM *Case Study I: Integrals and series using Mathematica.*
(6) **Victor H. Moll**, Tulane University
- 2:00PM *Algorithms for experimental mathematics, I.*
(7) **David H. Bailey**, Lawrence Berkeley National Laboratory
- 3:15PM Break.

- 3:45PM *Case Study II: Discrete math and number theory in Maple and C++.*
(8) **Neil J. Calkin**, Clemson University

Wednesday, January 11

MAA Board of Governors

8:00 AM – 5:00 PM

AMS Short Course on Modeling and Simulation of Biological Networks, II

9:00 AM – 5:00 PM

Organizer: **Reinhard Laubenbacher**, Virginia Bioinformatics Institute

- 9:00AM *A computational algebra approach to systems biology.*
(9) **Brandilyn Stigler**, Virginia Polytechnic Institute & State Univ
- 10:15AM Break.
- 10:45AM *Interaction-based computing approach to modeling and simulations of large biological and socio-technical systems.*
(10) **Madhav Marathe**, Virginia Bioinformatics Institute
- 2:00PM *Optimal control of population and disease models.*
(11) **Suzanne M. Lenhart**, University of Tennessee
- 3:15PM Break.
- 3:30PM Panel Discussion: *Opportunities in computational biology.*

MAA Short Course: Experimental Mathematics in Action, II

9:00 AM – 5:00 PM

Organizer: **Jonathan M. Borwein**, Dalhousie University

- 9:00AM *Case Study III: Inverse scattering on Matlab.*
(12) **D. Russell Luke**, University of Delaware
- 10:15AM Break.

The time limit for each AMS contributed paper in the sessions is ten minutes. The time limit for each MAA contributed paper varies. In the Special Sessions the time limit varies from session to session and within sessions. To maintain the schedule, time limits will be strictly enforced. For papers with more than one author, an asterisk follows the name of the author who plans to present the paper at the meeting.

Papers flagged with a solid triangle (▶) have been designated by the author as being of possible interest to undergraduate students. Abstracts of papers presented in the sessions at this meeting will be found in Volume 27, Issue 1 of *Abstracts of papers presented to the American Mathematical Society*, ordered according to the numbers in parentheses following the listings.

Program of the Sessions – Wednesday, January 11 (cont'd.)

- 10:45AM *Case Study IV: Analysis and probability on the computer.*
(13) **Roland Girgensohn**, Bundeswehr Medical Office
- 2:00PM *Algorithms for experimental mathematics, II.*
(14) **David H. Bailey**, Lawrence Berkeley National Laboratory
- 3:15PM Break.
- 3:45PM *Concluding examples. Putting everything together.*
(15) **Jonathan M. Borwein**, Dalhousie University

AMS Council

1:00 PM – 10:00 PM

Joint Meetings Registration

3:00 PM – 8:00 PM

Full registration will be conducted from 3:00 p.m. to 7:00 p.m. Badge/program pickup for those registered in advance will be open until 8:00 p.m.

Thursday, January 12

Joint Meetings Registration

7:30 AM – 6:00 PM

Full registration will be conducted from 7:30 a.m. to 4:00 p.m. Badge/program pickup for those registered in advance will be open until 6:00 p.m.

Employment Center

7:30 AM – 6:00 PM

MAA Session on Post-secondary Mathematics Assessment: Needs and Challenges

7:40 AM – 10:55 AM

Organizers: **Gloria S. Dion**, Educational Testing Service
Daryl Ezzo, Educational Testing Service
Luis E. Saldivia, Educational Testing Service

- 7:40AM *Measuring Student Competency at the Completion of Mathematics Developmental Courses.*
▶ (16) **Lidia Dobria**, Wilbur Wright College (1014-C1-1711)
- 8:00AM *Course Placement: Looking Beyond Skills Assessment.*
▶ (17) **Carrie Muir**, University of Colorado, Boulder (1014-C1-1487)
- 8:20AM *Assessing Pre-service Secondary School Teachers' Mathematical Knowledge for Teaching Algebra.*
▶ (18) Preliminary report.
Sharon L. Senk* and **Joan Ferrini-Mundy**, Michigan State University (1014-C1-1435)
- 8:40AM *Using Portfolios in Mathematics Education Programs to Assess Content and Connect to Future Practice.* Preliminary report.
▶ (19) **Janet A White**, Millersville University (1014-C1-476)
- 9:00AM *Math Major Portfolio Assessment.* Preliminary report.
(20) **Cheryl Olsen***, **J. Winston Crawley** and **Kate McGivney**, Shippensburg University (1014-C1-1558)

- 9:20AM *An Analytic Rubric for Assessing Proofs.* Preliminary report.
▶ (21) **Karen Batt Stanish**, Keene State College (1014-C1-1520)
- 9:40AM *Restructuring a Capstone Course to Assess Student Learning Outcomes.*
(22) **Debasree Raychaudhuri**, Calstate Los Angeles (1014-C1-1738)
- 10:00AM *Revision of the Quantitative Measure of the GRE General Test.*
▶ (23) **Jutta M Levin**, Educational Testing Service (1014-C1-423)
- 10:20AM *ConcepTests in College Algebra and Trigonometry.*
▶ (24) **David O. Lomen***, University of Arizona, and **Maria K. Robinson**, Seattle University (1014-C1-472)
- 10:40AM *Assessment using online assignment management systems.*
▶ (25) **Glenn Ledder**, University of Nebraska-Lincoln (1014-C1-1074)

AMS-MAA-MER Special Session on Mathematics and Education Reform, I

8:00 AM – 10:40 AM

Organizers: **Bonnie S. Saunders**, University of Illinois at Chicago
William H. Barker, Bowdoin College
Dale R. Oliver, Humboldt State University
Kenneth Millet, University of California Santa Barbara

- 8:00AM *The Mathematics Program at the University of Iowa: A community of mentors.*
▶ (26) **David C. Manderscheid**, University of Iowa (1014-97-1437)
- 8:30AM *Promoting excellence through a supportive environment.*
▶ (27) **John C Meakin**, University of Nebraska-Lincoln (1014-97-1058)
- 9:00AM *Building a Nurturing Mathematics Community.*
▶ (28) **Sylvia T. Bozeman**, Spelman College (1014-97-1534)
- 9:30AM *Increasing the number of mathematics majors: It takes a village.*
▶ (29) **William Y. Velez**, University of Arizona (1014-97-1238)
- 10:00AM *Mentoring and Nurturing Students in Mathematics Departments.*
(30) **Samuel M. Rankin***, American Mathematical Society, **Sylvia T. Bozeman**, Spelman College, **David C. Manderscheid**, University of Iowa, **John C. Meakin**, University of Nebraska-Lincoln, and **William Y. Velez**, University of Arizona (1014-97-1608)

AMS-SIAM Special Session on Frames and Operator Theory in Analysis and Signal Processing, I

8:00 AM – 10:50 AM

Organizers: **Peter R. Massopust**, Tuboscope Vetco Pipeline Services
David R. Larson, Texas A&M University
Manos I. Papadakis, University of Houston
Zuhair Nashed, University of Central Florida
Ahmed I. Zayed, DePaul University

Minh Chuong Nguyen, Institute of Mathematics, Hanoi, Vietnam

- 8:00AM (31) *Tikhonov regularization of ill-posed operator equations with weakly bounded noise*. Preliminary report.
P. P. B. Eggermont*, **V. N. LaRiccia**, University of Delaware, and **M. Z. Nashed**, University of Central Florida (1014-47-1276)
- 8:30AM (32) *Curvelets and the one-way acoustic wave equation*. Preliminary report.
Maarten V De Hoop, Purdue University (1014-35-1722)
- 9:00AM (33) *New Approaches to the Acoustic Wave Equation*. Preliminary report.
Donald J Kouri, Departments of Mathematics and Physics University of Houston (1014-35-1527)
- 9:30AM (34) *The relation between frames and POVM's in quantum information theory*. Preliminary report.
M. Beth Ruskai, Tufts University (1014-81-320)
- 10:00AM (35) *Oversampling a tight affine frame*. Preliminary report.
Qiyu Sun, University of Central Florida (1014-42-464)
- 10:30AM (36) *The structure of the set of Parseval frame wavelets*.
Hrvoje Šikić*, University of Zagreb, Croatia, **Darrin M. Speegle**, St.Louis University, and **Guido L. Weiss**, Washington University in St.Louis (1014-43-345)

AMS-ASL Special Session on Interdisciplinary Research Involving Analysis and Logic, I

8:00 AM – 10:45 AM

Organizers: **Su Gao**, University of North Texas
Jose N. Iovino, University of Texas at San Antonio
Itay Ben-Yacov, University of Wisconsin-Madison

- 8:00AM (37) *Model theory of representations of locally compact groups*.
Alex Usvyatsov*, UCLA, **Itay Ben Yaacov**, University of Wisconsin, Madison, and **Moshe Zadka**, The Hebrew University (1014-03-799)
- 8:35AM (38) *Hilbert spaces with generic groups of automorphisms*.
Alexander Berenstein, Universidad Nacional de Colombia (1014-03-601)
- 9:10AM (39) *Automatic Continuity of Group Homomorphisms*.
Slawomir Solecki, University of Illinois, Urbana-Champaign (1014-03-1028)
- 9:45AM (40) *Notions of symmetry and independence in noncommutative probability*. Preliminary report.
Marius Junge, University of Illinois at Urbana-Champaign (UIUC) (1014-46-807)
- 10:20AM (41) *Unique Representations of Families of Sets*.
R. Daniel Mauldin, University of North Texas (1014-03-526)

AMS Special Session on Mahler Measure and Heights, I

8:00 AM – 10:50 AM

Organizers: **Michael J. Mossinghoff**, Davidson College
Jeffrey D. Vaaler, University of Texas at Austin

- 8:00AM (42) *Global Discrepancy and Small Points on Elliptic Curves*.
Matthew Baker, Georgia Institute of Technology, and **Clayton Petsche***, The University of Georgia (1014-11-697)
- 8:30AM (43) *Effective theorems for quadratic spaces over $\overline{\mathbb{Q}}$* .
Lenny Fukshansky, Texas A&M University (1014-11-480)
- 9:00AM (44) *Heights and curves*.
Paula B Cohen, Texas A&M University (1014-11-1413)
- 9:30AM (45) *A Quantitative Measure of Linear Independence for Function Fields*. Preliminary report.
W Dale Brownawell*, Penn State, University Park, PA, and **Matthew A Papanikolas**, Texas A&M, College Station, TX (1014-11-1320)
- 10:00AM (46) *On heights of multiplicatively dependent algebraic numbers*. Preliminary report.
Cameron L. Stewart, University of Waterloo (1014-11-1032)
- 10:30AM (47) *Maximal Height of Divisors of $x^n - 1$* . Preliminary report.
Carl Pomerance, Dartmouth College, and **Nathan C Ryan***, UCLA (1014-11-1007)

AMS Special Session on Commutative Rings and Monoids, I

8:00 AM – 10:50 AM

Organizers: **Scott T. Chapman**, Trinity University
James B. Coykendall, North Dakota State University

- 8:00AM (48) *On the application of group algebras to zero-sum problems*.
Alfred Geroldinger, University of Graz (1014-13-874)
- 8:30AM (49) *Pseudo Almost Integral Elements*.
Daniel D. Anderson*, The University of Iowa, and **Muhammed Zafrullah**, Pocatello, ID (1014-13-629)
- 9:00AM (50) *Atomic decay in monoids*. Preliminary report.
Ulrich Krause, University of Bremen, Germany (1014-08-870)
- 9:30AM (51) *Block Monoid Extraction Degrees*.
Kimberly Cervello, SUNY-Geneseo, **Vadim Ponomarenko***, Trinity University, **Denise Terry**, University of Redlands, and **Liya Zhu**, UC-Berkeley (1014-13-117)
- 10:00AM (52) *Elasticity in Polynomial and Power Series Rings*.
Paul Baginski, University of California, Berkeley (1014-13-240)
- 10:30AM (53) *Congruence modulo n τ -relations and τ -factorization*.
Andrea M. Frazier*, University of Iowa, and **Suzanne Hamon**, (University of Iowa and) John Burroughs School (1014-13-295)

AMS Special Session on Topological Spaces Associated with $C(X)$, I

8:00 AM – 9:50 AM

Organizers: **Chawne M. Kimber**, Lafayette College
Warren Wm. McGovern, Bowling Green State University

- 8:30AM (54) *Tychonoff spaces X such that each maximal ideal of $C(X)$ contains a minimal prime ideal P for which $C(X)/P$ is a valuation domain*. Preliminary report.
Melvin Henriksen, Harvey Mudd College (1014-54-474)

- 9:00AM (55) *Rings of Continuous Functions on Spaces of Finite Rank and the SV Property.*
Suzanne L. Larson, Loyola Marymount University (1014-06-812)
- 9:30AM (56) *Sublattices generated by polars in algebraic frames and in $C(X)$.*
Jorge Martinez, University of Florida (1014-06-273)

AMS Special Session on Value Distribution in Classical and p -adic Functions Theory, I

8:00 AM – 10:50 AM

Organizers: **Alain Escassut**, University Blaise Pascal
Chung-Chun Yang, Hong Kong University of Science and Technology
Ilpo Laine, University of Joensuu

- 8:00AM (57) *Holomorphic curves into pseudo-canonical varieties.*
Pei-Chu HU*, Shandong University, and **Chung-Chun Yang**, Hong Kong University of Science and Technology (1014-30-589)
- 8:30AM (58) *Some recent applications of value distribution theory to functional and differential equations.*
Chung Chun Yang, University of Science and Technology of Hong Kong (1014-30-529)
- 9:00AM (59) *Critical Points of Certain Discrete Potentials.*
John F Rossi*, Virginia Tech, and **J K Langley**, University of Nottingham (1014-31-454)
- 9:30AM (60) *Extreme Curvature of Polynomials and Level Curves.*
Stephanie Edwards, University of Dayton (1014-30-1057)
- 10:00AM (61) *Converging Sets of Range Uniqueness for p -adic Analytic Functions.*
Abdelbaki Boutabaa*, **Kamal Boussaf** and **Alain Paul Escassut**, University Blaise Pascal, France (1014-11-590)
- 10:30AM (62) *Growth estimates on meromorphic solutions of certain partial differential equations.* Preliminary report.
Bao Qin Li, Florida International University (1014-32-803)

AMS Special Session on Syzygies in Commutative Algebra and Geometry, I

8:00 AM – 10:45 AM

Organizers: **Irena Peeva**, Cornell University
Sorin E. Popescu, SUNY at Stony Brook
Gregory G. Smith, Queen's University

- 8:00AM (63) *A Survey of some recent observations on the Evans-Griffith Syzygy Theorem.* Preliminary report.
Phillip A Griffith, University of Illinois (1014-13-922)
- 8:30AM (64) *Free resolutions of parameter ideals for some rings with finite local cohomology.*
Hamid Rahmati, University of Nebraska-Lincoln (1014-13-1671)
- 9:00AM (65) *Ferrers ideals.* Preliminary report.
Alberto Corso and **Uwe Nagel***, University of Kentucky (1014-13-1657)
- 9:30AM (66) *Compression.*
Jeffrey A Mermin, Cornell University (1014-13-1382)
- 10:00AM (67) *The Lex-plus-powers conjecture for ideals containing the squares of the variables.*
Jeff Mermin, **Irena Peeva** and **Michael Stillman***, Cornell University (1014-13-1698)

AMS Special Session on Algebraic Statistics: Theory and Practice, I

8:00 AM – 10:50 AM

Organizers: **Seth M. Sullivan**, University of California Berkeley
Elizabeth S. Allman, University of Southern Maine

- 8:00AM (68) *Introduction to Algebraic Statistics.*
Seth Sullivan, Harvard University (1014-62-1712)
- 8:30AM (69) *Bounds for real solutions to likelihood equations of phylogenetic trees.* Preliminary report.
Serkan Hosten, San Francisco State University (1014-14-1439)
- 9:00AM (70) *The Maximum Likelihood Degree of the Cauchy Location Likelihood.*
Max-Louis G. Buot*, Carnegie Mellon University, and **Donald Richards**, Penn State University (1014-62-1585)
- 9:30AM (71) *Markov chains and evolution algebras.* Preliminary report.
Jianjun Paul Tian, Mathematical Biosciences Institute, the Ohio State University (1014-08-434)
- 10:00AM (72) *Evolution on partially ordered sets.*
Nicholas K Eriksson* and **Niko Beerenwinkel**, University of California, Berkeley (1014-05-1182)
- 10:30AM (73) *System Identification: A computational Algebra Approach.*
Abdul Salam Jarrah*, Virginia Bioinformatics Institute, Virginia Tech, **Reinhard Laubenbacher**, Virginia Tech, and **Mike Stillman**, Cornell University (1014-12-1586)

AMS Special Session on Extension of Functions, I

8:00 AM – 10:50 AM

Organizers: **Alvario Arias**, University of Denver
Charles L. Fefferman, Princeton University
Edward W. Odell, University of Texas Austin
Thomas Slumprecht, Texas A&M University

- 8:00AM (74) *Coarse embeddings into a Hilbert space.*
William B. Johnson, Texas A&M University, and **N. Lovasoa Randrianarivony***, University of Missouri – Columbia (1014-46-1150)
- 8:30AM (75) *The class of L_1 spaces is closed under uniform equivalences.* Preliminary report.
William B Johnson, Texas A&M University, **Bernard Maurey**, Universite de Marne-la-Vallee, and **Gideon Schechtman***, The Weizmann Institute (1014-46-579)
- 9:00AM (76) *Gluing functions with random partitions of unity.*
James R Lee, Institute for Advanced Study (1014-46-1709)
- 9:30AM (77) *Assouad-Nagata dimension and Lipschitz extensions.*
Urs Lang, ETH Zurich, Switzerland (1014-51-1381)
- 10:00AM (78) *Simultaneous Lipschitz Extensions (Part I).*
Alexander Brudnyi*, University of Calgary, and **Yuri Brudnyi**, Technion (1014-46-486)
- 10:30AM (79) *Simultaneous Lipschitz Extensions (Part II).*
Yuri Brudnyi*, Technion, and **Alexander Brudnyi**, University of Calgary (1014-46-490)

AMS Session on Statistics

8:00 AM – 10:55 AM

- 8:00AM (80) *A new approach to test for interactions in Two-way ANOVA models.*
Wei Ning* and **Hyune-Ju Kim**, Syracuse University (1014-00-440)
- 8:15AM (81) *A statistical method for glaucoma detection using tomographic images, a projection pursuit approach.*
Ananda W A Bandulasiri* and **Victor Patrangenaru**, Texas Tech University (1014-62-1728)
- 8:30AM (82) *Extremes of Nonexchangeability.*
Roger B. Nelsen, Lewis & Clark College (1014-62-23)
- 8:45AM (83) *A Preliminary Report on High-Order Improvements of the Parametric Bootstrap for Long-memory Linear Regression Gaussian Processes.* Preliminary report.
Mosisa G Aga, Wayne State University (1014-62-215)
- 9:00AM (84) *Monitoring a Continuous Poisson Process Subject to Change.*
Marlo K Brown, Niagara University (1014-62-226)
- 9:15AM (85) *EDF Goodness-of-fit Tests for Testing the Distributional Assumptions in One-way Regression Model.*
Dhanuja Kasturiratna*, **Truc T Nguyen** and **Arjun K Gupta**, Bowling Green State University (1014-62-1001)
- 9:30AM (86) *Modeling Pipe Rehabilitation Liners Using the Weibull Distribution.* Preliminary report.
Mahmoud Yousef*, Central Missouri State University, and **Raja Nassar**, Louisiana Tech University (1014-62-1071)
- 9:45AM (87) *Sample Size Issues In Resource Selection Studies.*
Ashraf F El-Houbi, Valparaiso University (1014-62-1101)
- 10:00AM (88) *Frequentist Statistics and Inverse Probability: A Partial Rapprochement.*
David E. Payne, Monmouth University (1014-62-1336)
- 10:15AM (89) *Some new tests for normality based on U-processes.*
Miguel A Arcones and **Yishi Wang***, Binghamton University (1014-62-1449)
- 10:30AM (90) *Choosing the Optimal Weight for the Test in Aalen's Additive Hazard Regression Model.*
Mouchumi Bhattacharyya*, University of the Pacific, and **John Klein**, Medical College of Wisconsin (1014-62-1477)
- 10:45AM (91) *Data Augmentation for the Analysis of Coarse Woody Debris in an Old-Growth Riparian Forest.* Preliminary report.
G Jay Kerns, Youngstown State University (1014-62-1532)

MAA Session on Philosophy of Mathematics

8:00 AM – 10:55 AM

- Organizers: **Roger A. Simons**, Rhode Island College
Satish C. Bhatnagar, University of Nevada
- 8:00AM (92) *What Are Mathematical Objects? An Empiricist Hypothesis.*
Carl E. Behrens, Alexandria, VA (1014-A1-1158)

- 8:30AM (93) *Mathematical objects may be abstract, but they're NOT acausal.* Preliminary report.
Bonnie Gold, Monmouth University (1014-A1-276)
- 9:00AM (94) *How the way we 'see' mathematics changes mathematics.* Preliminary report.
Sarah-Marie Belcastro, Xavier University (1014-A1-1352)
- 9:30AM (95) *The Square Root of 2, Pi, and the King of France: Ontological and Epistemological Issues Encountered (and Ignored) in Introductory Mathematics Courses.* Preliminary report.
Martin E. Flashman, Humboldt State University and Occidental College (1014-A1-1010)
- 10:00AM (96) *Mathematics: An Aesthetic Endeavor.* Preliminary report.
Sam Stueckle, Trevecca Nazarene University (1014-A1-626)
- 10:30AM (97) *Propensities and the Two Varieties of Occult Qualities.*
James R Henderson, University of Pittsburgh-Titusville (1014-A1-500)

MAA Session on Professional Development Programs for K-12 Teachers, I

8:00 AM – 10:55 AM

- Organizers: **Zsuzsanna Szaniszló**, Valparaiso University
Laurie Burton, Western Oregon University
Judith L. Covington, Louisiana State University Shreveport
Patricia Hale, California State Polytechnic University, Pomona
- 8:00AM (98) *The Loras College Lesson Study Project.*
Daniel G. Willis, Loras College, Dubuque, Iowa (1014-D1-1035)
- 8:20AM (99) *Preparing Elementary Teachers to Teach Geometry: A 12-Month Program.*
Sue Brown, U Houston-Clear Lake (1014-D1-94)
- 8:40AM (100) *Balancing Mathematical Content with Practical Application to the Classroom in Mathematics Cluster Courses for a Masters Program in Curriculum and Instruction.* Preliminary report.
Kimberly J Presser*, **Katherine G McGivney** and **Thomas A Evitts**, Shippensburg University (1014-D1-744)
- 9:00AM (101) *Filling the Middle Grades Mathematics Gap.*
Steve C Hennagin and **Darin Buscher***, Ouachita Baptist University (1014-D1-1221)
- 9:20AM (102) *Mathematicians working with teachers in California: The ACCLAIM Experience.*
Tom Roby, University of Connecticut (1014-D1-1319)
- 9:40AM (103) *Interviews and School visits: Avenues for Assessing Professional Programs for K-12 Teachers.* Preliminary report.
Harel Barzilai* and **Homer W Austin**, Salisbury University (1014-D1-761)
- 10:00AM (104) *The Math Science Partnership of Southwestern Pennsylvania: Summer Academies Prepare Teachers to Become Educational Leaders.* Preliminary report.
Norman Hipps, Saint Vincent College, and **Japheth Wood***, Chatham College (1014-D1-1189)
- 10:20AM (105) *Louisiana's Comprehensive Curriculum.*
Lee E. Price, University of Louisiana at Lafayette (1014-D1-1533)

10:40AM (106) *Putting the Focus on Mathematics: Content-based Professional Development for Grade 5-12 Teachers.* Preliminary report.
Steven R Benson, Education Development Center/University of New Hampshire (1014-D1-1703)

MAA General Contributed Paper Session, I

8:00 AM – 10:55 AM

Chair: **Stephen L. Davis**
 Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University

- 8:00AM (107) ▶ *Three Singular Matrices in Business, Industry, and Government.*
William M. Wagner, Columbus, Ohio (1014-Z1-1306)
- 8:15AM (108) ▶ *Riemann Sums of Transcendental Functions.* Preliminary report.
Theodore S. Erickson, Wheeling Jesuit University (1014-Z1-556)
- 8:30AM (109) ▶ *Teaching Calculus with a Touchscreen Graphing Calculator.* Preliminary report.
Benjamin G. Klein, Davidson College (1014-Z1-109)
- 8:45AM (110) ▶ *Choosing Appropriate Derivative (Integral) Techniques.* Preliminary report.
Pam Crawford, Jacksonville University (1014-Z1-1559)
- 9:00AM (111) ▶ *Super Size Me: An Optimization Problem.*
Martha J. Shott, Davidson College (1014-Z1-1244)
- 9:15AM (112) ▶ *A Study on the Use of Multiple Forms of Technology in a Business Calculus Course.*
Erick Brian Hofacker, University of Wisconsin-River Falls (1014-Z1-820)
- 9:30AM (113) ▶ *My experience in offering the Financial Mathematics course for undergraduates.* Preliminary report.
Qin Lu, Lafayette College (1014-Z1-121)
- 9:45AM (114) ▶ *Using Sudoku Number Puzzles to Practice Reasoning Skills in a Basic Mathematics Course.*
Richard H Stout, Gordon College, Wenham, MA (1014-Z1-452)
- 10:00AM (115) ▶ *Using Colorings of Pascal's Triangle to Visualize Algebraic Concepts.* Preliminary report.
Cynthia J. Woodburn, Pittsburg State University (1014-Z1-317)
- 10:15AM (116) ▶ *Geometry of Quadratics.* Preliminary report.
Ion I Dinca, University of Notre Dame (1014-Z1-180)
- 10:30AM (117) ▶ *Teaching to Help Students Avoid the Misuse of the distributive Law in Algebra Class.* Preliminary report.
Shumei C. Richman, Midlands Technical College (1014-Z1-1258)
- 10:45AM (118) ▶ *Binary Quadratic Forms: A Historical View.* Preliminary report.
Azar N. Khosravani*, Columbia College Chicago, and **Mark B. Beintema**, College of Lake County (1014-Z1-502)

SIAM Minisymposium on Mathematical Neuroscience: From Experiment to Theory, I

8:00 AM – 10:55 AM

Organizer: **Kresimir Josic**, University of Houston
 8:00AM (119) *The geometry of oscillator recruitment.*
Jonathan E Rubin*, University of Pittsburgh, and **Amitabha Bose**, NJIT (1014-37-528)

- 8:25AM (120) *Subthreshold oscillatory activity and spiking in medial entorhinal cortex layer II stellate cells.*
Horacio G. Rotstein*, Boston University, **Tim Oppermann**, Institute for Theoretical Biology, Humboldt University Berlin, **John A. White**, Department of Biomedical Engineering and Center for Biodynamics, Boston University, and **Nancy Kopell**, Department of Mathematics and Center for Biodynamics, Boston University (1014-92-704)
- 8:50AM (121) *Inferring Calcium Channel Distribution from Calcium Fluorescence Data.*
Steven J. Cox* and **Jane Hartsfield**, CAAM, Rice University (1014-92-549)
- 9:15AM Break.
- 9:45AM (122) ▶ *Ionic mechanisms of bursting in neostriatal cholinergic interneurons.*
Charles J Wilson, Dept. Biology, Univ. Texas at San Antonio (1014-92-1232)
- 10:10AM (123) *Dynamic Clustering in a Model for an Insect's Antennal Lobe.*
David Terman*, Ohio State University, **Alla Borisyuk**, University of Utah, **Brian Smith**, Arizona State University, **Sungwoo Ahn**, **Xueying Wang** and **Jeong-sook Im**, Ohio State University (1014-92-685)
- 10:35AM (124) *Finite size effects in feedforward neural networks.*
Brent Doiron*, **Alex Reyes** and **John Rinzel**, New York University (1014-92-1362)

SIAM Minisymposium on Numerical Solution of Partial Differential Equations and Applications to Flow in Porous Media

8:00 AM – 10:53 AM

- Organizer: **Todd J. Arbogast**, University of Texas at Austin
- 8:00AM (125) *Numerical simulation of coupled ground water/surface flow and transport.*
Clint Dawson, The University of Texas at Austin (1014-65-1102)
 - 8:25AM (126) ▶ *Control Volume Finite Element Methods and Their Applications to Multiphase Flows in Porous Media.*
Zhangxin John Chen, Southern Methodist University (1014-65-466)
 - 8:50AM (127) *A fully mass and volume conserving implementation of a characteristic method for transport problems.*
Todd Arbogast, The University of Texas at Austin, and **Chieh-Sen Huang***, National Sun Yat-sen University (1014-65-1345)
 - 9:15AM (128) *Detecting and countering instability in operator splitting methods for reaction-diffusion equations.*
Donald Estep*, **Travis King**, Colorado State University, **David Ropp** and **John Shadid**, Sandia National Laboratories (1014-65-873)
 - 9:40AM (129) *Computing The Effective Behavior of Stiff Oscillatory Dynamical Systems.*
Bjorn Engquist, **Richard Sharp** and **Richard Tsai***, University of Texas at Austin (1014-65-798)
 - 10:05AM (130) *Multiscale finite element methods for flows in heterogeneous porous media.*
Y. R. Efendiev, Texas A&M University (1014-65-390)
 - 10:30AM (131) *Mixed Variational Multiscale Modeling of Stochastic Porous Media.*
Todd Arbogast*, The University of Texas at Austin, **Kirsten J Boyd**, Eureka College, **Michael S Lubke** and **James M Rath**, The University of Texas at Austin (1014-65-1649)

MAA-AMS Committee on Teaching Assistants and Part-Time Instructors Panel Discussion

8:00 AM – 9:20 AM

Permanent use of temporary faculty: The status of nonladder faculty in departments of mathematics.

Organizers: **Judith L. Baxter**, University of Illinois-Chicago

Kevin E. Charlwood, Washburn University

Natasha M. Speer, Michigan State University

Moderator: **Kevin E. Charlwood**

Panelists: **Fred Peskoff**, Borough of Manhattan Community College/CUNY

Curtis D. Bennett, Loyola-Marymount University

SIGMAA on Statistics Education Panel Discussion

8:00 AM – 9:20 AM

Implications of the new ASA (GAISE) guidelines for teaching statistics.

Organizers: **Thomas L. Moore**, Grinnell College

Christopher J. Lacke, Rowan University

Moderator: **Carolyn K. Cuff**, Westminster College

Panelists: **Robin H. Lock**, St. Lawrence University

Gary Kader, Appalachian State University

Mike Perry, Appalachian State University

Jessica Utts, University of California Davis

AMS Session on Combinatorics, I

8:15 AM – 10:55 AM

8:15AM *Angle sums on polytopal complexes.* Preliminary report. (132)

Kristin A Camenga, Cornell University (1014-52-1409)

8:30AM *A conjecture for the combinatorial structure of crystals for all Kirillov-Reshetikhin modules of type $D_n^{(1)}$.* (133)

Philip M Sternberg, University of California, Davis (1014-05-1665)

8:45AM *Notes on the Villainy of a Graph.* Preliminary report. (134)

Sarah H Holliday*, University of Tennessee at Martin, **Sally A Clark**, Birmingham-Southern College, **John E Holliday**, North Georgia College and State University, **Peter D Johnson**, **Janet E Trimm**, Auburn University, **Robert R Rubalcaba**, University of Alabama in Huntsville, and **Matthew P Walsh**, Indiana University Purdue University Fort Wayne (1014-05-1403)

9:00AM *Zero-Divisor Graphs of Commutative Rings: A Survey of Recent Results.* (135)

Joe A. Stickle, Jr., University of Evansville (1014-13-758)

9:15AM *A Matrix Theory Approach to the Genus of a Graph.* (136)

Jason J Moliterno, Sacred Heart University (1014-15-413)

9:30AM *Some results on Multidecompositions with the Order 4 Graph-Pair.* (137)

Atif Abueida, University of Dayton, **Sally Clark***, Birmingham-Southern College, and **David Leach**, University of West Georgia (1014-05-361)

9:45AM *A New Class of Multiset Wilf Equivalent Pairs.* (138)

Vidya Venkateswaran, Stanford University (1014-05-373)

10:00AM *On caps in $(\mathbb{Z}/n\mathbb{Z})^2$.* (139)

Jack W Huizenga, University of Chicago (1014-05-554)

10:15AM *On the sizes of graphs embeddable in surfaces of nonnegative Euler characteristic and their applications to edge choosability.* (140)

Ko-Wei Lih*, Academia Sinica, Taipei, and **Wei-Fan Wang**, Zhejiang Normal University (1014-05-107)

10:30AM *On the probability of finite metric spaces.* (141)

Vanja Mascioni, Ball State University (1014-05-327)

10:45AM *On Detectable Colorings of Graphs.* (142)

Henry Enriquez Escudro, Western Michigan University (1014-05-596)

AMS Special Session on Division Algebras, Galois Theory, Cohomology and Geometry, I

8:30 AM – 10:50 AM

Organizers: **Kelly L. McKinnie**, University of Texas at Austin

David J. Saltman, University of Texas at Austin

8:30AM *Division algebras of prime degree over function fields of surfaces.* (143)

Parimala Raman*, Emory University, Atlanta and Tata Institute of Fundamental Research, and **Manuel Ojanguren**, EPFL, Lausanne (1014-14-447)

9:00AM *A geometric approach to period-index problems.* (144)

Max Lieblich, Princeton University (1014-14-1420)

9:30AM *Orders of finite groups of matrices.* Preliminary report. (145)

Martin W Lorenz, Temple University (1014-20-764)

10:00AM *Division algebras with an anti-automorphism but with no involution.* (146)

Patrick Morandi*, New Mexico State University, **B. A. Sethuraman**, California State University, Northridge, and **Jean-Pierre Tignol**, Université catholique de Louvain (1014-16-231)

10:30AM *On graded polynomial identities and algebras with a projective basis.* Preliminary report. (147)

Eli Aljadeff, Technion - Israel Institute of Technology, **Darrell E Haile***, Indiana University, and **Michael Natapov**, Technion-Israel Institute of Technology (1014-20-1486)

MAA Committee on Graduate Students Presentation

8:30 AM – 10:55 AM

Workshop on training T.A.s.

Organizer: **David C. Manderscheid**, University of Iowa

Presenters: **Solomon Friedberg**, Boston College
Maria S. Terrell, Cornell University

MAA Session on Getting Students to Discuss and to Write about Mathematics, I

8:45 AM – 10:40 AM

Organizers: **Martha Ellen Murphy Waggoner**, Simpson College

Charlotte A. Knotts-Zides, Wofford College

Harrison W. Straley, Wheaton College

- 8:45AM ▶ (148) *A Classification of Secondary Mathematics Writing Tasks.* Preliminary report.
Kristin A Camenga, Cornell University (1014-H1-151)
- 9:00AM ▶ (149) *Writing about Mathematicians in General Education Courses.*
Karl-Dieter Crisman, Gordon College (1014-H1-280)
- 9:15AM (150) *Research Experiences in Mathematics for Mathematics Educators.*
Daniel Chazan, University of Maryland, and **Sarah Sword***, Education Development Center (1014-H1-1595)
- 9:30AM ▶ (151) *Using weekly laboratory sessions to stimulate student discussion.*
Charles F. Peltier, Saint Mary's College, Notre Dame, IN (1014-H1-986)
- 9:45AM ▶ (152) *Returned Assignments: A Tool for Fostering Mathematical Communication and Connections.* Preliminary report.
Rapti Manohara de Silva, California State University, Chico (1014-H1-1199)
- 10:00AM ▶ (153) *Thinking Statistically in Writing: Journals and Discussion Boards in an Introductory Statistics Course.* Preliminary report.
Julie M Theoret* and **Andrea Luna**, Lyndon State College (1014-H1-1529)
- 10:15AM (154) *Writing Assignments with No Grading Required.* Preliminary report.
Aprillya Lanz, Clayton State University (1014-H1-1647)
- 10:30AM ▶ (155) *Web Quests for Introductory Statistics Students.* Preliminary report.
Kimberly J Presser, Shippensburg University (1014-H1-1171)

MAA Minicourse #12: Part A

9:00 AM – 11:00 AM

Getting students involved in undergraduate research.

Organizers: **Aparna W. Higgins**, University of Dayton
Joseph A. Gallian, University of Minnesota Duluth

MAA Minicourse #1: Part A

9:00 AM – 11:00 AM

Designing and evaluating assessments for introductory statistics.

Organizers: **Beth L. Chance**, California Polytech State University
Robert C. Delmas, University of Minnesota
Allan J. Rossman, California Polytech State University

MAA Minicourse #7: Part A

9:00 AM – 11:00 AM

Geometry with history for teaching teachers.

Organizers: **David W. Henderson**, Cornell University

Daina Taimina, Cornell University

AMS Session on Complex Variables

9:00 AM – 10:55 AM

- 9:00AM (156) *A modification of the Roper-Suffridge extension operator.*
Jerry R. Muir, Jr., University of Scranton (1014-32-694)
- 9:15AM (157) *On the Serre Problem about Stein manifolds.*
Dan J. Zaffran, Academia Sinica, Taipei (Taiwan) (1014-32-646)
- 9:30AM (158) *General interpolation in spaces of analytic functions.* Preliminary report.
Daniel H. Luecking, University of Arkansas (1014-30-1631)
- 9:45AM (159) *Unexpected local extrema for the Sendov conjecture.*
Michael J. Miller, Le Moyne College (1014-30-275)
- 10:00AM (160) *A general formula for a special class of holomorphic functions from a multiply connected domain to the right half plane.* Preliminary report.
Faisal Kaleem, Purdue University, West Lafayette, IN (1014-30-727)
- 10:15AM (161) *Subordination results from a differential equation related to the de la Vallée Poussin means.* Preliminary report.
Stacey Muir, University of Scranton (1014-30-1128)
- 10:30AM (162) *Riemann Surface Deformations.* Preliminary report.
J'Lee Wyatt Bumpus* and **G. Brock Williams**, Texas Tech University (1014-30-1542)
- 10:45AM (163) *Higher Hyperbolic Derivatives In The Unit Disk.*
Chelst N. Dov, DeVry University - North Brunswick (1014-30-1707)

AMS Session on Number Theory, I

9:00 AM – 10:55 AM

- 9:00AM ▶ (164) *The Periodic Character of the Rational Difference Equation $y_n = 1 + \frac{y_{n-k}}{y_{n-m}}$.*
Kenneth S. Berenhaut, **John D. Foley***, Wake Forest University, and **Stevó Stević**, Mathematical Institute of Serbian Academy of Science (1014-39-1706)
- 9:15AM ▶ (165) *Orthogonal Polynomials Arising from Generalized Trigonometric Identities.* Preliminary report.
James C. Griffin, University of Central Florida (1014-33-1156)
- 9:30AM (166) *A Trace Formula for Compact Quotients of $SL(3, R)$ and Weyl's Law.*
Lee Stemkoski, Dartmouth College (1014-11-330)
- 9:45AM ▶ (167) *Discrepancy of Fractions with Divisibility Constraints.* Preliminary report.
Andrew H. Ledoan*, **Emre Alkan**, University of Illinois at Urbana-Champaign, **Marian Vájáitu**, Romanian Academy, Simion Stoilow Institute of Mathematics, and **Alexandru Zaharescu**, University of Illinois at Urbana-Champaign (1014-11-407)
- 10:00AM ▶ (168) *Sierpinski numbers with at least two prime divisors.*
Michael Filaseta, **Carrie E Finch*** and **Mark R Kozek**, University of South Carolina (1014-11-416)
- 10:15AM (169) *A summation formula for divisor functions associated to lattices.*
Jennifer Beineke*, Western New England College, and **Daniel Bump**, Stanford University (1014-11-1581)
- 10:30AM (170) *Stable Reduction of $X_0(81)$.*
Ken McMurdy, Rose-Hulman Institute of Technology (1014-11-1685)

10:45AM *Proof of the Fermat's Last Theorem (originally submitted to AMS on 2-16-1991).*
(171) **Andrew H Warren**, New York, NY (1014-11-40)

MAA Invited Paper Session on the Role of Online Technology Courses for Teachers of Preservice Mathematics Teachers

9:00 AM – 10:55 AM

Organizers: **Judy O'Neal**, North Georgia College & State University
Franklin D. Demana, The Ohio State University

9:00AM *Sooner or later you will use on-line technology to teach mathematics!*
▶ (172)

Roseanne S. Hofmann, Montgomery County Community College (1014-ZA-189)

9:30AM *Engaging Preservice Teachers in Online Learning: Interactive Video and Active Discussions.*
▶ (173) Preliminary report.

Janet Bowers, San Diego State University (1014-ZA-293)

10:00AM *Mathematics Methods Online.*
▶ (174)

Connie S Schrock, Emporia State University (1014-ZA-555)
10:30AM *Creating positive discussion environments in a mathematics content sequence for elementary education majors using traditional and distance formats.*
▶ (175)
James R. Hersberger, Indiana-Purdue Fort Wayne (1014-ZA-720)

MAA CUPM and SIGMAA on Statistics Education Panel Discussion

9:30 AM – 10:50 AM

Requiring statistics of every mathematics major: Model courses.

Organizers: **Thomas L. Moore**, Grinnell College
Harriet S. Pollatsek, Mount Holyoke College

Panelists: **George Cobb**, Mount Holyoke College
Robin Lock, St. Lawrence University
Deborah Nolan, University of California Berkeley
Allan Rossman, California Polytechnic University, San Luis Obispo

MAA Panel Discussion

9:30 AM – 10:50 AM

National Science Foundation programs supporting learning and teaching in the mathematical sciences.

Organizers: **Elizabeth J. Teles**, NSF Division of Undergraduate Education
John R. Haddock, NSF Division of Undergraduate Education
Lee L. Zia, NSF Division of Undergraduate Education
John S. Bradley, NSF Division of Elementary, Secondary, and Informal Education
Lloyd E. Douglas, NSF Division of Mathematical Sciences

AMS Invited Address

10:05 AM – 10:55 AM

(176) *Riemann-Roch for determinantal gerbes and infinite-dimensional bundles.*
Mikhail Kapranov, Yale University (1014-14-18)

AMS-MAA Invited Address

11:10 AM – NOON

(177) *Graph limits and graph homomorphisms.*
Lászlo Lovász, Microsoft Research (1014-05-68)

Exhibits and Book Sales

12:15 PM – 5:30 PM

Math on the Web, I

12:30 PM – 5:00 PM

12:30PM *MathML Software: A common format for many math programs.*
(178) **Neil Soiffer**, Design Science, Inc.

2:00PM *Communicating math on the Web: Promises, trials, and free beer.*
(179) **Patrick Ion**, American Mathematical Society

2:45PM *MAA reviews and classroom capsules: New features in MathDL.*
(180) **Lang Moore**, Mathematical Association of America

3:45PM *Creating mathematical documents for the Web with Scientific Workplace.*
(181) **Barry MacKichan**, MacKichan Software, Inc.

4:30PM *PlanetMath and free mathematics.*
(182) **Aaron Krowne**, Emory University

AMS Colloquium Lectures: Lecture I

1:00 PM – 2:00 PM

(183) *Entangled radicals, Part I.*
Hendrik W. Lenstra Jr., Universiteit Leiden (1014-12-13)

MAA Invited Address

2:15 PM – 3:05 PM

(184) *Preference Sets, Graphs, and Voting in Agreeable Societies.*
Francis Edward Su, Harvey Mudd College (1014-A0-08)

AMS-MAA-MER Special Session on Mathematics and Education Reform, II

2:15 PM – 6:05 PM

Organizers: **Bonnie S. Saunders**, University of Illinois at Chicago
William H. Barker, Bowdoin College
Dale R. Oliver, Humboldt State University
Kenneth Millet, University of California Santa Barbara

2:15PM *The search for common ground in K-12 mathematics education.* Preliminary report.
▶ (185) **R. James Milgram**, Stanford University (1014-97-1471)

- 2:45PM *Math War Veteran Tells All.*
▶ (186) **Jeremy Kilpatrick**, University of Georgia (1014-97-1387)
- 3:15PM *Reaching Common Ground: Issues in Teachers' Mathematical Education and Professional Development.*
▶ (187) **Joan Ferrini-Mundy**, Michigan State University (1014-97-1427)
- 3:45PM *Disagreeing about Common Ground.*
▶ (188) **Andrew M. Gleason**, Harvard University (1014-97-1613)
- 4:15PM *Standards and the National Math View.*
(189) **Johnny W Lott**, University of Montana (1014-97-290)
- 4:45PM *Results from a Capstone Course for Future High School Mathematics Teachers, jointly taught by a Mathematician and a Mathematics Educator.*
▶ (190) **Richard O. Hill*** and **Sharon L. Senk**, Michigan State University (1014-97-1086)
- 5:15PM *Lessons learned from our long-term discrete collaboration in the mathematical preparation of teachers.* Preliminary report.
▶ (191) **Valerie A. DeBellis***, Shodor Education Foundation, and **Joseph G. Rosenstein**, Rutgers University (1014-97-959)
- 5:45PM *The rush to calculus and the rush to algebra.*
▶ (192) Preliminary report.
Joseph G. Rosenstein, Rutgers University (1014-97-1174)

AMS-MAA Special Session on Ancient and Nonwestern Mathematics, I

2:15 PM – 4:05 PM

Organizer: **Duncan J. Melville**, St. Lawrence University

- 2:15PM *Controversies in the Early History of Trigonometry.*
▶ (193) Preliminary report.
Glen R Van Brummelen, Bennington College (1014-01-1062)
- 3:15PM *Equations in Arabic Algebra.* Preliminary report.
▶ (194) **Jeffrey A. Oaks**, University of Indianapolis (1014-01-393)
- 3:45PM *An Examination of Three Persian Arithmetic Texts.*
▶ (195) **Lawrence D'Antonio**, Ramapo College of New Jersey (1014-01-493)

AMS-SIAM Special Session on Contemporary Dynamical Systems, I

2:15 PM – 6:05 PM

Organizers: **Dmitry Zenkov**, North Carolina State University
Youngna Choi, Montclair State University
Anthony M. Bloch, University of Michigan
Todd L. Fisher, University of Maryland
Melvin Leok, University of Michigan
David S. Richeson, Dickinson College
James S. Wiseman, Agnes Scott College

- 2:15PM *Dynamics in Small Networks of Identical Coupled Systems.* Preliminary report.
(196) **Martin Golubitsky***, University of Houston, and **Maria C.A. Leite**, Purdue University (1014-34-344)

- 2:45PM *Limit laws for chaotic dynamical systems.*
(197) **Ian Melbourne**, University of Surrey, and **Matthew Nicol***, University of Houston (1014-37-517)
- 3:15PM *Dirac Structures, Variational Principles, and Implicit Lagrangian Systems.*
(198) **Hiroaki Yoshimura***, Mechanical Engineering, Waseda University, and **Jerrold E. Marsden**, Control and Dynamical Systems, Caltech (1014-70-1719)
- 3:45PM *A Dynamical Systems Study of Bose-Einstein Condensates in Optical Lattice and Superlattice Potentials.*
(199) **Mason A Porter**, California Institute of Technology (1014-37-237)
- 4:15PM *Geometric Rigidity for Automorphisms of Groups.*
(200) **Alex Clark***, University of North Texas, and **R. J. Fokkink**, T. U. Delft (1014-37-1394)
- 4:45PM *Examples of outer billiards with periodic dynamics.*
(201) **Filiz Dogru**, Grand Valley State University (1014-37-953)
- 5:15PM *Closed Relations and Equivalence Classes of Quasicontinuous Functions.*
(202) **Annalisa Crannell**, Franklin & Marshall College, **Marc Frantz**, Indiana University, Bloomington, and **Michelle LeMasurier***, Hamilton College (1014-54-1084)
- 5:45PM *Mixing and embedding properties of tiling spaces.*
(203) Preliminary report.
Brian F Martensen, Rose-Hulman Institute of Technology (1014-37-1676)

AMS Special Session on Mahler Measure and Heights, II

2:15 PM – 6:05 PM

Organizers: **Michael J. Mossinghoff**, Davidson College
Jeffrey D. Vaaler, University of Texas at Austin

- 2:15PM *Mahler Measure for Polynomials in Noncommuting Variables.* Preliminary report.
(204) **Douglas Lind**, University of Washington (1014-37-638)
- 2:45PM *Special functions and the range of multiplicative functions on $\mathbb{Z}[x]$.*
(205) **Christopher D Sinclair**, Pacific Institute of the Mathematical Sciences, Vancouver (1014-11-618)
- 3:15PM *The Mahler Measure of Polynomials with Odd Coefficients.*
(206) **Peter Borwein**, Simon Fraser University (1014-11-643)
- 3:45PM *Mahler's measure and derivatives.* Preliminary report.
▶ (207) **Igor E Pritsker**, Oklahoma State University (1014-11-1019)
- 4:15PM *Arithmetic Mean and Geometric Mean of Mahler Measure of Unimodular Polynomials.* Preliminary report.
▶ (208) **Stephen Choi**, Simon Fraser University (1014-11-862)
- 4:45PM *Univogue Beta Expansions of Pisot numbers.*
(209) **Kevin G. Hare**, University of Waterloo (1014-11-560)
- 5:15PM *Salem-Boyd polynomials and surface homeomorphisms.*
(210) **Eriko Hironaka**, Florida State University (1014-11-614)
- 5:45PM *Dilatations of pseudo-Anosov automorphisms.*
(211) **Christopher J Leininger**, University of Illinois at Urbana Champaign (1014-51-611)

AMS Special Session on Division Algebras, Galois Theory, Cohomology and Geometry, II

2:15 PM – 6:05 PM

Organizers: **Kelly L. McKinnie**, University of Texas at Austin
David J. Saltman, University of Texas at Austin

- 2:15PM *Projective Schur Groups over Henselian Fields.*
(212) **Eli Aljadeff**, **Jack Sonn**, Technion–Israel Institute of Technology, and **A. R. Wadsworth***, University of California, San Diego (1014-16-703)
- 2:45PM *Relative Brauer Groups of Function Fields of Binary Cubic Forms.*
(213) **Ilseop Han***, California State University, San Bernardino, **Darrell Haile**, Indiana University, Bloomington, and **Adrian R Wadsworth**, University of California, San Diego (1014-16-1344)
- 3:15PM *Kneser-Tits Conjecture and outer forms of E_6 .*
(214) **Skip Garibaldi**, Emory University (1014-20-1076)
- 3:45PM *Indecomposable p -algebras.* Preliminary report.
(215) **Kelly L. McKinnie**, University of Texas at Austin (1014-16-1302)
- 4:15PM *Valuations on Tensor Powers of a Division Algebra.*
(216) **Patrick J. Morandi**, New Mexico State University, and **B. A. Sethuraman***, California State University Northridge (1014-16-259)
- 4:45PM *The Unramified Witt Group of Curves in Characteristic Two.*
(217) **Bill Jacob***, University of California, Santa Barbara, and **Roberto Aravire**, Universidad Arturo Prat, Iquique, Chile (1014-12-389)
- 5:15PM Discussion

AMS Special Session on Dynamic Equations with Applications, I

2:15 PM – 6:05 PM

Organizers: **Allan C. Peterson**, University of Nebraska
Martin J. Bohner, University of Missouri-Rolla

- 2:15PM *Asymptotic Equivalence of Dynamic Systems.*
▶ (218) Preliminary report.
Billur Kaymakcalan*, Georgia Southern University, and **Agacik Zafer**, Middle East Technical University, Ankara, Turkey (1014-34-1187)
- 2:45PM *On the distinctions between “continuous” boundary value problems and “discrete” boundary value problems.*
▶ (219) **Christopher C Tisdell**, The University of New South Wales (1014-34-495)
- 3:15PM *Integral Comparison Theorems.* Preliminary report.
▶ (220) **Lynn H. Erbe**, University of Nebraska-Lincoln 68588-0130 (1014-39-1105)
- 3:45PM *Diffusion Equations on Basic Linear Grids.*
(221) Preliminary report.
Andreas Ludwig Ruffing and **Maria Meiler***, Munich University of Technology (1014-39-1046)
- 4:15PM *Discretization Scheme In Volterra*
(222) *Integro-differential Equations That Preserves Stability and Boundedness.*
Eric R Kaufmann, University of Arkansas at Little Rock, and **Youssef N Raffoul***, University of Dayton (1014-45-1079)

- 4:45PM *Error Estimates of Asymptotic Solutions of Second Order Dynamic Equations on Time Scale.*
▶ (223) Preliminary report.
Gro Hovhannisyan, Kent State University, Stark Campus (1014-34-150)
- 5:15PM *A Two Dimensional Dynamical System Underlying Cardiac Arrhythmias.*
▶ (224) **Irina Popovici***, **B. M. Baker** and **M. Kidwell**, US Naval Academy (1014-37-334)
- 5:45PM *Global Attractivity in Dynamic Equations on Time Scales with delays.*
(225) **Seshadev Padhi**, Mississippi State University (1014-39-188)

AMS Special Session on Commutative Rings and Monoids, II

2:15 PM – 6:05 PM

Organizers: **Scott T. Chapman**, Trinity University
James B. Coykendall, North Dakota State University

- 2:15PM *A generalization to Dedekind domains of an Erdős inequality connected to $n!$.*
(226) **Jean-Luc Chabert**, Université de Picardie, France (1014-13-522)
- 2:45PM *Direct-sum relations among modules over a one-dimensional local ring.*
(227) **Alberto Facchini**, University of Padua, **Wolfgang Hassler**, University of Graz, **Lee Klingler**, Florida Atlantic University, and **Roger Wiegand***, University of Nebraska (1014-13-671)
- 3:15PM *Gaussian Properties of Total Rings of Quotients.*
(228) Preliminary report.
Sarah Glaz, University of Connecticut (1014-13-1013)
- 3:45PM *Irreducible Divisor Graphs.*
▶ (229) **Jack L Maney***, The University of South Dakota, and **Jim B. Coykendall**, North Dakota State University (1014-13-358)
- 4:15PM *Transfer of Krull dimension, lying-over and going-down to the fixed ring.*
(230) **David E. Dobbs***, University of Tennessee, Knoxville, and **Jay Shapiro**, George Mason University (1014-13-607)
- 4:45PM *Anderson-Mott commutative rings: ϕ -commutative rings with a finite number of nonnil irreducible elements.* Preliminary report.
(231) **Ayman R. Badawi**, American University of Sharjah, U.A.E (1014-13-475)
- 5:15PM *Constructing chains of primes in power series rings.* Preliminary report.
▶ (232) **Alan Loper**, The Ohio State University, and **Thomas G. Lucas***, University of North Carolina Charlotte (1014-13-949)
- 5:45PM *Non-Noetherian Cohen-Macaulay Rings.* Preliminary report.
(233) **Tracy Dawn Hamilton***, California State University Sacramento, and **Thomas Marley**, University of Nebraska-Lincoln (1014-13-364)

AMS Special Session on Topological Spaces Associated with $C(X)$, II

2:15 PM – 5:05 PM

Organizers: **Chawne M. Kimber**, Lafayette College
Warren Wm. McGovern, Bowling Green State University

- 2:15PM *Network character and tightness of the compact-open topology.*
(234) **Anthony W. Hager***, Wesleyan University, and **Richard N. Ball**, University of Denver (1014-54-301)
- 2:45PM *An algebraic characterization of pointwise convergence in $C(X)$.* Preliminary report.
(235) **Richard N. Ball***, University of Denver, and **Anthony W. Hager**, Wesleyan University (1014-06-1360)
- 3:15PM *Conditional Completeness of $C(X, \mathbb{R}_\tau)$ Where \mathbb{R}_τ is a Weak P -Space.*
(236) **Michelle L. Knox**, Midwestern State University (1014-06-311)
- 3:45PM *Extremal Pseudocompact Abelian Groups Are Compact Metrizable.*
(237) **W. W. Comfort***, Wesleyan University, and **Jan van Mill**, Vrije Universiteit (1014-22-958)
- 4:15PM *The regular topology on $C(X)$, I.* Preliminary report.
(238) **Warren Wm. McGovern***, Bowling Green State University, **Wolf Iberkleid** and **Ramiro Lafuente-Rodriguez**, La Universidad de La Paz (1014-54-816)
- 4:45PM *The regular topology on $C(X)$, II.* Preliminary report.
(239) **Wolf Iberkleid***, **Ramiro Lafuente-Rodriguez**, Universidad Mayor de San Andres, and **Warren Wm. McGovern**, Bowling Green State University (1014-54-722)

AMS Special Session on Value Distribution in Classical and p -adic Functions Theory, II

2:15 PM – 5:35 PM

Organizers: **Alain Escassut**, University Blaise Pascal
Chung-Chun Yang, Hong Kong University of Science and Technology
Ilpo Laine, University of Joensuu

- 2:15PM *Dirac operators and automorphic forms for some conformally flat manifolds.* Preliminary report.
(240) **John Ryan***, University of Arkansas, Fayetteville., and **R. S. Krausshar**, Gent University (1014-58-869)
- 2:45PM *Eigenvalues of non-self-adjoint Schrödinger operators with polynomial potentials.* Preliminary report.
(241) **Kwang C. Shin**, University of Missouri-Columbia (1014-34-824)
- 3:15PM *On Borel Exceptional Values for Meromorphic Functions in the Unit Disk.* Preliminary report.
(242) **L. R. Sons**, Northern Illinois University (1014-30-672)
- 3:45PM *Picard's theorem for finite-order periodic functions.*
(243) **R G Halburd**, Loughborough University, and **R J Korhonen***, University of Joensuu (1014-30-446)
- 4:15PM *A Second Main Theorem on Generalized Parabolic Manifolds.*
(244) **Pit-Mann Wong**, University of Notre Dame (1014-32-1176)
- 4:45PM *Rational Solutions of Algebraic Differential Equations.*
(245) **Yujie Ma**, KLMM, Academy of Mathematics and System Sciences, Chinese Academy of Sciences (1014-30-598)
- 5:15PM *Scahtten P -Classes in Padic Hilbert spaces.* Preliminary report.
(246) **Sudeshna Basu**, Moragan State University (1014-46-168)

AMS Special Session on Syzygies in Commutative Algebra and Geometry, II

2:15 PM – 6:05 PM

Organizers: **Irena Peeva**, Cornell University
Sorin E. Popescu, SUNY at Stony Brook
Gregory G. Smith, Queen's University

- 2:15PM *Efficient toroidalization of morphisms.*
(247) **Steven D Cutkosky**, University of Missouri (1014-14-1447)
- 2:45PM *Some Ideals with Large Projective Dimension.*
(248) **Manoj Kummini***, University of Kansas, Lawrence, KS, and **Giulio Caviglia**, University of California, Berkeley, CA (1014-13-617)
- 3:15PM *Finite free complexes with homology of finite length.* Preliminary report.
(249) **Luchezar L. Avramov***, University of Nebraska – Lincoln, **Ragnar-Olaf Buchweitz**, University of Toronto, **Srikanth Iyengar**, University of Nebraska, and **Claudia Miller**, Syracuse University (1014-13-1393)
- 3:45PM *On the minimal free resolutions of a class of monomial ideals.* Preliminary report.
(250) **Alexandre B. Tchernev**, University at Albany, SUNY (1014-13-520)
- 4:15PM *Tropical Convexity via Cellular Resolutions.*
▶ (251) **Florian Block**, TU München, and **Josephine Yu***, UC Berkeley (1014-13-444)
- 4:45PM *Some componentwise linear monomial ideals.*
(252) **Christopher A. Francisco***, University of Missouri, and **Adam Van Tuyl**, Lakehead University (1014-13-368)
- 5:15PM *Bounding Frobenius powers uniformly.* Preliminary report.
(253) **Craig Huneke***, University of Kansas, and **M. Katzman. R. Sharp, Y. Yao**, Univ. of Sheffield, Univ. of Michigan (1014-13-564)
- 5:45PM Discussion

AMS Special Session on Extension of Functions, II

2:15 PM – 5:35 PM

Organizers: **Alvario Arias**, University of Denver
Charles L. Fefferman, Princeton University
Edward W. Odell, University of Texas Austin
Thomas Slumprecht, Texas A&M University

- 2:15PM *Extending Lipschitz and linear maps.*
(254) **Nigel Kalton**, University of Missouri (1014-46-926)
- 2:45PM *Lipschitz selections and extensions of smooth functions.*
▶ (255) **Pavel Shvartsman**, Technion - Israel Institute of Technology (1014-46-546)
- 3:15PM *Probabilistic techniques in the Lipschitz extension problem.*
(256) **Assaf Naor**, Microsoft Research (1014-51-441)
- 3:45PM *How Markov chains reflect geometry.*
(257) **Keith M Ball**, University College London (1014-46-1124)
- 4:15PM *C^1 extensions and stabilization of Glaeser refinements.*
(258) **Nahum Zobin***, College of William and Mary, and **Bo'az Klartag**, Institute for Advanced Study (1014-26-455)

- 4:45PM *Examples concerning extensions of Lipschitz maps from metric spaces into ℓ_1^n* . Preliminary report. **Beata Randrianantoanina**, Miami University of Ohio (1014-46-1523)
- 5:15PM *The Holomorphic Extension of CR Functions on Tube-Like CR Manifolds of CR Dimension 1: An Alternative to Wedge Extendability*. **Jennifer Halfpap**, University of Montana (1014-32-118)

MAA Minicourse #13: Part A

2:15 PM – 4:15 PM

The Fibonacci and Catalan numbers.
Organizer: **Ralph P. Grimaldi**, Rose-Hulman Institute of Technology

MAA Minicourse #2: Part A

2:15 PM – 4:15 PM

Java applets in teaching mathematics.
Organizers: **Joe Yanik**, Emporia State University
Michael E. Mays, West Virginia University

MAA Minicourse #8: Part A

2:15 PM – 4:15 PM

Mathematical and statistical modeling in biology: Competitive exclusion, coexistence, estimation, and control.
Organizers: **Azmy S. Ackleh**, University of Louisiana at Lafayette
H. Thomas Banks, North Carolina State University

AMS Session on Probability and Stochastic Processes

2:15 PM – 5:40 PM

- 2:15PM *Extinction of Generalized Branching Annihilating Random Walks*. Preliminary report. **Ryan S. Gantner**, University of Minnesota (1014-60-524)
- 2:30PM *Birth-Death Processes with Polynomial Transition Rates*. **Robert L. Bewernick**, University of California, Los Angeles, **Jeremy D. Dewar***, Loyola Marymount University, **Eunice Gray**, Sam Houston State University, **Nancy Y. Rodriguez**, Loyola Marymount University, and **Randall J Swift**, California State Polytechnic University Pomona (1014-60-587)
- 2:45PM *Busy Period of a Delayed Service M/M/c Queueing System*. **Aliakbar Montazer Haghighi*** and **Dimitar P Mishev**, Prairie View A&M University (1014-60-181)
- 3:00PM *Random, Finite Subsets with Exponential Distributions*. Preliminary report. **Kyle T Siegrist**, University of Alabama in Huntsville (1014-60-1444)
- 3:15PM *Simple formulas for conditional function space integrals and applications*. **Seung Jun Chang**, **Jae Gil Choi**, Dankook University, and **David L. Skoug***, University of Nebraska-Lincoln (1014-60-686)

- 3:30PM *The Mean-Field Blume-Emery-Griffiths Model with Varying Parameters*. **Peter T. Otto***, Union College, **Marius Costeniuc**, Max-Planck Institute for Mathematics in the Sciences, and **Richard S. Ellis**, University of Massachusetts, Amherst (1014-60-688)
- 3:45PM *Tail behavior of negatively associated heavy tailed sums*. Preliminary report. **Jaap L. Geluk***, The Petroleum Institute, and **Kai W. Ng**, University of Hong Kong (1014-60-838)
- 4:00PM *Sums of Point Processes and Attribute-Based Thinnings Leading to an Unusual Poisson Process*. **Matthew O. Jones***, Austin Peay State University, and **Richard F. Serfozo**, Georgia Institute of Technology (1014-60-1004)
- 4:15PM *Optimal buy/sell rules for correlated random walks*. Preliminary report. **Michael G Monticino*** and **Pieter Allaart**, University of North Texas (1014-60-1147)
- 4:30PM *The "Taylor" Map on a Hilbert Space of Holomorphic Functions on the Path Space of a Complex Simply Connected Lie Group*. **Matthew S Cecil**, UCSD (1014-60-1283)
- 4:45PM *Minimal Axiom Sets for Poisson Processes*. **Donald P. Minassian**, Butler University; Indianapolis, IN 46208 (1014-60-457)
- 5:00PM *Toward a Classification of Infinite Discrete Probability Measures*. **H. Radjavi**, University of Waterloo, and **Chelluri C.A. Sastri***, Dalhousie University (1014-60-1550)
- 5:15PM *Uniqueness for Martingale Problem Associated with Pure Jump Processes*. **Huili Tang**, University of Connecticut (1014-60-1704)
- 5:30PM *Ruin Probabilities on Two Finite State, Birth-Death Chains Connected in Parallel*. Preliminary report. **Alan Krinik*** and **Chau Nguyen**, California State Polytechnic University, Pomona (1014-60-1746)

AMS Session on Combinatorics, II

2:15 PM – 5:55 PM

- 2:15PM *2-Regular Leaves of Partial 8-cycle Systems*. **D. J. Ashe***, University of Tennessee at Chattanooga, **C. D. Leach**, University of West Georgia, and **C. A. Rodger**, Auburn University (1014-05-602)
- 2:30PM *Ihara zeta functions of irregular graphs and the deletion of edges*. **Matthew D. Horton**, University of California, San Diego (1014-05-681)
- 2:45PM *Shellability properties on planar graded posets*. **I. V. Cane**, Wesleyan University (1014-06-1452)
- 3:00PM *Generating functions for the alternative multi-restricted numbers*. Preliminary report. **Ji Young Choi**, Shippensburg University of PA (1014-05-781)
- 3:15PM *On the Degree of Regularity for the Equation $x_1 + x_2 + \dots + x_n - ay = 0$* . Preliminary report. **Ronald J. Clark**, UCLA (1014-05-790)
- 3:30PM *Probe interval orders*. **David E Brown**, Utah State University, and **Larry J Langley***, University of the Pacific (1014-05-822)
- 3:45PM *Survey on (96, 20, 4) difference sets*. **Omar A. AbuGhneim*** and **Ken W. Smith**, Central Michigan University (1014-05-832)
- 4:00PM *Permutation Reconstruction*. **Rebecca N Smith**, SUNY Brockport (1014-05-849)

Program of the Sessions – Thursday, January 12 (cont'd.)

- 4:15PM *Largest Circuit Pairs in Matroids.*
(283) **Manoel Lemos**, Universidade Federal de Pernambuco, **Talmage J Reid**, **Bryan Williams*** and **Haidong Wu**, University of Mississippi (1014-05-878)
- 4:30PM *A combinatorial model of the associated Hermite polynomials.* Preliminary report.
▶ (284) **Dan Drake**, University of Minnesota (1014-05-910)
- 4:45PM *Clones in minors of matroids.* Preliminary report.
(285) **Joseph E Bonin**, The George Washington University, **Carla D Cotwright***, **Talmage J Reid**, The University of Mississippi, and **Jakayla Robbins**, The University of Montana (1014-05-929)
- 5:00PM *Minimally 3-connected Binary Matroids.*
(286) **Joe Anderson*** and **Haidong Wu**, The University of Mississippi (1014-05-954)
- 5:15PM *Some plethysm results related to Foulkes's conjecture.*
(287) **Steven W. Sivek**, Massachusetts Institute of Technology (1014-05-1031)
- 5:30PM *Isosceles colorings of triangulations and their geometrical realizations.*
▶ (288) **Joseph Malkevitch**, York College (CUNY) (1014-05-1064)
- 5:45PM *Holey Knight's Tours.*
▶ (289) **Darren A. Narayan*** and **Shelley K. Speiss**, Rochester Institute of Technology (1014-05-1065)

AMS Session on Number Theory, II

2:15 PM – 5:55 PM

- 2:15PM *Additive Theorems and Davenport Constant over Finite Groups.*
(290) **Chuang Peng**, Morehouse College (1014-11-527)
- 2:30PM *Factoring Generalized Repunits.* Preliminary report.
▶ (291) **John H. Jaroma**, Austin College (1014-11-600)
- 2:45PM *Sequences of Reducible $\{0, 1\}$ -Polynomials over \mathbb{F}_p .*
▶ (292) **Judith Canner**, North Carolina State University, **Lenny Jones** and **Joseph Purdom***, Shippensburg University (1014-11-1468)
- 3:00PM *On the Galois group of the 2-class tower of a quadratic field.* Preliminary report.
(293) **Aliza A. Steurer**, University of Maryland (1014-11-928)
- 3:15PM *Bounds on a Remainder Term Associated with the Number of Base q Digits $\geq d$ Function.*
(294) **Curtis Cooper**, Central Missouri State University (1014-11-987)
- 3:30PM *A relative trace formula in the local setting.* Preliminary report.
(295) **Brooke G. Feigon**, UCLA (1014-11-1034)
- 3:45PM *Zeroes of Zeta Functions of Irregular Graphs.* Preliminary report.
(296) **Audrey A. Terras**, U.C.S.D. (1014-11-1038)
- 4:00PM *Homogeneous additive equations in finite fields.*
(297) **Michael P. Knapp**, Loyola College (1014-11-1094)
- 4:15PM *Algebraic Integers on the Unit Circle.*
(298) **Ryan C. Daileda**, Dartmouth College (1014-11-1145)
- 4:30PM *Quadratic twists of an elliptic curve with small Selmer rank.* Preliminary report.
(299) **Sungkon Chang**, Armstrong Atlantic State University (1014-11-1206)
- 4:45PM *A New Generalization of the Woods-Robbins Infinite Product to Base B .*
▶ (300) **Jonathan Sondow**, New York, NY (1014-11-1281)

- 5:00PM *Local Coefficient Matrices and Shimura's Correspondence.* Preliminary report.
(301) **Mark Budden**, Armstrong Atlantic State University (1014-11-1287)
- 5:15PM *Local corrections of discriminant bounds and S_n -extensions of quadratic base fields.* Preliminary report.
(302) **Sharon Brueggeman***, University of Tennessee at Chattanooga, and **Darrin Doud**, Brigham Young University (1014-11-1460)
- 5:30PM *Message Encoding on Elliptic Curves over Characteristic 2 in Deterministic Polynomial Time.*
(303) **Andrew R Shallue**, University of Wisconsin-Madison (1014-11-1461)
- 5:45PM *Polynomial Sequences Generated by Fibonacci & Lucas Numbers.* Preliminary report.
▶ (304) **Donald D Mills**, Southern Illinois University (1014-11-670)

MAA Session on Professional Development Programs for K-12 Teachers, II

2:15 PM – 4:10 PM

- Organizers: **Zsuzsanna Szaniszló**, Valparaiso University
Laurie Burton, Western Oregon University
Judith L. Covington, Louisiana State University Shreveport
Patricia Hale, California State Polytechnic University, Pomona
- 2:15PM *A Lesson Study Program for Middle and High School Teachers.* Preliminary report.
▶ (305) **Thomas W Judson**, Harvard University (1014-D1-1015)
- 2:35PM *A Master of Arts Program for High School and Middle School Teachers.*
(306) **Joseph R Fiedler**, CSU Bakersfield (1014-D1-318)
- 2:55PM *Integrated Math, Physical Science, and Technology Professional Development Program for 7-11 Grade Teachers.*
(307) **Becky Krakowski**, University of Dayton (1014-D1-396)
- 3:15PM *Empowering K-12 Teachers to Use Technology Wisely.*
(308) **Jerry Dwyer**, **Gary Harris**, **Tara Stevens** and **G. Brock Williams***, Texas Tech University (1014-D1-640)
- 3:35PM *A Mathematics Partnership with ESL Teachers: The Second Year.*
▶ (309) **Mary K. Porter*** and **Colleen M. Hoover**, Saint Mary's College, Notre Dame (1014-D1-1160)
- 3:55PM *Fostering Mathematical Research by Teachers.*
(310) **S. Rosenberg***, Boston University, **M. Spillane** and **D. Wulf**, Watertown HS, Watertown, MA (1014-D1-1493)

MAA Session on Number-Theoretic Applications

2:15 PM – 4:30 PM

- Organizers: **Thomas Koshy**, Framingham State College
Thomas Moore, Bridgewater State College
- 2:15PM *Number Theory, Polynomials, and the Advanced Encryption Standard.*
▶ (311) **Joshua Holden**, Rose-Hulman Institute of Technology (1014-E1-859)

- 2:35PM *Number Theoretic Applications to Group Generated Cellular Automata*. Preliminary report.
▶ (312) **Mike Bardzell***, Salisbury University, and **Tyler Evans**, Humboldt State University (1014-E1-1185)
- 2:55PM *Applications of Number Theory in Computer Science Curriculum*. Preliminary report.
▶ (313) **Yana Kortsarts**, Widener University, Computer Science Department (1014-E1-383)
- 3:15PM *A Number Theory Application to Origami*. Preliminary report.
▶ (314) **Tamara B Veenstra**, University of Redlands (1014-E1-185)
- 3:35PM *Non-Cantorian Cardinal Numbers*.
▶ (315) **H. Vic Dannon**, California (1014-E1-583)
- 3:55PM *New results on Jacobsthal and Fibonacci polynomials*. Preliminary report.
▶ (316) **Mohammad Salmassi*** and **Thomas Koshy**, Framingham State College (1014-E1-1257)
- 4:15PM *Tribinomials, Catalan Numbers, and Mersenne Numbers*.
▶ (317) **Thomas Koshy**, Framingham State College (1014-E1-1756)

MAA Session on Teaching Mathematics Courses Online

2:15 PM – 5:15 PM

Organizers: **Kate McGivney**, Shippensburg University
Cheryl L. Olsen, Shippensburg University

- 2:15PM *An Online College Algebra Course*.
(318) **Linda E. Sundbye**, Metropolitan State College of Denver (1014-F1-1597)
- 2:35PM *"Snap, Pop, Crackle": Calculus Online*. Preliminary report.
▶ (319) **Denise LeGrand**, University of Arkansas at Little Rock (1014-F1-901)
- 2:55PM *Suggestions for Some Tough Online Issues*.
▶ (320) **Karl J Havlak**, Angelo State University (1014-F1-401)
- 3:15PM *The Efficacy of Online Mathematics Courses: How Well Are Students Learning Mathematics In Online Course Environments*.
(321) **John T Smith**, Hawaii Pacific University (1014-F1-384)
- 3:40PM *Engaging Students in On-Line Course Learning*. Preliminary report.
▶ (322) **Robert N Andersen*** and **Simei Tong**, University of Wisconsin-Eau Claire (1014-F1-253)
- 4:00PM Break.
- 4:20PM *A Mathematica and XML-based Content Management System for the Delivery of Online Mathematics Courses*.
(323) **Kyehong Kang**, Lamar University (1014-F1-1726)
- 4:40PM *The Tale of Two Online Courses in Elementary Mathematics*. Preliminary report.
▶ (324) **Thomas M Zachariah*** and **Curtis Bennett**, Loyola Marymount University (1014-F1-1112)
- 5:00PM *Statistics: Meet Me Online*.
▶ (325) **Sarah L Mabrouk**, Framingham State College (1014-F1-1731)

MAA Session on Teaching and Assessing Modeling and Problem Solving

2:15 PM – 5:50 PM

Organizers: **Michael Huber**, U.S. Military Academy

- 2:15PM *Assessing Student Problem Solving Abilities Using Complex Projects*.
(326) **Geoffrey D Kuhlmann***, **Frank Wattenberg**, **Joseph Lindquist** and **John Jackson**, United States Military Academy (1014-G1-1430)
- 2:35PM *Beginning with a 21st Century View: Mathematical Modeling and Problem Solving Courses with Interdisciplinary Applications in College Algebra*. Preliminary report.
▶ (327) **William P. Fox*** and **Richard D West**, Francis Marion University (1014-G1-621)
- 2:55PM *Assessing Success in a Modeling Course*.
▶ (328) **Stuart Boersma**, Central Washington University (1014-G1-609)
- 3:15PM *Selecting Problems for Use in Problem-Solving Courses for Pre-Service Teachers*.
▶ (329) **Kathleen D. Lopez**, University of Louisiana at Lafayette (1014-G1-1681)
- 3:35PM *A problem solving class for math majors*.
▶ (330) **Maria S Nogin**, California State University, Fresno (1014-G1-1645)
- 3:55PM *Assessing Critical Thinking Skills While Improving Student Confidence in a Pre-Calculus College Course*. Preliminary report.
▶ (331) **Heather Stevenson*** and **Gerald Kobylski**, United States Military Academy (1014-G1-1455)
- 4:15PM *Using the Math Forum to teach an Elementary Problem Solving Course for Pre-Service Teachers*.
▶ (332) **Klay Kruczek**, Western Oregon University (1014-G1-942)
- 4:35PM *A Problem Solving Course for Seniors and Juniors*. Preliminary report.
▶ (333) **Thomas W Mattman**, California State University, Chico (1014-G1-1619)
- 4:55PM *Teaching Calculus Based Probability and Statistics with Technology*. Preliminary report.
▶ (334) **Andrew G Glen**, United States Military Academy (1014-G1-1751)
- 5:15PM *A new framework for grading open-ended problem solutions*. Preliminary report.
(335) **Kris Green*** and **Allen Emerson**, St. John Fisher College (1014-G1-1546)
- 5:35PM *Modeling Problems and Remodeling Attitudes*. Preliminary report.
▶ (336) **Michael Huber***, **Alex Heidenberg**, **Richard Brown**, **Gabriel Costa** and **Jason Miseli**, US Military Academy (1014-G1-749)

MAA Session on Getting Students to Discuss and to Write about Mathematics, II

2:15 PM – 5:55 PM

- Organizers: **Martha Ellen Murphy Waggoner**, Simpson College
Charlotte A. Knotts-Zides, Wofford College
Harrison W. Straley, Wheaton College
- 2:15PM *Mathematics Seminar at Central College*. Preliminary report.
▶ (337) **Russell E Goodman**, Central College (1014-H1-509)
- 2:30PM *The senior project as a method of teaching writing and oral presentation*. Preliminary report.
▶ (338) **Albert W Schueller**, Whitman College (1014-H1-1476)
- 2:45PM *Teaching Mathematical Writing Electronically*.
▶ (339) **Carl Spitznagel**, John Carroll University (1014-H1-353)

- 3:00PM *Using Peer Review to Improve Students' Proof Writing.*
(340) **Teresa D Magnus**, Rivier College (1014-H1-205)
- 3:15PM *Using Peer Review to Improve Students' Mathematical Writing.*
▶ (341) **Penelope H Dunham**, Muhlenberg College (1014-H1-487)
- 3:30PM *What Makes a Given Proof the Best Proof?*
▶ (342) Preliminary report.
Linda McGuire, Muhlenberg College (1014-H1-906)
- 3:45PM *Mathematics Career Simulations.*
(343) **Robb Sinn**, North Georgia College & State University (1014-H1-299)
- 4:00PM *From "...without words" to "only with words"—an experience with proofs.*
▶ (344) **Greisy Winicki-Landman**, Cal Poly Pomona, California (1014-H1-96)
- 4:15PM *The Use of Client Driven Projects for Discussing and Writing in Linked Mathematics and Computer Technology Courses.*
▶ (345) **Morteza Shafii-Mousavi** and **Paul Kochanowski***, Indiana University South Bend (1014-H1-101)
- 4:30PM *Dynamical Systems Modules Facilitating Student Driven Discussion and Projects, Part I.*
(346) **Aimee Johnson**, Swarthmore College, **Kathleen Madden***, Drew University, and **Ayse Sahin**, DePaul University (1014-H1-55)
- 4:45PM *Dynamical Systems Modules Facilitating Student Driven Discussion and Projects, Part 2.* Preliminary report.
▶ (347) **Aimee Johnson***, Swarthmore College, **Kathleen Madden**, Drew University, and **Ayse Sahin**, DePaul University (1014-H1-56)
- 5:00PM *Students Write Mathematics - Instructors Do Not Need To Grade.*
(348) **Mary Kay Abbey**, Montgomery College, MD (1014-H1-532)
- 5:15PM *Pass it On.*
(349) **Andrew J. Miller**, Belmont University (1014-H1-418)
- 5:30PM *Experimental Mathematics and Writing: Motivating First Year Students.*
(350) **David A. Brown**, Ithaca College (1014-H1-369)
- 5:45PM *Transforming Math Into Words And Attitudes Into Delight.*
▶ (351) **Deborah Lynn Gochenaur**, Elizabethtown College (1014-H1-1307)
- 2:45PM *Hand-Held Technology in Mathematics Teacher Preparation Courses.*
▶ (354) **Mary Ann Connors**, Westfield State College (1014-Z1-843)
- 3:00PM *Developing Pedagogical Content Knowledge Through Lesson Study: A Capstone Experience for In-service Teachers in Mathematics and Science.*
▶ (355) Preliminary report.
Diane Barrett, St. John Fisher College (1014-Z1-1144)
- 3:15PM *Models for middle school gifted students in mathematics, chemistry and engineering summer camp activities.*
▶ (356) **Faiz B. Al-Rubae**, University of North Florida (1014-Z1-356)
- 3:30PM *Korean K-12 Mathematics Education System: What Can We Learn for the Undergraduate Mathematical Preparation of Teachers in the United States?*
▶ (357) Preliminary report.
Ward E Canfield, National-Louis University (1014-Z1-1566)
- 3:45PM *Preparing K - 12 Mathematics Teachers.*
▶ (358) **Kenneth J. Bernard**, Virginia State University (1014-Z1-938)
- 4:00PM *College Math in High School: Why Not?*
▶ (359) **Jerry F Dwyer***, **Leah Chenault** and **Billy Duke**, Texas Tech University (1014-Z1-969)
- 4:15PM *Three interesting Calculus Problems.* Preliminary report.
▶ (360) **Heakyung Lee**, Winthrop University (1014-Z1-817)
- 4:30PM *On the length and area of the unit disc in normed planes.* Preliminary report.
▶ (361) **Zokhrab Mustafae**, Ithaca College (1014-Z1-315)
- 4:45PM *Finite Groups with Cyclic Autocommutator Subgroups.*
▶ (362) **Marian Deaconescu**, Kuwait University, and **Gary L Walls***, West Texas A&M University (1014-Z1-362)
- 5:00PM *Using Euclidean Area Formulas to Find Genral Sequence Rules.* Preliminary report.
▶ (363) **Mohammed A. Hamid**, Temple University (1014-Z1-825)
- 5:15PM *Animated Examples of Curl.*
(364) **Michael Rogers**, Oxford College of Emory University (1014-Z1-678)
- 5:30PM *Clarifying the parallels between single-variable and multivariate calculus: Creating a more cohesive curriculum.* Preliminary report.
▶ (365) **Robert A. Peacock**, Young Harris College (1014-Z1-1729)

MAA General Contributed Paper Session, II

2:15 PM – 5:40 PM

- Chair: **Shawnee L. McMurrin**, California State University San Bernadino
- Chair: **Jeff L. Hirst**, Appalachian State University
- Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University
- 2:15PM *Is there a "real" problem with your mathematical software?* Preliminary report.
▶ (352) **Richard J Marchand***, Slippery Rock University, and **Timothy J McDevitt**, Elizabethtown College (1014-Z1-478)
- 2:30PM *Using Alice Software in Middle Schools.*
▶ (353) **Agata Dean***, **Barbara Moskal**, Colorado School of Mines, **Steven Cooper**, St. Joseph's University, and **Wanda Dann**, Ithaca College (1014-Z1-1356)

SIAM Minisymposium on Geometric Representations of Graphs

2:15 PM – 5:30 PM

- Organizers: **Alice M. Dean**, Skidmore College
Ellen Gethner, University of Colorado at Denver
Joshua D. Laison, Colorado College
- 2:15PM *On Visibility Representations of Graphs.*
(366) **Sue Whitesides**, McGill University (1014-05-1042)
- 2:40PM *Bar k-Visibility Graphs.*
▶ (367) **Alice M Dean**, Skidmore College, **William Evans**, University of British Columbia, **Ellen Gethner**, University of Colorado at Denver, **Joshua D Laison***, Colorado College, **Mohammad A Safari**, University of British Columbia, and **William T Trotter**, Georgia Institute of Technology (1014-05-1474)

- 3:05PM *Further results on bar k-visibility graphs.*
 ▶ (368) Preliminary report.
Stephen G. Hartke*, **Jennifer Vandenbussche**
 and **Paul Wenger**, University of Illinois at
 Urbana-Champaign (1014-05-1371)
- 3:30PM *Locally Planar Graphs.* Preliminary report.
 (369) **Michael O. Albertson**, Smith College (1014-05-631)
- 3:55PM *Connecting the isometric embedding dimension and
 the determining number of a graph.* Preliminary
 (370) report.
Debra Boutin, Hamilton College (1014-05-827)
- 4:20PM *Highly Modulo linked Graphs.*
 (371) **Guantao Chen***, Georgia State University, and
Zhiquan Hu, Huazhong Normal University
 (1014-05-1367)
- 4:45PM *A Force-Directed Graph Drawing Approach for
 Computer Chip Layout.* Preliminary report.
 ▶ (372) **Greta Pangborn***, **Joanna Ellis-Monaghan**, Saint
 Michael's College, **Paul Gutwin**, Cadence Design
 Systems, and **Jamey Lewis**, Saint Michael's College
 (1014-68-1229)
- 5:10PM *Thickness-Two Graphs: New Approaches and
 Generalizations.* Preliminary report.
 (373) **Debra L. Boutin**, Hamilton College, **Priyadarshini
 Das** and **Ellen Gethner***, University of Colorado at
 Denver (1014-05-1108)

**SIAM Minisymposium on Education: Preparing
 Mathematics Students for Interdisciplinary Research**

2:15 PM – 5:10 PM

Organizer: **William L. Briggs**, University of
 Colorado at Denver

- 2:15PM *Computational Science Education and Research for
 Undergraduate Biology Majors.*
 ▶ (374) **Angela B. Shiflet**, Wofford College (1014-97-1168)
- 2:45PM *Collaborative Research with Math and Biology
 Majors.* Preliminary report.
 ▶ (375) **Suzanne Lenhart**, University of Tennessee
 (1014-92-1186)
- 3:15PM *A Team Learning Approach to Teaching
 Bioinformatics.*
 (376) **Laurie J Heyer**, Davidson College (1014-97-1338)
- 3:45PM *PRIMES (PRogram for Interdisciplinary Mathematics,
 Ecology, and Statistics).*
 (377) **Donald Estep***, **Jay Breidt**, **Richard Davis** and
Simon Tavener, Colorado State University
 (1014-97-875)
- 4:15PM *Industrial Mathematics Program at the University
 of Minnesota.*
 (378) **Fadil Santosa**, University of Minnesota
 (1014-97-829)
- 4:45PM *Interdisciplinary Education in a World of
 Stovepipes.* Preliminary report.
 ▶ (379) **C. David Levermore**, University of Maryland,
 College Park (1014-97-1777)

**MAA Invited Paper Session on Assessment of
 Learning in the Mathematics Major**

2:15 PM – 5:10 PM

Organizers: **Bernard L. Madison**, University of
 Arkansas
William E. Haver, Virginia
 Commonwealth University

- 2:15PM *Specialized Assessment Tools in a Complex Setting.*
 (380) **Shahar Boneh*** and **Larry Johnson**, Metropolitan
 State College of Denver (1014-ZB-263)

- 2:45PM *Developing and Assessing a Mathematics Inquiry
 Course.* Preliminary report.
 ▶ (381) **Barbara B Ward***, **Mike Pinter** and **Mary Goodloe**,
 Belmont University (1014-ZB-297)
- 3:15PM *Moving from Reactive to Proactive Assessment.*
 ▶ (382) Preliminary report.
David Gurney* and **Rebecca Muller**, Southeastern
 Louisiana University (1014-ZB-282)
- 3:45PM *Assessment of Student Learning Using Oral
 Presentations.*
 ▶ (383) **Lyn Stallings*** and **Dan Kalman**, American
 University (1014-ZB-300)
- 4:15PM *How to Evolve Rubrics to Assess the Skills of Math
 Majors.*
 (384) **Mark Schlatter*** and **Derrick Head**, Centenary
 College of Louisiana (1014-ZB-296)
- 4:45PM *The Symbiotic Relationship between the Assessment
 Programs for Mathematics and Mathematics
 Education at Kennesaw State University.*
 (385) **Mary L Garner**, **Lewis N VanBrackle** and **Virginia R
 Watson***, Kennesaw State University (1014-ZB-308)

**MAA Invited Paper Session on Environmental
 Modeling**

2:15 PM – 4:10 PM

Organizer: **Ben A. Fusaro**, Florida State University

- 2:15PM *Modeling the predator-prey relationship.*
 (386) **Mike Olinick**, Middlebury College (1014-ZC-1328)
- 2:45PM *A mathematical look at extinction.*
 (387) **Roland Lamberson**, Humboldt State University,
 Arcata, CA (1014-ZC-1335)
- 3:15PM *White water rafting in the Grand Canyon.*
 (388) **Catherine Roberts**, College of the Holy Cross
 (1014-ZC-1342)
- 3:45PM *Algorithms for modeling flow and reactive
 transport in porous media.*
 (389) **Shuyu Sun*** and **Mary Wheeler**, Institute for
 Computational Engineering & Science, University of
 Texas, Austin, TX (1014-ZC-1348)

Project NEXt Panel Discussion

2:15 PM – 3:45 PM

*Firefighting, paper trailing, and cat herding:
 Everything you wanted to know to be an
 administrator but were afraid to ask.*

- Organizers: **Linda Braddy**, East Central University
Rebekah Dupont, Augsburg College
- Panelists: **Charlotte J. Chell**, Carthage College
Amy Cohen, Rutgers University
Susan C. Geller, Texas A&M University
Dennis M. Luciano, Western New
 England College
Mickey McDonald, Occidental College
Jack Narayan, SUNY Oswego

**MAA Committee on Graduate Students-YMN Panel
 Discussion**

2:15 PM – 3:35 PM

How to interview for your first job.

- Organizer: **David C. Manderscheid**, University of
 Iowa
- Panelists: **Sharon M. Clarke**, Pepperdine
 University
James H. Freeman, Cornell College

David C. Manderscheid
John A. Vano, University of Wisconsin

MAA Panel Discussion

2:15 PM – 3:35 PM

Advice and admonitions for NSF projects: What worked, what did not, and what lessons were learned.

Organizers: **Tingxiu Wang**, Oakton Community College

Elizabeth J. Teles, NSF Division of Undergraduate Education

Joe Kotowski, Oakton Community College

Gloria E. Liu, Oakton Community College

Panelists: **Shirley B. Gray**, California State University-Los Angeles
Deborah Hughes-Hallett, University of Arizona
David A. Smith, Duke University
Ignatios E. Vakalis, Capital University
Sharon Cutler Ross, Georgia Perimeter College
Philip D. Wagreich, University of Illinois-Chicago

4:30PM *Optimal Control of Swinging Elements in a Parabolic Competition Model.* Preliminary report.
(398) **Erika Asano**, University of Tennessee, Knoxville (1014-49-1210)

4:45PM *On convergence of computational methods for optimal control of re-entrant queues on bounded domain.*

José María Menéndez* and **Martin V. Day**, Virginia Tech (1014-49-1739)

5:00PM *An optimization framework for polynomial zerofinders.*

► (400) **Aaron Melman***, Santa Clara University, and **William B. Gragg**, Naval Postgraduate School (1014-65-863)

5:15PM *Maximizing the generalized Fekete-Szegö functional over a class of hyperbolically convex functions.* Preliminary report.

Roger W. Barnard, **David R. Martin*** and **G. Brock Williams**, Texas Tech University (1014-30-1414)

5:30PM *Some PDE models for the simulation of alcohol transport in the body and extensions of the Kalman filtering to non-normal distributions.* Preliminary report.

► (402) **Miguel A Dumett**, University of Southern California (1014-49-1346)

5:45PM *A Homogenization Result in the Gradient Theory of Phase Transitions.*

(403) **Irene Fonseca**, Carnegie Mellon University, and **Cristina Popovici***, University of Utah (1014-49-154)

AMS Session on Optimization and Control

2:30 PM – 5:55 PM

2:30PM *The Mathematics of Space Shuttle Return to Flight: Impact Damage Modeling.*

(390) **James D. Walker**, Southwest Research Institute (1014-74-73)

2:45PM *Optimization of composite structures subject to local stress constraints.*

(391) **Michael Stuebner*** and **Robert Lipton**, Louisiana State University (1014-74-1407)

3:00PM *Second Order Optimality Conditions Based on Second Order Tangent Cones.*

(392) **Elena Constantin**, University of Pittsburgh at Johnstown (1014-49-642)

3:15PM *On the Dynamic Programming Equation for a Deterministic Optimal Control Problem.*

(393) **Betsi J. Tirado***, Universidad del Zulia, Maracaibo, Venezuela, and **Jesus A. Pascal**, Louisiana State University, Baton Rouge (1014-49-110)

3:30PM *Nonlinear Periodic Optimal Control: A pseudospectral Fourier Approach.*

(394) **Gamal N Elnagar**, University of South Carolina Upstate (1014-49-220)

3:45PM *Fenchel Transform of a Convex Functional.*

(395) **Y Chen**, **M Rao** and **J C Tweddle***, University of Florida (1014-49-1091)

4:00PM *Optimal Harvesting of a Semilinear Elliptic Fishery Model.* Preliminary report.

(396) **Wandi Ding***, University of Tennessee - Knoxville, and **Suzanne Lenhart**, University of Tennessee - Knoxville & Oak Ridge National Laboratory (1014-49-1167)

4:15PM *Optimal control of a biharmonic obstacle problem.* Preliminary report.

(397) **David R. Adams**, University of Kentucky, **Volodymyr Hryniv*** and **Suzanne M. Lenhart**, University of Tennessee (1014-49-1197)

MAA Section Officers

2:30 PM – 5:00 PM

MAA Invited Address

3:20 PM – 4:10 PM

(404) *Participation in mathematics by American Indians: A case study in underrepresentation.*

Robert E. Megginson, University of Michigan, Ann Arbor (1014-A0-11)

AWM Panel Discussion

3:20 PM – 4:35 PM

Lawrence Summers: One year later.

Organizer: **Barbara Lee Keyfitz**, Fields Institute and University of Houston

Panelists: **Richard M. Dudley**, M.I.T.

Mary W. Gray, American University

Ellen E. Kirkman, Wake Forest University

M. Beth Ruskai, Tufts University

Alice Silverberg, University of California Irvine

Karen Uhlenberg, University of Texas at Austin

MAA-YMN Panel Discussion

3:50 PM – 5:10 PM

You have a job, now what? Professional development opportunities.

Organizers: **Kimberly A. Roth**, Wheeling Jesuit University

Joshua D. Laison, Colorado College

Panelists: Sarah Ann Stewart, Belmont University
 Janet L. Andersen, Hope College
 Eric W. Aurand, Eastfield College
 Carolyn S. Gordon, Dartmouth College
 Jacqueline A. Jensen, Sam Houston State University
 Michael B. Scott, California State University Monterey Bay
 Francis E. Su, Harvey Mudd College

MAA Special Presentation

4:00 PM – 4:45 PM

The great Pi/e debate.
 Organizers: Colin C. Adams, Williams College
 Thomas Garrity, Williams College
 Moderator: Edward B. Burger, Williams College

Welcome Reception for Undergraduate Students

4:00 PM – 5:00 PM

SIGMAA on Environmental Mathematics Business Meeting and Special Invited Presentation

4:15 PM – 6:15 PM

Organizer: Ben A. Fusaro, Florida State University
 (405) Complex environmental and earth systems.
 Bruce Herbert, Texas A&M University (1014-A0-52)

AMS Committee on the Profession Presentation

4:30 PM – 6:00 PM

Programs that make a difference.
 Presenters: David C. Manderscheid, University of Iowa
 Ivelisse M. Rubio, Universidad de Pureto Rico, Humacao

AWM Business Meeting

4:40 PM – 5:10 PM

MAA Minicourse #14: Part A

4:45 PM – 6:45 PM

Teaching linear algebra with applications.
 Organizer: Gilbert Strang, Massachusetts Institute of Technology

MAA Minicourse #3: Part A

4:45 PM – 6:45 PM

Using and adapting online materials.
 Organizers: David A. Smith, Duke University (retired)
 Lang Moore, Duke University (retired)

MAA Minicourse #9: Part A

4:45 PM – 6:45 PM

Discrete dynamical systems and problem solving.
 Organizers: David C. Arney, U.S. Military Academy
 Gary W. Krahn, U.S. Military Academy

Reception for Graduate Students and First-Time Participants

5:30 PM – 6:30 PM

The AMS and MAA warmly invite these special groups to meet the leadership of your sponsoring organizations.

AMS Josiah Willard Gibbs Lecture

8:30 PM – 9:30 PM

(406) *Function, design, and evolution of gene circuitry.*
 Michael A. Savageau, University of California Davis (1014-92-25)

Friday, January 13

Employment Center

7:00 AM – 7:30 PM

Joint Meetings Registration

7:30 AM – 4:00 PM

AMS-SIAM Special Session on Nonlinear Dynamical Systems, I

8:00 AM – 11:55 AM

Organizers: Zhijun Qiao, University of Texas Pan American
 Andras Balogh, University of Texas Pan American
 Guihua Fei, University of Minnesota-Duluth
 Zhaosheng Feng, University of Texas Pan American

- 8:00AM ▶ (407) *Nonlinear Fourier Transforms, Integrability and Nonlocality in Multidimensions.* Preliminary report. Thanasis Fokas, University of Cambridge (1014-35-551)
- 8:30AM (408) *Vortices, circulations and tropical cyclone tracks from the Euler equation.* SY Lou*, XY Tang, Department of Physics, Shanghai Jiao Tong University, M Jia, Center of Nonlinear Science, Ningbo University, and F Huang, Department of Marine Meteorology, Ocean University of China, (1014-00-581)
- 9:00AM (409) *On the well-posedness of an integrable evolution equation.* Alex A Himonas, University of Notre Dame (1014-35-260)
- 9:30AM (410) *Partial Differential Equations which Admit Integrable Systems.* Preliminary report. Paul F Bracken, University of Texas (1014-53-134)
- 10:00AM (411) *Compactly supported ground states for an equation arising in plasma physics.* Alfonso Castro*, Harvey Mudd College, and Victor Padron, University of Minnesota (1014-35-1213)
- 10:30AM ▶ (412) *A Finite Dimensional Integrable System Associated with a Polynomial Eigenvalue Problem.* Taixi Xu*, Southern Polytechnic State University, and Weihua Mu, Shijiazhuang Railway Institute (1014-35-1020)

- 11:00AM *New Traveling Wave Solutions for Camassa-Holm Equation*. Preliminary report.
(413) **Guoping Zhang***, Delaware State University, **Zhijun Qiao**, The University of Texas-Pan American, and **Fengshan Liu**, Delaware State University (1014-35-219)
- 11:30AM *A new integrable equation and its solution*.
(414) **Zhijun Qiao**, UTPA (1014-35-1418)

AMS-ASL Special Session on Interdisciplinary Research Involving Analysis and Logic, II

8:00 AM – 11:35 AM

Organizers: **Su Gao**, University of North Texas
Jose N. Iovino, University of Texas San Antonio
Itay Ben-Yacov, University of Wisconsin Madison

- 8:00AM *Ordinal indices in Banach spaces*. Preliminary report.
(415) **Edward Odell**, The University of Texas at Austin (1014-46-319)
- 8:35AM *lattice structures and spreading models*.
(416) **Stephen J Dilworth***, University of South Carolina, **Edward Odell**, The University of Texas at Austin, and **Bunjamin Sari**, University of North Texas (1014-46-412)
- 9:10AM *Two Persons Games in Banach Spaces*. Preliminary report.
(417) **Thomas Schlumprecht**, Texas A&M University (1014-46-489)
- 9:35AM Break
- 10:00AM *Ergodic theory and descriptive set theory*. Preliminary report.
(418) **Alexander S. Kechris**, California Institute of Technology (1014-37-483)
- 10:35AM *Classifying Borel transformations in Kakutani style*.
(419) **Christian Rosendal**, University of Illinois at Urbana-Champaign (1014-37-1778)
- 11:10AM *Pre-compact families of finite sets of integers and weakly null sequences in Banach spaces*.
(420) **Jordi Lopez-Abad**, University of Paris 7, and **Stevo Todorcevic***, University of Toronto and CNRS, Paris (1014-46-850)

AMS Special Session on Algebraic and Enumerative Combinatorics, I

8:00 AM – 11:50 AM

Organizers: **Catherine H. Yan**, Texas A&M University
Marcelo Aguiar, Texas A&M University
Joseph P. Kung, University of North Texas
Laura F. Matusevich, University of Pennsylvania

- 8:00AM *Updown categories and algebraic structures*. Preliminary report.
(421) **Michael E. Hoffman**, U. S. Naval Academy (1014-06-112)
- 8:30AM *P-partitions and descent algebras, enriched P-partitions and peak algebras*. Preliminary report.
(422) **T. Kyle Petersen**, Brandeis University (1014-05-155)
- 9:00AM *Cyclotomic Solomon Algebras*.
(423) **Andrew Mathas**, University of Sydney, and **Rosa C Orellana***, Dartmouth College (1014-05-498)

- 9:30AM *Leonard Pairs and Representations of Quantum Algebras*. Preliminary report.
(424) **Darren Funk-Neubauer**, University of Wisconsin-Madison (1014-16-932)
- 10:00AM *The Amazing Loehr-Warrington TEN to the Power n Conjecture*.
▶ (425) **Shalosh B Ekhad**, Rutgers University, **Vince Vatter***, University of St. Andrews, and **Doron Zeilberger**, Rutgers University (1014-05-1177)
- 10:30AM *New Records for Stanley-Wilf Limits*.
▶ (426) **Miklos Bona**, University of Florida (1014-05-1119)
- 11:00AM *Enumerative and Probabilistic Applications of the Extended Wilf-Zeilberger Theory*.
(427) **Moa Apagodu*** and **Doron Zeilberger**, Rutgers University (1014-05-1106)
- 11:30AM Discussion

AMS Special Session on Arithmetic Geometry and Modular Forms, I

8:00 AM – 11:50 AM

Organizers: **Matthew A. Papanikolas**, Texas A&M University
Ahmad M. El-Guindy, Texas A&M University

- 8:00AM *Arithmetic of Maass-Poincare series*.
▶ (428) **Ken Ono*** and **Kathrin Bringmann**, University of Wisconsin, Madison (1014-11-284)
- 8:30AM *Weyl Group Multiple Dirichlet Series: The Stable Case*.
(429) **Benjamin Brubaker**, **Daniel Bump**, Stanford University, and **Solomon Friedberg***, Boston College (1014-11-432)
- 9:00AM *Weyl Group Multiple Dirichlet Series: The Unstable Case*.
(430) **Ben Brubaker**, Stanford University (1014-11-1142)
- 9:30AM *Multiple Dirichlet series over function fields*.
(431) **Gautam Chinta**, CUNY (City College) (1014-11-1126)
- 10:00AM *Maass-Poincaré series and p-divisibility of traces of singular moduli*.
(432) **Paul Jenkins**, University of Wisconsin-Madison (1014-11-766)
- 10:30AM *Congruences for the Coefficients of Weakly Holomorphic Modular Forms*.
(433) **Stephanie Treneer**, University of Illinois at Urbana-Champaign (1014-11-921)
- 11:00AM *Jacobi forms over complex quadratic fields*. Preliminary report.
(434) **Olav K. Richter***, University of North Texas, **Kathrin Bringmann**, University of Wisconsin, and **Charles H. Conley**, University of North Texas (1014-11-341)
- 11:30AM *Counting colorings*.
(435) **Fernando Rodriguez Villegas**, University of Texas at Austin (1014-11-1417)

AMS Special Session on Recent Trends in Convex and Discrete Geometry, I

8:00 AM – 11:50 AM

Organizers: **Valeriu Soltan**, George Mason University
Tibor Bisztriczky, University of Calgary
Paul Goodey, University of Oklahoma

- 8:00AM *Approximation of the Euclidean ball by polytopes.*
(436) Preliminary report.
Carsten Schuett, University of Kiel, Germany, and
Elisabeth Werner*, Case Western Reserve
University (1014-52-1025)
- 8:30AM *Relative isoperimetric inequality outside convex*
(437) *bodies.*
Mohammad Ghomi*, Georgia Tech, **Jaigyoung**
Choe, Seoul National University, and **Manuel**
Ritore, University of Granada (1014-53-565)
- 9:00AM *A characterization of ellipsoids via illumination*
(438) *bodies.* Preliminary report.
Alina Stancu, University of Massachusetts Lowell
(1014-52-791)
- 9:30AM *Central limit properties of convex bodies.*
(439) **Mark W Meckes**, Stanford University (1014-52-854)
- 10:00AM Problem Session
- 10:30AM *f-Vectors of Regular Triangulations.*
(440) **Laura J Schmidt***, University of Wisconsin-Stout,
and **Carl Lee**, University of Kentucky (1014-52-195)
- 11:00AM *Ball-Polytopes.*
▶ (441) **Károly Bezdek**, **Zsolt Lángi**, **Márton Naszódi** and
Peter Papez*, University of Calgary (1014-52-913)
- 11:30AM *On a conjecture of Ehrhart.*
(442) **Imre Bárány**, Rényi Institute of Mathematics,
Hungarian Academy of Sciences, and **Attila Pór***,
Case Western Reserve University (1014-52-1575)

AMS Special Session on Dynamic Equations With Applications, II

8:00 AM – 11:50 AM

Organizers: **Allan C. Peterson**, University of
Nebraska
Martin J. Bohner, University of
Missouri Rolla

- 8:00AM *Time Scale Transforms.* Preliminary report.
(443) **John M Davis**, Baylor University (1014-39-1301)
- 8:30AM *A Qualitative Analysis of the Diamond- α Dynamic*
▶ (444) *Derivatives on Time Scales.* Preliminary report.
James W Rogers, Baylor University (1014-65-1438)
- 9:00AM *Convergence of Solutions of Dynamic Equations on*
▶ (445) *Converging Time Scales.* Preliminary report.
Bonita A. Lawrence*, **Ralph Oberste-Vorth**, **Kelli J.**
Hall and **Elizabeth R. Duke**, Marshall University
(1014-34-1246)
- 9:30AM *Problems in the development of series solutions for*
▶ (446) *dynamic equations on time scales.* Preliminary
report.
B D Haile, Northwest Missouri State University,
and **L M Hall***, University of Missouri - Rolla
(1014-37-979)
- 10:00AM *Recessive Solutions of Quasilinear Dynamic*
(447) *Equations.*
Elvan Akin-Bohner (1014-34-1220)
- 10:30AM *Time-Scale Integral Inequalities.*
(448) **Douglas R Anderson**, Concordia College
(1014-34-941)
- 11:00AM *Global behavior of solutions of the nonlinear*
▶ (449) *difference equation $x_{n+1} = p_n + x_{n-1}/x_n$.*
Richard DeVault*, Northwestern State University of
Louisiana, **Vlajko Kocic** and **Donna Stutson**, Xavier
University of Louisiana (1014-39-277)
- 11:30AM *A Global Attractivity Result for Maps with Invariant*
▶ (450) *Boxes.*
M R.S. Kulenovic* and **Orlando Merino**, University
of Rhode Island (1014-39-148)

AMS Special Session on Nonautonomous Discrete Dynamics, I

8:00 AM – 11:50 AM

Organizers: **Saber N. Elaydi**, Trinity University
Jim M. Cushing, University of Arizona

- 8:00AM *Dominance in the periodic Lotka-Volterra difference*
▶ (451) *equation and existence of heteroclinic orbits in the*
Leslie matrix model. Preliminary report.
Ryusuke Kon, Kyushu University (1014-92-531)
- 8:30AM *On persistence of coupled sink populations.*
(452) Preliminary report.
Sebastian Schreiber, College of William and Mary
(1014-37-1549)
- 9:00AM *Discrete-time model of diurnal seabird distribution*
(453) *with environmental forcing.* Preliminary report.
Shandelle M. Henson* and **James L. Hayward**,
Andrews University (1014-92-484)
- 9:30AM *Periodic solutions of generalized nonautonomous*
▶ (454) *logistic equations.* Preliminary report.
Jia Li, University of Alabama in Huntsville
(1014-39-967)
- 10:00AM *Population dynamics under bounded enforcement.*
(455) Preliminary report.
Ulrich Krause, University of Bremen, Germany
(1014-37-872)
- 10:30AM *Allee effects in a discrete-time host-parasitoid*
▶ (456) *model with age structure in the host.* Preliminary
report.
Sophia R.-J. Jang, University of Louisiana at
Lafayette (1014-92-1118)
- 11:00AM *Stability Analysis of Pielou's Equation with*
▶ (457) *Period-Two Coefficient.* Preliminary report.
M R.S. Kulenovic* and **Orlando Merino**, University
of Rhode Island (1014-39-66)
- 11:30AM *Nonautonomous delay difference equations and*
▶ (458) *applications to population models.* Preliminary
report.
Saber N Elaydi, Howard University (1014-39-1361)

AMS Special Session on Algebraic Statistics: Theory and Practice, II

8:00 AM – 11:50 AM

Organizers: **Seth M. Sullivant**, University of
California Berkeley
Elizabeth S. Allman, University of
Southern Maine

- 8:00AM *Identifiability of the covarion model of*
(459) *phylogenetics.*
Elizabeth S. Allman and **John A. Rhodes***,
University of Alaska Fairbanks (1014-92-468)
- 8:30AM *Computational Support of a Conjecture on*
(460) *Phylogenetic Invariants for the General Markov*
Model for $k > 2$ states. Preliminary report.
Thomas R Hagedorn, The College of New Jersey
(1014-62-1567)
- 9:00AM *Application of Algebraic Statistics for Statistical*
▶ (461) *Disclosure Limitation.*
Aleksandra B Slavkovic, Penn State University
(1014-62-1535)
- 9:30AM *Relaxation Techniques for Computing Bounds on*
(462) *Cell Entries in Contingency Tables.* Preliminary
report.
Seth Sullivant, Harvard University, and **Ruriko**
Yoshida*, Duke University (1014-62-265)

Program of the Sessions – Friday, January 13 (cont'd.)

- 10:00AM *On the geometry of the MLE in log-linear model analysis.* (463)
Alessandro Rinaldo, Department of Statistics, Carnegie Mellon University (1014-62-1063)
- 10:30AM *Secant varieties of smooth toric varieties.* (464)
David Cox, Amherst College, and **Jessica S Sidman***, Mount Holyoke College (1014-14-606)
- 11:00AM *Algebraic factor analysis.* (465)
Mathias Drton*, University of Chicago, **Bernd Sturmfels**, University of California Berkeley, and **Seth Sullivant**, Harvard University (1014-62-245)
- 11:30AM *Parameterization of Binary Ancestral Graph Models.* Preliminary report. (466)
Thomas S Richardson, Department of Statistics, University of Washington (1014-62-1357)

AMS Special Session on Continued Fractions, I

8:00 AM – 11:50 AM

Organizers: **Nancy Wyshinski**, Trinity College
James G. McLaughlin, Trinity College and West Chester University

- 8:00AM *Convergence of continued fractions.* Preliminary report. (467)
Lisa Lorentzen, NTNU, Trondheim, Norway (1014-40-1052)
- 9:00AM *Some Problems Suggested by Ramanujan's Work on Continued Fractions.* (468)
Bruce C Berndt, University of Illinois (1014-11-745)
- 9:30AM *Multidimensional Continued Fractions and Toric Varieties.* (469)
Thomas Garrity, Williams (1014-11-1068)
- 10:00AM *Complex Continued Fractions.* (470)
Doug Hensley, Texas A& M University (1014-11-37)
- 10:30AM *A Randomized Variant of the Jacobi-Perron Algorithm.* Preliminary report. (471)
Richard C. Burge, Cool, CA (1014-11-200)
- 11:00AM *Quasiconformal Connections Between Continued Fractions and Circle Packings.* (472)
G. Brock Williams, Texas Tech University (1014-30-306)
- 11:30AM *A proof of the continued fraction expansion of $\exp(1/M)$.* (473)
Thomas J. Osler, Rowan University (1014-41-801)

AMS Special Session on the Many Lives of Lattice Theory, the Theory of Ordered Sets, and Universal Algebra, I

8:00 AM – 11:50 AM

Organizers: **Japheth L. M. Wood**, Chatham College
John W. Snow, Sam Houston State University
Jonathan D. Farley, Harvard University
Stefan E. Schmidt, Phoenix Math Systems Modeling, Inc.
Anthony A. Harkin, Harvard University

- 8:00AM *A hyperplane arrangement arising from partially ordered voting preferences.* Preliminary report. (474)
Eric I Gottlieb*, Rhodes College, **Japheth Wood**, Chatham College, **Michael Ackerman**, Bellarmine University, and **Sul Young Choi**, Le Moyne College (1014-06-1604)
- 8:30AM *Preliminary report on types of polynomial completeness in universal algebras.* Preliminary report. (475)
Erhard Aichinger, Johannes Kepler University Linz (1014-08-149)

- 9:00AM *Message Authentication Codes and Quasigroups.* (476)
Kristen Meyer, Iowa State University (1014-17-909)
- 9:30AM *Partial Orderings in Chemistry: Substitution-Reaction Posets.* (477)
Douglas J. Klein, Texas A&M University at Galveston (1014-06-582)
- 10:00AM *Simple Relation Algebras.* (478)
Steven R. Givant, Mills College (1014-06-1664)
- 10:30AM *Thompson monoids and Tamari lattices.* Preliminary report. (479)
Zoran Sunik, Texas A&M University (1014-06-203)
- 11:00AM *Equational Logic for Finitary Multi-Algebras.* Preliminary report. (480)
Matt Insall, University of Missouri - Rolla (1014-08-1109)
- 11:30AM *Residuated Approximations and their Connection to Cluster Analysis.* Preliminary report. (481)
R. J. Greechie*, Louisiana Tech University, and **M. F. Janowitz**, Rutgers University (1014-06-485)

MAA Minicourse #4: Part A

8:00 AM – 10:00 AM

Creating interactive workbooks using MS excel.
Organizer: **Sarah L. Mabrouk**, Framingham State College

AMS Session on Algebra

8:00 AM – 11:55 AM

- 8:00AM *An inductive algorithm for constructing c -sequences.* Preliminary report. (482)
Hamid Kulosman, University of Louisville (1014-13-1679)
- 8:15AM *The n -generator property in rings of integer-valued polynomials.* (483)
Jason Boynton* and **Lee Klingler**, Florida Atlantic University (1014-13-1517)
- 8:30AM *Arithmetic Properties of Pullbacks II.* Preliminary report. (484)
Evan Houston and **John R Taylor***, UNC Charlotte (1014-13-1499)
- 8:45AM *Factorization in Polynomial Rings of Two Noncommuting Variables.* (485)
Kenneth L. Price, University of Wisconsin Oshkosh (1014-16-251)
- 9:00AM *A q -Hilbert matrix.* (486)
Warren P. Johnson, Connecticut College (1014-15-575)
- 9:15AM *A realization of quantum groups via product valued quivers.* (487)
Yiqiang Li* and **Zongzhu Lin**, Kansas State University (1014-16-811)
- 9:30AM *Projective Resolutions for Cleft Binomial Rings.* (488)
Martin William Montgomery, University of Oregon (1014-16-968)
- 9:45AM *Flat Braided Symmetric Algebras.* (489)
Sebastian Zwicknagl, University of Oregon (1014-17-1228)
- 10:00AM *A Radical Structure for Some Rings with Partial Identities.* (490)
Karen Batt Stanish, Keene State College (1014-17-1512)
- 10:15AM *Hyperbolically convex standard fundamental domain of a subgroup of a modular group.* (491)
Omer Yayenie, Murray State University (1014-11-461)

- 10:30AM *On Relative Homotopy Groups of Modules.*
(492) **C Joanna Su**, Providence College (1014-18-1737)
- 10:45AM *Endomorphisms of Monogenic Hopf Algebras.*
(493) **Alan Koch**, Agnes Scott College (1014-14-417)
- 11:00AM *Construct Integral Matrices with Integral Inverse and Applications to Coding.*
▶ (494) **Yan Wu**, Georgia Southern University (1014-00-254)
- 11:15AM *Symmetric Brace Algebras and A_∞ Structures.*
(495) Preliminary report.
Rebecca Ann Hillman, University of South Carolina in Sumter (1014-55-1562)
- 11:30AM *Calculation of Gerstenhaber Operations on $H^*(R, R)$, when $R = \mathbb{Q}[X]/p$.* Preliminary report.
▶ (496) **R C Mitchell**, Purdue University (1014-55-1531)
- 11:45AM *Derived functors of the locally finite functor.*
(497) Preliminary report.
Hayden M Harker, Vassar College (1014-55-1200)

AMS Session on Numerical Analysis and Fluid Mechanics

8:00 AM – 10:55 AM

- ▶ 8:00AM *Numerical and experimental results obtained from modeling and testing a double cover plate bolted splice connection.*
(498) **Alexandros Antonioy Tasopoulos**, Athens, Greece (1014-65-02)
- 8:15AM *Total Variation Based Semi-Blind Image Deconvolution.* Preliminary report.
(499) **James H Money**, University of Kentucky (1014-65-586)
- 8:30AM *The non-symmetric eigenvalue problem: Finding middle deflations in the QR Algorithm.* Preliminary report.
(500) **Karen Braman**, South Dakota School of Mines (1014-65-1214)
- 8:45AM *Numerical Solutions of Robust and Minimum-Norm Quadratic Partial Eigenvalue Assignment Problems.* Preliminary report.
(501) **Sanjoy Kumar Brahma*** and **Biswa Datta**, Northern Illinois University (1014-65-1670)
- ▶ 9:00AM *Numerical Methods for Solving Ill-conditioned Nonlinear Systems.* Preliminary report.
(502) **Olga Brezhneva**, Miami University (1014-65-1701)
- 9:15AM *Nonlinear Analysis and Numerical Simulations of a Two-Layer Thin Liquid Film.*
(503) **Lael S Fisher*** and **Alexander A Golovin**, Northwestern University (1014-76-403)
- 9:30AM *Adomian Decomposition to Solve Navier-Stokes Equations.* Preliminary report.
(504) **M. Najafi**, Kent State University, **M. Taeibi-Rahni***, Sharif University of Tech., and **A. Hassanpour**, Islamic Azad University (1014-76-1066)
- 9:45AM *On the adomian decomposition as applied to highly nonlinear two phase fluid dynamic system.* Preliminary report.
(505) **H.R. Massah**, Acoustical Research Center, and **M Najafi***, Kent State University Ashtabula (1014-76-1416)
- 10:00AM *Symmetric waves of a tow layer fluid over an obstruction.*
(506) **Jeongwhan Choi*** and **W.S. Bae**, Korea University (1014-76-1750)
- 10:15AM *Influence of Surfactant on the Breakup of a Low Viscosity Jet in Highly viscous Surrounding.*
(507) **Muhammad I Hameed**, Benjamin Levich Institute for Physico-Chemical Hydrodynamics, CCNY New York (1014-76-1764)

- 10:30AM *Improved Generalized Quasilinearization Method and Rapid Convergence for Reaction Diffusion Equations.* Preliminary report.
(508) **Tanya G. Melton***, Louisiana State University at Alexandria, and **Aghalaya S. Vatsala**, University of Louisiana at Lafayette (1014-35-1092)
- 10:45AM *On Sobolev Spaces of Divergence-Free Vector Fields.* Preliminary report.
(509) **Pangyen Weng**, Ramapo College of New Jersey (1014-76-470)

AMS Session on Partial Differential Equations, I

8:00 AM – 11:55 AM

- 8:00AM *Asymptotic behavior near transition fronts for equations of Cahn-Hilliard type.* Preliminary report.
(510) **Peter B Howard**, Texas A&M University (1014-35-145)
- 8:15AM *Analytic solutions of some free boundary problems.*
(511) **Xuming Xie**, Morgan State University (1014-35-201)
- ▶ 8:30AM *Spatiotemporal patterns and decay in diffusive fluid mixtures.*
(512) **Weijiu Liu**, University of Central Arkansas (1014-35-202)
- 8:45AM *The nonautonomous wave equation with general Wentzell boundary conditions.*
(513) **Ciprian G Gal**, University of Memphis (1014-35-286)
- 9:00AM *On the blow-up rate of large solutions for a porous media logistic equation.* Preliminary report.
(514) **Peng Feng**, Florida Gulf Coast University (1014-35-348)
- ▶ 9:15AM *Electrophoretic Behavior of a Dispersion of Non-Newtonian Drops: Effect of Charge-Regulated Surface.*
(515) **Shiojenn Tseng***, Tamkang University, **Eric Lee**, **Chia-Ping Chiang** and **Jyh-Ping Hsu**, Department of Chemical Engineering National Taiwan University (1014-35-494)
- 9:30AM *On Normal Mode Expansion of Solutions to the Paraxial Wave Equation.*
(516) **Peter McCoy*** and **Reza Malek-Madani**, U.S. Naval Academy (1014-35-541)
- 9:45AM *Using the Finite Element Approximation of Steklov Eigenfunctions to Solve the Laplace Equation Efficiently with Multiple Boundary Data.*
(517) **Petr Kloucek**, **Danny C. Sorensen**, Rice University, and **Jennifer L. Wightman***, Coastal Carolina University (1014-35-633)
- 10:00AM *Inverse scattering algorithms for attenuating artifacts produced by internal multiple reflections (reverberations).*
(518) **Bogdan G. Nita**, Montclair State University (1014-35-757)
- 10:15AM *A Degenerate Semilinear Parabolic Problem with Solution Blows Up at the Boundary.*
(519) **W. Y. Chan**, Southeast Missouri State University (1014-35-795)
- 10:30AM *A Compressible Viscous Heat-Conducting Fluid and its Quasi-Static Approximation.* Preliminary report.
(520) **Gavin Waters*** and **Richard Weinacht**, University of Delaware (1014-35-879)
- 10:45AM *Wave loads due to diffraction by an elliptic structure.*
(521) **Dambaru D Bhatta**, The University of Texas-Pan American, Edinburg, TX (1014-35-915)
- 11:00AM *Homogenization of a nonlinear elliptic boundary value problem modeling galvanic currents.*
(522) **Y. Sujeet Bhat**, University of Florida (1014-35-950)

- 11:15AM *The Existence of Global Solution of Variational Equations.*
(523) **Taewan Park***, Michigan State University, and **Zhengfang Zhou**, Professor/Michigan State University (1014-35-1125)
- 11:30AM *Liouville Theorem for 2-D Navier-Stokes Equations.*
(524) Preliminary report.
Gabriel S. Koch, University of Minnesota, Twin Cities (1014-35-1131)
- 11:45AM *Nonlinear nonautonomous parabolic evolution equations in an infinite cylinder.*
(525) **Jason R Morris**, University of Alabama at Birmingham (1014-35-1190)

AMS Session on Combinatorics, III

8:00 AM – 11:55 AM

- 8:00AM *Ascending Subgraph Decompositions of Digraphs.*
▶ (526) Preliminary report.
Ron Gould and **Brian Charles Wagner***, Emory University (1014-05-1080)
- 8:15AM *Menger Path-Systems and Minimum Graph Size.*
▶ (527) Preliminary report.
Jeffrey S. Powell*, Emory University, **Ralph J. Faudree**, University of Memphis, and **Ronald J. Gould**, Emory University (1014-05-1083)
- 8:30AM *Cycles in Bipartite Tournaments.* Preliminary report.
(528) **Darren B Parker***, University of Dayton, **Randy F Westhoff** and **Marty J Wolf**, Bemidji State University (1014-05-1089)
- 8:45AM *Coverings containing packings for adaptive binary block coding.* Preliminary report.
▶ (529) **Robert B Ellis**, Illinois Institute of Technology (1014-05-1113)
- 9:00AM *Critical groups of cleft graphs.* Preliminary report.
(530) **Michael Slone**, University of Kentucky (1014-05-1117)
- 9:15AM *On Hamiltonian Walks in Graphs.*
▶ (531) **Ping Zhang**, Western Michigan University (1014-05-1133)
- 9:30AM *A construction of a projective plane in harmonic matroids.*
(532) **Rigoberto Florez**, University of South Carolina Sumter (1014-05-1164)
- 9:45AM *On Maximal Packings of $K_V - E(K_W)$ with 6-cycles.*
(533) Preliminary report.
L Brown, East Tennessee State University, **G. Coker**, Francis Marion University, **R. Gardner**, East Tennessee State University, and **Janie Kennedy***, Samford University (1014-05-1170)
- 10:00AM *An almost bijective proof of an asymptotic property of partitions.*
(534) **Aaron D. Jaggard**, Tulane University (1014-05-1181)
- 10:15AM *Isomorphic components of tensor products of bipartite graphs.*
(535) **Richard H Hammack**, Randolph-Macon College (1014-05-1184)
- 10:30AM *Subdivisibility: Towards an “algebra” of connectivity.*
(536) **Thor C Whalen**, Atlanta, GA (1014-05-1254)
- 10:45AM *Bounds for Recurrences on Partially Ordered Sets.*
▶ (537) **Augustine B. O’Keefe*** and **Kenneth S. Berenhaut**, Wake Forest University (1014-05-1392)
- 11:00AM *A matroid-based decomposition of 3-connected graphs.* Preliminary report.
(538) **Brian Beavers**, Louisiana State University - Baton Rouge (1014-05-1465)

- 11:15AM *Using neighborhood complexes to compute rational generating functions.*
▶ (539) **Kevin M. Woods**, University of California, Berkeley (1014-05-1480)
- 11:30AM *On $L(2,1)$ -labeling of graphs.*
(540) **Jeong-Hyun Kang**, University of Central Florida (1014-05-1528)
- 11:45AM *The limited hats game.*
▶ (541) **Steven K Butler**, University of California, San Diego (1014-05-1545)

MAA Session on Mathlets for Teaching and Learning Mathematics

8:00 AM – 10:55 AM

- Organizers: **David M. Strong**, Pepperdine University
Thomas E. Leathrum, Jacksonville State University
Joe Yanik, Emporia State University
- 8:00AM *Java Applets for a Cryptology Course.*
▶ (542) **Ulrich A Hoensch**, Rocky Mountain College (1014-B1-132)
- 8:20AM *More tools for linear algebra.*
▶ (543) **David E Meel**, Bowling Green State University (1014-B1-724)
- 8:40AM *Maplets for Calculus.*
▶ (544) **Douglas B Meade***, University of South Carolina, and **Philip B Yasskin**, Texas A & M University (1014-B1-186)
- 9:00AM *Using Mathematica to Explore Algebra and Number Theory.*
▶ (545) **Christopher P Moretti**, Southeastern Oklahoma State University (1014-B1-108)
- 9:20AM *Do mathlets deliver what we want them to teach?*
▶ (546) Preliminary report.
Andrew G Bennett, Kansas State University (1014-B1-146)
- 9:40AM *Flash as a Tool for Creating Calculus and Analysis Mathlets.*
▶ (547) **Barbara Kaskosz**, University of Rhode Island (1014-B1-250)
- 10:00AM *Flash as a Tool for Creating Discrete Math Applets.*
▶ (548) **Doug Ensley**, Shippensburg University (1014-B1-249)
- 10:20AM *A Sonification Mathlet for Calculus, Pre-Calculus, and Analytic Geometry.* Preliminary report.
▶ (549) **Steven M. Hetzler*** and **Robert M. Tardiff**, Salisbury University (1014-B1-1563)
- 10:40AM *MS Excel Interactive Tools for Statistics.*
▶ (550) **Sarah L Mabrouk**, Framingham State College (1014-B1-1724)

MAA Session on Using History of Mathematics in your Mathematics Courses

8:00 AM – 11:55 AM

- Organizers: **Richard J. Jardine**, Keene State College
Amy Shell-Gellasch, Grafenwoer, Germany
- 8:00AM *Motivating the Learning of Applied Mathematics with History.*
▶ (551) **Dick Jardine**, Keene State College (1014-11-1766)
- 8:20AM *Historical vs axiomatic viewpoint: teaching today foundations of geometry.*
(552) **Bogdan D. Suceava**, California State University Fullerton (1014-11-129)

- 8:40AM *A Different Sort of Calculus Debate*. Preliminary report. (553)
Vicky W Klima, Appalachian State University (1014-I1-1492)
- 9:00AM *The history of calculus in an honors calculus course*. Preliminary report. (554)
Todd Timmons, University of Arkansas–Fort Smith (1014-I1-229)
- 9:20AM *Using History to make Differential Calculus Come Alive*. (555)
Jeffrey Clark, Elon University (1014-I1-29)
- 9:40AM *Primary sources in the classroom: Blaise Pascal in Discrete Mathematics and Arthur Cayley in Abstract Algebra*. (556)
David J. Pengelley, New Mexico State University (1014-I1-823)
- 10:00AM *Lamé’s Counting of Triangulations*. Preliminary report. (557)
Jerry Lodder, New Mexico State University (1014-I1-1472)
- 10:20AM *Using History to Teach Mathematics with Some Examples*. (558)
Jim Fulmer, University of Arkansas at Little Rock (1014-I1-1592)
- 10:40AM *Using History as a Motivating Strategy in Lower-level Mathematics Courses*. (559)
Kevin L Dove* and **Beth S Lundquist**, Lander University (1014-I1-430)
- 11:00AM *History Live! Examples of differential equations studied by Newton and Leibniz*. (560)
Huseyin Kocak, University of Miami (1014-I1-30)
- 11:20AM *A Symbiosis of Beauty: Transformational geometry and the Art, Architecture and Textiles of Central and South America*. (561)
Elizabeth C. Rogers, Piedmont College (1014-I1-1694)
- 11:40AM *A Stealth Group in History*. Preliminary report. (562)
Agnes M. Kalemari, SUNY Farmingdale (1014-I1-1702)

MAA Session on Innovative Teaching/Learning Ideas Using Technology in the Teaching of Courses before College Algebra

8:00 AM – 11:55 AM

Organizers: **Ed Laughbaum**, The Ohio State University
Mohammad H. Ahmadi, University of Wisconsin-Whitewater

- 8:00AM *The Modeling of a Remote Control using Flash-A Computer Application of the Use of Functions*. (563)
Paul Raymond Bouthellier, University of Pittsburgh-Titusville (1014-J1-165)
- 8:30AM *Using Scroll Bars and Macros in Excel to Excite and Engage Students*. (564)
Robert Lee Kimball, Wake Technical Comm Coll (1014-J1-64)
- 9:00AM *Teaching and Learning with Tablet PCs*. Preliminary report. (565)
Lois A Martin, Massasoit Community College, Brockton, MA (1014-J1-59)
- 9:30AM *What Are You Thinking? (Use of Polling Devices)*. (566)
Roseanne S. Hofmann, Montgomery County Community College (1014-J1-453)
- 10:00AM *Quadratic vs. Exponential- a Growth Model for Social Security*. (567)
Murray H. Siegel, South Carolina GSSM (1014-J1-125)

- 10:30AM *Introducing Algebra Using Graphs*. (568)
Frances Van Dyke, American University (1014-J1-212)
- 11:00AM *Graphing Calculator Activities to Develop Mathematical Reasoning and Number Sense*. (569)
Sue McMillen, Buffalo State College (1014-J1-31)
- 11:30AM *Online Homework in Intermediate Algebra*. (570)
Preliminary report.
Laurie Johnson, Marymount University (1014-J1-706)

MAA Session on Research and Other Mathematical Experiences for Students Outside the Classroom

8:00 AM – 11:55 AM

Organizers: **Kay B. Somers**, Moravian College
Susan E. Morey, Texas State University
Sivaram K. Narayan, Central Michigan University
Jody Sorensen, Grand Valley State University

- 8:00AM *An Interdisciplinary Seminar in Mathematical Economics*. (571)
Alexandra Kurepa, North Carolina A&T State University (1014-K1-1166)
- 8:15AM *Reaching Out to the Entire Campus through Mathematics*. Preliminary report. (572)
David E. Boliver, University of Central Oklahoma (1014-K1-399)
- 8:30AM *Structured interdisciplinary research experiences in mathematics and biology*. Preliminary report. (573)
Glenn Ledder, University of Nebraska-Lincoln (1014-K1-1069)
- 8:45AM *Find What Works: Fostering Undergraduate Research in Your Own Backyard*. Preliminary report. (574)
Steven D. Leonhardi, Winona State University (1014-K1-1408)
- 9:00AM *Initial Probes of Mathematics: a Systematic Approach*. (575)
David F Snyder, Texas State University-San Marcos (1014-K1-1009)
- 9:15AM *JSU Math Club—A Community of New Learners and Alumni*. (576)
David W. Dempsey* and **Jan O. Case**, Jacksonville State University (1014-K1-997)
- 9:30AM *Exciting Things are Happening for Students at Georgia Perimeter College*. (577)
Alice Eiko Pierce, Georgia Perimeter College (1014-K1-1688)
- 9:45AM *High School Day and Emerging Scholars Program at ULM*. Preliminary report. (578)
Annala R Kelly, University of Louisiana at Monroe (1014-K1-1755)
- 10:00AM *Advising Undergraduate Research: Tales From the Front Lines*. (579)
Lisa A DeMeyer, Central Michigan University (1014-K1-1501)
- 10:15AM *PascGalois Summer Research Retreat at New College of Florida*. Preliminary report. (580)
Eirini Pomenidou*, New College of Florida,
Michael Bardzell and **Kathleen Shannon**, Salisbury University (1014-K1-1495)
- 10:30AM *Research Opportunities for Students at Grand Valley State University*. (581)
Steven Schlicker, Grand Valley State University (1014-K1-242)

- 10:45AM *Celebrating Pi Day at Slippery Rock*. Preliminary report.
▶ (582) **Robert W. Vallin**, Slippery Rock University (1014-K1-211)
- 11:00AM *Organizing and maintaining an undergraduate mathematics competition*. Preliminary report.
▶ (583) **Jeffery D. Sykes**, Ouachita Baptist University (1014-K1-1169)
- 11:15AM *MathCounts! Not Just for Middle-Schoolers, Anymore...* Preliminary report.
▶ (584) **Charlotte M. Schulze-Hewett**, University of Wisconsin Colleges, Rock County Campus (1014-K1-139)
- 11:30AM *Catch the Buzz: the Annual Integration Bee(s) at Pitt*.
▶ (585) **Jonathan E Rubin**, University of Pittsburgh (1014-K1-934)
- 11:45AM *Recruiting future math teachers with an early K-12 classroom experience*. Preliminary report.
▶ (586) **Alejandra Sorto***, Texas State University, **Max Warshauer**, Texas State University, **Hiroko Warshauer**, **Alexander White** and **Terry McCabe**, Texas State University (1014-K1-679)

MAA Session on Courses Below Calculus: A Continuing Focus, I

8:00 AM – 9:55 AM

Organizers: **Mary Robinson**, University of New Mexico-Valencia Campus
Florence S. Gordon, New York Institute of Technology
Laurette Foster, Prairie View A&M University
Arlene H. Kleinstein, Farmingdale State University of New York
Norma M. Agras, Miami Dade Community College
Linda Martin, Albuquerque T-VI

- 8:00AM *A Modeling-Based College Algebra Course and Its Effect on Student Achievement*.
▶ (587) **Aimee J. Ellington**, Virginia Commonwealth University (1014-L1-222)
- 8:20AM *Finding the Right Path for Entry-Level Math Students*.
(588) **Susan Nelson*** and **Alice Eiko Pierce**, Georgia Perimeter College (1014-L1-1577)
- 8:40AM *Introductory Mathematical Modeling and Problem Solving Courses with Interdisciplinary Applications in College Algebra as a General Education Mathematics Course*. Preliminary report.
▶ (589) **William P. Fox** and **Richard West***, Francis Marion University (1014-L1-622)
- 9:00AM *The Effect of Different College Algebra Curriculums on Students' Understanding of Function Concepts*. Preliminary report.
(590) **Erick Brian Hofacker**, University of Wisconsin-River Falls (1014-L1-818)
- 9:20AM *A Counterrevolutionary College Algebra Course*. Preliminary report.
▶ (591) **Stacy G. Langton**, University of San Diego (1014-L1-1005)
- 9:40AM *Content courses for preservice teachers*.
▶ (592) **Cristina Gomez***, SUNY-Cortland, **Cecelia Laurie** and **Wei Shen Hsia**, The University of Alabama (1014-L1-1099)

MAA Session on Models That Work: Building Diversity in Advanced Mathematics, I

8:00 AM – 11:55 AM

Organizers: **Abbe H. Herzig**, University at Albany, SUNY
Patricia Hale, California State Polytechnic University, Pomona

- 8:00AM *Fostering the Success of Students of Underrepresented Groups: Common Threads*.
▶ (593) **Abbe H. Herzig**, University at Albany, State University of New York (1014-Y3-821)
- 8:30AM *Supporting Women in Mathematics at the University of Nebraska-Lincoln*.
▶ (594) **Judy Walker**, University of Nebraska-Lincoln (1014-Y3-695)
- 9:00AM *The Maryland Experience: Building a community of African American graduate students*.
(595) **Raymond L Johnson**, University of Maryland at College Park (1014-Y3-1093)
- 9:30AM *Increasing the Number of Minority Ph.D.'s in Mathematics*.
▶ (596) **David C Manderscheid**, University of Iowa (1014-Y3-853)
- 10:00AM *Research as the driver of increased diversity in undergraduate and graduate applied mathematics programs*.
(597) **Carlos Castillo-Chavez**, Arizona State University (1014-Y3-1749)
- 10:30AM *The Center for Excellence and Equity in Education at Rice University: Successes in the Recruitment, Retention, and Matriculation of Minority Scholars*.
▶ (598) **Richard A. Tapia**, Rice University, Center for Excellence and Equity in Education (1014-Y3-1776)
- 11:00AM *Increasing the Participation of Women in Computer Science*.
▶ (599) **Lenore Blum**, Computer Science Department, Carnegie Mellon University (1014-Y3-731)
- 11:30AM *Minority Doctorates in Mathematics and the Pipeline*.
▶ (600) **David Finston**, New Mexico State University (1014-Y3-1660)

MAA General Contributed Paper Session, III

8:00 AM – 11:55 AM

Chair: **Joan S. Morrison**, Goucher College
Chair: **Timothy P. Chartier**, Davidson College
Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University

- 8:00AM *Meridian Lines in Cathedrals*.
▶ (601) **Barbara Ashton**, Borough of Manhattan Community College - CUNY (1014-Z1-773)
- 8:15AM *An Earnest, Hamming Way to do Magic*.
(602) **Jeffrey A. Ehme*** and **Colm Mulcahy**, Spelman College (1014-Z1-1768)
- 8:30AM *Poker Faced*. Preliminary report.
▶ (603) **Colm Mulcahy*** and **Jeffrey Ehme**, Spelman College (1014-Z1-1673)
- 8:45AM *A combinatorial analog of a theorem of F. Dyson*. Preliminary report.
▶ (604) **Peter Wong*** and **Pallavi Jayawant**, Bates College (1014-Z1-1358)
- 9:00AM *Runs of Heads and Tails - Genuine or Bogus?*
▶ (605) **Bill Linderman**, King College (1014-Z1-1266)

- 9:15AM *Interval Tournaments.*
▶ (606) **David E. Brown***, Utah State University, **Arthur H. Busch**, LeHigh University, and **J. Richard Lundgren**, University of Colorado at Denver (1014-Z1-1165)
- 9:30AM *The Probability of a Tied Vote under a Multiple Vote Scheme.* Preliminary report.
▶ (607) **Dennis Patrick Walsh**, Middle Tennessee State University (1014-Z1-1640)
- 9:45AM *Picking the President.*
▶ (608) **Joseph Evan*** and **Daniel Ghezzi**, King's College (1014-Z1-940)
- 10:00AM *A Network Analysis of Committee Assignments in the United States House of Representatives.*
▶ (609) **Mason A Porter**, California Institute of Technology (1014-Z1-62)
- 10:15AM *Cutting right triangles right!* Preliminary report.
▶ (610) **Wasin So**, San Jose State University (1014-Z1-1763)
- 10:30AM *On the Nash Equilibrium Theorem.* Preliminary report.
▶ (611) **Peter Schallot**, Slippery Rock University (1014-Z1-1509)
- 10:45AM *Parallelogons and Cutting Elliptical Cakes.*
▶ (612) **Douglas G. Burkholder**, Lenoir-Rhyne College (1014-Z1-1157)
- 11:00AM *Challenges for Students from the Final Simplex Tableau - Adjusting the Optimal Solution when the Constraints Change.*
(613) **James J Reynolds**, Clarion University of Pennsylvania (1014-Z1-835)
- 11:15AM *The many faces of WJU.*
▶ (614) **Marc Brodie**, Wheeling Jesuit University (1014-Z1-1053)
- 11:30AM *Overview of Three Ongoing Undergraduate Investigations at MWSU.* Preliminary report.
▶ (615) **Jeffrey L. Poet**, Missouri Western State University (1014-Z1-880)
- 11:45AM *Behaviour of trigonometric polynomials with only real zeros near a critical point.* Preliminary report.
(616) **Mohammed A. Qazi***, Tuskegee University, and **Q. I. Rahman**, Universite de Montreal (1014-Z1-1103)

SIAM Minisymposium on Inverse Problems: Theory and Numerics for Novel Applications, I

8:00 AM – 10:55 AM

Organizers: **Heinz W. Engl**, Johannes Kepler University
Lothar Reichel, Kent State University

- 8:00AM *Level sets in inverse problems and optimization I.*
(617) **Martin Burger**, Johannes Kepler University and RICAM, Linz (1014-65-530)
- 8:30AM *Level sets in inverse problems and optimization II.*
▶ (618) **Michael Hintermueller**, University of Graz (1014-49-868)
- 9:00AM *Discretization of Dirac Delta Functions in Level Set Methods.*
(619) **Bjorn Engquist**, University of Texas at Austin, **Anna-Karin Tornberg**, Courant Institute, New York University, and **Richard Tsai***, University of Texas at Austin (1014-65-797)
- 9:30AM *A Mumford-Shah approach for the inversion of SPECT data.* Preliminary report.
(620) **Wolfgang Ring***, University of Graz, and **Ronny Ramlau**, Johann Radon Institute for Computational and Applied Math. (1014-49-1389)

- 10:00AM *Some computational issues on inverse problems in medical imaging.*
(621) **Luisa D'Amore**, University of Naples Federico II Italy, **Serena Morigi**, University of Bologna Italy, **Almerico Murli**, University of Naples Federico II Italy, and **Fiorella Sgallari***, CIRM University of Bologna Italy (1014-65-375)
- 10:30AM *Solving nonlinear inverse problems by multi-frame based shrinkage iterations.*
(622) **Gerd Teschke**, Konrad-Zuse Institute, Berlin, Germany (1014-45-386)

SIAM Minisymposium on Mathematical Neuroscience: From Experiment to Theory, II

8:00 AM – 11:00 AM

Organizer: **Kresimir Josic**, University of Houston

- 8:00AM *The dynamic range of bursting in a network of respiratory pacemaker cells.*
(623) **Alla Borisuyk**, University of Utah (1014-92-1638)
- 8:25AM *Synchrony in networks of Cortical Fast-Spiking Neurons.* Preliminary report.
(624) **Tim Lewis**, University of California, Davis (1014-92-784)
- 8:50AM *Using one-dimensional maps for analyzing neuronal dynamics.*
(625) **Georgi S. Medvedev**, Drexel University (1014-34-1574)
- 9:15AM Break.
- 9:25AM *Conditional Back-Propagation of Dendritic Action Potentials in CA1 Pyramidal Neurons: Implications for Spike-Timing Dependent Synaptic Plasticity.*
(626) **Costa M. Colbert**, Department of Biology and Biochemistry, University of Houston (1014-92-1173)
- 9:50AM *How architecture restricts spiking patterns in networks of phase oscillators.*
(627) **Eric T Shea-Brown***, Courant Institute, New York Univ., **Kresimir Josic** and **Martin Golubitsky**, University of Houston (1014-92-736)
- 10:15AM *Discrete-time neural models for large-scale network studies.*
(628) **Nikolai F Rulkov***, Institute for Nonlinear Science, UCSD, and **Maxim Bazhenov**, The Salk Institute for Biological Studies (1014-92-1249)
- 10:40AM *Applications of the Poincaré mapping technique to analysis of neuronal dynamics.*
(629) **Andrey Shilnikov***, **Gennady Cymbalyuk** and **Paul Channell**, GSU (1014-37-577)

SIGMAA Officers Meeting

8:00 AM – 10:00 AM

AMS-MAA-MER Special Session on Mathematics and Education Reform, III

8:30 AM – 11:50 AM

Organizers: **Bonnie S. Saunders**, University of Illinois at Chicago
William H. Barker, Bowdoin College
Dale R. Oliver, Humboldt State University
Kenneth Millet, University of California Santa Barbara

- 8:30AM *Attracting and Retaining Students in the Mathematical Sciences.* Preliminary report.
▶ (630) **W. James Lewis**, University of Nebraska-Lincoln (1014-97-1242)

- 9:00AM ▶ (631) *Attracting More Students to the Mathematical Sciences: strategies from the CUPM Illustrative Resources for changing department culture and curricula.*
Harriet Pollatsek, Mount Holyoke College (1014-97-907)
- 9:30AM ▶ (632) *Bringing Contemporary Mathematics into the Curriculum.*
Robert L. Devaney, Boston University (1014-97-689)
- 10:00AM ▶ (633) *Attracting more minority students into the Mathematical Sciences through undergraduate research experiences: Why and How?*
Robert Eugene Megginson, University of Michigan at Ann Arbor (1014-97-1037)
- 10:30AM (634) *How does technology affect student attitudes to mathematics?*
William McCallum, University of Arizona (1014-97-1699)
- 11:00AM (635) *Pizza, Problem-Solving, and Promoting a Math-Friendly Culture.*
Andrew J. Bernoff, **Francis Edward Su*** and **Lesley A. Ward**, Harvey Mudd College (1014-97-1615)
- 11:30AM (636) *Getting Students to Speak Mathematics: One Model that Works.*
Robert S Keller, Loras College (1014-00-1591)

MAA-Project NExT Panel Discussion

8:30 AM – 10:00 AM

Getting started in mathematical biology.
Organizers: **T. Christine Stevens**, St. Louis University
Joseph A. Gallian, University of Minnesota, Duluth
Aparna W. Higgins, University of Dayton
Panelists: **Laurie J. Heyer**, Davidson College
Janet L. Andersen, Hope College
Carl C. Cowen, Indiana University-Purdue University Indianapolis
Jonathan E. Rubin, University of Pittsburgh

AWM Emmy Noether Lecture

9:00 AM – 9:50 AM

- (637) *Mathematical results and challenges in learning theory.*
Ingrid Daubechies, Princeton University (1014-68-102)

MAA Minicourse #10: Part A

9:00 AM – 11:00 AM

A beginner's guide to the scholarship of teaching and learning in mathematics.
Organizers: **Curtis D. Bennett**, Loyola Marymount University
Jacqueline M. Dewar, Loyola Marymount University
Thomas F. Banchoff, Brown University
John P. Holcomb, Cleveland State University

MAA Minicourse #15: Part A

9:00 AM – 11:00 AM

A novel approach to problem solving.
Organizer: **Andrew C-F Liu**, University of Alberta

MAA-YMN Panel Discussion

9:00 AM – 10:20 AM

Undergraduate career paths in mathematics.
Organizers: **James E. Hamblin**, Shippensburg University
John A. Vano, University of Wisconsin-Madison

Exhibits and Book Sales

9:30 AM – 5:30 PM

Math on the Web, II

10:00 AM – 3:30 PM

- 10:00AM (638) *Math accessibility with MathML: Meeting your students' needs and legal requirements.*
Neil Soiffer, Design Science, Inc.
- 11:20AM (639) *Interactive math on the Web by Maplesoft.*
Mohamed Bendame, Maplesoft
- 12:15PM (640) *Creating mathematical documents for the Web with Scientific Workplace.*
Barry MacKichan, MacKichan Software, Inc.
- 1:00PM (641) *Student answers to math homework on the Web using proper mathematical notation: A scalable, universal approach.*
John Risley, WebAssign
- 2:00PM (642) *Maplets for calculus.*
Philip B. Yasskin*, Texas A&M University, and **Douglas B. Meade***, University of South Carolina
- 3:00PM (643) *Metamathematical visions: Metadata, learning, and knowledge communities.*
Aaron Krowne, Emory University

MAA Invited Address

10:05 AM – 10:55 AM

- (644) *The mathematics of everyday language.*
Keith J. Devlin, Center for the Study of Language and Information, Stanford University (1014-A0-10)

MAA Minicourse #5: Part A

10:30 AM – 12:30 PM

Finite group behavior: Windows software for teaching beginning group theory.
Organizers: **Edward C. Keppelmann**, University of Nevada Reno
Ellen J. Maycock, Depauw University

AMS Special Presentation

10:30 AM – NOON

Who wants to be a mathematician.
Organizers: **Michael A. Breen**, AMS
Annette W. Emerson, AMS
William T. Butterworth, Barat College of DePaul University

AMS Special Presentation

10:30 AM – NOON

T.A. development using case studies: A workshop for faculty (Part 1).

Organizers: **Solomon Friedberg**, Boston College
Diane L. Herrmann, University of Chicago

MAA Panel Discussion

10:45 AM – 12:05 PM

Integrating mathematics with other disciplines.

Organizer: **Jenna P. Carpenter**, Louisiana Technical University

Panelists: **Sheldon P. Gordon**, SUNY at Farmingdale
Gary W. Krahn, U.S. Military Academy
Eric S. Marland, Appalachian State University
Bernd S. Schroeder, Louisiana Technical University

MAA Special Presentation

10:45 AM – 12:05 PM

Proposal writing workshop for grant applications to the NSF Division of Undergraduate Education.

Organizers: **Elizabeth J. Teles**, NSF Division of Undergraduate Education
John R. Haddock, NSF Division of Undergraduate Education
Lee L. Zia, NSF Division of Undergraduate Education

SIAM Invited Address

11:10 AM – NOON

(645) *Generalized Fourier Transforms, the Dirichlet-to-Neumann Map, and the Imaging of the Brain.*
Thanasis Fokas, Cambridge University (1014-44-103)

AMS Colloquium Lectures: Lecture II

1:00 PM – 2:00 PM

(646) *Entangled radicals, Part II.*
Hendrik W. Lenstra Jr., Universiteit Leiden (1014-12-14)

AMS-MAA Special Session on Ancient and Nonwestern Mathematics, II

1:00 PM – 2:50 PM

Organizer: **Duncan J. Melville**, St. Lawrence University

1:00PM
► (647) *Decimal and sexagesimal computation in Indian mathematics.*
Kim Plofker, University of Utrecht, and International Institute for Asian Studies, Leiden (1014-01-713)

2:00PM
(648) *The Pārthapura school and the exact sciences in India.*
Toke Lindegaard Knudsen, Brown University (1014-01-999)

2:30PM
► (649) *'Practical' mathematics: the view from inside and outside.* Preliminary report.
Duncan J. Melville, St. Lawrence University (1014-01-1600)

AMS-SIAM Special Session on Frames and Operator Theory in Analysis and Signal Processing, II

1:00 PM – 3:50 PM

Organizers: **Peter R. Massopust**, Tuboscope Vetco Pipeline Services
David R. Larson, Texas A&M University
Manos I. Papadakis, University of Houston
Zuhair Nashed, University of Central Florida
Ahmed I. Zayed, DePaul University
Minh Chuong Nguyen, Institute of Mathematics, Hanoi Vietnam

1:00PM
(650) *The use of filters and direct limits in the construction of fractal wavelets.* Preliminary report.
Judith A Packer*, University of Colorado at Boulder, and **Iain Raeburn**, University of Newcastle, Australia (1014-46-1205)

1:30PM
(651) *A Noncommutative Wiener Lemma and A Faithful Tracial State on Banach Algebras of Time-Frequency Shift Operators.* Preliminary report.
Radu V Balan, Siemens Corporate Research (1014-47-324)

2:00PM
(652) *Waveform design and a general form of matched filtering.* Preliminary report.
John J. Benedetto, Norbert Wiener Center, University of Maryland (1014-42-409)

2:30PM
Break

3:00PM
► (653) *Pseudo-differential operators, localization operators and time-frequency analysis.* Preliminary report.
Luigi G. Rodino and **Elena Cordero***, Universita' di Torino (1014-47-449)

3:30PM
(654) *Multiscale approximation in electronic structure calculation.*
Reinhold Schneider, Christian-Albrechts-Universität Kiel, Germany (1014-41-1519)

AMS Special Session on Mahler Measure and Heights, III

1:00 PM – 3:20 PM

Organizers: **Michael J. Mossinghoff**, Davidson College
Jeffrey D. Vaaler, University of Texas at Austin

1:00PM
(655) *Mahler measures of Alexander polynomials of alternating links.*
Daniel S. Silver and **Susan G Williams***, University of South Alabama (1014-57-1239)

1:30PM
(656) *Lehmer's Question and Surface Dynamics.*
Daniel S Silver* and **Susan G Williams**, University of South Alabama (1014-57-1235)

2:00PM
(657) *Proving relations between $m(P)$ and $L'(E,0)$.*
Fernando Rodriguez Villegas, University of Texas at Austin (1014-11-1415)

3:00PM
(658) *On the Mahler measure of resultants in small dimension.*
Carlos D'Andrea, Departament d'Àlgebra i Geometria, and **Matilde N Lalin***, Institute for Advanced Study (1014-11-645)

AMS Special Session on Recent Trends in Convex and Discrete Geometry, II

1:00 PM – 3:50 PM

Organizers: **Valeriu Soltan**, George Mason University
Tibor Bisztriczky, University of Calgary
Paul Goodey, University of Oklahoma

- 1:00PM ▶ (659) *Optimal configurations of k congruent balls packed in a sphere in \mathbb{R}^n ($k \leq 2n$).*
Włodzimierz Kuperberg, Auburn University (1014-52-1114)
- 1:30PM (660) *The Colourful Hadwiger Transaversal Theorem.*
Luis Montejano, University of Guerrero at Acapulco, Mexico (1014-52-1234)
- 2:00PM ▶ (661) *Symmetric Delone subdivisions and their application.* Preliminary report.
Achill Schuermann, University of Magdeburg (1014-52-261)
- 2:30PM ▶ (662) *Revisiting a problem of D. Ismailescu and R. Radoicic concerning dense point sets.* Preliminary report.
Andras Bezdek* and **Gergely Ambrus**, Auburn University (1014-52-1773)
- 3:00PM ▶ (663) *Additive Discrete Geometry.* Preliminary report.
Jozsef Solymosi, University of British Columbia (1014-52-1172)
- 3:30PM ▶ (664) *Locating points in a sensor network, with distance information.* Preliminary report.
Walter J. Whiteley, York University, Toronto (1014-52-594)

AMS Special Session on Division Algebras, Galois Theory, Cohomology and Geometry, III

1:00 PM – 3:50 PM

Organizers: **Kelly L. McKinnie**, University of Texas at Austin
David J. Saltman, University of Texas at Austin

- 1:00PM (665) *The admissibility of $PSL(2, 7)$.* Preliminary report.
Murray M. Schacher*, UCLA, and **Danny Goldstein**, IDA-CCR La Jolla (1014-12-804)
- 1:30PM (666) *Generic polynomials.*
Arne Ledet, Texas Tech University (1014-12-1148)
- 2:00PM (667) *Centers of generic algebras with involution.*
Esther Beneish, Central Michigan University (1014-17-970)
- 2:30PM (668) *A Gersten sequence for 2-dimensional regular local rings.* Preliminary report.
Eric S Brussel, Emory University (1014-17-1611)
- 3:00PM (669) *The Brauer group of a 2-dimensional regular local ring.* Preliminary report.
Eduardo Tengan, Emory University (1014-17-1607)
- 3:30PM (670) *Division algebras over surfaces.* Preliminary report.
David J Saltman, University of Texas at Austin (1014-12-881)

AMS Special Session on Topological Spaces Associated with $C(X)$, III

1:00 PM – 3:50 PM

Organizers: **Chawne M. Kimber**, Lafayette College
Warren Wm. McGovern, Bowling Green State University

- 1:00PM (671) *Elementarily equivalent l -groups of continuous functions on essential P -spaces.*
Brian Wynne, Colgate University (1014-03-1067)
- 1:30PM (672) *Examples of absolute CR -epic topological spaces.*
Robert Raphael, Concordia University (1014-00-279)
- 2:00PM (673) *Hewitt realcompactifications and P -coreflections.*
Robert Raphael, Concordia University, and **R. Grant Woods***, University of Manitoba (1014-54-548)
- 2:30PM (674) *Disjointness preserving operators and their associated algebra homomorphisms.* Preliminary report.
Gerard J Buskes*, University of Mississippi, and **Karim Boulabiar**, Tunis, Tunisia (1014-06-462)
- 3:00PM (675) *Strongly clean rings of matrices over $C(X)$.*
Wolf Iberkleid, **Ramiro H. Lafuente-Rodriguez***, Universidad Mayor de San Andres, and **Warren Wm. McGovern**, Bowling Green State University (1014-06-1012)
- 3:30PM (676) *Lattice-ordered $C(X)$ -modules.* Preliminary report.
James J. Madden, Louisiana State University (1014-06-1530)

AMS Special Session on Value Distribution in Classical and p -adic Functions Theory, III

1:00 PM – 3:20 PM

Organizers: **Alain Escassut**, University Blaise Pascal
Chung-Chun Yang, Hong Kong University of Science and Technology
Iipo Laine, University of Joensuu

- 1:00PM (677) *Non-convergent SRU 's for analytic elements in a p -adic field.*
Kamal Boussaf, University Blaise Pascal, Clermont-Ferrand, France (1014-11-516)
- 1:30PM (678) *An analogue of continued fractions in number theory for Nevanlinna theory.*
Zhuan J. Ye, Northern Illinois University (1014-30-1036)
- 2:00PM (679) *Hermite Multiplier Sequences.*
George L. Csordas and **Andrzej Piotrowski***, University of Hawaii (1014-30-450)
- 2:30PM (680) *Meromorphic functions of uniqueness.*
Alain Paul Escassut, University Blaise Pascal, Clermont-Ferrand, France (1014-30-513)
- 3:00PM Discussion.

AMS Special Session on Algebraic Statistics: Theory and Practice, III

1:00 PM – 3:50 PM

Organizers: **Seth M. Sullivan**, University of California Berkeley
Elizabeth S. Allman, University of Southern Maine

- 1:00PM (681) *On the fan of a design and on maximal-fan designs.*
Hugo Maruri-Aguilar, Department of Statistics, The University of Warwick, and **Eva Riccomagno***, Department of Statistics, The University of Warwick and Department of Mathematics, Politecnico di Torino (1014-62-1043)
- 1:30PM (682) *Sampling for Conditional Inference on Multiway Tables.*
Yuguo Chen*, University of Illinois at Urbana-Champaign, **Ian Dinwoodie**, Duke University, and **Seth Sullivan**, Harvard University (1014-62-792)

- 2:00PM *Network Delay Tomography with Correlation.*
(683) Preliminary report.
Ian H Dinwoodie* and **Eric Vance**, Duke University (1014-62-140)
- 2:30PM *Genetic linkage analysis.*
(684) **Ingileif Bryndis Hallgrimsdottir**, Department of Statistics, University of Oxford (1014-62-1059)
- 3:00PM *EM Algorithm for Hidden Markov Models.*
▶ (685) **Ingileif B. Hallgrimsdottir**, University of Oxford, **R. Alexander Milowski**, UC Davis, and **Josephine Yu***, UC Berkeley (1014-62-445)
- 3:30PM *The posterior map.*
(686) **Lior Pachter**, UC Berkeley (1014-92-1399)

- 2:30PM *Finite basis problems for quasivarieties, and the weak extension property.*
(695) **Ralph Nelson McKenzie**, Vanderbilt University (1014-06-865)
- 3:00PM *Forbidden quotients of bounded distributive lattices.* Preliminary report.
(696) **Richard N. Ball***, University of Denver, **Ales Pultr**, Charles University, and **Jiri Sichler**, University of Manitoba (1014-06-1373)
- 3:30PM *From bordered sets to two-complexes.* Preliminary report.
(697) **John C Meakin**, University of Nebraska-Lincoln (1014-06-1278)

AMS Special Session on Continued Fractions, II

1:00 PM – 3:50 PM

Organizers: **Nancy Wyshinski**, Trinity College
James G. McLaughlin, Trinity College and West Chester University

- 1:00PM *Ramanujan's continued fractions via orthogonal polynomials.*
(687) **Mourad E. H. Ismail***, University of Central Florida, and **Dennis Stanton**, University of Minnesota (1014-33-805)
- 2:00PM *Szegő polynomials and para-orthogonal polynomials on the real line, and the associated continued fractions.*
(688) **A. Sri Ranga***, **Cleonice F. Bracciali** and **Eliana X. de Andrade**, DCCE/IBILCE, Universidade Estadual Paulista (1014-33-755)
- 2:30PM *Parabolic Iterated Function Systems with Applications to the Backward Continued Fractions.*
(689) **Eugen Andrei Ghenciu**, University of North Texas, Denton, Texas (1014-37-809)
- 3:00PM *Distribution Analysis Using PPC-Continued Fractions.*
(690) **William B. Jones**, University of Colorado, Boulder, and **Walter M. Reid***, University of Wisconsin-Eau Claire (1014-30-957)
- 3:30PM *Continued Fraction Handbook Project.*
▶ (691) **William B. Jones**, University of Colorado, Boulder (1014-33-408)

AMS Special Session on the Many Lives of Lattice Theory, the Theory of Ordered Sets, and Universal Algebra, II

1:00 PM – 3:50 PM

Organizers: **Japheth L. M. Wood**, Chatham College
John W. Snow, Sam Houston State University
Jonathan D. Farley, Harvard University
Stefan E. Schmidt, Phoenix Math Systems Modeling, Inc.
Anthony A. Harkin, Harvard University

- 1:00PM *Semilattices and Congruence Heredity.* Preliminary report.
▶ (692) **Eric J Martin***, University of Northern British Columbia, and **John W. Snow**, Sam Houston State University (1014-06-1629)
- 1:30PM *M_4 and Congruence Heredity.*
▶ (693) **John W Snow**, Sam Houston State University (1014-06-72)
- 2:00PM *Using Order in Distributed Computing.*
(694) **Vijay K Garg***, University of Texas, **Neeraj Mittal**, University of Texas at Dallas, and **Alper Sen**, Freescale Semiconductors (1014-06-421)

MAA Minicourse #11: Part A

1:00 PM – 3:00 PM

Teaching a course in the history of mathematics.

Organizers: **V. Frederick Rickey**, U.S. Military Academy
Victor J. Katz, University of the District of Columbia

MAA Minicourse #16: Part A

1:00 PM – 3:00 PM

Fair division: From cake-cutting to dispute resolution.

Organizer: **Steven J. Brams**, New York University

MAA Minicourse #6: Part A

1:00 PM – 3:00 PM

Technology tools for discrete mathematics.

Organizers: **Douglas E. Ensley**, Shippensburg University
Katherine G. McGivney, Shippensburg University

AMS Session on Algebraic Geometry

1:00 PM – 1:55 PM

- 1:00PM *Period and index of curves: various constructions.*
(698) **S. Sharif**, UC Berkeley (1014-11-1507)
- 1:15PM *Higher Order Bad Loci.* Preliminary report.
(699) **Gian Mario Besana***, DePaul University, **Sandra DiRocco**, KTH Royal Institute of Technology, and **Antonio Lanteri**, Universita' degli Studi di Milano (1014-14-782)
- 1:30PM *Smooth monomial-ideal points of the Hilbert scheme of points of an affine space.* Preliminary report.
(700) **Mark E. Huibregtse**, Skidmore College (1014-14-1431)
- 1:45PM *Special metrics on intersection of quadrics.* Preliminary report.
(701) **Daniela Mihai*** and **George Sparling**, University of Pittsburgh (1014-51-1305)

AMS Session on Mathematics Education

1:00 PM – 2:25 PM

- 1:00PM *Mathematical Connections: For Example, "How To Teach Radicals In Less Than 5 Minutes" (Grades 6-16).* Preliminary report.
▶ (702) **Juli D'Ann Ratheal**, West Texas A & M University (1014-97-06)

- 1:15PM *Motivating Undergraduates with Different Backgrounds to do Mathematics Research.* Preliminary report.
Manmohan Kaur, Benedictine University (1014-97-331)
- 1:30PM *Geometry on a HubCap.*
David E Ewing, Central Missouri State University (1014-97-561)
- 1:45PM *Algebra and Uniform Estimates Give a Face-lift to Calculus and Introductory Analysis.*
Michael Livshits, Cambridge MA (1014-97-1272)
- 2:00PM *Closing the Gaps for English Language Learners (ELL) in Mathematics Learning by Improving In-Service Teacher Professional Development Thus Increasing Teacher Content, Pedagogy, and Methods Knowledge.*
Joyce F. Fischer, Texas State University-San Marcos (1014-97-1557)
- 2:15PM *Native American-based Materials for Undergraduate Mathematics Courses.*
Charles Peter Funkhouser, University of Montana-Missoula, College of Technology, and **A. Duane Porter***, University of Wyoming (1014-97-1760)
- 3:00PM *Approximate Solutions of Heat equation on unbounded domains using Heatlets.*
Gnana Bhaskar Tenali, Florida Institute of Technology, and **Hariharan Seetharaman***, Florida Institute of Technology (1014-35-1572)
- 3:15PM *Systems of Nonlinear Wave Equations With Damping and Source Terms.* Preliminary report.
Keith Agre*, St. Cloud State University, and **Mohammad A. Rammaha**, University of Nebraska-Lincoln (1014-35-1583)
- 3:30PM *On the shape of a cookie.* Preliminary report.
▶ (718) **David L Finn**, Rose-Hulman Institute of Technology (1014-35-1733)
- 3:45PM *Sobolev Space Interior Regularity Results for a Variational Inequality Involving an Elliptic Pseudo-Differential Operator.* Preliminary report.
Randolph Garfield Cooper, California State University, Los Angeles (1014-35-1744)
- 4:00PM *Design of a two-electrode electrostatic lens for optimum aberration characteristics.*
S. M. Makky*, Owens College, **A. K. Ahmad**, Al Nahrain University, Baghdad, Iraq, and **S. M. Juma**, University of Baghdad, Bagdad, Iraq (1014-78-1216)

AMS Session on Partial Differential Equations, II

1:00 PM – 4:10 PM

- 1:00PM *Stability and Bifurcation in a Fractionally Damped Nonlinear Diffusion Process.*
Brahima Mbodje, Rust College (1014-35-176)
- 1:15PM *Partial differential equations related to dielectric breakdown and polycrystal plasticity.*
Marian Bocea, University of Utah (1014-35-152)
- 1:30PM *Nonlinear stability of viscous shock waves arising in conservation laws in the presence of both second and fourth order regularizations.* Preliminary report.
▶ (710) **Changbing Hu***, Missouri State University, and **Peter Howard**, Texas A&M University (1014-35-1204)
- 1:45PM *On the oscillations of the solution curve for a class of semilinear equations.*
Anahit Galstyan*, University of Texas-Pan American, **Philip Korman**, University of Cincinnati, and **Yi Li**, University of Iowa (1014-35-1327)
- 2:00PM *Attractor Stability via Morse-Smale Property for Diffusive Two-Species Competition Systems.* Preliminary report.
Georg Hetzer, **Wenxian Shen** and **Tung Nguyen***, Auburn University (1014-35-1337)
- 2:15PM *Eigenvalue Characterization and Computation for the Laplacian on General Domains, and its Application to Inverse Spectral Problems.*
James V Lambers*, Stanford University, **Maeve L McCarthy**, Murray State University, and **Patrick Guidotti**, University of California, Irvine (1014-35-1359)
- 2:30PM *Cauchy problem for nonlinear wave equation with variable speed of propagation.*
Karen Yagdjian, University of Texas-Pan American (1014-35-1363)
- 2:45PM *N-Bump Solutions of Amari-Type Equation.*
J. Angela Murdock, University of Memphis (1014-35-1548)
- 1:00PM *Counting and 3-Edge-Coloring Spherical Buckyballs.*
▶ (721) **Thomas C. Hull**, Merrimack College (1014-05-1587)
- 1:15PM *Rado Numbers for Some Linear Equations.*
▶ (722) **Daniel Schaal***, **Donna Flint** and **Joseph Mousel**, South Dakota State University (1014-05-1601)
- 1:30PM *The Isoperimetric Numbers of Certain Cayley Graphs of the Projective Special Linear Groups.* Preliminary report.
Dominic Lanphier, Western Kentucky University, and **Jason Rosenhouse***, James Madison University (1014-05-1625)
- 1:45PM *An Identity of Partial Derangement and Its Applications.* Preliminary report.
▶ (724) **Kang Wu**, Southern China Normal University, and **Haishen Yao***, CUNY Queensborough Community College (1014-05-1207)
- 2:00PM *Set systems with the minimal number of sets and the (4,3)-threshold property.*
▶ (725) **Zoltán Füredi**, University of Illinois at Urbana-Champaign, **Robert H. Sloan**, University of Illinois at Chicago, **Ken Takata***, Adelphi University, and **György Turán**, University of Illinois at Chicago (1014-05-1211)
- 2:15PM *A proof of differential identities using lattice path encodings.*
▶ (726) **Anna Varvak**, Soka University of America (1014-05-715)
- 2:30PM *Domino Fibonacci Tableaux.* Preliminary report.
(727) **Kendra S Killpatrick***, Pepperdine University, and **Naiomi Cameron**, Occidental College (1014-05-558)
- 2:45PM *A geometric form for the extended patience sorting algorithm and its generalizations.*
▶ (728) **Alexander I Burstein***, Iowa State University, and **Isaiah P Lankham**, University of California, Davis (1014-05-164)
- 3:00PM *Combinatorics of Patience Sorting Piles.*
(729) **Isaiah P Lankham***, University of California, Davis, and **Alexander I Burstein**, Iowa State University (1014-05-161)

AMS Session on Combinatorics, IV

1:00 PM – 4:10 PM

- 3:15PM *A triple lacunary generating function for Hermite polynomials.*
(730) **Pallavi Jayawant***, Bates College, and **Ira Gessel**, Brandeis University (1014-05-156)
- 3:45PM *On Proofs of Certain Combinatorial Identities.*
▶ (731) **Akalu Tefera***, Grand Valley State University, **Aklilu Zeleke**, Lyman Briggs School and Department of Statistics and Probability, and **George Grossman**, Central Michigan University (1014-05-559)
- 4:00PM *The Shields-Harary Numbers of the complete bipartite graph $K_{m,n}$ for Continuous Concave Cost Functions Vanishing at One.*
(732) **John E Holliday***, North Georgia College and State University, and **Peter D Johnson**, Auburn University (1014-00-1288)

MAA Session on Professional Development Programs for K-12 Teachers, III

1:00 PM – 4:15 PM

Organizers: **Zsuzsanna Szaniszló**, Valparaiso University
Laurie Burton, Western Oregon University
Judith L. Covington, Louisiana State University Shreveport
Patricia Hale, California State Polytechnic University, Pomona

- 1:00PM *Experiences with an In-Service Professional Development Program: The Vermont Mathematics Partnership and its Impact on School Systems in Vermont.* Preliminary report.
▶ (733) **George L. Ashline**, St. Michael's College (1014-D1-170)
- 1:20PM *Team Planning and Team Teaching: College and School Mathematics Instructors Collaborate to Increase Mathematical Content Knowledge in Elementary Teachers.*
(734) **Martha L Wallace**, St. Olaf College (1014-D1-459)
- 1:40PM *The Leadership Program in Discrete Mathematics.* Preliminary report.
▶ (735) **Valerie A. DeBellis**, Shodor Education Foundation, and **Joseph G. Rosenstein***, Rutgers University (1014-D1-951)
- 2:00PM *Hosting a Probability and Statistics Institute.* Preliminary report.
▶ (736) **Sharon S Emerson-Stonnell**, Longwood University (1014-D1-1459)
- 2:20PM *Improving Mathematical Content Knowledge of K-8 Teachers: Experiences and Successes with a State-Funded Project.*
(737) **Brian J. Lindaman*** and **A. Susan Gay**, University of Kansas (1014-D1-975)
- 2:40PM *Integrating Technology/Engineering Concepts into the Teaching of Mathematics in Middle School.*
▶ (738) **Mary Ann Connors**, Westfield State College (1014-D1-492)
- 3:00PM *Prime: Partnership for Revitalized Instruction in Mathematics Education.* Preliminary report.
▶ (739) **Jennifer A. Bergner*** and **Michael Bardzell**, Salisbury University (1014-D1-1237)
- 3:20PM *Building K-12 Mathematics Leaders: Experiences of the Oregon Mathematics Leadership Institute (OMLI) Partnership Project in enhancing mathematics content knowledge for teaching.*
▶ (740) **Thomas P Dick***, Oregon State University, and **Karen Marrongelle**, Portland State University (1014-D1-786)

- 3:40PM *Hands-On Mathematics Education for Pennsylvania Learning and Teaching (HOME PlaTe).*
▶ (741) **Francisco E Alarcon*** and **Larry Feldman**, Indiana University of PA (IUP) (1014-D1-1056)
- 4:00PM *EMCAT: Exploring Mathematical Concepts through Applications of Technology.*
▶ (742) **Jan O. Case*** and **David Dempsey**, Jacksonville State University (1014-D1-943)

MAA Session on Getting Students to Discuss and to Write about Mathematics, III

1:00 PM – 4:10 PM

Organizers: **Martha Ellen Murphy Waggoner**, Simpson College
Charlotte A. Knotts-Zides, Wofford College
Harrison W. Straley, Wheaton College

- 1:00PM *Do we make students talk about what they see?* Preliminary report.
▶ (743) **Jose H. Giraldo**, Texas A&M University-Corpus Christi (1014-H1-1406)
- 1:15PM *Introducing Students to Difference Quotients via a Writing Assignment Involving Experimental Data.* Preliminary report.
▶ (744) **Joe T. Harris**, St. Andrews Presbyterian College (1014-H1-1027)
- 1:30PM *Introducing Students to Writing About Mathematics Using Calculus Problems.*
▶ (745) **Michael L. Berry**, West Virginia Wesleyan College (1014-H1-177)
- 1:45PM *Using Journals to Emphasize Writing and Homework in Calculus.*
▶ (746) **J'Lee W. Bumpus*** and **G. Brock Williams**, Texas Tech University (1014-H1-326)
- 2:00PM *Involving Students in Their Own Learning: Course End Presentation.* Preliminary report.
▶ (747) **Rodney X. Sturdivant***, **Alex J Heidenberg** and **Brian Souhan**, United States Military Academy (1014-H1-974)
- 2:15PM *Student Reflections on Mathematics.*
▶ (748) **Alex M McAllister**, Centre College (1014-H1-274)
- 2:30PM *The Use of Frequent Oral Presentations in Third-Semester Calculus.*
▶ (749) **William R. Harris**, Georgetown College (1014-H1-1192)
- 2:45PM *Reading and Writing about Calculus—A First Year Mathematics Seminar.*
(750) **Daniel S. Alexander*** and **Alexander F. Kleiner**, Drake University (1014-H1-994)
- 3:00PM *Who's The Man?: The Question That Made My Students Fight About Mathematics.* Preliminary report.
▶ (751) **Pam Miltenberger**, West Virginia Wesleyan College (1014-H1-187)
- 3:15PM *Create Your Own Mini Poster Session!*
▶ (752) **Jenny Switkes**, California State Polytechnic University, Pomona. (1014-H1-34)
- 3:30PM *Low Stakes Writing Questions.* Preliminary report.
▶ (753) **Karen Batt Stanish**, Keene State College (1014-H1-1525)
- 3:45PM *Helping Mathematics Students Become Math Presenters.* Preliminary report.
▶ (754) **David Fowler**, University of Nebraska-Lincoln (1014-H1-270)

- 4:00PM *Integrating a writing-intensive component into a traditional upper-division course.* Preliminary report.
 (755) **Susan Hammond Marshall**, Monmouth University (1014-H1-1723)

MAA Session on Mathematics of Sports and Games, I

1:00 PM – 3:55 PM

Organizers: **Sean L. Forman**, Saint Joseph's University
Douglas Drinen, Sewanee: University of the South

- 1:00PM *How Well Can Random Walkers Rank Football Teams?*
 ▶ (756) **Thomas S Callaghan**, Stanford University, **Peter J Mucha**, University of North Carolina at Chapel Hill, and **Mason A Porter***, California Institute of Technology (1014-M1-61)
- 1:20PM *Paired comparison ranking systems: an old topic and a new application.* Preliminary report.
 ▶ (757) **Douglas Drinen**, Sewanee: the University of the South (1014-M1-1398)
- 1:40PM *A Maple Simulation for the 2004 Red Sox-Yankees Playoff Series.* Preliminary report.
 ▶ (758) **Phil Gustafson**, Mesa State College (1014-M1-861)
- 2:00PM *Down 4 with a Minute to Play.* Preliminary report.
 ▶ (759) **G Edgar Parker***, James Madison University, and **Richard Miller**, Fort Defiance High School (1014-M1-281)
- 2:20PM *The Price is Right's Three Strikes Game and Other Possibilities.*
 ▶ (760) **Paula R. Stickles**, Indiana University (1014-M1-342)
- 2:40PM *Bill James as an Exemplar of Statistical Writing.*
 ▶ (761) **William Branson**, St Cloud State University (1014-M1-1514)
- 3:00PM *Pigs on the Court.*
 ▶ (762) **Marc Brodie**, Wheeling Jesuit University (1014-M1-1060)
- 3:20PM *Using NASCAR to Illustrate Optimization.* Preliminary report.
 ▶ (763) **Mark A Mills***, Central College, and **Dale R Buske**, St. Cloud State University (1014-M1-332)
- 3:40PM *NCAA Membership and a Piecewise-Defined Model.*
 ▶ (764) **Murray H. Siegel**, South Carolina GSSM (1014-M1-126)

MAA Session on Mathematical Connections in the Arts, I

1:00 PM – 3:55 PM

Organizers: **Douglas E. Norton**, Villanova University
Reza Sarhangi, Towson University
Nathaniel A. Friedman, State University of New York, Albany

- 1:00PM *Clear as a Bell: Applying Principles of Graphical Excellence to Campanology.* Preliminary report.
 ▶ (765) **Leslie Hayes**, Saint Joseph's University (1014-N1-1538)
- 1:15PM *Learning Styles of College Algebra Students Support the Use of Dance in Mathematics Courses: Ideas for using Dance in the College Algebra classroom.* Preliminary report.
 (766) **Ann D. Bingham*** and **Beth K. Wright**, Peace College (1014-N1-1224)

- 1:30PM *A Salamander's Tale: Art and Mathematics at Ohio Northern.* Preliminary report.
 ▶ (767) **William R Fuller**, Ohio Northern University (1014-N1-819)
- 1:45PM *Modular Sculpture from Surface Patches.*
 ▶ (768) **Stephen J Luecking**, DePaul University (1014-N1-992)
- 2:00PM *Variations on an All-Purpose Algorithm.* Preliminary report.
 ▶ (769) **Anne M. Burns**, Long Island University, C.W. Post Campus (1014-N1-227)
- 2:15PM *The Symmetries of Beaded Beads.*
 ▶ (770) **Gwen Laura Fisher**, California Polytechnic State University (1014-N1-256)
- 2:30PM *Griddy Mathematics (The art and the mathematics of grids).* Preliminary report.
 ▶ (771) **Josefina Alvarez**, New Mexico State University (1014-N1-692)
- 2:45PM *Imagemosaics: Painting with Pictures.*
 ▶ (772) **Gavin W. Taylor**, Davidson College (1014-N1-1055)
- 3:00PM *The Square's talk: the language of Flatland.*
 ▶ (773) **William Lindgren***, Slippery Rock University, and **Thomas Banchoff**, Brown University (1014-N1-752)
- 3:15PM *The History and Nature of Mathematics in the Works of Jorge Luis Borges.* Preliminary report.
 ▶ (774) **Mary L Garner**, Kennesaw State University (1014-N1-1458)
- 3:30PM *Mathematical literature and literary mathematics: Oulipo.* Preliminary report.
 ▶ (775) **Christine Kinsey***, Canisius College, and **Teresa Moore**, Ithaca College (1014-N1-937)
- 3:45PM *A Cost-Based Approach to Adaptivity in Literary Hypertext.*
 ▶ (776) **Juan B Gutierrez**, Florida State University (1014-N1-141)

MAA Session on Research on the Teaching and Learning of Undergraduate Mathematics, I

1:00 PM – 3:15 PM

Organizers: **William O. Martin**, North Dakota State University
Barbara E. Edwards, Oregon State University
Michael Oehrtman, Arizona State University

- 1:00PM *Findings from a Study of Gender Parity.*
 ▶ (777) **Teri J Murphy**, University of Oklahoma (1014-O1-1312)
- 1:20PM *Student understanding of the Inverse Relationship of Exponential and Logarithmic Functions.* Preliminary report.
 (778) **Michelle Reed***, Wright State University, **Gretchen Whipple**, Warren Wilson College, **Lynette Roller**, Dulaney High School, Timonium, Maryland, and **Barbara Edwards**, Oregon State University (1014-O1-1579)
- 1:40PM *Theoretical Lenses for Examining Undergraduate Students' Statistical Thinking.*
 (779) **Randall E Groth*** and **Jennifer A Bergner**, Salisbury University (1014-O1-696)
- 2:00PM *Helping Bridge Course Students Begin to Write Proofs.* Preliminary report.
 ▶ (780) **Carolyn Yackel**, Mercer University (1014-O1-676)

- 2:20PM *Teaching Mathematics Using a Computer Algebra System—What are the Effects on the Students' Performance??*
(781) **Karsten Schmidt***, Faculty of Management Science & Economics, University of Applied Sciences Schmalkalden, and **Wolfgang Moldenhauer**, Thuringian Institute for In-service Teacher Training, Curriculum Development and Media (ThILLM) (1014-O1-209)
- ▶ 2:40PM *Data-Mining an Online Homework System.*
(782) Preliminary report.
Andrew Bennett, **Genevra Neumann***, **Eric Lawrence** and **Elena Verbych**, Kansas State University (1014-O1-143)
- 3:00PM *Effects of Elaborate Contextual Information in Group Homework.*
(783) **Dale J. Winter***, University of Michigan, and **Matthew E. DeLong**, Taylor University (1014-O1-95)

MAA Session on Models That Work: Building Diversity in Advance Mathematics, II

1:00 PM – 3:55 PM

Organizers: **Abbe H. Herzig**, University at Albany, SUNY
Patricia Hale, California State Polytechnic University, Pomona

- ▶ 1:00PM *Girls Explorations in Mathematics and Science (GEMS): An Outreach Program Attracting a Diverse Group of High Achieving High School Girls.* Preliminary report.
Mazen Shahin*, Delaware State University, and **Melissa A. Harrington**, Department of Biology, Delaware State University (1014-Y3-1655)
- ▶ 1:30PM *Giving Women the EDGE in Mathematics.*
(785) **Ami Radunskaya***, Pomona College, **Sylvia T. Bozeman**, Spelman College, and **Rhonda J. Hughes**, Bryn Mawr College (1014-Y3-1695)
- 2:00PM *Model Summer Programs for Students from Underrepresented Groups.*
(786) **Deborah Nolan**, University of California, Berkeley (1014-Y3-1674)
- ▶ 2:30PM *Diversifying the research experience: creating an REU environment that is conducive to the education of the whole person.*
(787) **Erika T. Camacho***, Loyola Marymount University, and **Stephen A. Wirkus**, California State Polytechnic University, Pomona (1014-Y3-1376)
- 3:00PM *The Advance Program and the Career Partner Program at UCI, and the Mentoring Program for Women Mathematicians at IAS.* Preliminary report.
(788) **Chuu-Lian Terng**, University of California at Irvine (1014-Y3-1662)
- 3:30PM *NSF ADVANCE at the University of Michigan.*
(789) Preliminary report.
Kristen S. Moore, University of Michigan (1014-Y3-780)

MAA General Contributed Paper Session, IV

1:00 PM – 4:10 PM

Chair: **Eric S. Marland**
Chair: **Jay A. Malmstrom**, Oklahoma City Community College
Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University

- ▶ 1:00PM *Teaching Undergraduate Courses in Biomathematics.* Preliminary report.
Raina S. Robeva*, Sweet Briar College, and **Michael L. Johnson**, University of Virginia School of Medicine (1014-Z1-1759)
- ▶ 1:15PM *Computational Tools for a Two-Course Calculus Sequence for Biology Majors.*
(791) **Timothy D Comar**, Benedictine University (1014-Z1-363)
- ▶ 1:30PM *Bioinformatics and the Undergraduate Mathematics Curriculum.* Preliminary report.
(792) **Steven M Deckelman**, University of Wisconsin-Stout (1014-Z1-402)
- ▶ 1:45PM *Chances in Life—Creating a Statistics/Biology Learning Community.* Preliminary report.
(793) **William D Ardis**, Collin County Community College - Preston Ridge Campus (1014-Z1-1432)
- ▶ 2:00PM *Mathematical Preparation for First Statistics Courses.*
(794) **Paul Kochanowski**, Indiana University South Bend, and **Morteza Shafii-Mousavi***, Indiana University South Bend (1014-Z1-99)
- ▶ 2:15PM *A review of the literature pertaining to the interactions between teachers pedagogical beliefs, their content knowledge, and their attitudes toward specific topics, as applied to statistics.*
(795) **Stephen Max Lancaster**, University of Oklahoma (1014-Z1-984)
- ▶ 2:30PM *Using the CSI effect in Calculus: applying forensic science to infinite series.* Preliminary report.
(796) **R Travis Kowalski**, South Dakota School of Mines and Technology (1014-Z1-1317)
- ▶ 2:45PM *Curtailment Procedure for Selecting Among Bernoulli Populations.*
(797) **Elena Mihaela Buzaiianu*** and **Pinyuen Chen**, Syracuse University (1014-Z1-833)
- ▶ 3:00PM *The weather report: daily and seasonal temperature extremes.* Preliminary report.
(798) **Richard N Barshinger**, Penn State Scranton (1014-Z1-675)
- ▶ 3:15PM *Special Averages with Sums of Powers of Integers.* Preliminary report.
(799) **Thomas Pfaff**, Ithaca College (1014-Z1-431)
- ▶ 3:30PM *Finite Dimensional Approximations to Wiener Measure on a Compact Manifold with Positive Curvature.*
(800) **Adrian P. C. Lim**, UCSD (1014-Z1-939)
- ▶ 3:45PM *Constructing 5-Regular 5/2-Tough Graphs.*
(801) **Lynne L Doty**, Marist College, and **Kevin K Ferland***, Bloomsburg University (1014-Z1-610)
- ▶ 4:00PM *Graphs with the disjoint linking property.*
(802) **Joel S. Foisy**, SUNY Potsdam (1014-Z1-753)

SIAM Minisymposium on New Transform Methods for Differential Equations

1:00 PM – 4:00 PM

Organizers: **Beatrice Pelloni**, University of Reading, UK
Li-yeung Sung, University of South Carolina

▶ 1:00PM *The solution of linear boundary value problems on time-dependent domains.*
(803) **Beatrice Pelloni**, University of Reading (1014-35-1422)

- 1:30PM (804) *Initial-boundary-value problems for linear and nonlinear differential-difference evolution equations.* Preliminary report.
Gino Biondini*, SUNY at Buffalo, and **Athanasios Fokas**, University of Cambridge (1014-34-1515)
- 2:00PM (805) *Harmonic and biharmonic problems in fixed and free domains.*
Darren G Crowdy, Imperial College London (1014-35-828)
- 2:30PM (806) *On the Global Relation and Moment Theory for the Ellipse.*
George Dassios, University of Cambridge, UK (1014-35-588)
- 3:00PM (807) *Numerical Solution of the Global Relation for Linear Elliptic Equations.*
Scott R. Fulton, Clarkson University (1014-65-1436)
- 3:30PM Discussion of Open Problems.

SIAM Minisymposium on Inverse Problems: Theory and Numerics for Novel Applications, II

1:00 PM – 3:55 PM

Organizers: **Heinz W. Engl**, Johannes Kepler University
Lothar Reichel, Kent State University

- 1:00PM (808) *Inverse Obstacle problems for Laplace's Equation.* Preliminary report.
William Rundell, Texas A&M University (1014-35-885)
- 1:30PM (809) *An inverse problem in photolithography.*
Fadil Santosa, University of Minnesota (1014-49-846)
- 2:00PM (810) *Inferring gene regulatory networks as nonlinear inverse problem with sparsity constraints.*
Philipp Kuegler, RICAM, Austria (1014-92-725)
- 2:30PM (811) *Spatial Domain Decomposition and Model Reduction for Parabolic Parameter Identification Problems.*
Matthias Heinkenschloss, Rice University (1014-49-357)
- 3:00PM (812) *Inverse Scattering Applied to the Reconstruction of Coated Objects.*
Peter Monk* and **David Colton**, University of Delaware (1014-65-1598)
- 3:30PM (813) *Doppler-only radar imaging.*
Margaret Cheney*, Rensselaer Polytechnic Institute, and **Brett Borden**, Naval Postgraduate School (1014-35-914)

MAA-AWM Panel Discussion

1:00 PM – 2:20 PM

Teaching a course on women and/or minorities in mathematics.

Organizers: **Therese L. Bennett**, Southern Connecticut State University
Sarah J. Greenwald, Appalachian State University

Panelists: **Sarah J. Greenwald**
John H. Kellermeier, Tacoma Community College
Helen Moore, American Institute of Mathematics
Bonnie J. Shulman, Bates College

MAA-Project NExT Panel Discussion

1:00 PM – 2:30 PM

The mathematics profession in 2016: Where are we going?

Organizers: **John F. Bukowski**, Juniata College
Dale R. Buske, St. Cloud State University

Kenneth L. Price, University of Wisconsin-Oshkosh

Panelists: **David M. Bressoud**, Macalester College

Michael Starbird, University of Texas at Austin

Tina H. Straley, MAA

Paul Zorn, St. Olaf College

MAA Committee on the Profession Panel Discussion

1:00 PM – 2:20 PM

Scholarship scenarios.

Organizer: **David J. Lutzer**, The College of William and Mary

MAA Project NExT-YMN Poster Session

2:00 PM – 4:00 PM

Organizers: **Kevin E. Charlwood**, Washburn University

Kenneth A. Ross, University of Oregon

Summer Program for Women in Mathematics

2:00 PM – 4:00 PM

Participants from past programs will describe their experiences.

Organizer: **Murli M. Gupta**, George Washington University

AMS Invited Address

2:15 PM – 3:05 PM

(814) *Homotopy properties of Hamiltonian group actions.*
Dusa McDuff, SUNY at Stony Brook (1014-57-04)

AMS Session on Topology, I

2:30 PM – 4:10 PM

2:30PM (815) *A Presentation For The Automorphisms Of The 3-Sphere That Preserve A Genus Two Heegaard Splitting.*
Erol Akbas, University of Illinois at Chicago (1014-57-1395)

2:45PM (816) *The Eilenberg-Moore spectral sequence for Morava K-theory.* Preliminary report.
F John Carter, University of Oregon (1014-55-1121)

3:00PM (817) *Kelley's specialization of Tychonov's Theorem is equivalent to the Boolean Prime Ideal Theorem.*
Eric Schechter, Vanderbilt University (1014-03-1590)

3:15PM (818) *Typical Closed Subsets of R^n .* Preliminary report.
Elizabeth M Bator, University of North Texas (1014-26-1757)

- 3:30PM *Detecting invertibility from the topology of the pullback of hyperplane foliations.*
 ▶ (819) **Eduardo Cabral Balreira**, University of Notre Dame (1014-58-802)
- 3:45PM *Special Manifolds.* Preliminary report.
 (820) **Violeta Vasilevska**, The University of South Dakota (1014-57-1603)
- 4:00PM *Pictures of the Second Homotopy Group of a Two-Complex.* Preliminary report.
 (821) **Katherine Byler Kelm**, California State University, Fresno (1014-57-1353)

AMS Special Presentation

2:30 PM – 4:00 PM

T.A. development using case studies: A workshop for faculty (Part 2).

Organizers: **Solomon Friedberg**, Boston College
Diane L. Herrmann, University of Chicago

MAA Panel Discussion

2:30 PM – 3:50 PM

What business looks for in new hires.

Organizer: **Donald B. Small**, U.S. Military Academy
 Panelists: **Anthony Edwards**, San Antonio Public Service
Sandra Martinez, Kelly Aviation Center
Steve Bryant, Zachary Construction Company
Frances Gonzalez, Assistant City Manager of the City of San Antonio

MAA Panel Discussion

2:30 PM – 3:50 PM

AMATYC's Beyond Crossroads: Implementing standards-based mathematics instruction.

Organizer: **Susan S. Wood**, J. Sargeant Reynolds Community College

Panelists: **Susan S. Wood**
Richelle M. Blair, Lakeland Community College
Kathy A. Mowers, Owensboro Community and Technical College
William E. Haver, Virginia Commonwealth University

AMS Session on Dynamical Systems, I

2:45 PM – 4:10 PM

- 2:45PM *Whirly Transformations.* Preliminary report.
 (822) **Yue Wu**, Rice University, Houston (1014-37-912)
- 3:00PM Break
- 3:15PM *Critically Finite Maps and Attractors on Complex Projective Spaces.* Preliminary report.
 (823) **Feng Rong**, University of Michigan, Ann Arbor (1014-37-627)
- 3:30PM *Turing patterns on growing square domains.*
 (824) **Adela Nicoleta Comanici*** and **Martin Golubitsky**, University of Houston (1014-37-1049)
- 3:45PM *Levitán almost periodicity.* Preliminary report.
 (825) **Alica Miller**, University of Louisville (1014-37-1682)

- 4:00PM *Bounds for Linear Recurrence Relations with Unbounded Order.*
 ▶ (826) **Kenneth S Berenhaut**, Wake Forest University, **Ying Wai Fan**, Emory University, and **Zachary J Abernathy***, Wake Forest University (1014-39-1693)

AMS Retiring Presidential Address

3:20 PM – 4:10 PM

- (827) *Threads from My Life: Linear (good) Resolutions and Small (seductive) Varieties.*
David Eisenbud, Mathematical Sciences Research Institute (1014-14-07)

Joint Prize Session

4:25 PM – 5:25 PM

SIGMAA on Research in Undergraduate Mathematics Business Meeting and Guest Lecture

5:45 PM – 7:45 PM

- Organizer: **Barbara E. Edwards**, Oregon State University
- (828) *On infinite processes and actual infinity.*
Anne E. Brown, Indiana University South Bend (1014-A0-1594)

MAA Information Session

5:45 PM – 7:15 PM

- Current issues in actuarial science education.*
 Organizers: **Bettye Anne Case**, Florida State University
Steve P. Paris, Florida State University
Matthew J. Hassett, Arizona State University

SIGMAA on Business, Industry, and Government Reception

5:45 PM – 6:45 PM

- Organizer: **Michael G. Monticino**, University of North Texas

SIGMAA on Statistics Education Business Meeting

5:45 PM – 7:45 PM

- Organizer: **Thomas L. Moore**, Grinnell College

MAA Two-Year College Reception

5:45 PM – 7:00 PM

Joint Prize Session Reception

5:45 PM – 7:00 PM

SIGMAA on the History of Mathematics Annual Meeting and Guest Lecture

6:00 PM – 8:00 PM

- Organizer: **Amy Shell-Gellasch**, Grafenwoer, Germany

- (829) *History of mathematics and original sources in India: A fieldwork report.*
Kim L. Plofker, University of Utrecht (1014-A0-54)

WEB SIGMAA Business Meeting and Guest Lectures

6:00 PM – 7:30 PM

Organizer: **Murray Eisenberg**, University of Massachusetts

- (830) *Internet-Based Software for the Geometry of Linear Algebra.*
Thomas F. Banchoff, Brown University (1014-A0-77)
- (831) *Report from across the Great Pond: On-line mathematics resources and delivery systems.*
Douglas A. Quinney, University of Keele, UK (1014-A0-78)
- (832) *The Web on Steroids—Croquet on Mars.*
Frank Wattenberg, United States Military Academy (1014-A0-1672)

Young Mathematicians' Network Town Meeting

7:30 PM – 8:30 PM

Concerns of young mathematicians.

Organizer: **David C. Kung**, St. Mary's College of Maryland

Saturday, January 14

Combined MAA Department Liaisons and PME/MAA Student Chapter Advisors Breakfast Meeting

7:00 AM – 8:30 AM

Joint Meetings Registration

7:30 AM – 4:00 PM

Employment Center

7:30 AM – 7:30 PM

AMS-SIAM Special Session on Nonlinear Dynamical Systems, II

8:00 AM – 10:55 AM

Organizers: **Zhijun Qiao**, University of Texas Pan American

Andras Balogh, University of Texas Pan American

Guihua Fei, University of Minnesota Duluth

Zhaosheng Feng, University of Texas Pan American

- 8:00AM (833) *Backstepping boundary controller and observer designs for the slender Timoshenko beam.*
Krstic Miroslav, University of California, San Diego (1014-35-442)

- 8:30AM (834) *Dynamic bifurcation and stability of the Taylor problem.*
Tian Ma, Sichuan University, and **Shouhong Wang***, Indiana University (1014-35-298)

- 9:00AM (835) *A Stable Method to Solve Nonlinear Elliptic PDE Systems for Multiple Vector Solitons.*
Xianjin Chen* and **Jianxin Zhou**, Texas A&M University, College Station (1014-35-397)

- 9:30AM (836) *Nonlinear dynamics for semi-linear equations in circular domains and anisotropic Sobolev spaces.* Preliminary report.
Vladimir V Varlamov, University of Texas – Pan American (1014-35-851)

- 10:00AM (837) *Zero dynamics interior point control for a viscous Burgers equation.*
David S Gilliam*, Texas Tech University, **Christopher I Byrnes**, **Alberto Isidori**, Electrical and Systems Engineering / Washington University, St. Louis, and **Victor Shubov**, Colby College (1014-93-228)

- 10:30AM (838) *On the quantization of the three-particle Fermi-Pasta-Ulam lattice.* Preliminary report.
Bao-Feng Feng, The University of Texas-Pan American (1014-37-923)

AMS-SIAM Special Session on Frames and Operator Theory in Analysis and Signal Processing, III

8:00 AM – 10:45 AM

Organizers: **Peter R. Massopust**, Tuboscope Vetco Pipeline Services

David R. Larson, Texas A&M University
Manos I. Papadakis, University of Houston

Zuhair Nashed, University of Central Florida

Ahmed I. Zayed, DePaul University
Minh Chuong Nguyen, Institute of Mathematics, Hanoi Vietnam

- 8:00AM (839) *The Kadison-Singer Problem in Mathematics and Engineering: Part II.*

Peter G. Casazza*, University of Missouri, **Fickus Matt**, Air Force Institute of Technology, **Crandell Janet Tremain**, University of Missouri, **Roman Vershynin**, University of California - Davis, and **Eric Weber**, Iowa State University (1014-47-310)

- 8:30AM (840) *Construction of Sampling Theorems for Unions of Shifted Lattices.*

Hamid Behrard, Western Oregon University, **Adel Faridani***, Oregon State University, and **David Walnut**, George Mason University (1014-94-714)

- 9:00AM (841) *Multidimensional Prolate Spheroidal Wavelets.*
Gilbert G Walter, University of Wisconsin-Milwaukee (1014-41-304)

- 9:30AM (842) *Prolate spheroidal wavelets in a periodic setting.* Preliminary report.
Xiaoping Shen, Ohio University (1014-42-160)

- 10:00AM (843) *Two applications of frames for the analysis of astrophysical data.*
Sandrine Anthoine, Universite de Marseille, France, and **Ingrid Daubechies***, Princeton University (1014-46-1364)

AMS-SIAM Special Session on Contemporary Dynamical Systems, II

8:00 AM – 10:50 AM

Organizers: **Dmitry Zenkov**, North Carolina State University

Youngna Choi, Montclair State University

Anthony M. Bloch, University of Michigan
Todd L. Fisher, University of Maryland
Melvin Leok, University of Michigan
David S. Richeson, Dickinson College
James S. Wiseman, Agnes Scott College

- 8:00AM (844) *Natural Frames, Interacting Particles and Stealth.*
P S Krishnaprasad, University of Maryland, Department of Electrical and Computer Engineering and Institute for Systems Research (1014-93-1226)
- 8:30AM (845) *Geodesic Flows on the Symplectic Group.*
Anthony M. Bloch*, University of Michigan, **Arieh Iserles**, Cambridge University, **Jerrold E. Marsden**, California Institute of Technology, and **Tudor S. Ratiu**, Ecole Polytechnique Federale de Lausanne (1014-34-919)
- 9:00AM (846) *Symmetry breaking for toral actions in simple mechanical systems.*
Petre Birtea, **Mircea Puta**, Universitatea de Vest, Timisoara, Romania, **Tudor S Ratiu***, Ecole Polytechnique Federale de Lausanne, Switzerland, and **Razvan Tudoran**, Universitatea de Vest, Timisoara, Romania (1014-37-1222)
- 9:30AM (847) *A new proof of Sharkovsky's theorem.*
Keith Burns*, Northwestern University, and **Boris Hasselblatt**, Tufts University (1014-37-995)
- 10:00AM (848) *The Relative Growth of Information.*
Aimee S.A. Johnson*, Swarthmore College, **K Dajani**, Utrecht University, and **M de Vries**, Free University Amsterdam (1014-37-840)
- 10:30AM (849) *Fixed Points of abelian actions on S^2 and R^2 .* Preliminary report.
John Franks*, Northwestern University, **Michael Handel**, Herbert H. Lehman College (CUNY), and **Kamlesh Parwani**, University of Houston (1014-37-891)

AMS Special Session on Algebraic and Enumerative Combinatorics, II

8:00 AM – 10:45 AM

Organizers: **Catherine H. Yan**, Texas A&M University
Marcelo Aguiar, Texas A&M University
Joseph P. Kung, University of North Texas
Laura F. Matusevich, University of Pennsylvania

- 8:00AM (850) *From Schur Positivity to Schur Log-Concavity.*
Thomas Lam, Harvard University, **Alexander Postnikov** and **Pavlo Pylyavskyy***, Massachusetts Institute of Technology (1014-05-382)
- 8:30AM (851) *k-Schur functions, Macdonald polynomials, and quantum cohomology.*
Luc Lapointe, Universidad de Talca, and **Jennifer Morse***, University of Miami (1014-05-1661)
- 9:00AM (852) *Longest alternating subsequences of permutations.* Preliminary report.
Richard P. Stanley, M.I.T. (1014-05-325)
- 9:30AM (853) *The q, t -Catalan theorem and the q, t -Square theorem.*
Nicholas A. Loehr*, College of William and Mary, **Mahir B. Can**, University of Pennsylvania, and **Gregory S. Warrington**, Wake Forest University (1014-05-360)
- 10:00AM Problem Session

AMS Special Session on Arithmetic Geometry and Modular Forms, II

8:00 AM – 10:50 AM

Organizers: **Matthew A. Papanikolas**, Texas A&M University
Ahmad M. El-Guindy, Texas A&M University

- 8:00AM (854) *Orbits of curves on $K3$ surfaces and a fractal associated to the ample cone.*
Arthur Baragar, University of Nevada, Las Vegas (1014-14-711)
- 8:30AM (855) *Intersection numbers of Hecke cycles on Hilbert modular varieties.*
Jayce Robert Getz, University of Wisconsin-Madison (1014-11-1081)
- 9:00AM (856) *Hilbert's Tenth Problem for function fields over p -adic fields.*
Kirsten Eisentraeger, University of Michigan (1014-11-889)
- 9:30AM (857) *A finiteness conjecture for abelian varieties over number fields.*
Christopher Rasmussen, Rice University (1014-14-1372)
- 10:00AM (858) *Independence of Heegner Points.*
Michael I Rosen* and **Joseph H Silverman**, Brown University (1014-11-1180)
- 10:30AM (859) *Towards Lang-Trotter for Elliptic Curves over Function Fields.*
J. Felipe Voloch, Univ. of Texas at Austin (1014-11-266)

AMS Special Session on Recent Trends in Convex and Discrete Geometry, III

8:00 AM – 10:50 AM

Organizers: **Valeriu Soltan**, George Mason University
Tibor Bisztriczky, University of Calgary
Paul Goodey, University of Oklahoma

- 8:00AM (860) *Determination of convex bodies by directed projection functions.*
Paul Goodey, University of Oklahoma, and **Wolfgang Weil***, University of Karlsruhe, Germany (1014-52-1386)
- 8:30AM (861) *Convex Bodies with Constant Projection Functions.*
Ralph Howard*, University of South Carolina, and **Daniel Hug**, Mathematisches Institut, Universität Freiburg (1014-52-1230)
- 9:00AM (862) *On the road between intersection bodies and polar projection bodies.*
Alexander Koldobsky, University of Missouri-Columbia (1014-52-178)
- 9:30AM (863) *Centroid bodies and comparison of volumes.*
Vladyslav Yaskin* and **Maryna Yaskina**, University of Missouri - Columbia (1014-52-379)
- 10:00AM (864) *Non-intersection bodies all of whose central sections are intersection bodies.*
Maryna Yaskina, University of Missouri - Columbia (1014-52-378)
- 10:30AM (865) *General measures of a convex body.*
Artem Zvavitch, Kent State University (1014-52-748)

AMS Special Session on Commutative Rings and Monoids, III

8:00 AM – 10:50 AM

Organizers: **Scott T. Chapman**, Trinity University
James B. Coykendall, North Dakota State University

- 8:00AM (866) *On the integrally closed overrings of two-dimensional Noetherian domains.* Preliminary report.
Bruce Olberding, New Mexico State University (1014-13-1462)
- 8:30AM (867) *Extensions of local domains with trivial generic fibers.* Preliminary report.
William Heinzer, Purdue University, **Christel Rotthaus**, Michigan State University, and **Sylvia M Wiegand***, University of Nebraska Lincoln (1014-13-1175)
- 9:00AM (868) *Arithmetic Properties of Pullbacks.* Preliminary report.
Evan Houston* and **John Taylor**, UNC Charlotte (1014-13-925)
- 9:30AM (869) *Integral closure of graded integral domains.*
Mi Hee Park, Chung-Ang University (1014-13-1045)
- 10:00AM (870) *A classification of the minimal ring extensions of an integral domain.*
David E. Dobbs, University of Tennessee, Knoxville, and **Jay Shapiro***, George Mason University (1014-13-604)
- 10:30AM (871) *The Regularity Condition R_k of Serre.*
Marie A. Vitulli, University of Oregon (1014-13-157)

AMS Special Session on Syzygies in Commutative Algebra and Geometry, III

8:00 AM – 10:50 AM

Organizers: **Irena Peeva**, Cornell University
Sorin E. Popescu, SUNY at Stony Brook
Gregory G. Smith, Queen's University

- 8:00AM (872) *Cohomology of Orlik-Solomon algebras and geometry of line configurations.* Preliminary report.
Sergey Yuzvinsky, University of Oregon, Eugene, Oregon (1014-13-366)
- 8:30AM (873) *Holonomy Lie algebras, Graphic Arrangements, and $Tor_i^A(k, k)_i$.*
Hal Schenck* and **Paulo Lima-Filho**, Texas A&M University (1014-14-340)
- 9:00AM (874) *Core of ideals.* Preliminary report.
Claudia Polini, University of Notre Dame (1014-13-793)
- 9:30AM Discussion
- 10:00AM (875) *A computational study for the quadratic generation conjecture for smooth projective toric varieties.* Preliminary report.
Serkan Hosten* and **Joseph Gubeladze**, San Francisco State University (1014-13-1442)
- 10:30AM (876) *Some conjectures on the resolutions of defining ideals of Veronese embeddings.* Preliminary report.
Jerzy M Weyman, Northeastern University (1014-13-1758)

AMS Special Session on Field Extensions and Algorithms, I

8:00 AM – 10:50 AM

Organizers: **Peter Stevenhagen**, Universiteit Leiden

H. W. Lenstra, Jr., Universiteit Leiden

- 8:00AM (877) *The correction factor in Artin's primitive root conjecture.*
Peter Stevenhagen, Universiteit Leiden (1014-11-576)
- 8:30AM (878) *Computing the Galois group of a radical field extension.*
Bart de Smit, Universiteit Leiden (1014-12-410)
- 9:30AM (879) *Computing near-primitive root densities.* Preliminary report.
Willem Jan Palenstijn, Universiteit Leiden (1014-11-876)
- 10:00AM (880) *Radical algorithms.* Preliminary report.
Wieb Bosma, Radboud University, Nijmegen, the Netherlands (1014-11-1383)
- 10:30AM (881) *Irreducible radical extensions and Euler-function chains.* Preliminary report.
Florian Luca, Universidad Nacional Autonoma de México, Morelia, and **Carl Pomerance***, Dartmouth College (1014-11-244)

AMS Special Session on Nonautonomous Discrete Dynamics, II

8:00 AM – 10:50 AM

Organizers: **Saber N. Elaydi**, Trinity University
Jim M. Cushing, University of Arizona

- 8:00AM (882) *Signature Function for Predicting Resonant and Attenuant Population Cycles.*
John E Franke, North Carolina State University (1014-92-1136)
- 8:30AM (883) *Genetic variations due to periodic immigration for a discrete, selection model.* Preliminary report.
James F Selgrade*, North Carolina State University, and **James H Roberds**, USDA Forest Service (1014-92-837)
- 9:00AM (884) *A Discrete Model for the Spread of Periodic Diseases.*
Ronald E Mickens, Clark Atlanta University (1014-39-120)
- 9:30AM (885) *The dynamics of a discrete model of pulse propagation in a ring of cardiac tissue.*
Hassan Sedaghat, Virginia Commonwealth University (1014-39-683)
- 10:00AM (886) *Existence and Stability of Periodic Solutions of $x_n = f(n - 1 \bmod p, x_{n-k})$.* Preliminary report.
Ziyad M. Al-Sharawi, Central Michigan University (1014-37-38)
- 10:30AM (887) *Open Problems and Conjectures.* Preliminary report.
Gerasimos Ladas, University of Rhode Island (1014-39-794)

AMS Special Session on Continued Fractions, III

8:00 AM – 10:50 AM

Organizers: **Nancy Wyshinski**, Trinity College
James G. McLaughlin, Trinity College and West Chester University

- 8:00AM (888) *Accumulation Point Sets for Infinite Matrix Products and Continued Fractions.*
Douglas C Bowman*, Northern Illinois University, and **James McLaughlin**, West Chester University (1014-30-1365)

- 9:00AM (889) *A q-continued fraction and some new proofs of some old continued fraction identities.*
James Mc Laughlin*, West Chester University, West Chester, PA., **Douglas Bowman**, Northern Illinois University, and **Nancy J Wyshinski**, Trinity College, Hartford, CT. (1014-11-1120)
- 9:30AM (890) *Inhomogeneous Diophantine approximation for irrationals with quasi-periodic continued fractions.* Preliminary report.
Mary E. Flahive*, Oregon State University, and **Richard T. Bumby**, Rutgers, The State University of New Jersey (1014-11-217)
- 10:00AM (891) *Resurrecting the divided cell algorithm for inhomogeneous Diophantine approximation.* Preliminary report.
Richard T. Bumby*, Rutgers, The State University of New Jersey, and **Mary E. Flahive**, Oregon State University (1014-11-218)
- 10:30AM (892) *Expressing real quadratic irrationals as period-two continued fractions and their connections with diophantine approximation.*
Edward B Burger, Williams College (1014-11-746)

AMS Session on Topology, II

8:00 AM – 10:55 AM

- 8:00AM (893) *Non-Archimedean Topologies as Boolean Rings and Their Maximal Ideals.*
Rahim G Karimpour, Southern Illinois University Edwardsville (1014-54-534)
- 8:15AM (894) *Filament sets, aposyndesis, and the decomposition theorem of Jones.*
Keith Whittington*, University of the Pacific, and **Janusz Prajs**, Sacramento State University (1014-54-323)
- 8:30AM (895) *Cohomological dimension with respect to nonabelian groups.*
Atish Mitra, University of Tennessee- Knoxville (1014-55-1256)
- 8:45AM (896) *Shift Points and the Fixed Point Property for Products.*
T. Bruce McLean*, Georgia Southern University, and **Sam B. Nadler, Jr.**, West Virginia University (1014-54-847)
- 9:00AM (897) *Binary Statements of Closed Curves and Graphs.*
Avery S Zoch, Atlas Distributions (1014-54-920)
- 9:15AM (898) *The equivalence of the net & open-filter process and the open C^* -filter process of compactification.*
Hueyzen J Wu*, Texas A&M University - Kingsville, and **Wan-Hong Wu**, The Institute for Drug Development, Cancer Therapy & Research Center (1014-54-1097)
- 9:30AM (899) *Some applications of signatures.* Preliminary report.
W. Kulpa, Silesian University, and **A. Szymanski***, Slippery Rock University (1014-54-1330)
- 9:45AM (900) *Knitting Topological Surfaces.* Preliminary report.
Sarah-Marie Belcastro, Xavier University (1014-54-1355)
- 10:00AM (901) *Partial Metrics.*
Homeira Pajooresh*, **Ralph David Kopperman**, City College of CUNY, and **Steve Matthews**, Warwick University, U.K., (1014-54-1565)
- 10:15AM (902) *Covering properties of symmetrizable spaces.* Preliminary report.
Sheldon W Davis, Miami University (1014-54-1569)

- 10:30AM (903) *Asymmetric Ellis theory.* Preliminary report.
Susan Andima, C W Post Campus of Long Island University, **Ralph Kopperman***, City College of CUNY, and **Peter Nickolas**, University of Wollongong, Australia (1014-54-1725)
- 10:45AM (904) *Shift operators on 0-dimensional compact metric spaces.* Preliminary report.
Minakshisundaram Rajagopalan, Tennessee State University (1014-00-329)

AMS Session on History of Math

8:00 AM – 9:25 AM

- 8:00AM (905) *A remarkable alternative to trigonometric tables in determining the angles of a right triangle, given the lengths of two of its sides, as described by Thomas Ratcliffe, Mariner, in 1684.* Preliminary report.
Joel S Silverberg, Roger Williams University (1014-01-122)
- 8:15AM (906) *Kein's Erlangen program.* Preliminary report.
Alan Durfee, Mount Holyoke College (1014-01-1000)
- 8:30AM (907) *Beyond Omar Khayyam's Rubaiyat.* Preliminary report.
Mohammad Moazzam, Salisbury University (1014-01-595)
- 8:45AM (908) *Sharing resources and insights for teaching a History/Philosophy of Mathematics course.* Preliminary report.
John R. Hinton* and **David Stucki**, Otterbein College (1014-01-603)
- 9:00AM (909) *Programming Gauss's algorithms for quadratic forms.* Preliminary report.
R. Michael Josephy, Universidad de Costa Rica (1014-01-705)
- 9:15AM (910) *Christiaan Huygens and the Problem of the Hanging Chain.* Preliminary report.
John F. Bukowski, Juniata College (1014-01-136)

AMS Session on Mathematical Biology, I

8:00 AM – 10:40 AM

- 8:00AM (911) *Mathematical Modelling of the Hemodynamical Flow of Blood.*
J C Misra, Indian Institute of Technology, Kharagpur, India (1014-92-593)
- 8:15AM (912) *Deterministic and Stochastic Models of Development of Resistance to Genetically Modified Pesticidal Crops.* Preliminary report.
Jemal S. Mohammed-Awel* and **John Ringlnad**, State University of New York at Buffalo (1014-92-292)
- 8:30AM (913) *Eradication of the Screwworm Fly By Sterile Insect Release Method.* Preliminary report.
John G Alford* and **Robert Matlock**, Tulane University (1014-92-346)
- 8:45AM (914) *A Continuum Model with Free Boundary Formulation and the Inverse Problem for Ameboid Cell Motility.*
Huseyin Coskun, University of Iowa (1014-92-365)
- 9:00AM (915) *Modeling the molecular mechanisms of circadian rhythms and their response to light.*
Tanya Leise, Amherst College (1014-92-918)
- 9:15AM (916) *Biomechanical Model of Arabidopsis thaliana Root Hair Growth.* Preliminary report.
Sarah E. Frey* and **Claudia Uhde-Stone**, California State University, East Bay (1014-92-981)

- 9:30AM *Population density methods for stochastic neurons with a 2-D state space: application to neural networks with realistic synaptic kinetics.*
 ▶ (917) **Daniel Tranchina**, Courant Institute / NYU, and **Felix J Apfaltrer***, City University of New York - BMCC (1014-92-1017)
- 9:45AM *On Optical Flow of Fluorescent Microscope Protein Images.* Preliminary report.
 ▶ (918) **Robert C Stolz***, **Camille A. McKayle**, University of the Virgin Islands, **Robert Murphy**, **Elvira Garcia Osuna** and **Yanhua Hu**, Carnegie Mellon University (1014-92-1104)
- 10:00AM *Competing Species Models with an Infectious Disease.*
 (919) **Roberto A. Saenz*** and **Herbert W. Hethcote**, University of Iowa (1014-92-1115)
- 10:15AM *Calcium Wave Initiation and Evolution in a Neuron.*
 ▶ (920) **Bradford E Peercy**, Rice University (1014-92-1130)
- 10:30AM *An Erythropoiesis Structured Model with Nonlinear Cell Maturation Velocity and Hormone Decay Rate.*
 (921) **Azmy S. Ackleh**, **Keng Deng**, University of Louisiana at Lafayette, **Kazufumi Ito**, North Carolina State University, and **Jeremy J. Thibodeaux***, University of Louisiana at Lafayette (1014-92-1193)

AMS Session on Group Theory, I

8:00 AM – 10:40 AM

- 8:00AM *Number of Character Tables of Finite Groups.*
 (922) **Adriana Nenciu**, University of Florida (1014-20-159)
- 8:15AM *Capability of nilpotent groups of class two and prime exponent.* Preliminary report.
 (923) **Arturo Magidin**, University of Louisiana at Lafayette (1014-20-169)
- 8:30AM *Splitting pure extensions of LCA groups.* Preliminary report.
 (924) **Peter Loth**, Sacred Heart University (1014-20-257)
- 8:45AM *Density in Arbitrary Semigroups.* Preliminary report.
 (925) **Neil Hindman***, Howard University, and **Dona Strauss**, University of Hull (1014-20-350)
- 9:00AM *On Autocommutators in Groups.*
 ▶ (926) **Luise-Charlotte Kappe**, SUNY at Binghamton (1014-20-381)
- 9:15AM *A Classification of Certain Maximal Subgroups of Finite Symmetric Groups.*
 ▶ (927) **Benjamin Newton***, University of Wisconsin-Madison, and **Bret Benesh**, Harvard University (1014-20-422)
- 9:30AM *An Introduction to Permutably Detectable Groups.* Preliminary report.
 (928) **Joseph Evan**, King's College (1014-20-512)
- 9:45AM *Block-Diagonality of LFS-Groups of p-Type.* Preliminary report.
 (929) **Stefaan Dirk Delcroix**, California State University, Fresno (1014-20-569)
- 10:00AM *On the Location of the Near Frattini Subgroups of Generalized Free Products of Groups With Amalgamations.*
 (930) **Mohammad K. Azarian**, University of Evansville (1014-20-735)
- 10:15AM *The Representations of The Heisenberg Group over a Finite Field.*
 (931) **Manouchehr Misaghian**, Johnson C. Smith University (1014-20-776)

- 10:30AM *Simple Groups and $H^2(G, \mathbb{Q}/\mathbb{Z})$.*
 (932) **Fedor Bogomolov**, CIMS-NYU, and **Jorge Maciel***, BMCC-CUNY (1014-20-813)

MAA Session on Courses Below Calculus: A Continuing Focus, II

8:00 AM – 10:55 AM

Organizers: **Mary Robinson**, University of New Mexico-Valencia Campus
Florence S. Gordon, New York Institute of Technology
Laurette Foster, Prairie View A&M University
Arlene H. Kleinstein, Farmingdale State University of New York
Norma M. Agras, Miami Dade Community College
Linda Martin, Albuquerque T-VI

- 8:00AM *Technology and Linear Programming in a Finite Mathematics Course.*
 ▶ (933) **Ronald Harshbarger***, University of South Carolina Beaufort, and **Lisa S. Yocco**, Georgia Southern University (1014-L1-1578)
- 8:20AM *A Course BEFORE Calculus, but not necessarily BELOW Calculus, Continued Growth and Evolution.* Preliminary report.
 ▶ (934) **Geoffrey Kuhlmann***, **Gerald Kobylski**, **Alex Heidenberg** and **Jack Picciuto**, United States Military Academy (1014-L1-1201)
- 8:40AM *Adoption and Implementation of a Reform Curriculum for Courses Below Calculus, One Department's Experience.*
 (935) **David Dudley**, Scottsdale CC (1014-L1-1300)
- 9:00AM Break
- 9:20AM *Mathematics for Measurement—"Math for Practical Arts".*
 ▶ (936) **Mary R. Parker***, Austin Community College, and **Hunter Ellinger**, Exemplar Technologies (1014-L1-1087)
- 9:40AM *A Common-Sensible FTY Curriculum For Colleges: Visions And Guidance From Scientific Clinical Research.*
 ▶ (937) **Clyde L. Greeno**, MALEI Mathematics Institute (1014-L1-1040)
- 10:00AM *Towards a Geometry Course that Focuses on Mathematical Ways of Reasoning and Knowing.* Preliminary report.
 (938) **James Morrow**, Mount Holyoke College (1014-L1-1075)
- 10:20AM *A Two-Semester Precalculus/Calculus I Sequence: A Case Study.*
 ▶ (939) **Mike Axtell**, Wabash College (1014-L1-287)
- 10:40AM *The "Basic Four" Elementary Functions and their Applications.*
 ▶ (940) **Scott R. Herriott**, Maharishi University of Management (1014-L1-1326)

MAA Session on Mathematics of Chemistry

8:00 AM – 10:50 AM

Organizer: **George Rublein**, College of William and Mary

8:00AM *Calculation of Molecular Configurations for Identical Atoms.*
 ▶ (941) **Ronald E Mickens**, Clark Atlanta University (1014-Q1-119)

- 8:25AM *See The Light! (Beer's Law in Calculus).*
 ▶ (942) **Stuart Boersma***, Central Washington University, and **Garrett J McGowan**, Alfred University (1014-Q1-612)
- 8:50AM *Mathematical Modeling of Chemical Stoichiometry.*
 ▶ (943) **Bill Fox**, Francis Marion University (1014-Q1-623)
- 9:15AM *Molecular Vibrations in an elementary linear algebra course with early eigenvalues.*
 (944) **Charles S. Holmes**, Miami University (Ohio) (1014-Q1-1433)
- 9:40AM *Exploring Proteins and Hyperbolic Surfaces Using 3D Computer Graphics.* Preliminary report.
 ▶ (945) **Paul R McCreary**, Xavier University of Louisiana (1014-Q1-1469)
- 10:05AM *Chemistry applications in beginning calculus.*
 ▶ (946) **George Rublein**, College of William and Mary (1014-Q1-1753)
- 10:30AM *Connecting Mathematics, Computing and Chemistry: An Undergraduate Computational Science Program.*
 ▶ (947) **Ignatios Vakalis**, Capital University (1014-Q1-1754)

MAA Session on Mathematics Experiences in Business, Industry, and Government

8:00 AM – 10:20 AM

Organizers: **Philip E. Gustafson**, Mesa State College
Michael G. Monticino, University of North Texas

- 8:00AM Welcome remarks.
- 8:05AM *Cost-Benefit Analysis of a Rotavirus Immunization Program in the Arab Republic of Egypt.* Preliminary report.
 ▶ (948) **Omayra Y Ortega***, NAMRU-3 / University of Iowa, **Mark Riddle** and **John Sanders**, Naval Medical Research Unit No. 3 (1014-R1-514)
- 8:40AM *Teller Staffing in Retail Banks.* Preliminary report.
 ▶ (949) **Michael G Monticino**, University of North Texas (1014-R1-993)
- 9:15AM *Ionospheric Dispersion of LFM Pulses.* Preliminary report.
 ▶ (950) **Gregory E. Coxson**, Technology Service Corporation (1014-R1-1340)
- 9:50AM *Optimal Control Theory Applied to a Cooperative Game between Manufacturer and Retailer.*
 (951) **Ellina Grigorieva**, Texas Woman's University (1014-R1-1003)

MAA Session on Countering "I Can't Do Math": Strategies for Teaching Underprepared, Math-Anxious Students, I

8:00 AM – 10:55 AM

Organizers: **Bonnie Gold**, Monmouth University
Suzanne Dorée, Augsburg College
Richard J. Jardine, Keene State College

- 8:00AM *The effects of exam retakes on mathematics anxiety levels of college students enrolled in developmental mathematics.*
 ▶ (952) **Joan E Brown**, Eastern New Mexico University, Portales, NM (1014-S1-572)
- 8:20AM *Using Quizzes to Reinforce Learning and Reduce Test Anxiety.*
 (953) **Mary I Kay**, Del Mar College (1014-S1-1253)

- 8:40AM *A Decimal Point Can Kill You.* Preliminary report.
 ▶ (954) **Agnes M. Kalemaris**, SUNY Farmingdale (1014-S1-1692)
- 9:00AM *Using the "Color the Board" game to challenge anxious students' notions of mathematics.* Preliminary report.
 ▶ (955) **Mika Munakata*** and **Michael A. Jones**, Montclair State University (1014-S1-1624)
- 9:20AM *Reducing Math Anxiety by Improving the Math.*
 ▶ (956) **Steven R. Lay**, Lee University (1014-S1-380)
- 9:40AM *The role of content in countering math anxiety.* Preliminary report.
 (957) **David Marshall**, Monmouth University (1014-S1-1463)
- 10:00AM *'I Can't do Math' Where Does the Attitude Come From?*
 ▶ (958) **Jean M Horn***, Northern Virginia Community College - Woodbridge Campus, and **Harrison W Straley**, Wheaton College (1014-S1-352)
- 10:20AM *Confidence to Competence: Giving Back the Control in a Math-anxious Classroom.*
 (959) **Debasree Raychaudhuri**, CalState Los Angeles (1014-S1-1668)
- 10:40AM *Strategies for Working with Under Prepared Students and Students who Have a Poor Attitude Towards Mathematics.*
 ▶ (960) **Ann C Hanson**, Columbia College, Chicago (1014-S1-309)

MAA Session on Teaching Operations Research in the Undergraduate Classroom

8:00 AM – 10:55 AM

Organizers: **Christopher J. Lacke**, Rowan University
Paul E. Fishback, Grand Valley State University

- 8:00AM *Group Presentations in an Undergraduate Operations Research Course.* Preliminary report.
 ▶ (961) **Paul E. Fishback**, Grand Valley State University (1014-T1-751)
- 8:20AM *An Operations Research Course for Teachers.*
 ▶ (962) **Nancy J Boynton**, SUNY Fredonia (1014-T1-1568)
- 8:40AM *A Modeling Project in Linear Programming.* Preliminary report.
 ▶ (963) **Maria Cristina Villalobos**, University of Texas-Pan American (1014-T1-1633)
- 9:00AM *Assigning Upper Division Mathematics Courses at "California University".*
 ▶ (964) **Jenny Switkes**, California State Polytechnic University, Pomona (1014-T1-35)
- 9:20AM *Undergraduate Nonlinear Optimization.*
 (965) **Bill Fox**, Francis Marion University (1014-T1-625)
- 9:40AM *Open Ended Explorations in Optimization.* Preliminary report.
 ▶ (966) **Mark Parker**, Carroll College, Montana (1014-T1-1720)
- 10:00AM *Utility Trailer Cargo Bed Optimization Problem.* Preliminary report.
 ▶ (967) **Danny W Turner**, Winthrop University (1014-T1-680)
- 10:20AM *Using a CAS in the Teaching of Operations Research.*
 (968) **Christopher J. Lacke**, Rowan University (1014-T1-515)

Program of the Sessions – Saturday, January 14 (cont'd.)

- 10:40AM *TSP Generator: On-line generation of real-life traveling salesman problems.*
▶ (969) **Sean L. Forman**, Saint Joseph's University (1014-T1-624)

MAA Session on My Favorite Demo: Innovative Strategies for Mathematics Instructors, I

8:00 AM – 10:55 AM

Organizers: **David R. Hill**, Temple University
Lila F. Roberts, Georgia College & State University

- 8:00AM *Two hands-on demos for teaching about centroids in Calculus.*
▶ (970) **David M Strong**, Pepperdine University (1014-U1-74)
- 8:15AM *Image Processing With Mathematica.*
▶ (971) **Roland Minton**, Roanoke College (1014-U1-182)
- 8:30AM *Visualizing the Method of Finding Volumes by Cross Section: An Eggsperiment.*
▶ (972) **Jean Uhl**, **Patricia B Humphrey*** and **James Braselton**, Georgia Southern University (1014-U1-191)
- 8:45AM *Desktop Sharing and Collaborative Learning in a Wireless Classroom Network.*
▶ (973) **Jong H. Chung*** and **Randal E. Hickman**, United States Military Academy (1014-U1-933)
- 9:00AM *In Search of the Singular Value Decomposition.*
(974) **Thomas Hern*** and **David Meel**, Bowling Green State University (1014-U1-1026)
- 9:15AM *Visualizing Partial Derivatives without Graphs.*
▶ (975) Preliminary report.
Martin E. Flashman, Humboldt State University and Occidental College (1014-U1-1011)
- 9:30AM *Using the Geometer's Sketchpad Software for Introductory Calculus Demonstrations.*
▶ (976) **Monica Pierri-Galvao**, Gannon University (1014-U1-673)
- 9:45AM *Average and Instantaneous Rates of Change.*
▶ (977) **James J Reynolds**, Clarion University of Pennsylvania (1014-U1-562)
- 10:00AM *The Use of Spreadsheets to Illustrate Finite Mathematics Concepts.*
(978) **Paul Kochanowski** and **Morteza Shafii-Mousavi***, Indiana University South Bend (1014-U1-100)
- 10:15AM *Statistics Before Your Eyes: Photographs of Statistical Concepts.*
▶ (979) **Robert W Jernigan**, American University (1014-U1-208)
- 10:30AM *The Tablet PC: A Tool for Teaching a Large-Group Calculus Class.*
▶ (980) **Nicholas Gorgievski***, Nichols College, **Thomas C. DeFranco**, **Robert A. Stroud** and **Mary P. Truxaw**, University of Connecticut (1014-U1-506)

MAA General Contributed Paper Session, V

8:00 AM – 10:40 AM

Chair: **Sarah L. Mabrouk**, Framingham State College
Chair: **Mary Beth Searcy**, Appalachian State University
Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University

- 8:00AM *Math War in China: They Know What They Don't Know.* Preliminary report.
(981) **Annie Y Han**, The City University of New York, BMCC (1014-Z1-1715)

- 8:15AM *The history of development of mathematics in Georgia.* Preliminary report.
▶ (982) **Nino Khatiashvili**, Tbilisi IJavakhishvili State University (1014-Z1-130)
- 8:30AM *Resources for QL: Mathematics Across the Curriculum and the National Numeracy Network at the University of Nevada.*
(983) **Jerry A Johnson**, University of Nevada, Reno (1014-Z1-216)
- 8:45AM *Math: The Unpopular Culture.* Preliminary report.
▶ (984) **Victor Dorff**, California Lutheran University (1014-Z1-1584)
- 9:00AM *"But I Got the Right Answer!".*
▶ (985) **Fred Worth**, Henderson State University (1014-Z1-1582)
- 9:15AM *Multiple Assessments: Uncovering Mathematical Misunderstandings.*
▶ (986) **Susie M. Lanier*** and **Donna B. Saye**, Georgia Southern University (1014-Z1-351)
- 9:30AM *Assessing the Mathematics Core: A Mixed Method Approach at the Colorado School of Mines.*
(987) **Scott A. Strong**, **Barbara M. Moskal** and **Graeme Fairweather***, Colorado School of Mines (1014-Z1-1494)
- 9:45AM *Student Statistical Analysis of A Student Tutoring Laboratory.*
▶ (988) **Richard D. Summers**, Reinhardt College (1014-Z1-935)
- 10:00AM *Review Sheets: Motivating students to learn and self assess.* Preliminary report.
▶ (989) **Luz Maria DeAlba**, Drake University (1014-Z1-742)
- 10:15AM *Dropping Lowest Grades.*
▶ (990) **Jonathan M. Kane***, University of Wisconsin - Whitewater, and **Daniel M. Kane**, Massachusetts Institute of Technology (1014-Z1-471)
- 10:30AM *A Master's Program for Middle School Mathematics Teachers.*
▶ (991) **Julie A. Belock**, Salem State College (1014-Z1-973)

PME Council

8:00 AM – 11:00 AM

AMS Invited Address

9:00 AM – 9:50 AM

- (992) *Whitney's extension problems.*
Charles L. Fefferman, Princeton University (1014-26-05)

ASL Invited Address

9:00 AM – 9:50 AM

- (993) *Model theory of metric structures.*
C. Ward Henson, University of Illinois at Urbana Champaign

MAA Minicourse #12: Part B

9:00 AM – 11:00 AM

Getting students involved in undergraduate research.

Organizers: **Aparna W. Higgins**, University of Dayton

Joseph A. Gallian, University of
Minnesota Duluth

MAA Minicourse #1: Part B

9:00 AM – 11:00 AM

*Designing and evaluating assessments for
introductory statistics.*

Organizers: **Beth L. Chance**, California Polytech
State University
Robert C. Delmas, University of
Minnesota
Allan J. Rossman, California Polytech
State University

MAA Minicourse #7: Part B

9:00 AM – 11:00 AM

Geometry with history for teaching teachers.

Organizers: **David W. Henderson**, Cornell
University
Daina Taimina, Cornell University

MAA-YMN Panel Discussion

9:00 AM – 10:20 AM

Transitioning into graduate school.

Organizers: **Dov N. Chelst**, DeVry University
Heather Ames Lewis, Nazareth
College

MAA Session for Chairs

9:00 AM – 10:20 AM

Building bridges.

Organizers: **Catherine M. Murphy**, Purdue
University Calumet
Daniel P. Maki, Indiana University
Panelists: **Susan L. Ganter**, Clemson University
William E. Haver, Virginia
Commonwealth University

SIGMAA on the Teaching of Advanced High School Mathematics Panel Discussion

9:00 AM – 10:20 AM

AP Calculus: Friend or foe?

Organizer: **Daniel J. Teague**, North Carolina
School of Science and Mathematics
Panelists: **David M. Bressoud**, Macalaster
College
Susan Schwartz Wildstrom, Walt
Whitman High School
Daniel Kennedy, The Baylor School

MAA Poster Session

9:00 AM – 11:00 AM

Special mathematical outreach programs.

Organizers: **Elizabeth G. Yanik**, Emporia State
University
Jennifer Hontz, Meredith College
Kathleen A. Sullivan, Seattle University

MAA Committee on Technologies in Mathematics Education Panel Discussion

9:00 AM – 10:20 AM

Electronic homework systems.

Organizers: **Michael D. Hvidsten**, Gustavus
Adolphus College
Bruce W. Yoshikawa, Los Angeles
Pierce College
Panelists: **Irene Doo**, Austin Community College
Vadim V. Ponomarenko, Trinity
University
Amelia Taylor, St. Olaf College
John W. Jones, Arizona State
University

MAA-Project NEXt Panel Discussion

9:30 AM – 11:00 AM

Making the most of your sabbatical.

Organizers: **Blair F. Madore**, SUNY Potsdam
Pamela B. Pierce, College of Wooster
Panelists: **Jennifer R. Galovich**, St. John's
University
Charles R. Hampton, College of
Wooster
Judy A. Holdener, Kenyon College
William A. Marion, Valparaiso
University
Thomas Q. Sibley, St. John's University

Exhibits and Book Sales

9:30 AM – 5:30 PM

ASL Invited Address

10:00 AM – 10:50 AM

(994) *Effectively closed sets.*
Douglas Cenzer, University of Florida

Math on the Web, III

10:00 AM – 5:00 PM

10:00AM *The Math Gateway: An NSDL portal for
(995) undergraduate math.*
Lang Moore, Mathematical Association of America
12:30PM *Math-aware Web searching.*
(996) **Robert Miner**, Design Science, Inc.
1:30PM *Communicating math on the Web: Promises, trials,
(997) and free beer.*
Patrick Ion, American Mathematical Society
2:30PM *Interactive math on the Web by Maplesoft.*
(998) **Mohamed Bendame**, Maplesoft
3:30PM *Writing questions with randomized parameters in
(999) proper mathematical notation for online homework
assignments.*
John Risley, WebAssign
4:30PM *Techniques for using the equation editor in
(1000) Blackboard and WebCT.*
Bob Matthews, Design Science, Inc.

AMS Invited Address

10:05 AM – 10:55 AM

- (1001) *Persistent homology, diagrams, and vineyards.*
Herbert Edelsbrunner, Duke University (1014-55-17)

AMS-MAA Invited Address

11:10 AM – NOON

- (1002) *Spectral properties of quasiperiodic operators: The competition between order and chaos.*
Svetlana Y. Jitomirskaya, University of California Irvine (1014-81-28)

AMS Colloquium Lectures: Lecture III

1:00 PM – 2:00 PM

- (1003) *Entangled radicals, Part III.*
Hendrik W. Lenstra Jr., Universiteit Leiden (1014-12-15)

MAA Student Lecture

1:00 PM – 1:50 PM

- ▶ (1004) *The many faces of pi.*
Marc Chamberland, Grinnell College (1014-A0-22)

AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates, I

1:00 PM – 5:55 PM

Organizers: **Darren Narayan**, Rochester Institute of Technology
Carl V. Lutzer, Rochester Institute of Technology
Michael J. Fisher, California State University, Fresno
Bernard Brooks, Rochester Institute of Technology
Tamas I. Wiandt, Rochester Institute of Technology

- ▶ (1005) 1:00PM *Algebraic Model and Monte Carlo Model of Financial Management.* Preliminary report.
Yan Li*, Wells College, and **Sean Wilkoff**, University of California, Berkeley (1014-00-272)
- ▶ (1006) 1:20PM *Optimized Least Squares Approach For Valuation of American Options.*
T.J. Deems, Slippery Rock University, **Jennifer Geis**, Augsburg College, **Troy Tingey***, Arizona State University, and **Anastasia Wong**, Mills College (1014-00-307)
- ▶ (1007) 1:40PM *Size and Difficulty of Mass Problems.*
Elizabeth T Brown, James Madison University, **Andre Kornell***, Princeton University, and **Justin Palumbo**, Rutgers University (1014-03-158)
- ▶ (1008) 2:00PM *Upper Bounds in Graph Pebbling and a Look at the 2-Pebbling Property.*
Joyce D Charlesworth, Warren Wilson College, **Theang T Ho**, University of Nebraska, **Brian W Keinath***, Central Michigan University, and **David Y Lin**, Princeton University (1014-05-116)
- ▶ (1009) 2:20PM *Investigations in Nonabelian Difference Sets of Order 25.* Preliminary report.
M. Strom Borman*, Reed College, and **Ken W. Smith**, Central Michigan University (1014-05-133)

- ▶ (1010) 2:40PM *The Isoperimetric Numbers of Block Design Graphs.*
Dominic Lanphier, Western Kentucky University, **Christopher Miller**, Fairfield University, **Jason Rosenhouse**, James Madison University, and **Amber Russell***, Mississippi State University (1014-05-142)
- ▶ (1011) 3:00PM *Necessary and Sufficient Conditions for Tiling with 4×6 and 5×7 Rectangles.*
Rachell Ashley*, **Aisosa Ayela-Uwangue**, **Frances Cabrera**, **Carol Callesano**, **Darren A. Narayan**, Rochester Institute of Technology, and **Allen J. Schwenk**, Western Michigan University (1014-05-573)
- ▶ (1012) 3:20PM *Partial covering arrays and a generalized Erdős-Ko-Rado property.*
Particia Ann Carey* and **Anant P Godbole**, East Tennessee State University (1014-05-1122)
- ▶ (1013) 3:40PM *The Negs and Regs of Continued Fractions.* Preliminary report.
Alex Eustis* and **Arthur T. Benjamin**, Harvey Mudd College (1014-05-1496)
- ▶ (1014) 4:00PM *Color-Permuting Automorphisms of Cayley Graphs.* Preliminary report.
J. Bratz*, Lafayette College, **P. Cahn**, Smith College, **N. Haber**, Brown University, **E. McMahon**, Lafayette College, and **S. Tekansik**, Mesa State College (1014-05-1740)
- ▶ (1015) 4:20PM *Pursuing the Perfect Parallelepiped.*
Clifford A Reiter and **Jordan Olliver Tirrell***, Lafayette College (1014-11-343)
- ▶ (1016) 4:40PM *Fibonacci Numbers and Diophantine Equations.*
Michael T Holm*, Northwestern College, and **Ryan K Johnson**, The University of Akron (1014-11-867)
- ▶ (1017) 5:00PM *Units in $\mathbb{Q}[z, \sqrt{z^2 - 4v}]$.*
Anne L Chmura*, University of Akron, and **Sally A Hall**, Swarthmore College (1014-11-1396)
- ▶ (1018) 5:20PM *Class Number Divisibility in Cubic Function Fields.*
Nathan Kaplan*, Princeton University/Williams College, **Carl Erickson**, Stanford University/Williams College, **Allison Pacelli**, **Neil Mendoza** and **Todd Shayler**, Williams College (1014-11-1626)
- ▶ (1019) 5:40PM *3-rank in Class Groups of Quadratic Number Fields.*
Carl Erickson*, Stanford University and Williams College, **Nathan Kaplan**, Princeton University and Williams College, **Neil Mendoza**, **Allison Pacelli** and **Todd Shayler**, Williams College (1014-11-1412)

AMS-MAA Special Session on History of Mathematics, I

1:00 PM – 5:55 PM

- Organizers: **Joseph W. Dauben**, Herbert H. Lehman College (CUNY)
Patti Hunter, Westmont College
Karen H. Parshall, University of Virginia
- ▶ (1020) 1:00PM *Reconstructing Early Developments of Determinants in China: Evidence from the "Nine Chapters of Mathematical Methods" (Jiu zhang suan shu) and Later Commentaries.*
Roger Hart, University of Texas at Austin (1014-01-497)
 - ▶ (1021) 1:30PM *Western Concepts of Infinity Introduced to China in the Seventeenth Century.* Preliminary report.
Yibao Xu, Borough of Manhattan Community College of the City University of New York (1014-01-916)

- 2:00PM *Giacomo Rho (1592-1638) and his mathematical work in Beijing.*
▶ (1022) **Jose A. Cervera**, ITESM, Campus Monterrey, Dep. Estudios Humanisticos (1014-01-693)
- 2:30PM *Descartes, the Princess Elisabeth, and the Problem of Apollonius: The dangers of Underestimating a Geometrical Problem.*
▶ (1023) **Henk J.M. Bos**, Utrecht University, The Netherlands (1014-51-456)
- 3:00PM *A War of Words in Pictures: the Dispute between Montmort and De Moivre over the Probability Calculus.*
▶ (1024) **David R Bellhouse**, Department of Statistical and Actuarial Sciences, University of Western Ontario (1014-01-465)
- 3:30PM *On a Result of Lagrange in the Theory of Infinite Series.* Preliminary report.
▶ (1025) **Craig G. Fraser**, University of Toronto (1014-01-637)
- 4:00PM *Early Theories of Vectors.*
▶ (1026) **Sandro Caparrini**, Dibner Institute for the History of Science, Cambridge MS (1014-01-503)
- 4:30PM *Cayley's counting problems.* Preliminary report.
▶ (1027) **Anthony J. Crilly**, Middlesex University (1014-01-504)
- 5:00PM *Mathematical crystallography after Hilbert's 18th problem.* Preliminary report.
(1028) **Jeanine Daems**, Leiden University (1014-01-733)
- 5:30PM *Euler's Amicable Numbers.*
▶ (1029) **William Dunham**, Muhlenberg College (1014-01-510)

AMS-SIAM Special Session on Nonlinear Dynamical Systems, III

1:00 PM – 5:55 PM

Organizers: **Zhijun Qiao**, University of Texas Pan American
Andras Balogh, University of Texas Pan American
Guihua Fei, University of Minnesota Duluth
Zhaosheng Feng, University of Texas Pan American

- 1:00PM *A Nash-Moser inverse function result using continuous Newton's method.*
▶ (1030) **John W. Neuberger**, University of North Texas (1014-35-391)
- 1:30PM *Mathematical Analysis of the Fourier Spectrum of Chaos with Applications to the Chaotic Vibration of the Wave Equation with a Nonlinear Boundary Condition.*
(1031) **Goong Chen**, Texas A&M University (1014-35-632)
- 2:00PM *Spectral Representations of Solutions of linear evolution equations using Steklov eigenfunctions.* Preliminary report.
(1032) **Giles Auchmuty**, National Science Foundation (1014-49-597)
- 2:30PM *A Nonlinear Parabolic/Hyperbolic System Arising in a Size Dependent Population Dynamics Model.*
(1033) **Jay R. Walton**, Texas A&M University (1014-35-414)
- 3:00PM *Canonical Duality Theory and Method for Solving Non-convex and Non-conservative Hamilton Systems with Applications.*
(1034) **David Yang Gao**, Virginia Tech, Blacksburg, VA (1014-35-737)

- 3:30PM *Newton's Method and Partial Differential and difference Equations.*
(1035) **John M Neuberger***, **James W Swift** and **Nandor Sieben**, Northern Arizona University (1014-35-518)
- 4:00PM *Anti-symmetric KdV equation and application to ocean waves.* Preliminary report.
▶ (1036) **Lokenath Debnath**, University of Texas - Pan American (1014-35-615)
- 4:30PM *Decomposition method for Camassa-Holm equation.*
(1037) **Sadefo Kamdem Jules***, Université de Reims, UMR CNRS 6056, and **Qiao Zhijun**, University of Texas Pan-American (1014-35-135)
- 5:00PM *Approximation of Eigenvalues of a Class of Fourth Order Nonselfadjoint Differential Operators.* Preliminary report.
▶ (1038) **Andras Balogh*** and **Roberto Castillo**, University of Texas - Pan American (1014-65-1096)
- 5:30PM *Qualitative Study to A Reaction-Diffusion Equation.*
(1039) **Zhaosheng Feng***, University of Texas-Pan American, and **Qingguo Meng**, Tianjin University of Technology and Education (1014-35-278)

AMS-SIAM Special Session on Analysis and Implementation of Finite Element Methods

1:00 PM – 5:20 PM

Organizer: **Atife Caglar**, University of Wisconsin-Green Bay

- 1:00PM *Domain Decomposition Preconditioners for C^0 Interior Penalty Methods.*
(1040) **Kening Wang*** and **Susanne C. Brenner**, University of South Carolina (1014-65-1303)
- 1:30PM *Sensitivity Analysis and Control of Systems Governed by Partial Differential Equations.*
▶ (1041) **Lisa G. Davis***, Montana State University, and **John Singler**, Oregon State University (1014-65-1485)
- 2:00PM *Efficient Implementation of Characteristic Finite Element Methods.*
(1042) **Jiangguo Liu***, Colorado State University, **Hongsen Chen**, **Richard E Ewing** and **Guan Qin**, Texas A&M University (1014-65-184)
- 2:30PM *No-Slip Boundary Conditions for Navier-Stokes Equations by a Penalty Method.*
(1043) **Atife Caglar***, University Of Wisconsin-Green Bay, and **Anastasios Liakos**, US Naval Academy-Annapolis, MD (1014-65-01)
- 3:00PM *Numerical Simulation of Fractured Porous Medium.*
(1044) **Shuang Li*** and **Hong Wang**, University of South Carolina (1014-65-1289)
- 3:30PM *A Nonconforming Finite Element Method for the Reduced Time-Harmonic Maxwell Equations.*
(1045) **Susanne C. Brenner**, **Fengyan Li*** and **Li-Yeng Sung**, University of South Carolina, Columbia, SC (1014-65-971)
- 4:00PM *An alternating-direction finite element method combined with a modified method of characteristics for the problem of the pollution of groundwater in duple porous media.*
(1046) **Ming Cui**, Jinan, China (1014-65-124)
- 4:30PM *A new version of implementing h-adaptivity of finite element method for elliptic problems.* Preliminary report.
(1047) **Ivan I. Dyyak*** and **Mazen Shahin**, Delaware State University (1014-65-1675)
- 5:00PM *Sensitivity Analysis and a Second Order Semi-Implicit Scheme for Large Eddy Simulation.*
(1048) **Faranak Pahlevani*** and **Lisa Davis Stanley**, Montana State University (1014-65-1570)

AMS-SIAM Special Session on Time Reversal Methods: Analysis and Applications, I

1:00 PM – 6:00 PM

Organizers: **Peter A. McCoy**, U.S. Naval Academy
Reza Malek-Madani, U.S. Naval Academy

- 1:00PM *Interferometric array imaging in clutter.*
(1049) Preliminary report.
George C Papanicolaou, Stanford University (1014-60-1505)
- 1:30PM *Wave diffusion in two dimensions.*
(1050) **Tomasz Komorowski**, University of Marie Curie-Sklodowska, and **Lenya Ryzhik***, University of Chicago (1014-60-982)
- 2:00PM *Time Reversal in Randomly Layered Media.*
(1051) **Jean-Pierre Fouque**, Statistics and Applied Probability, UC Santa Barbara (1014-60-458)
- 2:30PM *Propagation and Detection in a Cluttered Environment.*
(1052) **Knut Solna**, University of California at Irvine (1014-00-1571)
- 3:00PM Break
- 3:30PM *Time-reversal techniques applied to communications through unknown obscuring medium.*
(1053) **Akira Ishimaru***, **Sermsak Jaruwatanadilok** and **Yasuo Kuga**, University of Washington (1014-00-316)
- 4:00PM *Adaptive coherent interferometric imaging.*
(1054) **Chrysoula Tsogka***, University of Chicago, **L Borcea**, Rice University, and **G Papanicolaou**, Stanford University (1014-86-1634)
- 4:30PM *A direct imaging algorithm for extended targets using active arrays.*
(1055) **Hongkai Zhao**, University of California, Irvine (1014-35-1621)
- 5:00PM *Kinetic models for wave propagation in random media.*
(1056) **Guillaume Bal**, Columbia University (1014-35-856)
- 5:40PM *Adaptive Coherent Interferometric Imaging in Cluttered Media.*
(1057) **Liliana Borcea**, Rice University (1014-60-322)

AMS-SIAM Special Session on Stochastic, Large Scale and Hybrid Systems with Applications, I

1:00 PM – 5:20 PM

Organizers: **Aghalaya S. Vatsala**, University of Louisiana at Lafayette
Gangaram S. Ladde, University of Texas at Arlington

- ▶ 1:00PM *Numerical Experiments with Differential Automata Models of Hybrid Systems.* Preliminary report.
(1058) **Lucio Tavernini**, University of Texas at San Antonio (1014-65-858)
- ▶ 1:30PM *Valuation and Hedging of Power-Sensitive Contingent Claims for Power with Spikes: a Non-Markovian Approach.*
(1059) **Valery A. Kholodnyi**, Middle Tennessee State University (1014-90-388)
- 2:00PM *Mean Reversal for Transformed Dynamical Systems.* Preliminary report.
(1060) **Andrzej Korzeniowski**, University of Texas at Arlington (1014-60-1700)

- 2:30PM *Molecular based model for the viscoelasticity of rubber.*
(1061) **Negash G Medhin**, North Carolina State University (1014-00-775)
- ▶ 3:00PM *Boundary Value Problems Arising in Diffusion of Chemically Reactive Species in a Porous Medium.*
(1062) **Kuppalapalle Vajravelu**, University of Central Florida (1014-34-349)
- 3:30PM *Numerical Solution to Hybrid Fuzzy Systems.* Preliminary report.
(1063) **M Sambandham*** and **Steve Pederson**, Morehouse College (1014-34-1044)
- 4:00PM *Generalized Monotone Method for Stochastic Initial Value Problems.* Preliminary report.
(1064) **Gangaram S. Ladde**, University of Texas at Arlington, and **Aghalaya S Vatsala***, University of Louisiana at Lafayette (1014-34-426)
- ▶ 4:30PM *An Efficient Ensemble Kalman Filter for Numerical Weather Prediction.*
(1065) **John Harlim***, University of Maryland, and **Brian Hunt**, Institute for Physical Science and Technology, University of Maryland (1014-76-347)
- 5:00PM *Numerical Solutions for Stochastic Controls and Differential Games of Regime-Switching Diffusions.* Preliminary report.
(1066) **Q. S. Song***, **George Yin** and **Zhimin Zhang**, Wayne State University (1014-60-57)

AMS Special Session on Current Events

1:00 PM – 4:45 PM

Organizer: **David Eisenbud**, Mathematical Sciences Research Institute

- ▶ 1:00PM *Contact network epidemiology: Bond percolation applied to infectious disease prediction and control.*
(1067) **Lauren Ancel Meyers**, Section of Integrative Biology, University of Texas at Austin (1014-92-1354)
- ▶ 2:00PM *Small gaps between prime numbers.*
(1068) **Kannan Soundararajan**, University of Michigan, Ann Arbor (1014-11-1450)
- 3:00PM *Probabilistically Checkable Proofs.*
(1069) **Madhu Sudan**, MIT (1014-68-1107)
- ▶ 4:00PM *Symmetry in Neuroscience.* Preliminary report.
(1070) **Martin Golubitsky**, University of Houston (1014-92-808)

AMS Special Session on Algebraic Groups, Symmetric Spaces, and Invariant Theory

1:00 PM – 5:50 PM

Organizers: **Aloysius G. Helminck**, North Carolina State University
Dan Gagliardi, St. Lawrence University

- 1:00PM *Cartan decomposition of the moment map.*
(1071) **Peter Heinzner**, Ruhr-Universitaet Bochum, and **Gerald Schwarz***, Brandeis University (1014-22-501)
- 1:30PM *Decomposing a modular representation of Z/p^2 .*
(1072) **David L Wehlau**, Royal Military College of Canada (1014-13-313)
- 2:00PM *Adapted complex structures in Lie theory.* Preliminary report.
(1073) **Ralph J Bremigan**, Ball State University (1014-22-763)
- 2:30PM *Vector Invariant Rings.*
(1074) **Jianjun Chuai**, University of Montreal (1014-13-836)

- 3:00PM *Intertwining operators related to p -adic symmetric varieties.*
(1075) **G. F. Helminck***, University of Twente, and **A. G. Helminck**, North Carolina State University (1014-22-1008)
- 3:30PM *On the Classification of Orbits of Symmetric Varieties Acting on Flag Varieties of $SL(2, k)$.*
(1076) **Stacy L Beun*** and **Aloysius Helminck**, North Carolina State University (1014-20-739)
- 4:00PM *Bilinear Forms on $V = k^n$ and Involutions of $SL(n, k)$ and $SO(n, k, \beta)$.*
(1077) **Christopher E. Dometrius***, Wake Forest University, **Aloysius Helminck**, North Carolina State University, and **Ling Wu**, Seattle, Washington (1014-20-1023)
- 4:30PM *On the classification of k -involutions of $SP(2n, k)$.*
(1078) Preliminary report.
Farrah Jackson Chandler, University of North Carolina-Wilmington (1014-20-1073)
- 5:00PM *Algorithms for reductive symmetric spaces.*
(1079) **Jennifer Daniel**, Lamar University (1014-20-1219)
- 5:30PM *Algorithms for computing characters of symmetric spaces.*
(1080) **Daniel J Gagliardi***, Saint Lawrence University, and **Aloysius G Helminck**, North Carolina State University (1014-20-1488)

AMS Special Session on Quantum Invariants of Knots and 3-Manifolds, I

1:00 PM – 5:50 PM

- Organizers: **Patrick M. Gilmer**, Louisiana State University
Charles D. Frohman, University of Iowa
- 1:00PM *Classical and quantum 3-manifold invariants.*
(1081) **Charles Frohman**, The University of Iowa, and **Joanna Kania-Bartoszyńska***, National Science Foundation (1014-57-1151)
- 1:30PM *On integrality of quantum invariants of rational homology 3-spheres.* Preliminary report.
(1082) **Thang T. Q. Le**, Georgia Institute of Technology (1014-57-1021)
- 2:00PM *Holonomic relations between quantum invariants.*
(1083) Preliminary report.
Adam S. Sikora, SUNY Buffalo (1014-57-855)
- 2:30PM *Asymptotics of the quantum $SU(2)$ -invariants for surgeries on the figure 8 knot.*
(1084) **Soren K Hansen**, Kansas State University (1014-57-511)
- 3:00PM *The Kauffman Bracket Skein Module of Torus Knots.*
(1085) Preliminary report.
Kristen Sellke, The University of Iowa (1014-57-691)
- 3:30PM *Triad Spaces in the Kauffman Skein Theory.*
(1086) Preliminary report.
Jianyuan Kathy Zhong* and **Bin Lu**, California State University Sacramento (1014-57-482)
- 4:00PM *Finding the basis of the Hilbert space of a certain quantum system.*
(1087) **Razvan Gelca**, Texas Tech University (1014-81-718)
- 4:30PM *Integral Bases for Certain TQFT-Modules of the Torus.*
(1088) **Khaled M Qazaqzeh**, Louisiana State University (1014-57-608)

- 5:00PM *The Positive Root Posets of Coxeter groups and Special bases for the associated Temperley Lieb algebras (Preliminary Report).*
(1089) **Neal W. Stoltzfus**, Louisiana State University (1014-57-710)
- 5:30PM *Reducibility of Quantum- $SU(n)$ Representations of Mapping Class Groups.* Preliminary report.
(1090) **Qi Chen** and **Thomas Kerler***, The Ohio State University (1014-57-1095)

AMS Special Session on New Developments in Symplectic Topology, I

1:00 PM – 5:50 PM

- Organizers: **Dusa McDuff**, SUNY at Stony Brook
Aleksey Zinger, SUNY at Stony Brook
Ely Kerman, University of Illinois at Urbana-Champaign
Margaret F. Symington, Georgia Institute of Technology and Mercer University
- 1:00PM *On the classification of symplectic 6-manifolds with semi-free circle actions.*
(1091) **Eduardo Gonzalez**, Rutgers University (1014-53-750)
- 1:30PM *Semi-global invariants of piece-wise smooth Lagrangian fibrations.*
(1092) **Ricardo Castano-Bernard***, Max Planck Institut for Mathematics & University of Leipzig, and **Diego Matessi**, Universita degli Studi del Piamonte Orientale (1014-53-1241)
- 2:00PM *Toric Integrable Geodesic Flows.* Preliminary report.
(1093) **Christopher Rae Lee**, University of Illinois at Urbana-Champaign (1014-53-1334)
- 2:30PM *Holomorphic curves in Lagrangian torus fibrations.*
(1094) **Brett D Parker**, MIT (1014-58-488)
- 3:00PM *Estimated transversality.*
(1095) **Rosa Sena-Dias**, Harvard University (1014-51-1708)
- 3:30PM *From Morse functions to Lefschetz fibrations, and related invariants.*
(1096) **Joseph A Johns**, IL (1014-53-785)
- 4:00PM *Spaces of symplectic embeddings of disjoint balls in $\mathbb{C}P^2$.* Preliminary report.
(1097) **Martin Pinsonnault**, Fields Institute (1014-53-1521)
- 4:30PM *Bi-invariant metrics on the group of symplectomorphisms.*
(1098) **Zhigang Han**, State University of New York at Stony Brook (1014-54-448)
- 5:00PM *The Conley conjecture near nowhere-coisotropic submanifolds.*
(1099) **Basak Gurel**, SUNY at Stony Brook (1014-53-960)
- 5:30PM *Towards the continuous Hamiltonian dynamical systems.*
(1100) **Yong-Geun Oh**, University of Wisconsin-Madison (1014-58-469)

AMS Special Session on the Many Lives of Lattice Theory, the Theory of Ordered Sets, and Universal Algebra, III

1:00 PM – 5:50 PM

- Organizers: **Japheth L.M. Wood**, Chatham College
John W. Snow, Sam Houston State University
Jonathan D. Farley, Harvard University

Stefan E. Schmidt, Phoenix Math Systems Modeling, Inc.
Anthony A. Harkin, Harvard University

H. Thomas Banks, North Carolina State University

- 1:00PM *Asymptotic growth of free spectra of monoids.* Preliminary report.
 (1101) **Steven W. Seif**, University of Louisville (1014-20-1663)
- 1:30PM *Finite Algebras that Generate Congruence-Distributive Varieties.* Preliminary report.
 (1102) **Howard C Lee**, UCLA (1014-08-716)
- 2:00PM *An Intersection Property of Subalgebras in Congruence Distributive Varieties.* Preliminary report.
 (1103) **Matt Valeriote**, McMaster University (1014-08-354)
- 2:30PM *Algebraic characterizations for topological separation properties.*
 (1104) **Wolfram F Bentz**, Sir Wilfrid Laurier University (1014-08-1630)
- 3:00PM *Edge Colorings and Weak Representations.* Preliminary report.
 (1105) **Jeremy F Alm**, Iowa State University (1014-06-1223)
- 3:30PM *A Unique Normal Decomposition Lattice without the representation.* Preliminary report.
 (1106) **Michael E. Detlefsen**, Slippery Rock University (1014-06-1155)
- ▶ 4:00PM *On general constructions of Macaulay posets.* Preliminary report.
 (1107) **Sergei L Bezrukov**, University of Wisconsin - Superior (1014-05-946)
- 4:30PM *Infinite Products of Ordered Sets with the Fixed Point Property.*
 (1108) **Bernd S. W. Schroeder**, Louisiana Tech University (1014-06-60)
- 5:00PM *On some properties of Post lattices of r -classifications.*
 (1109) **Michel P. Serfati**, IREM- Université Paris VII / Denis Diderot (1014-06-39)
- 5:30PM *Representable Idempotent Commutative Residuated Lattices.*
 (1110) **Jeffrey S Olson**, University of Illinois at Chicago (1014-06-1410)

MAA Minicourse #13: Part B

1:00 PM – 3:00 PM

The Fibonacci and Catalan numbers.
 Organizer: **Ralph P. Grimaldi**, Rose-Hulman Institute of Technology

MAA Minicourse #2: Part B

1:00 PM – 3:00 PM

Java applets in teaching mathematics.
 Organizers: **Joe Yanik**, Emporia State University
Michael E. Mays, West Virginia University

MAA Minicourse #8: Part B

1:00 PM – 3:00 PM

Mathematical and statistical modeling in biology: Competitive exclusion, coexistence, estimation, and control.
 Organizers: **Azmy S. Ackleh**, University of Louisiana at Lafayette

AMS Session on Analysis on Graphs, Polytopes, and Groups

1:00 PM – 2:10 PM

- 1:00PM *The Euler Characteristic of Graph Configuration Spaces.*
 (1111) **David G.C. Handron**, Carnegie Mellon University (1014-57-845)
- 1:15PM *Heat Kernel Asymptotics on Euclidean Polytopal Complexes.* Preliminary report.
 (1112) **Melanie Anne Pivarski**, Cornell University (1014-57-1275)
- 1:30PM *The Fourier Inversion Formula for the Continuous Spectrum of $L^2(\Gamma \backslash G)$.* Preliminary report.
 (1113) **Keith R. Ouellette**, University of California, Los Angeles (1014-43-628)
- 1:45PM *The Kelvin-Neumanlinna-Royden Criterion and the Existence of solution in p -Dirichlet spaces to the Poisson equation for p -Laplacian on Graphs.*
 (1114) **Lucio M.G. Prado**, BMCC (1014-31-1309)
- 2:00PM *Sharp Hardy-type inequalities and uncertainty principle inequality on Carnot Groups.*
 (1115) **Ismail Kombe**, Oklahoma City University (1014-43-1721)

AMS Session on Geometry: Convex, Discrete, Differential

1:00 PM – 5:40 PM

- 1:00PM *Differential Invariants of Geometric Structures.*
 (1116) **Stanislav Dubrovskiy**, Keio University, Yokohama Japan (1014-53-33)
- 1:15PM *New Results on Gromov's Distortion.*
 (1117) **Chad A.S. Mullikin**, University of Georgia (1014-53-137)
- 1:30PM Break
- 1:45PM *A New Family of Curvature Homogeneous Pseudo-Riemannian Manifolds.* Preliminary report.
 (1118) **Corey M Dunn**, University of Oregon (1014-53-765)
- 2:00PM *Transversely holomorphic flows on 3-manifolds and singular projectable vector fields.* Preliminary report.
 (1119) **Amine Fawaz**, The University of Texas of the Permian Basin (1014-53-983)
- 2:15PM *Helicity of vector fields on S^3 .*
 (1120) **Jason Parsley**, University of Georgia (1014-53-1467)
- 2:30PM *Conformal algebras in 3D and their generalization.* Preliminary report.
 (1121) **Daniela Mihai*** and **George Sparling**, University of Pittsburgh (1014-53-1537)
- 2:45PM *Extremal properties of logarithmic spirals.*
 (1122) **Michael D Bolt**, Calvin College (1014-53-1652)
- 3:00PM *Topological remarks on closed orientable cohomogeneity one 4-manifolds via harmonic forms.*
 (1123) **Eduard Chiru**, Ohio State University (1014-53-1658)
- 3:15PM *Hexagonal Refinement Preserves Combinatorial Type.* Preliminary report.
 (1124) **William Wood**, Florida State University (1014-52-1030)
- 3:30PM Break

- 3:45PM *Squaring the Plane.*
 ▶ (1125) **Frederick V Henle**, Mercersburg Academy, and **James M Henle***, Smith College (1014-52-1524)
- 4:00PM *j, k – planes of order 4^3 .*
 (1126) **Oscar E. Vega**, University of Iowa (1014-51-892)
- 4:15PM *The Three-Point Problem in Taxicab Circles.*
 ▶ (1127) **Shing S. So***, **Mohamad Bkdadi** and **Mahmoud Yousef**, Central Missouri State University (1014-51-888)
- 4:30PM *Existence and Uniqueness of Ellipses in the Taxicab Geometry.*
 ▶ (1128) **Shing So**, **Mahmoud Yousef** and **Dale Bachman***, Central Missouri State University (1014-51-1132)
- 4:45PM *Self-similar systems and complex dimensions.*
 ▶ (1129) Preliminary report.
Michel L. Lapidus and **Erin P. J. Pearse***, University of California, Riverside (1014-37-153)
- 5:00PM *An application of parallel-axis theorem to geometric inequalities.* Preliminary report.
 ▶ (1130) **Mostafa Ghandehari***, University of Texas at Arlington, and **Fred Kashefi**, University of Texas Arlington (1014-52-26)
- 5:15PM *Stable minimal hypersurfaces.*
 (1131) **Junfang Li**, University of Oklahoma (1014-35-114)
- 5:30PM *Nonexistence of stable manifolds in an ellipsoid.*
 ▶ (1132) Preliminary report.
Lina Wu, The University of Oklahoma (1014-53-289)

AMS Session on Mathematical Biology, II

1:00 PM – 4:40 PM

- 1:00PM *Optimal control of drug delivery to brain tumors for a two dimensional case using Galerkin finite element method.*
 (1133) **Siddhartha P Chakrabarty*** and **Floyd B Hanson**, University of Illinois at Chicago (1014-92-1350)
- ▶ 1:15PM *A mathematical model of tumor angiogenesis, equilibria and stability in the one and two dimensional cases.* Preliminary report.
 (1134) **Andrew Lewis Matteson**, Texas A&M University (1014-92-1368)
- 1:30PM *Three Dimensional Stress Distribution in Axisymmetric Cerebral Saccular Aneurysms.*
 (1135) **Dawn Alisha Lott***, Delaware State University, **Hans R. Chaudhry**, **Michael Siegel**, New Jersey Institute of Technology, and **Charles J. Prestigiacomio**, University of Medicine and Dentistry of New Jersey (1014-92-1388)
- ▶ 1:45PM *Optimal Control of Plant Invasions.*
 (1136) **Andrew J Whittle*** and **Suzanne Lenhart**, University of Tennessee (1014-92-1400)
- 2:00PM *A mathematical framework for the modeling of atherosclerosis.*
 (1137) **Laura R Ritter***, Texas A&M University, **Akif I Ibragimov**, Texas Tech University, **Catherine J McNeal**, Dept. of Internal Medicine, Div. of Cardiology Department of Pediatrics, Div. of Endocrinology Scott & White Hospital, and **Jay R Walton**, Texas A&M University (1014-92-1404)
- ▶ 2:15PM *Modeling Tri-trophic Interactions.* Preliminary report.
 (1138) **Janet Andersen*** and **Tom Bultman**, Hope College (1014-92-1428)

- 2:30PM *Optimal harvesting during an invasion of a sublethal plant pathogen.*
 (1139) **Holly D. Gaff***, University of Maryland, Baltimore, **Hem Raj Joshi**, Xavier University, and **Suzanne Lenhart**, University of Tennessee, Knoxville (1014-92-1503)
- ▶ 2:45PM *Multifrequency Forcing of a Nonlinear Oscillator Model of the Inner Ear.* Preliminary report.
 (1140) **K A Montgomery**, University of Utah (1014-92-1555)
- 3:00PM *Custom performance functions for ANN applications to coastal water level forecast.*
 ▶ (1141) **G. Beate Zimmer***, **Philippe Tissot** and **Alexey Sadovski**, Texas A&M University - Corpus Christi (1014-92-1637)
- 3:15PM *Clustering, Fixed Rank Approximation Algorithm, and DNA Microarrays.*
 (1142) **Amir Niknejad**, University of Illinois at Chicago (1014-92-1642)
- ▶ 3:30PM *Comparison of Different Optimization Techniques Applied to the Soft Protein Docking Problem.*
 (1143) **Victoria A Shimanovich***, University of Iowa, Iowa City, and **Alberto Maria Segre**, Department of Computer Science, Center for Statistical Genetics, UI (1014-92-1734)
- 3:45PM *Modeling in Kidney Functions.*
 ▶ (1144) **Saziye Bayram**, SUNY- Buffalo (1014-35-1648)
- 4:00PM *Multiple-Spike Ground State Solutions of the Activator-Inhibitor Equations.*
 (1145) **Yuncheng You**, University of South Florida (1014-35-767)
- 4:15PM *Stochastic approximations of Volterra Integro-differential equation arising in neurosciences.*
 (1146) **M M Rahman**, University of North Florida (1014-92-1203)
- ▶ 4:30PM *Modeling the Divergence of Two Genetic Lineages.*
 (1147) **Scott R. Herriott**, Maharishi University of Management (1014-92-1316)

AMS Session on Ordinary Differential Equations

1:00 PM – 4:10 PM

- 1:00PM *Networks of Three Identical Coupled Systems.*
 (1148) **Maria C.A. Leite***, Purdue University, and **Martin Golubitsky**, University of Houston (1014-34-553)
- 1:15PM *Solution of Differential Equations Using Hypergeometric-Type Functions.*
 (1149) **A. Gary Childs**, University of North Alabama (1014-34-264)
- 1:30PM *Integro differential systems with state dependent delay and the instability.*
 (1150) **Seenith Sivasundaram**, Embry-Riddle University (1014-34-374)
- 1:45PM *Stability of solutions for shearing flow of nematic liquid crystals under an external field.*
 (1151) **Arup Mukherjee***, Montclair State University, NJ, and **Bagisa Mukherjee**, Penn State University, Worthington Scranton, Dunmore (1014-34-911)
- ▶ 2:00PM *Nonlinear Second Order Boundary Value Problems with Multiple Solutions.* Preliminary report.
 (1152) **John V Baxley** and **Kristen Elizabeth Kobylus***, Wake Forest University (1014-34-1082)
- 2:15PM *Uniqueness Implies Uniqueness, Uniqueness Implies Existence for Nonlocal Boundary Value Problems for Third Order Differential Equations.*
 (1153) **Michael J. Gray**, Baylor University (1014-34-1178)

- 2:30PM *Traveling Pulses for the Klein-Gordon Equation on a Lattice or Continuum with Long-range Interaction.* (1154)
Peter W Bates and **Chunlei Zhang***, Michigan State University (1014-34-1267)
- 2:45PM *Pervasiveness of Polynomial Differential Equations.* Preliminary report. (1155)
David C. Carothers* and **G. Edgar Parker**, James Madison University (1014-34-1580)
- 3:00PM *Properties of periodic solutions generated by Hopf bifurcation of a neutral delay-differential equation.* (1156)
Marion Weedermann, Dominican University (1014-34-1617)
- 3:15PM *Asymptotic Behavior of Solutions of a Nonhomogenous Refinement Differential Equation.* (1157)
Gnana Bhaskar Tenali and **Sameer Kumar M.K.***, Florida Institute of Technology (1014-34-1627)
- 3:30PM *Index Theory for Symplectic Paths and the Stability of Periodic Solutions for N-body Problem.* (1158)
Tiancheng Ouyang and **Zhifu Xie***, Brigham Young University (1014-37-221)
- 3:45PM *A New Technique for Asymptotic Summation of Potentially Oscillatory Difference Systems.* (1159)
Harry Gingold and **Fei Xue***, West Virginia University (1014-39-567)
- 4:00PM *Nonlinear strongly monotone quasivariational inclusions.* (1160)
Ram U. Verma, University of Akron (1014-49-75)

MAA Session on Achieving Quantitative Literacy, I

1:00 PM – 3:55 PM

- Organizers: **Aaron G. Montgomery**, Central Washington University
Stuart Boersma, Central Washington University
Semra Kilic-Bahi, Colby Sawyer College
- 1:00PM *Paradoxes: Explanations and Discussions.* Preliminary report. (1161)
Saburo Matsumoto, The Master's College (1014-P1-79)
- 1:15PM *A Contemporary Approach to Quantitative Literacy in a College Mathematics Curriculum.* (1162)
Jay P Abramson* and **Matt Isom**, Arizona State University (1014-P1-20)
- 1:30PM *How a writing assignment changed our understanding of quantitative literacy.* Preliminary report. (1163)
Allen Emerson* and **Kris Green**, St. John Fisher College (1014-P1-1543)
- 1:45PM *QL Spreadsheet Modules: Lessons from the Spreadsheets Across the Curriculum Workshop.* (1164)
Eric C. Gaze, Alfred University (1014-P1-288)
- 2:00PM *Learning to Make Inferences: Connecting Quantitative Literacy and Language Arts for Math and English Preservice Teachers.* Preliminary report. (1165)
Kimberly M. Vincent* and **Beth Buyserie**, Washington State University (1014-P1-1490)
- 2:15PM *Incorporating Civic Engagement in Quantitative Literacy Courses.* Preliminary report. (1166)
Thomas M Zachariah*, **Suzanne Larson** and **Jacqueline M Dewar**, Loyola Marymount University (1014-P1-1260)
- 2:30PM *Ethnomathematics: Fusion or Fear.* Preliminary report. (1167)
Michelle R DeDeo, University of North Florida (1014-P1-1425)

- 2:45PM *The Quantitative Reasoning requirement at the University of Massachusetts Boston.* (1168)
Maura B Mast* and **Mark Pawlak**, University of Massachusetts Boston (1014-P1-1443)
- 3:00PM *News Math: Working toward QL.* (1169)
Bernard L. Madison, University of Arkansas (1014-P1-49)
- 3:15PM *Developing a QL Program: Do's and Don'ts.* (1170)
Judith Flagg Moran, Trinity College Hartford CT (1014-P1-830)
- 3:30PM *Defining and Implementing Quantitative Literacy Programs.* (1171)
Rick Gillman, Valparaiso University (1014-P1-32)
- 3:45PM *An Overview of QL/QR Programs, Events and Publications.* Preliminary report. (1172)
Caren Diefenderfer*, Hollins University, **Rebecca Hartzler**, Seattle Central Community College, and **Cinnamon Hillyard**, University of Washington, Bothell (1014-P1-1269)

MAA Session on My Favorite Demo: Innovative Strategies for Mathematics Instructors, II

1:00 PM – 3:55 PM

- Organizers: **David R. Hill**, Temple University
Lila F. Roberts, Georgia College & State University
- 1:00PM *Sine Waves and Sound.* (1173)
David R Hill*, Temple University, and **Lila F. Roberts**, Georgia College and State University (1014-U1-213)
- 1:15PM *Discovering the Euler Characteristic & Duality Through Platonic Solids: AKA "Exactly Five Platonic Solids—Part II".* (1174)
Jacqueline Anderson Hall, Longwood University, Farmville, VA (1014-U1-848)
- 1:30PM *Using Fluid Flow to Illustrate Properties of Vector Fields.* (1175)
Mike O'Leary, Towson University (1014-U1-499)
- 1:45PM *Getting Acquainted With the Harmonic Series.* Preliminary report. (1176)
David Fowler, University of Nebraska-Lincoln (1014-U1-271)
- 2:00PM *Poll the Audience: Using ConcepTests in Teaching Mathematics.* Preliminary report. (1177)
Patti Frazer Lock, St. Lawrence University (1014-U1-258)
- 2:30PM *Tower of Hanoi.* (1178)
Kimberly Jordan Burch, Indiana University of Pennsylvania (1014-U1-163)
- 2:45PM *Modeling Activity to Develop Sequential, Power and Exponential Functions.* (1179)
Kathleen Cage Mittag, The University of Texas at San Antonio (1014-U1-19)
- 3:00PM *More Paradoxical than the St. Petersburg Paradox?* (1180)
Arnold Lebow, Yeshiva University (1014-U1-956)
- 3:15PM *A First Application of Fourier Series Using Spreadsheets.* (1181)
Donald C. York, University of the Virgin Islands (1014-U1-831)
- 3:30PM *Animated Spreadsheet Demonstrations for Linear Algebra.* (1182)
Deane E. Arganbright, Korea Advanced Institute of Science and Technology (1014-U1-294)

MAA Session on Mathematics and Popular Culture

1:00 PM – 4:55 PM

Organizers: **Sarah J. Greenwald**, Appalachian State University

Christopher D. Goff, University of the Pacific

- ▶ 1:00PM *Exploiting math moments from reality television in the classroom.* Preliminary report.
Mark S MacLean, Seattle University (1014-V1-339)
- ▶ 1:20PM *Prisoners' Dilemma and the TV Game Show "Friend or Foe".* Preliminary report.
Paul R. Coe*, Dominican University, **William T. Butterworth**, DePaul University, **Peter Alonzi** and **Daniel Condon**, Dominican University (1014-V1-1374)
- ▶ 1:40PM *Mathematics and Science in the Whedon Universe ("Buffy the Vampire Slayer", "Angel", and "Firefly").*
Mary E Searcy, Appalachian State University (1014-V1-241)
- ▶ 2:00PM *Fab Math.* Preliminary report.
Colm Mulcahy, Spelman College (1014-V1-1669)
- ▶ 2:20PM *Googling with Linear Algebra.*
Pedro Teixeira, Union College (1014-V1-1666)
- ▶ 2:40PM *Putting a Spring in Yoda's Step.*
Timothy P. Chartier*, Davidson College, and **Dan B Goldman**, University of Washington (1014-V1-268)
- ▶ 3:00PM *The Good, the Bad, and the Ugly.* Preliminary report.
Mary L Garner* and **Josip Derado**, Kennesaw State University (1014-V1-1646)
- ▶ 3:20PM *"Science-in-Theatre" and Arcadia.*
Steven B. Zides, Wofford College (1014-V1-1022)
- ▶ 3:40PM *Mathematical Heroes—No Longer Unsung.* Preliminary report.
Cynthia E. Chin*, **Jeffrey C. Sanders** and **Alexander V. Pinigis**, Madison East High School (1014-V1-788)
- ▶ 4:00PM *Harry Potter and the Magic of Mathematics.*
Betsy J McShea* and **Judith Vogel**, Richard Stockton College (1014-V1-927)
- ▶ 4:20PM *Good News, Everyone! David X. Cohen's Mathematical Influence on "The Simpsons" and "Futurama".*
Sarah J Greenwald, Appalachian State University (1014-V1-966)
- ▶ 4:40PM *Hollywood Math and Science Film Consulting: From "Primer" to "Numb3rs," Shifting the Paradigm.*
Jonathan D Farley, Stanford University, Center for International Security and Cooperation (1014-V1-1684)

MAA Session on My Three Favorite Original Calculus Problems

1:00 PM – 5:55 PM

Organizers: **J. D. Phillips**, Wabash College
Timothy J. Pennings, Hope College

- ▶ 1:00PM *Problems on tangent lines and infinite series.*
Byungchul Cha, Hendrix College (1014-W1-171)
- ▶ 1:15PM *Quarter horses, deer and wolves.* Preliminary report.
Stephen Hilbert, Ithaca College, Ithaca NY (1014-W1-1686)
- ▶ 1:30PM *My Favorite Integrals.*
Nimr Fahmy, Tougaloo College (1014-W1-173)

- ▶ 1:45PM *Acceleration of a MagneticTape; Numerical Evidence for the Chain Rule.*
Robert P Webber, Longwood University (1014-W1-243)
- ▶ 2:00PM *Two calculus problems from the real world: volume and root finding.*
Norton Starr, Amherst College (1014-W1-246)
- ▶ 2:15PM *Optimizing a real box and a computer disk.*
Thomas A. Hern, Bowling Green State Univ. (1014-W1-207)
- ▶ 2:30PM *Calculus Problems with a Parabolic Theme.*
John H. Wilson, Centre College (1014-W1-931)
- ▶ 2:45PM *Of Surfaces and Balls: Two Interesting Geometric and one Interesting Physical Application of the Integral.*
Jeff A. Rosoff, Gustavus Adolphus College (1014-W1-908)
- ▶ 3:00PM *A Rocket, a Holy Bucket and a Parabola.*
Michael Livshits, Cambridge, MA (1014-W1-1370)
- ▶ 3:15PM *Series and Spacecurves on my list of favorites.*
Ioana Mihaila, Cal Poly Pomona (1014-W1-376)
- ▶ 3:30PM *Three Calculus Problems: Applications to the Real (?) World.* Preliminary report.
Charlotte M. Schulze-Hewett, University of Wisconsin Colleges, Rock County Campus (1014-W1-262)
- ▶ 3:45PM Problem session.

MAA Session on First Steps for Implementing the Recommendations of the Guidelines for Assessment and Instruction in Statistics Education (GAISE) College Report

1:00 PM – 5:15 PM

Organizers: **Ginger Holmes Rowell**, Middle Tennessee State University
Thomas L. Moore, Grinnell College

- ▶ 1:00PM Session Introduction.
- ▶ 1:15PM *The Evolution of a Modern Statistics Course.* Preliminary report.
Barbara A. Wainwright, Salisbury University (1014-X1-451)
- ▶ 1:30PM *National Science Foundation Statistics Education Projects that Model Assessment and Instruction Guidelines.*
Megan D. Hall* and **Ginger Holmes Rowell**, Middle Tennessee State University (1014-X1-1561)
- ▶ 1:45PM *Using Web-based Practice Problems to Improve and Evaluate Student Learning.* Preliminary report.
Julie M Clark, Hollins University (1014-X1-1632)
- ▶ 2:00PM *Developing a Conceptual Understanding of Average.* Preliminary report.
Sharon S Emerson-Stonnell* and **Robert P Webber**, Longwood University (1014-X1-985)
- ▶ 2:15PM *Emphasizing Conceptual Learning in Statistics by Using Technology and Classroom Data.* Preliminary report.
Semra Kilic-Bahi, Colby-Sawyer College (1014-X1-162)
- ▶ 2:30PM *Using Fathom to Explain Central Tendency and Variability.*
Christopher J Lacke, Rowan University (1014-X1-760)
- ▶ 2:45PM *Did the educational program improve students' knowledge?*
Madhuri S Mulekar, University of South Alabama (1014-X1-1152)
- ▶ 3:00PM Floor Discussion.

Program of the Sessions – Saturday, January 14 (cont'd.)

- 3:15PM *Not-Quite a Semester-Long Project for Getting Your Students to Look at Real Data That They Obtain Themselves.*
▶ (1213) **Dexter C. Whittinghill**, Rowan University (1014-X1-834)
- 3:30PM *Two Steps Forward and One Step Back: This Kind of Implementation of the Guidelines for Assessment and Instruction in Statistics Education (GAISE) Can Ever Last.*
(1214) **John D McKenzie**, Babson College (1014-X1-1639)
- 3:45PM *Using Simulations to Discover the Truth About the Sampling Distribution of Means.*
▶ (1215) **Murray H. Siegel**, South Carolina GSSM (1014-X1-127)
- 4:00PM *Statistics, Lively and Involved.*
▶ (1216) **Dorothy W Anway**, University of Wisconsin-Superior (1014-X1-1291)
- 4:15PM *A Statistical Consulting Project in an Introductory Statistics Course.*
▶ (1217) **Lisa B. Green*** and **Anita Crockett**, Middle Tennessee State University (1014-X1-1215)
- 4:30PM *Comparison of two different project-based strategies for teaching introductory statistics.*
▶ (1218) **Anand L. Pardhanani**, Southwestern University, Texas (1014-X1-1678)
- 4:45PM *The Statistics Concept Inventory: An Instrument for Assessing Student Understanding of Statistics Concepts.*
(1219) **Teri J Murphy**, University of Oklahoma (1014-X1-1333)
- 5:00PM *Examples of Assessments to Improve Student Learning in Introductory Statistics.*
(1220) **Allan J. Rossman*** and **Beth L. Chance**, Cal Poly - San Luis Obispo (1014-X1-1510)

MAA Session on Handheld Technology in Content and Methods Courses for Prospective Teachers with a Special Interest Strand Devoted to Teaching and Learning Geometry

1:00 PM – 2:35 PM

- Organizers: **Charles Vonder Embse**, Central Michigan University
Deborah A. Crocker, Appalachian State University
Gregory D. Foley, The Liberal Arts and Science Academy of Austin at Lyndon B. Johnson High School
Stephen F. West, SUNY Geneseo
- 1:00PM *Enriching visualization in an integrated inservice/summer 5-8 lab school with Cabri Jr.*
(1221) Preliminary report.
Barbara J Pence, San Jose State University (1014-Y1-206)
- ▶ 1:20PM *Whaddya bet? Probability Investigations through Simulations.*
(1222) **Jean M McGivney-Burrelle**, University of Hartford (1014-Y1-728)
- ▶ 1:40PM *A Capstone Course for Mathematics Secondary Education Majors at the University of Utah.*
(1223) **Dennis L. Allison**, The University of Utah (1014-Y1-996)
- ▶ 2:00PM *Handheld Technology versus Computer Software.*
(1224) **Constance C. Edwards**, Coastal Carolina University (1014-Y1-1683)

- ▶ 2:20PM *Fully Integrating the Use of a Dynamic Geometry Software to teach College Geometry for Preservice Secondary Mathematics Teachers-Emphasis on Discovery, Conjecture, and Proof.* Preliminary report.
Thomas B Fox, University of Houston-Clear Lake (1014-Y1-1742)

MAA General Contributed Paper Session, VI

1:00 PM – 5:45 PM

- Chair: **Richard J. Marchand**, Slippery Rock University
- Chair: **Benjamin G. Klein**, Davidson College
- Chair: **Michael J. Mossinghoff**, Davidson College
- Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University
- 1:00PM *Marrying Form and Function: Mathematics as Motivation in an Introductory Programming Course for Engineers and Applied Mathematicians.*
(1226) **Steven J. Cox**, **Elaine T. Hale*** and **Brad Percy**, Rice University (1014-Z1-1588)
- ▶ 1:15PM *Personal Response Systems: Pearl or Peril?*
(1227) Preliminary report.
Desiree A. McCullough* and **Chris K. Caldwell**, University of Tennessee at Martin (1014-Z1-989)
- ▶ 1:30PM *Adventures with Regression in the RI State Legislature.*
(1228) **Barry Schiller**, Rhode Island College (emeritus) (1014-Z1-1610)
- ▶ 1:45PM *Playing Games to Teach Multivariable Calculus.*
(1229) Preliminary report.
Edwin P Herman, University of Wisconsin, Stevens Point (1014-Z1-961)
- ▶ 2:00PM *Two (or Three) Maple Visualizations for a Linear Algebra Course: Decomposing Vectors into Components.*
(1230) **David A. Huckaby**, Angelo State University (1014-Z1-1421)
- ▶ 2:15PM *Detailed Feedback as an Integral Part of an Online Homework System in Calculus.*
(1231) **Ryan J. Zerr**, University of North Dakota (1014-Z1-395)
- 2:30PM *Graphing Calculator Software in Calculus.*
(1232) **Jennifer Hontz*** and **Timothy M Hendrix**, Meredith College (1014-Z1-1191)
- 2:45PM *Take-A-Hike and Road Trip Motion Detector Activities in Calculus.*
(1233) **Timothy M Hendrix*** and **Jennifer Hontz**, Meredith College (1014-Z1-1198)
- ▶ 3:00PM *Maple TA Enhances Significant Learning.*
(1234) Preliminary report.
Simei Tong, University of Wisconsin-Eau Claire (1014-Z1-194)
- ▶ 3:15PM *The effects of computer assisted instruction on college algebra students.*
(1235) **Amanda M Klein**, Texas Tech University, Lubbock, TX (1014-Z1-1593)
- ▶ 3:30PM *The Use of ALEKS in a College Algebra Course.*
(1236) Preliminary report.
Linda G Thompson, Carroll College (1014-Z1-50)
- ▶ 3:45PM *Using Computer Aided Learning to teach College Algebra.*
(1237) **Tristan M J Denley*** and **Kimberly A Denley**, University of Mississippi (1014-Z1-1322)

- 4:00PM *Web Enhanced Learning in Mathematics with Public Domain Software.*
 ▶ (1238) **Maider J Marin**, Mayaguez, Puerto Rico, and **Daniel L McGee***, University of Puerto Rico - Mayaguez (1014-Z1-235)
- 4:15PM *Should technology affect the order of topics toward a more effective learning? Preliminary report.*
 (1239) **Jose H. Giraldo**, Texas A&M University-Corpus Christi (1014-Z1-1441)
- 4:30PM *Effectively combining online learning with face-to-face instruction: Using WebCT and WeBWork in a Business Math Class.*
 ▶ (1240) **Julia Darby Head*** and **G. Brock Williams**, Texas Tech University (1014-Z1-1596)
- 4:45PM *Online Homework That Works. Preliminary report.*
 ▶ (1241) **Terry J. Walters*** and **Stephen W. Kuhn**, University of Tennessee of Chattanooga (1014-Z1-1482)
- 5:00PM *Web-Based Homework and Achievement.*
 (1242) **M. Affouf**, Kean University, NJ (1014-Z1-864)
- 5:15PM *Creating and Using Online Quizzes.*
 (1243) **Manmohan Kaur**, Benedictine University (1014-Z1-333)
- 5:30PM *Teaching a class of 75,000 students.*
 ▶ (1244) **David Fowler**, University of Nebraska-Lincoln (1014-Z1-917)

MAA Poster Session on Projects Supported by the NSF Division of Undergraduate Education

1:00 PM – 3:00 PM

Organizer: **Jon W. Scott**, Montgomery Community College

- 1:00PM *Writing to Learn Mathematics-No Instructor Grading.*
 (1245) **Mary Kay Abbey*** and **Bette Daudu**, Montgomery College
- 1:00PM *San Juan County Initiative for the Enhancement of Pre-Service and In-Service Math/Science Teacher Education through Curriculum Development and Internship Experiences in Technology.*
 (1246) **Jana Wallace**, San Juan College
- 1:00PM *Development of a Computer Lab Manual for use in a First Course in Abstract Algebra.*
 (1247) **Julianne Rainbolt**, Saint Louis University
- 1:00PM *Geometric Structures for Elementary Teachers (GeoSET).*
 (1248) **Douglas B. Aichele*** and **John Wolfe**, Oklahoma State University
- 1:00PM *Interdisciplinary Application Projects in Calculus - Strengths, Weaknesses, and Lessons Learned.*
 (1249) **Bill Briggs***, **Bruce MacMillan**, **Lynn Bennethum** and **Mike Kawai**, University of Colorado at Denver
- 1:00PM *A Data-Oriented, Active Learning, Post-Calculus Introduction to Statistical Concepts, Applications, and Theory.*
 (1250) **Allan J. Rossman*** and **Beth L Chance**, California Polytechnic State University, San Luis Obispo
- 1:00PM *A Comprehensive WeBWork Problem Library.*
 (1251) **Jeff Holt***, University of Virginia, **John Jones**, Arizona State University, and **William Ziemer**, California State University Long Beach
- 1:00PM *Knot Theory for Preservice and Practicing Secondary Mathematics Teachers.*
 (1252) **Thomas Mattman***, California State University, Chico, and **Neil Portnoy**, Stony Brook University

- 1:00PM *Workshop Precalculus: Developing Pedagogically Powerful Instructional Materials for an Integrated Course in Functions, Data Analysis and Modeling.*
 (1253) **Nancy Baxter Hastings***, Dickinson College, **David Hastings**, Shippensburg University, **David Callahan**, California State University, Hayward, and **Allan Rossman**, California Polytechnic State University, San Luis Obispo
- 1:00PM *Core Mathematics.*
 (1254) **Gary Krahn*** and **Don Small**, United States Military Academy
- 1:00PM *Enhancing Mathematics Communication: Creating and Delivering Web-Based Homework.*
 (1255) **Terry Walters*** and **Stephen Kuhn**, University of Tennessee at Chattanooga
- 1:00PM *Adapting and implementing guided discovery notes in combinatorics for large classes.*
 (1256) **Mary Flahive**, Oregon State University
- 1:00PM *Seeing the Connections: Promoting Profound Understanding of Secondary Mathematics.*
 (1257) **Steven Benson***, **Al Cuoco**, Education Development Center, **Karen Graham**, University of New Hampshire, and **Neil Portnoy**, Stony Brook University
- 1:00PM *Statistics Online Computational Resource for Education.*
 (1258) **Ivo Dinov*** and **Annie Che**, UCLA School of Medicine
- 1:00PM *Making Math Engaging: Discrete Mathematics for K-8 Teachers.*
 (1259) **Valerie A. DeBellis***, Shodor Education Foundation, and **Joseph G. Rosenstein**, Rutgers University
- 1:00PM *Topology and Its Applications.*
 (1260) **William Basener*** and **George Thurston**, Rochester Institute of Technology
- 1:00PM *A motivational course in cryptology and coding theory.*
 (1261) **Sarah Spence Adams***, Franklin W. Olin College of Engineering, and **Gordon Prichett**, Babson College
- 1:00PM *Teaching Discrete Mathematics via Original Historical Sources.*
 (1262) **David Pengelley*** and **Gerald Lodder**, New Mexico State University
- 1:00PM *Development of Interactive Materials for the Constructivist Teaching of Mathematical Proof to Future Teachers.*
 (1263) **Doug Ensley*** and **Winston Crawley**, Shippensburg University
- 1:00PM *A radical approach to teaching object-oriented programming.*
 (1264) **Ann Moskol*** and **Kate Sanders**, Rhode Island College
- 1:00PM *Adapting ATLAST Problems into WeBWork for Linear Algebra I and II.*
 (1265) **Thomas Hagedorn*** and **Karen Clark**, The College of New Jersey
- 1:00PM *Mathematics for Elementary Teachers: Project MET.*
 (1266) **George W. Johnson**, University of South Carolina
- 1:00PM *Online Statistics Education: An Interactive Multimedia Course of Study.*
 (1267) **David M. Lane**, Rice University
- 1:00PM *Implementing WeBWork in a Teacher Training Curriculum.*
 (1268) **Angelo Segalla**, California State University, Long Beach

Program of the Sessions – Saturday, January 14 (cont'd.)

- 1:00PM *The National Curve Bank Project: A MATH Archive.*
(1269) **Shirley B. Gray***, California State University Los Angeles, **Bill Austin**, University of Tennessee at Martin, **Phillip Johnson**, Appalachian State University, and **Lou Talman**, Metropolitan State College of Denver
- 1:00PM *Math Across the Community College Curriculum.*
(1270) **Rebecca Hartzler***, Seattle Central Community College, and **Caren Diefenderfer**, Hollins University
- 1:00PM *ACCESS: Advancing Community College Engineering Student's Success.*
(1271) **Dan G. Dimitriu**, San Antonio College
- 1:00PM *PHASER: A Universal Simulator for Dynamical Systems.*
(1272) **Huseyin Kocak*** and **Brian Coomes**, University of Miami
- 1:00PM *Native American-based Materials for Undergraduate Mathematics Courses.*
(1273) **Charles P. Funkhouser***, University of Montana College of Technology, and **A. Duane Porter**, University of Wyoming
- 1:00PM *Collaborative Project: Kentucky Information Technology Center.*
(1274) **Lillie Crowley***, Lexington Community College, and **Darrell H. Abney**, Maysville Community & Technical College
- 1:00PM *Full Realization of Visualization Tools for 3D.*
(1275) **Daniel McGee***, University of Puerto Rico Mayaguez, **David Lomen**, University of Arizona, **Deborah Moore-Russo**, University at Buffalo, and **Dennis Ebersole**, Northampton Community College
- 1:00PM *The PascGalois Project: Visualization in Abstract Mathematics.*
(1276) **Michael Bardzell*** and **Kathleen Shannon**, Salisbury University
- 1:00PM *Collaborative Development of Java Laboratories for College Algebra and Trigonometry.*
(1277) **Michael Mays**, West Virginia University
- 1:00PM *Biostatistics: Developing a Textbook and Case Study Manual for Introductory Courses in Mathematical Biology.*
(1278) **Raina Robeva**, Sweet Briar College
- 1:00PM *Bridging the Vector Calculus Gap.*
(1279) **Tevian Dray**, Oregon State University
- 1:00PM *Improving Preservice Teachers' Understanding of Fundamental Concepts in the Secondary Mathematics Curriculum.*
(1280) **John Lorch*** and **Ralph Bremigan**, Ball State University
- 1:00PM *Developing a Mathematics Curriculum to Serve the Biosciences: The First Step.*
(1281) **James Fulton***, Suffolk County Community College, **Sheldon Gordon**, **Matthew Bahamonde**, **Jack Winn**, Farmingdale State University, **Linda Sabatino** and **Rob Lowry**, Suffolk County Community College
- 1:00PM *Integrating Computer Explorations into College Geometry.*
(1282) **Sr. Barbara E. Reynolds**, Cardinal Stritch University, and **William E. Fenton***, Bellarmine University
- 1:00PM *Training Environmental Statisticians Using Complicated Data Sets to Make More Informed Environmental Decisions.*
(1283) **Nagambal Shah*** and **Monica Stephens**, Spelman College
- 1:00PM *Motivating Geometry through Computation and Visualization.*
(1284) **David L. Finn**, Rose-Hulman Institute of Technology

- 1:00PM *Pathways Through Algebra Project.*
(1285) **Wade Ellis***, West Valley College, and **Terrie Teegarden**, San Diego Mesa College
- 1:00PM *Renewal of College Algebra.*
(1286) **Norma Agras***, Miami Dade College, and **J. Michael Pearson**, Mathematical Association of America
- 1:00PM *The Math Gateway.*
(1287) **Lawrence Moore***, Duke University, and **Donald Albers**, Mathematical Association of America
- 1:00PM *Professional Development Program (PREP).*
(1288) **J. Michael Pearson**, Mathematical Association of America, **William Haver**, Virginia Commonwealth University, **Nancy Baxter Hastings**, Dickinson College, **Nathaniel Dean**, Texas Southern University, and **Jon Scott***, Montgomery College

MAA Panel Discussion

1:00 PM – 2:20 PM

Topics of ethics in mathematics.

- Organizers: **Brian Birgen**, Wartburg College
Karolyne Fogel, California Lutheran University
Walter Whiteley, York University
- Panelists: **Mariah Birgen**, Wartburg College
Lee Lorch, York University
Walter Whiteley

MAA Panel Discussion

1:00 PM – 2:20 PM

Mathematics and biology 2010: Building connections.

- Organizers: **Elton Graves**, Rose-Hulman Institute of Technology
John R. Birge, University of Chicago
- Panelists: **John R. Jungck**, Beloit College
Lisette de Pillis, Harvey Mudd College
David Asai, Harvey Mudd College

MAA Panel Discussion

1:00 PM – 2:20 PM

Algebra at various levels: How does it differ?

- Organizers: **Bernard L. Madison**, University of Arkansas
Susan L. Forman, CUNY Bronx Community College
- Panelists: **Bonnie Gold**, Monmouth University
Cathy L. Seely, University of Texas at Austin
Bernard L. Madison
Sheldon P. Gordon, SUNY at Farmingdale

ASL Invited Address

1:10 PM – 2:00 PM

- (1289) *Countable quotients of combinatorial structures.*
Alain Louveau, CNRS and University of Paris VI

AMS Special Session on Field Extensions and Algorithms, II

2:00 PM – 5:50 PM

Organizers: **Peter Stevenhagen**, University of Leiden
H. W. Lenstra, University of Leiden

- 2:00PM *Factoring polynomials over global fields.*
 (1290) **Mark van Hoeij**, Florida State University (1014-11-842)
- 3:00PM *The Calculation of Algebraic Conjugates.*
 (1291) Preliminary report.
H M Stark, UCSD (1014-11-1039)
- 3:30PM *Connecting special values of partial zeta functions with Ankeny, Artin, and Chowla's formulae.*
 ► (1292) Preliminary report.
Barry R. Smith, University of California, San Diego (1014-11-719)
- 4:00PM *Higher order Stark-type conjectures.* Preliminary report.
 (1293) **Caleb J. Emmons**, University of California, San Diego (1014-11-269)
- 4:30PM *Density of primitive elements for field extensions.*
 ► (1294) **Shuhong Gao**, Clemson University (1014-12-1440)
- 5:00PM *Codes from field extensions.* Preliminary report.
 (1295) **Gretchen L. Matthews**, Clemson University (1014-14-729)
- 5:30PM *Word-oriented PN sequence generation and polynomials of special forms over \mathbb{F}_{2^m} .* Preliminary report.
 ► (1296) **Gadiel Seroussi**, Mathematical Sciences Research Institute, Berkeley, California (1014-12-1541)

ASL Invited Address

2:10 PM – 3:00 PM

- (1297) *Complex analytic geometry over o-minimal structures.*
Sergei Starchenko, University of Notre Dame

NAM Granville-Brown-Haynes Session of Presentations by Recent Doctoral Recipients in the Mathematical Sciences

2:15 PM – 4:00 PM

RMMC Board of Directors

2:15 PM – 4:10 PM

MAA Presentations by Teaching Award Recipients

2:30 PM – 4:00 PM

- Organizer: **Martha J. Siegel**, Towson University
 Moderator: **Carl C. Cowen**, IUPUI
- (1298) *Mathematics is - - - - .*
Jacqueline Dewar, Loyola Marymount University (1014-A0-232)
- (1299) *Small opportunities at a big university.*
Keith D. Stroyan, University of Iowa (1014-A0-233)
- (1300) *The Joy of Teaching The Joy of Numbers.*
Judy L. Walker, University of Nebraska-Lincoln (1014-A0-234)

MAA Committee on Mathematics Across the Disciplines Panel Discussion

2:30 PM – 3:50 PM

Models for a one-semester course in discrete mathematics.
 Organizer: **William A. Marion**, Valparaiso University
 Panelists: **William A. Marion**
Susanna S. Epp, DePaul University
Gerald W. Kruse, Juniata College

MAA Demonstration and Discussion

2:30 PM – 4:50 PM

Mathematical circles.
 Organizer: **Zsuzsanna Szaniszló**, Valparaiso University
 Presenters: **Paul A. Zeitz**, University of San Francisco
Zsuzsanna Szaniszló

MAA Panel Discussion

2:30 PM – 3:50 PM

Mathematicians involved in school mathematics.
 Organizers: **Roger E. Howe**, Yale University
Alan C. Tucker, SUNY Stony Brook
 Panelists: **Richard J. Schaar**, Texas Instruments
R. James Milgram, Stanford University
Johnny W. Lott, University of Montana

WEB SIGMAA Special Presentation

2:30 PM – 3:50 PM

Serious data and serious tools on the Web for a serious problem.
 Organizer: **Franklin A. Wattenberg**, U.S. Military Academy
 Panelists: **Geoff Kuhlmann**, U.S. Military Academy
Joe Lindquist, U.S. Military Academy
Heather Stevenson, U.S. Military Academy
Franklin A. Wattenberg

AMS Session on Fourier and Harmonic Analysis, Approximation

2:45 PM – 6:10 PM

- 2:45PM *The Heating of the Beurling operator.*
 (1301) **Janine Wittwer***, Westminster College, Salt Lake City, and **S. Petermichl**, University of Texas, Austin (1014-42-523)
- 3:00PM *Notes on Matrix Valued Dyadic Paraproducts.*
 (1302) Preliminary report.
Tao Mei, Texas A&M Univ. (1014-42-634)
- 3:15PM *Bochner-Riesz means With Respect to a Rough Distance Function.*
 (1303) **Paul T Taylor**, McMaster University (1014-42-668)
- 3:30PM *An integral estimate involving the Dirichlet kernel.*
 (1304) **J. Marshall Ash**, DePaul University (1014-42-1078)

- 3:45PM *Sampling and Interpolation of Two-Band Signals.*
(1305) **Sergei A Avdonin, Anna S Bulanova***, University of Alaska Fairbanks, and **William Moran**, University of Melbourne (1014-42-1248)
- 4:00PM *L_p convergence with rates of smooth Picard singular operators.* Preliminary report.
(1306) **George A Anastassiou**, University of Memphis (1014-41-16)
- 4:15PM *An inequality for a class of almost periodic entire functions.* Preliminary report.
(1307) **Q I Rahman**, University of Montreal, Montreal Canada, and **Q M Tariq***, Virginia State University, Petersburg, VA (1014-41-1297)
- 4:30PM *The Algebraic-Maclaurin-Pade' Rational Polynomial Approximation for ODE BVPs.* Preliminary report.
(1308) **Paul G. Warne*** and **Debra A. Warne**, James Madison University (1014-41-1489)
- 4:45PM *Summability of Taylor series by methods from Burmann-series expansions.*
(1309) **Jerry P. King**, Lehigh University (1014-40-605)
- 5:00PM *A $C^{k,\lambda}$ approximation of Sobolev functions in norm and capacity.*
(1310) **Javad Namazi**, Fairleigh Dickinson University (1014-26-190)
- ▶ 5:15PM *Geometric Fourier analysis for cognitive visual neuroscience.*
(1311) **Jacek Turski**, University of Houston-Downtown (1014-43-1419)
- 5:30PM *Ultra-wideband Pulse Propagation: The Signal Contribution.*
(1312) **Natalie A Cartwright*** and **Kurt E. Oughstun**, University of Vermont (1014-78-770)
- 5:45PM *Constructing Pulse Solutions for Neural Networks Models.* Preliminary report.
(1313) **Fernanda Botelho***, **James E Jamison** and **Angela J Murdock**, University of Memphis (1014-45-1218)
- 6:00PM *The Bargmann Transform and Windowed Fourier Localization.*
(1314) **Min-Lin Lo**, California State University, San Bernardino (1014-47-945)

MAA Session on Research on the Teaching and Learning of Undergraduate Mathematics, II

3:00 PM – 4:55 PM

Organizers: **William O. Martin**, North Dakota State University
Barbara E. Edwards, Oregon State University
Michael Oehrman, Arizona State University

- ▶ 3:00PM *Preliminary Identification of Difficulties Encountered by Students Reading Mathematics.* Preliminary report.
(1315) **Mary D Shepherd**, Northwest Missouri State University (1014-01-1602)
- ▶ 3:20PM *Developmental Continuity: A Key To Academic Success.*
(1316) **Clyde L. Greeno**, MALEI Mathematics Institute (1014-01-1041)
- 3:40PM *College Physics Majors' Mathematical Reasoning.*
(1317) **Barbara Edwards***, **Corinne Manogue**, **Gulden Karakok** and **Tevian Dray**, Oregon State University (1014-01-1540)
- ▶ 4:00PM *Unified Representation of Function: Graphing.* Preliminary report.
(1318) **Aaron Montgomery***, Central Washington University, and **Bernadette Baker**, Drake University (1014-01-1506)

- 4:20PM *Levels of understanding of the relation between ε and N in the definition of the limit of a sequence.*
(1319) **Kyeong Hah Roh**, Arizona State University (1014-01-1483)
- ▶ 4:40PM *Learning Theory and Linear Algebra.* Preliminary report.
(1320) **Sergio Loch***, Grand View College, **Laurel A Cooley**, Brooklyn College - CUNY, **William O Martin**, North Dakota State University, and **Draga Vidakovic**, Georgia State University (1014-01-1401)

MAA Minicourse #14: Part B

3:30 PM – 5:30 PM

Teaching linear algebra with applications.
Organizer: **Gilbert Strang**, Massachusetts Institute of Technology

MAA Minicourse #3: Part B

3:30 PM – 5:30 PM

Using and adapting online materials.
Organizers: **David A. Smith**, Duke University
Lang Moore, Duke University

MAA Minicourse #9: Part B

3:30 PM – 5:30 PM

Discrete dynamical systems and problem solving.
Organizers: **David C. Arney**, U.S. Military Academy
Gary W. Krahn, U.S. Military Academy

ASL Contributed Paper Session, I

3:45 PM – 5:45 PM

- 3:45PM *Co-stationarity of the ground model.*
(1321) **Natasha Dobrinen*** and **Sy Freidman**, Kurt Goedel Research Center for Mathematical Logic, Univ. of Vienna
- 4:10PM *Ehrenfeucht-Fraser games and generic coding.*
(1322) **Ross Bryant**, University of North Texas
- 4:35PM *Semigroups of partial automorphisms of countable structures.*
(1323) **Eric Ufferman***, **Jennifer Chubb**, **Valentina Harizanov**, George Washington University, **Andrei Morozov**, Sobolev Institute of Mathematics, and **Sarah Pingrey**, George Washington University
- 5:00PM *Representations of reals in reverse mathematics.*
(1324) **Jeffrey L Hirst**, Appalachian State University
- 5:25PM *The Modal Logic of Forcing.*
(1325) **Benedikt Loewe***, ILLC, Univ. Van Amsterdam, and **Joel David Hamkins**, Graduate Center of the City University of New York

MAA Undergraduate Poster Session

4:00 PM – 6:30 PM

Organizers: **Mario U. Martelli**, Claremont McKenna College
Diana M. Thomas, Montclair State University

SIGMAA on Quantitative Literacy Business Meeting and Reception

4:00 PM – 5:00 PM

Organizers: **Caren L. Diefenderfer**, Hollins University
Judith F. Moran, Trinity College
Maura B. Mast, University of Massachusetts Boston

MAA Session on Mathematical Connections in the Arts, II

4:15 PM – 6:10 PM

Organizers: **Douglas E. Norton**, Villanova University
Reza Sarhangi, Towson University
Nathaniel A. Friedman, State University of New York, Albany

- 4:15PM *Mathematics and the Creation of Literature.*
 ▶ (1326) Preliminary report.
Michael P. Saclolo, St. Edward's University (1014-N1-1411)
- 4:30PM *Classifying the Frieze Patterns of Seville's Real Alcazar.*
 ▶ (1327) **B. Lynn Bodner**, Monmouth University (1014-N1-1024)
- 4:45PM *Do you like Paleolithic Op-art?* Preliminary report.
 ▶ (1328) **Slavik V. Jablan**, The Mathematical Institute, Belgrade, Serbia and Montenegro (1014-N1-768)
- 5:00PM *Fractal Tilings Based on Prototiles with Angles that are Multiples of 36 Degrees.*
 ▶ (1329) **Robert W Fathauer**, Tessellations Company (1014-N1-964)
- 5:15PM *A Collection of Curves.*
 ▶ (1330) **Susan A McBurney**, Western Springs, Illinois (1014-N1-1453)
- 5:30PM *Cycles in Math and Music.*
 (1331) **Rehana Patel*** and **Heidi Upton**, St. John's University (1014-N1-1748)
- 5:45PM *Renaissance Banff Conference: A Three-Day Bridges Conference, and a Coxeter Day A Collaborative Effort for a Mathematics and Art Conference in Canada.*
 ▶ (1332) **Reza Sarhangi**, Towson University (1014-N1-1391)
- 6:00PM *What are demi-regular tilings?* Preliminary report.
 ▶ (1333) **Helmer Aslaksen**, National Univ. of Singapore (1014-N1-1380)

AMS Session on Operations Research, Game Theory, Economics

4:45 PM – 6:10 PM

- 4:45PM *On Deriving Volumetric Center Decomposition Algorithms for Stochastic Semidefinite Programs.*
 (1334) **K. A. Ariyawansa** and **Yuntao Zhu***, Washington State University (1014-90-1606)
- 5:00PM *Proportional Pie-Cutting.*
 ▶ (1335) **Steven J. Brams**, New York University, **Michael A. Jones***, Montclair State University, and **Christian Klamler**, University of Graz (Austria) (1014-91-1713)
- 5:15PM *On Solving Games Constructed Using Both Shortened and Continued Conjunctive Sums.*
 (1336) Preliminary report.
Daniel M Kane, Massachusetts Institute of Technology (1014-91-508)

- 5:30PM *Differential Equations and Computational Optimization for Closed End Funds.*
 (1337) **A. Duran*** and **G. Caginalp**, University of Pittsburgh (1014-91-1029)
- 5:45PM *Optimal and Nearly-Optimal Strategies for Minimizing the Probability of Ruin in Retirement.*
 (1338) **Kristen S. Moore*** and **Virginia R. Young**, University of Michigan (1014-35-1481)
- 6:00PM *The Limits of Monetary Policy Effectiveness, Implied by Abel's Impossibility Theorem.*
 (1339) **James Michael Haley**, Pittsburgh, Pennsylvania (1014-90-1072)

SIGMAA on the Philosophy of Mathematics Annual Meeting, Reception, and Guest Lecture

6:00 PM – 8:00 PM

- Chair: **Roger A. Simons**, Rhode Island College
- Organizer: **Bonnie Gold**, Monmouth University
- ▶ (1340) *Computer assisted mathematics.*
Paul Humphreys, University of Virginia/IHPST, Paris (1014-A0-53)

AMS Mathematical Reviews Reception

6:00 PM – 7:00 PM

MAA-Project NExT Reception

8:30 PM – 10:30 PM

NAM Cox-Talbot Address

8:45 PM – 9:30 PM

- (1341) *Teaching mathematics in the 21st century: Anecdotes form the past and future.*
Wade Ellis, Jr., West Valley College

Sunday, January 15

MAA Minority Chairs Breakfast Meeting

7:00 AM – 8:45 AM

Joint Meetings Registration

7:30 AM – 4:00 PM

AMS-MAA-SIAM Special Session on Recent Advances in Mathematical Biology and Epidemiology, I

8:00 AM – 10:50 AM

- Organizers: **Sophia Jang**, University of Louisiana at Lafayette
Linda Allen, Texas Tech University
Lih-Ing Roeger, Texas Tech University
- 8:00AM *Metapopulation Models for Disease Spread.*
 (1342) **P. van den Driessche**, University of Victoria, BC (1014-92-783)
- 8:30AM *Linking immunology and epidemiology in mathematical models.* Preliminary report.
 (1343) **Maia Martcheva*** and **Sergei S. Pilyugin**, University of Florida (1014-92-806)

Program of the Sessions – Sunday, January 15 (cont'd.)

- 9:00AM (1344) *A control-theoretic approach to combining immunotherapy with antiviral treatment for HIV.* **Rebecca V Culshaw**, The University of Texas at Tyler (1014-92-1129)
- 9:30AM (1345) *Brain tumor, oncolytic virus, innate immune cells and cyclophosphamide.* Preliminary report. **Jianjun Paul Tian**, Mathematical Biosciences Institute, the Ohio State University (1014-35-436)
- 10:00AM (1346) *Cellular Automata with Propensity for Insectal Pollen Propagation.* Preliminary report. **David M Chan*** and **Rodney Dyer**, Virginia Commonwealth University (1014-92-175)
- 10:30AM (1347) *Integer-Valued Population Models.* **Dorian Wilkerson***, Clark Atlanta University, and **Ronald Mickens**, Clark Atlanta University (1014-39-479)
- 8:30AM (1355) *Stochastic 2D Euler and Navier-Stokes Hybrid Dynamics of Fluid Flows under Markovian Switching.* Preliminary report. **Sivapragasam Sathananthan**, Tennessee State University, **Mahmoud Anabtawi***, American University of Sharjah, UAE, and **Gangaram Ladde**, The University of Texas at Arlington (1014-60-1179)
- 9:00AM (1356) *Weakly overtaking optimal strategies for controlled diffusion processes.* Preliminary report. **Onésimo Hernández-Lerma**, CINVESTAV-IPN, Mexico City (1014-93-283)
- 9:30AM (1357) *Quantum Stochastic Differential Inclusions Satisfying a General Lipschitz Condition.* **Ezekiel Olusola Ayoola**, University of Ibadan, Ibadan, Nigeria (1014-81-372)
- 10:00AM (1358) *Numerical Study of Interacting Particles Approximations for Integro-Differential Equations.* **Dan Stanescu**, University of Wyoming (1014-65-1434)
- 10:30AM (1359) *Stochastic perturbation of power law optical solitons.* **Anjan Biswas**, Delaware State University (1014-78-1772)

AMS-SIAM Special Session on Boundary Value Problems for Ordinary Differential Equations, I

8:00 AM – 10:50 AM

Organizers: **John R. Graef**, University of Tennessee at Chattanooga

Johnny L. Henderson, Baylor University

- 8:00AM (1348) *Nonstandard semi-implicit shooting methods for second order singular ODE boundary value problems.* Preliminary report. **Qin Sheng***, Baylor University, and **Joseph W Haus**, University of Dayton (1014-34-429)
- 8:30AM (1349) *Limits of Sturm-Liouville Eigenvalues When the Interval Shrinks to an End Point.* **Qingkai Kong***, **Hongyou Wu** and **Anton Zettl**, Northern Illinois University (1014-34-1110)
- 9:00AM (1350) *Descartes systems of functions and disconjugacy of linear fractional differential equations.* **Paul W Eloe**, University of Dayton (1014-34-1050)
- 9:30AM (1351) *Multiple solutions for impulsive functional differential equations.* **Mouffak Benchohra**, Université de Sidi Bel Abbes, **Johnny Henderson***, Baylor University, **Sotiris Ntouyas**, University of Ioannina, and **Abdelghani Quahab**, Laboratoire de Mathématiques (1014-34-321)
- 10:00AM (1352) *Uniqueness and Existence Via Linearized Boundary Value Problems.* **Jeffrey A. Ehme**, Spelman College (1014-34-734)
- 10:30AM (1353) *Radial solutions of quasilinear semipositone boundary-value problems.* Preliminary report. **Matthew B. Rudd**, University of Texas at Austin (1014-34-962)

AMS-SIAM Special Session on Theory and Application of Stochastic Differential Equations, I

8:00 AM – 10:50 AM

Organizers: **Armando Arciniega**, University of Texas at San Antonio

Edward J. Allen, Texas Tech University

- 8:00AM (1354) *Stability Analysis of Stochastic Multi-Agent Dynamic Systems.* Preliminary report. **Jagdish Chandra**, The George Washington University, and **G. S. Ladde***, The University of Texas at Arlington (1014-93-936)

AMS-SIAM Special Session on Symbolic-Numeric Computation and Applications, I

8:00 AM – 10:50 AM

Organizers: **Agnes Szanto**, North Carolina State University
Jan Verschelde, University of Illinois at Chicago
Zhonggang Zeng, Northeastern Illinois University

- 8:00AM (1360) *Adaptive precision in homotopy continuation.* **Daniel J. Bates***, **Andrew J. Sommese**, University of Notre Dame, and **Charles W. Wampler**, GM Research & Development (1014-65-285)
- 8:30AM (1361) *Local Regularization of the Autoconvolution Problem.* **Zhewei Dai***, Alma College, and **Patricia K Lamm**, Michigan State University (1014-45-1553)
- 9:00AM (1362) *Stationary Configurations of Four Vortices.* **Marshall Hampton***, University of Minnesota, Duluth, and **Richard Moeckel**, University of Minnesota, Minneapolis (1014-76-147)
- 9:30AM (1363) *Approximate Factorization of Complex Multivariate Polynomials.* **Erich Kaltofen**, North Carolina State University (1014-65-359)
- 10:00AM (1364) *Computing the approximate rank of large inexact matrices.* **Tsung-Lin Lee***, **T. Y. Li**, Michigan State University, and **Zhonggang Zeng**, Northeastern Illinois University (1014-65-1208)
- 10:30AM (1365) *Symbolic-Numeric Sparse Polynomial Interpolation.* **Wen-shin Lee**, University of Antwerp, Belgium (1014-65-636)

AMS-AWM-MAA Special Session on Mathematical Results and Challenges in Learning Theory

8:00 AM – 11:00 AM

Organizer: **Cynthia Rudin**, Courant Institute, NYU

- 8:00AM *Ranking with a P-Norm Push.*
 ▶ (1366) **Cynthia Rudin**, Center for Neural Science and Courant Institute, New York University (1014-68-443)
- 8:30AM *Online Convex Programming: A Survey.*
 (1367) **Martin A Zinkevich**, University of Alberta (1014-68-1343)
- 9:00AM *Sparse Function Estimation in High Dimensions.*
 (1368) **John Lafferty*** and **Larry Wasserman**, Carnegie Mellon University (1014-62-924)
- 9:30AM *Optimization Challenges in Capacity Control.*
 (1369) **Kristin P Bennett**, Rensselaer Polytechnic Institute (1014-49-772)
- 10:00AM *Theoretical Challenges Arising from Empirical Observations about Boosting Algorithms.*
 ▶ (1370) **Phil Long**, Google (1014-68-435)
- 10:30AM Discussion

- 9:00AM *Symmetry in Twisted Families of L-functions.*
 (1378) Preliminary report.
Eduardo Duenez*, The University of Texas at San Antonio, and **Steven J Miller**, Brown University (1014-11-1154)
- 9:30AM *L-values of Eisenstein Series and Reducible Double L-values.*
 (1379) **David Terhune**, Penn State University (1014-11-123)
- 10:00AM *Special Values of Gaussian Hypergeometric Functions.* Preliminary report.
 (1380) **Sharon M Frechette***, College of the Holy Cross, and **Matthew Papanikolas**, Texas A&M University (1014-11-1504)
- 10:30AM *Zariski-density of exceptional points of hypergeometric functions.*
 (1381) **Paula B Cohen***, Texas A&M University, **Pierre-Antoine Desrousseaux**, Bamako, Mala, and **Marvin Tretkoff**, Texas A&M University (1014-11-1423)

AMS Special Session on Algebraic and Enumerative Combinatorics, III

8:00 AM – 10:50 AM

Organizers: **Catherine H. Yan**, Texas A&M University
Marcelo Aguiar, Texas A&M University
Joseph P. Kung, University of North Texas
Laura F. Matusevich, University of Pennsylvania

- 8:00AM *The combinatorics of type A nonsymmetric Macdonald polynomials.*
 (1371) **Jim Haglund***, Ohio State, **M. Haiman**, UC Berkeley, and **N. Loehr**, William and Mary (1014-05-738)
- 8:30AM *Nonsymmetric Schur functions and standard bases.* Preliminary report.
 (1372) **Sarah K. Mason**, University of Pennsylvania (1014-05-1149)
- 9:00AM *The bounded complex of an affine oriented matroid.*
 (1373) **Xun Dong**, University of Miami (1014-52-977)
- 9:30AM *Shelling Coxeter-like complexes and sorting on trees.*
 (1374) **Patricia Hersh**, Indiana University-Bloomington (1014-05-796)
- 10:00AM *Combinatorics.* Preliminary report.
 (1375) **Swapneel Mahajan**, Indian Institute of Technology Bombay (1014-05-1445)
- 10:20AM Discussion

AMS Special Session on Arithmetic Geometry and Modular Forms, III

8:00 AM – 10:50 AM

Organizers: **Matthew A. Papanikolas**, Texas A&M University
Ahmad M. El-Guindy, Texas A&M University

- 8:00AM *The Fricke involution and congruences for modular forms of weight four.*
 ▶ (1376) **Scott Ahlgren***, University of Illinois, and **Mugurel Barcau**, Bucharest, Romania (1014-11-1225)
- 8:30AM *Atkin and Swinnerton-Dyer congruence and the modularity for certain noncongruence cuspforms.*
 (1377) **A.O.L. Atkin**, University of Illinois at Chicago, **W.C. Li**, Pennsylvania State University, and **L. Long***, Iowa State University (1014-11-1141)

AMS Special Session on Field Extensions and Algorithms, III

8:00 AM – 10:50 AM

Organizers: **Peter Stevenhagen**, University of Leiden
H. W. Lenstra, University of Leiden

- 8:00AM *Eisenstein Reciprocity Law, Gaussian Sums and Application to Primality Testing.* Preliminary report.
 ▶ (1382) **Pedro J Berrizbeitia**, Universidad Simón Bolívar (1014-11-1736)
- 8:30AM *Power Residue Symbol Algorithms.* Preliminary report.
 (1383) **J. P. Buhler**, CCR (1014-11-1745)
- 9:00AM *Rational torsion of elliptic curves.*
 (1384) **Amod Agashe**, Florida State University (1014-11-839)
- 9:30AM *Toward an explicit 2-descent on the Jacobian of a generic curve of genus 2.* Preliminary report.
 (1385) **Ronald M. van Luijk***, UC Berkeley, CRM, MSRI, and **Adam M. Logan**, University of Liverpool, CRM, and University of Waterloo (1014-11-1153)
- 10:00AM *Pointless curves of genus 3 and 4.*
 (1386) **Everett W Howe***, Center for Communications Research, La Jolla, **Kristin E Lauter**, Microsoft Research, and **Jaap Top**, University of Groningen (1014-11-947)
- 10:30AM *Cup products and unramified extensions.*
 (1387) Preliminary report.
Romyar T. Sharifi, McMaster University (1014-11-826)

AMS Special Session on New Developments in Symplectic Topology, II

8:00 AM – 10:50 AM

Organizers: **Dusa McDuff**, SUNY at Stony Brook
Aleksey Zinger, SUNY at Stony Brook
Ely Kerman, University of Illinois at Urbana-Champaign
Margaret F. Symington, Georgia Institute of Technology and Mercer University

- 8:00AM *On the topology of Lagrangian submanifolds.*
 (1388) **Peter Albers**, Courant Institute, New York University (1014-53-550)

- 8:30AM (1389) *Conormal bundles to knots and the Gopakumar-Vafa conjecture.*
Sergiy V. Koshkin, Kansas State University (1014-53-291)
- 9:00AM (1390) *Holomorphic shadows in the eyes of model theory.*
Liat Kessler, Courant Institute of Mathematical Sciences, New York University (1014-53-1259)
- 9:30AM (1391) *Heegaard-Floer homology for manifolds with parametrized boundary.*
Robert Lipshitz, Stanford University (1014-57-467)
- 10:00AM (1392) *Fiber sum formulae for Ozsváth-Szabó invariants.*
Stanislav Jabuka, University of Nevada, Reno, and **Thomas E. Mark***, Southeastern Louisiana University (1014-57-97)
- 10:30AM (1393) *Symplectic 4-manifolds with arbitrary fundamental group near the BMY line.* Preliminary report.
Scott Baldrige*, Louisiana State University, and **Paul Kirk**, Indiana University (1014-57-481)

AMS Special Session on Nonautonomous Discrete Dynamics, III

8:00 AM – 10:50 AM

Organizers: **Saber N. Elaydi**, Trinity University
Jim M. Cushing, University of Arizona

- 8:00AM (1394) *Detection of periodic driving in systems of difference equations.*
Timothy D Sauer, George Mason University (1014-39-1061)
- 8:30AM (1395) *Linear difference equations defined by polynomial hypergroups: Examples and basic properties.*
Rupert Lasser, GSF-Research Center and University of Technology Munich, Germany (1014-39-174)
- 9:00AM (1396) *On $x_{n+1} = \max \left\{ \frac{A_n}{x_n}, \frac{B_n}{x_{n-1}} \right\}$ With Both Parameters*
Period-Four or Period-Five. Preliminary report.
Candace Marie Kent*, Virginia Commonwealth University, and **Jennifer S. Sanchez**, Nashville, Tennessee (1014-37-871)
- 9:30AM (1397) *Deterministic Dynamics and Chance.*
Sandra A. Hayes*, Technical University of Munich, Germany, and **Yunping Jiang**, Queens College of the City University of New York (1014-37-1654)
- 10:00AM (1398) *Discrete Inertial Manifolds.*
Christian Poetzsche, University of Minnesota (1014-39-505)
- 10:30AM (1399) *Central Limit Theorem for one-dimensional dynamical systems with weak random noise.* Preliminary report.
Oliver Diaz, University of Texas at Austin (1014-37-41)

AMS Session on Knots, Links, and Tangles

8:00 AM – 8:55 AM

- 8:00AM (1400) *Quandle Cocycle Invariants and Tangle Embeddings.*
Kheira Ameur, USF (1014-55-1576)
- 8:15AM (1401) *Existence and Upper Bounds of Regular Stick Numbers of Knots and Links.* Preliminary report.
Timothy D Comar*, **Kenneth Miller** and **Debra Witczak**, Benedictine University (1014-57-138)

- 8:30AM (1402) *Scaling Behavior, Equilibrium Lengths, and Probabilities of Knotted Polymers.*
Akos Dobay, Ludwig-Maximilians-Universitaet Muenchen, **Kenneth C. Millett**, University of California, Santa Barbara, **Michael Piatek**, University of Washington, **Eric Rawdon***, Duquesne University, and **Andrzej Stasiak**, University of Lausanne (1014-57-698)
- 8:45AM (1403) *On the Structure of Tight Knots.* Preliminary report.
Ted Ashton, University of Georgia (1014-53-144)

AMS Session on Lattices, Ordered Structures, Logic and Model Theory

8:00 AM – 9:55 AM

- 8:00AM (1404) *Aspects of Certain Countable Universal H-Free Graphs.*
Rehana Patel, St. John's University (1014-03-1690)
- 8:15AM (1405) *Spaces of orders on groups.* Preliminary report.
Malgorzata A. Dabkowska*, George Washington University, **Mieczyslaw Dabkowski**, University of Texas at Dallas, and **Valentina Harizanov**, George Washington University (1014-03-1718)
- 8:30AM (1406) *Degrees of Monotone Complexity.*
William C Calhoun, Bloomsburg University of Pennsylvania (1014-03-1564)
- 8:45AM (1407) *A Peculiar Connection Between the Axiom of Choice and Predicting the Future.* Preliminary report.
Christopher S Hardin*, Smith College, and **Alan D Taylor**, Union College (1014-03-1551)
- 9:00AM (1408) *Generating a Finite Subset of a Lattice of Convex Sets.* Preliminary report.
M. P. Nolte* and **Matt Insall**, University of Missouri-Rolla (1014-06-1691)
- 9:15AM (1409) *Type Isomorphisms and Program Isomorphisms.* Preliminary report.
Carlos C Martinez, Wesleyan University (1014-68-1716)
- 9:30AM (1410) *j-calculus: a foundation for discrete analysis.*
Phil Thrift, The University of Texas at Dallas (1014-39-1614)
- 9:45AM (1411) *Predicates, categorically.*
Ayalur R Krishnan, Kingsborough CC, CUNY. (1014-18-1714)

AMS Session on Real Analysis

8:00 AM – 10:40 AM

- 8:00AM (1412) *Rational Landen Transformations on \mathbb{R} .*
Dante V. Manna, Tulane University, New Orleans, Louisiana (1014-33-210)
- 8:15AM (1413) *Resultants of Chebyshev polynomials.*
Jemal Emina Giske*, University of South Florida, and **Mourad E.H. Ismail**, University of Central Florida (1014-33-1457)
- 8:30AM (1414) *An Inductive Limit Topology on the Denjoy Space.*
J. Alan Alewine*, McKendree College, and **Eric Schechter**, Vanderbilt University (1014-28-367)
- 8:45AM (1415) *A Comparison of Newton's Interpolation Theory and the Mean Value Theorem of Calculus.* Preliminary report.
Nasser Dastrange, Buena Vista University (1014-26-815)
- 9:00AM (1416) *Subspaces of finitely additive measures on N .* Preliminary report.
Ron E. Rietz and **Trevor J. Potter***, Gustavus Adolphus College (1014-28-1384)

- 9:15AM *A note on 2-to-1 function.* Preliminary report.
 ▶ (1417) **Kandasamy Muthuvel**, University of Wisconsin-Oshkosh (1014-26-1735)
- 9:30AM *The symbol of a function of a pseudo-differential operator.* Preliminary report.
 (1418) **Alfonso Gracia-Saz***, UC Berkeley, and **Cornelius Paufler**, Johannes-Gutenberg-Universitaet Mainz (1014-81-963)
- 9:45AM *Making Forecasts for Chaotic Physical Processes.*
 (1419) **Chris Danforth*** and **James A. Yorke**, University of Maryland (1014-86-377)
- 10:00AM *Classification of multipartite entanglement types with minimum orbit dimension.*
 (1420) **David W. Lyons*** and **Scott N. Walck**, Lebanon Valley College (1014-81-1478)
- 10:15AM *A Reformulation of the Empirical Mode Decomposition.*
 ▶ (1421) **Daniel R Van Vliet**, West Virginia University (1014-00-1618)
- 10:30AM *The identification of a time dependent sorption parameter from soil column experiments.*
 (1422) **K. Renee Fister**, **Maeve L. McCarthy***, Murray State University, and **Seth F. Oppenheimer**, Mississippi State University (1014-35-1771)

AMS Session on Group Theory, II

8:00 AM – 10:40 AM

- 8:00AM *Deciding Membership in Finitely Generated Submonoids of the Free Product of two Groups.*
 (1423) **Justin Amery James**, University of Nebraska - Lincoln (1014-20-990)
- 8:15AM *An analog of McCarthy's result.*
 (1424) **Chiru Bhattacharya**, Randolph-Macon College, Ashland, VA (1014-20-1163)
- 8:30AM *An Application of Graph Pebbling to Zero-Sum Sequences in Abelian Groups.*
 ▶ (1425) **Glenn H Hurlbert*** and **Shawn Elledge**, Arizona State University (1014-20-1522)
- 8:45AM *Chain Conditions on Subnormal Subgroups.*
 (1426) **Colin C. Ferguson**, University of Illinois at Urbana-Champaign (1014-20-1536)
- 9:00AM *Decomposition numbers of finite groups of Lie type of small rank in the defining characteristic.*
 (1427) **Hossein Andikfar**, University of Illinois at Chicago. (1014-20-1605)
- 9:15AM *Geometric Analysis of Groups of Piecewise-linear Homeomorphisms of the Unit Interval.*
 (1428) **Collin Bleak**, Binghamton University (1014-20-1653)
- 9:30AM *Weyl filtration dimension for simple modules with p -singular highest weights for some low rank Algebraic groups.* Preliminary report.
 (1429) **Matthew J. Beswick**, Kansas State University (1014-00-252)
- 9:45AM *Embedding a Connected Topological Group into a Connected Group.* Preliminary report.
 (1430) **Ryo Ohashi**, King's College (1014-22-477)
- 10:00AM *When do locally isometric topologies for the real numbers yield isomorphic topological groups?* Preliminary report.
 (1431) **Jon W. Short**, Sam Houston State University, and **T. Christine Stevens***, Saint Louis University (1014-22-1636)
- 10:15AM *Nilpotent Conjugacy Classes in p -adic Lie Algebras.*
 (1432) **Jyotsna Mainkar Diwadkar**, University of Pittsburgh (1014-08-1502)

- 10:30AM *Modern Algebra and Social Choice.* Preliminary report.
 ▶ (1433) **S. Baker Peacock*** and **M. Paredes**, University of Texas-Pan American (1014-06-1667)

MAA Session on Mathematics of Sports and Games, II

8:00 AM – 10:55 AM

- Organizers: **Sean L. Forman**, Saint Joseph's University
Douglas Drinen, Sewanee: University of the South
- 8:00AM *Optimal Allocation of Energy Resources for Athletes in Bicycling, Running, Skiing and Swimming Competition as a Time Optimal Control Problem.*
 ▶ (1434) **Alexey L Sadovski*** and **G Beate Zimmer**, Texas A&M University-Corpus Christi (1014-M1-1140)
- 8:20AM *Scrabble[®] Tournaments, Ramsey Theory, and Resolvable Designs.*
 ▶ (1435) **Paul Becker*** and **Paul Olson**, Penn State Erie - The Behrend College (1014-M1-778)
- 8:40AM *Transient Stress Analysis of Baseball-Bat Collision.* Preliminary report.
 ▶ (1436) **Rich Laverty**, Juniata College (1014-M1-1159)
- 9:00AM *Playing Ball in a Rotating Space Station.*
 ▶ (1437) **Andrew J. Simoson**, King College (1014-M1-67)
- 9:20AM *Thinking Inside the Box: The Mathematics of a Tennis Serve.*
 ▶ (1438) **Roland Minton*** and **Jake Bennett**, Roanoke College (1014-M1-183)
- 9:40AM *Baseball Decision-Making with Markov Chain Models.*
 ▶ (1439) **Thomas W Polaski**, Winthrop University (1014-M1-965)
- 10:00AM *Using Theil's T Statistic to Explore Salary Inequality in Professional Sports: New Tools, New Questions, New Answers.* Preliminary report.
 ▶ (1440) **Joshua Travis Hale**, LBJ School of Public Affairs; University of Texas at Austin (1014-M1-1466)
- 10:20AM *Scoring Rules for Golf.*
 ▶ (1441) **Michael A. Jones**, Montclair State University (1014-M1-591)
- 10:40AM *Mathematics in Officiating: Data Sets and Voting Records for Introductory Statistics and Quantitative Literacy Classes.*
 ▶ (1442) **Christopher D Oehrlein**, Oklahoma City Community College (1014-M1-1484)

MAA Session on Achieving Quantitative Literacy, II

8:00 AM – 10:15 AM

- Organizers: **Aaron G. Montgomery**, Central Washington University
Stuart Boersma, Central Washington University
Semra Kilic-Bahi, Colby Sawyer College
- 8:00AM *Numeracy: A Course for Honor Students.* Preliminary report.
 ▶ (1443) **John C Maceli**, Ithaca College (1014-P1-944)
- 8:20AM *The Mathematics of Association in Quantitative Literacy.* Preliminary report.
 ▶ (1444) **Milo Schield**, Augsburg College (1014-P1-36)
- 8:40AM *Spreadsheets Across the Curriculum.* Preliminary report.
 ▶ (1445) **Gary T Franchy**, Davenport University (1014-P1-1727)

Program of the Sessions – Sunday, January 15 (cont'd.)

- 9:00AM *Profit Maximization and Level Curves: Applying Excel Data Tables, Conditional Formatting, and the Solver.*
▶ (1446) **Mike Pogodzinski**, Department of Economics, San Jose State University (1014-P1-404)
- 9:20AM *The Unholy Alliance: Integrating Math and Religion.*
▶ (1447) Preliminary report.
Harrison W Straley* and **Barbara Darling-Smith**, Wheaton College (1014-P1-27)
- 9:40AM *From Math Distress To Math Success: The Development of a Quantitative Reasoning Course To Motivate Student Learning.*
▶ (1448) **Klement Teixeira*** and **Fred Peskoff**, Borough of Manhattan Community College (1014-P1-789)
- 10:00AM *Join the Mathematics Across the Community College Curriculum Project.*
▶ (1449) **Rebecca Hartzler**, Seattle Central Community College (1014-P1-1264)

MAA Session on Countering “I Can’t Do Math”: Strategies for Teaching Underprepared, Math-Anxious Students, II

8:00 AM – 9:55 AM

Organizers: **Bonnie Gold**, Monmouth University
Suzanne Dorée, Augsburg College
Richard J. Jardine, Keene State College

- 8:00AM *Improving Developmental Math Classes: What We’ve Learned.*
(1450) **Christopher S. O’Connor*** and **B. Fiske Michael**, Shawnee State University (1014-S1-355)
- 8:20AM *Using Standards-Based Instruction and Assessment to Reach Anxious, Reluctant, and Under-Prepared Math Students.* Preliminary report.
▶ (1451) **Victor Dorff**, California Lutheran University (1014-S1-1560)
- 8:40AM *In Other Words: Using Writing Assignments and Memory Aides to Help Students Learn Mathematics.* Preliminary report.
▶ (1452) **Sarah V Cook**, Washburn University (1014-S1-1473)
- 9:00AM *Coaching a Student to Overcome Math Anxiety.*
▶ (1453) **Roger A Simons**, Rhode Island College (1014-S1-1689)
- 9:20AM *Needed Reforms for Class-Instruction of Under-Prepared, Math-Anxious Students: Revelations from Casework with Clinical Instruction.*
(1454) **Clyde L. Greeno**, The MALEI Mathematics Institute (1014-S1-1134)
- 9:40AM *Coping With Math Anxiety in College: A Case Study Approach.*
▶ (1455) **Fred Peskoff**, Borough of Manhattan Community College (1014-S1-723)

MAA General Contributed Paper Session, VII

8:00 AM – 10:55 AM

Chair: **Timothy P. Chartier**, Davidson College
Chair: **Stephen L. Davis**
Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University

- 8:00AM *Reforming an Introduction to Modern Algebra.*
▶ (1456) Preliminary report.
Jeffrey L. Hirst, Appalachian State University (1014-Z1-1077)
- 8:15AM *Generalized primary rings and ideals.*
(1457) **Christine E. Gorton**, University of Louisiana at Lafayette (1014-Z1-1680)

- 8:30AM *Using Discovery Activities to Teach Mathematical Induction.*
(1458) **Brian P Kelly**, U. of Louisiana at Monroe (1014-Z1-1539)
- 8:45AM *A charlatanic proof: the case of proof by induction.*
▶ (1459) Preliminary report.
May F. Hamdan, Lebanese American University (1014-Z1-726)
- 9:00AM *Teaching the Lebesgue Integral to Undergraduates: A New Course.*
▶ (1460) **William W Johnston**, Centre College (1014-Z1-777)
- 9:15AM *Approximate Contour Image Generation: A Project in Linear Algebra.*
▶ (1461) **Mohamed Allali**, Chapman University (1014-Z1-1659)
- 9:30AM *Does Experience Matter? Comparisons of freshmen and sophomores in Calculus III.* Preliminary report.
▶ (1462) **Kurt Herzinger** and **Beth Schaubroek***, U.S. Air Force Academy (1014-Z1-669)
- 9:45AM *An Alternative Method to Partial Fraction Decomposition of Integral Computation.*
▶ (1463) **Chokri Cherif**, BMCC-CUNY (1014-Z1-574)
- 10:00AM *Time dilation, neutron stars, and space war: teaching relativity and differential geometry aboard a Bussard ramjet.*
▶ (1464) **Christopher G Moseley**, United States Military Academy (1014-Z1-1331)
- 10:15AM Break
- 10:30AM *Engaging math faculty in teacher preparation.*
▶ (1465) **Cecelia Laurie***, The University of Alabama, **Cristina Gomez**, SUNY-Cortland, and **Wei Shen Hsia**, The University of Alabama (1014-Z1-1138)
- 10:45AM *No Boys Allowed: Assessing A Girls Only Math Club.*
▶ (1466) **Rachel S Cline*** and **Jerry Dwyer**, Texas Tech University (1014-Z1-1100)

AMS Session on Frames, Operators, and Approximation

8:15 AM – 10:55 AM

- 8:15AM *Back step extensions of subnormal weighted shifts.*
(1467) Preliminary report.
George Robert Exner, Bucknell University (1014-47-657)
- 8:30AM *Positive Definite Kernels and Lattice Paths.*
(1468) **Tiberiu Constantinescu** and **Nermine El-Sissi***, University of Texas at Dallas (1014-47-406)
- 8:45AM *On the Cauchy integrals taken over the doubly-periodic line.* Preliminary report.
(1469) **Nino Khatishvili**, Tbilisi I.Javakhishvili State University, Georgia Tbilisi (1014-45-111)
- 9:00AM *The Answer to Blecher’s Open Question about Properties (L) and (R).*
(1470) **Masayoshi Kaneda**, University of California, Irvine (1014-47-1741)
- 9:15AM *Multiresolutions in non-linear dynamics.*
(1471) **Dorin Ervin Dutkay***, Rutgers University, and **Palle E. T. Jorgensen**, University of Iowa (1014-43-1650)
- 9:30AM *Non-separable Frame Multiresolution Analysis and Fast Wavelet Algorithms in Multidimensions.*
(1472) Preliminary report.
Juan R. Romero* and **Manos Papadakis**, University of Houston (1014-41-1635)
- 9:45AM *A Pre and Post Processing to Reduce the Gibbs Phenomenon.*
(1473) **Muhammad Aslam***, **Sherman D. Riemenschneider**, West Virginia University, and **Lixin Shen**, Western Michigan University (1014-65-1516)

- 10:00AM *An Efficient Method for Band-limited Extrapolation by Regularization.*
(1474) **Weidong Chen**, Kansas State University (1014-65-70)
- 10:15AM *PCM Quantization Errors and The White Noise Hypothesis.*
(1475) **David Jimenez**, Georgia Institute of Technology, **Long Wang***, Southern Polytechnic State University, and **Yang Wang**, Georgia Institute of Technology (1014-42-741)
- 10:30AM *An approximation-solvability for variational inequalities.* Preliminary report.
(1476) **Dan D. Pascali**, Courant Institute, New York University (1014-47-1085)
- 10:45AM *Asymptotics of determinants and traces of Toeplitz matrices with symbols in weighted Wiener algebras.*
(1477) **Alexei Yu. Karlovich**, Universidade do Minho (Braga, Portugal) (1014-47-1426)

MAA Session on Strategies to Encourage Persistence in Mathematics

8:20 AM – 10:55 AM

Organizers: **David C. Carothers**, James Madison University
Ahmed I. Zayed, DePaul University
Keith E. Mellinger, University of Mary Washington

- 8:20AM *Teaching a Course in Cryptology - strengthening mathematical interests in a variety of majors.* Preliminary report.
▶ (1478) **Katarzyna Potocka**, Ramapo College of New Jersey (1014-Y5-473)
- 8:40AM *Courting New Majors at the University of Mary Washington.*
(1479) **Debra L. Hydorn**, University of Mary Washington (1014-Y5-1006)
- 9:00AM *Talent Expansion in Quantitative Biology.* Preliminary report.
▶ (1480) **Anant P Godbole**, East Tennessee State University (1014-Y5-1143)
- 9:20AM *Motivating Students by Incorporating Software in the Classroom.* Preliminary report.
▶ (1481) **W. Christopher Schroeder*** and **Kendra S. Schroeder**, Morehead State University (1014-Y5-400)
- 9:40AM *Using Personal Invitations to Encourage Future Study in Mathematics.*
(1482) **Andrew J. Miller**, Belmont University (1014-Y5-419)
- 10:00AM *Discrete Mathematics for Freshmen (a.k.a: grabbing them early).* Preliminary report.
▶ (1483) **Homer W. Austin*** and **Kathleen M Shannon**, Salisbury University (1014-Y5-619)
- 10:20AM *Extra math courses for students - a mathematics placement coordinator's point of view.*
(1484) **Hisa Tsutsui**, Embry-Riddle Aeronautical University and **Millersville University of Pennsylvania** (1014-Y5-1743)
- 10:40AM *Competency Grading, Student Choice, and Persistence in Mathematics.* Preliminary report.
▶ (1485) **Janet L Andersen**, Hope College (1014-Y5-1767)

AWM Workshop

8:20 AM – 4:20 PM

This session has several parts listed separately by time in this program. Listed Workshop presentations are open to all JMM participants.

Organizers: **Claudia Polini**, University of Notre Dame
Marie A. Vitulli, University of Oregon
Judy L. Walker, University of Nebraska-Lincoln

AWM Workshop: Research Presentations by Recent Ph.D.s, I

8:30 AM – 10:20 AM

- 8:30AM *Hilbert's Tenth Problem for function fields of characteristic zero.*
(1486) **Kirsten Eisentraeger**, University of Michigan (1014-11-712)
- 9:00AM *The topology of symplectic and hyperkahler quotients.*
(1487) **Megumi Harada**, University of Toronto (1014-53-592)
- 9:30AM *The Road to Super Quantum Groups.*
(1488) **Gizem Karaali**, University of California, Santa Barbara (1014-17-580)
- 10:00AM *The Motion of a Thin Liquid Film Driven by Surfactant and Gravity.*
(1489) **Rachel Levy**, Duke University (1014-76-568)

AMS Committee on Education Panel Discussion

8:30 AM – 10:00 AM

International perspectives on undergraduate mathematics.
Organizer: **William G. McCallum**, University of Arizona
Moderator: **Deborah Hughes Hallett**, University of Arizona
Panelists: **Lofti Hermi**, University of Arizona
Jia Ling Dai, University of Arizona
Bin Lu, California State University Sacramento
Hideo Nagashshi, Colby College
Presenter: **Ko Hyoung Ko**, Korean Advanced Institute for Science and Technology

MAA Invited Address

9:00 AM – 9:50 AM

- (1490) *Mathematicians and education reform: A cautionary tale.*
Naomi Fisher, University of Illinois at Chicago (1014-A0-09)

ASL Invited Address

9:00 AM – 9:50 AM

- (1491) *Spectra of Turing degrees.*
Russell Miller, Queens College (CUNY)

MAA Minicourse #10: Part B

9:00 AM – 11:00 AM

A beginner's guide to the scholarship of teaching and learning in mathematics.

Organizers: **Curtis D. Bennett**, Loyola Marymount University

Jacqueline M. Dewar, Loyola Marymount University

Thomas F. Banchoff, Brown University

John P. Holcomb, Cleveland State University

MAA Minicourse #15: Part B

9:00 AM – 11:00 AM

A novel approach to problem solving.

Organizer: **Andrew C-F Liu**, University of Alberta

MAA Minicourse #4: Part B

9:00 AM – 11:00 AM

Creating interactive workbooks using MS excel.

Organizer: **Sarah L. Mabrouk**, Framingham State College

MAA Session on Mathematics and Popular Culture, II

9:00 AM – 10:55 AM

Organizers: **Sarah J. Greenwald**, Appalachian State University

Christopher D. Goff, University of the Pacific

- ▶ 9:00AM (1492) *Using Popular Culture to Meet Quantitative Reasoning Teaching and Learning Goals.* Preliminary report. **Cinnamon Hillyard**, University of Washington, Bothell (1014-V1-1651)
- ▶ 9:20AM (1493) *Mathematics in Popular Texts for a First-Year Seminar.* **Mike Pinter**, Belmont University (1014-V1-666)
- ▶ 9:40AM (1494) *The Mathematics of Ripley's Believe It Or Not!* **Vince Schielack**, Texas A&M University (1014-V1-1375)
- ▶ 10:00AM (1495) *The myth of the good mathematics teacher.* **Judith Lynn Gieger**, Oglethorpe University (1014-V1-1217)
- ▶ 10:20AM (1496) *Media Influences and Gender Equity in Mathematics Education.* Preliminary report. **Shelby P Morge**, Indiana University, Bloomington (1014-V1-166)
- ▶ 10:40AM (1497) *Is Hollywood Good for Mathematics? (a brief discussion).* Preliminary report. **Christopher D Goff**, University of the Pacific (1014-V1-988)

MAA Session on Introductory Actuarial Science Programs

9:00 AM – 10:55 AM

Organizer: **Robert E. Buck**, Slippery Rock University

- ▶ 9:00AM (1498) *Adjusting to Changes in the Actuarial Exam Structure.* **Robert E. Buck**, Slippery Rock University (1014-Y7-1070)

- ▶ 9:20AM (1499) *Growing an Actuarial Science Program into an Advanced Undergraduate Program.* Preliminary report. **Kevin E. Charlwood**, Washburn University (1014-Y7-398)

- ▶ 9:40AM (1500) *Actuarial Science curriculum in a regional institution.* Preliminary report. **Kumer P Das**, Lamar University (1014-Y7-1526)

- ▶ 10:00AM (1501) *Moving from undergraduate actuarial science program to advanced undergraduate actuarial science program - Central Washington University, Ellensburg, WA.* Preliminary report. **Centsong Lin*** and **Yvonne Chueh**, Central Washington University (1014-Y7-1656)

- ▶ 10:20AM (1502) *Actuarial Science: Implementation and Revision.* Preliminary report. **Youngna Choi**, Montclair State University (1014-Y7-1196)

- ▶ 10:40AM (1503) *A possible accreditation system for actuarial-education programs.* Preliminary report. **James W. Daniel**, University of Texas at Austin (1014-Y7-1054)

MAA CUPM Subcommittee on Curriculum Renewal Across the First Two Years Panel Discussion

9:00 AM – 10:20 AM

Developing standards for college algebra.

Organizers: **Norma M. Agras**, Miami Dade College
William C. Bauldry, Appalachian State University

SIGMAA on Research in Undergraduate Mathematics Education Panel Discussion

9:00 AM – 10:20 AM

A MAA Notes sampler.

Organizers: **Barbara E. Edwards**, Oregon State University
William O. Martin, North Dakota State University

Panelists: **Chris Rasmussen**, San Diego State University
Marilyn P. Carlson, Arizona State University
Michael Oehrtman, Arizona State University

NAM Panel Discussion

9:00 AM – 10:00 AM

Exhibits and Book Sales

9:00 AM – NOON

Employment Center

9:00 AM – NOON

ASL Invited Address

10:00 AM – 10:50 AM

- (1504) *Strictly stable theories and descriptive set theory.* **Michael C. Laskowski**, University of Maryland

Math on the Web, IV

10:00 AM – 10:30 AM

10:00AM *Using MathML with Blackboard and WebCT.*
(1505) **Bob Matthews**, Design Science, Inc.

NAM Business Meeting

10:00 AM – 10:55 AM

MAA Invited Address

10:05 AM – 10:55 AM

(1506) *Patterns of primes.*
Ben Green, University of Bristol

AWM Workshop: Poster Session with Presentations from Women Recent Ph.d.s and Graduate Students

10:30 AM – 11:00 AM

- 10:30AM *Constitutive Restrictions for Isotropic Hyperelastic Material Modeled Using Invariants of Logarithmic Strain.*
(1507) **Tsvetanka Sendova*** and **Jay R. Walton**, Texas A&M University (1014-74-563)
- 10:30AM *Arithmetic Properties of the Coefficients of Modular Forms.*
(1508) **Stephanie Treneer**, University of Illinois at Urbana-Champaign (1014-11-599)
- 10:30AM *Szygies of toric varieties.*
(1509) **Milena Hering***, University of Michigan, **Hal Schenck**, Texas A&M University, and **Gregory G. Smith**, Queen's University (1014-14-641)
- 10:30AM *The core of ideals.* Preliminary report.
(1510) **Louiza Fouli**, Purdue University (1014-13-644)
- 10:30AM *Two-Dimensional Languages and Their Automata.*
(1511) **Joni Burnette Pirnot**, Manatee Community College (1014-68-700)
- 10:30AM *Non-Simple Non-Stationary Bratteli-Vershik Systems.* Preliminary report.
(1512) **Sarah E Bailey**, University of North Carolina, Chapel Hill (1014-37-740)
- 10:30AM *A Stochastic Dynamical System for the Evolution of Repeat Strings.* Preliminary report.
▶ (1513) **Suzanne S Sindi**, University of Maryland (1014-37-747)
- 10:30AM *Layer potential techniques for parabolic PDE in nonsmooth cylinders.*
(1514) **Tunde Jakab**, University of Missouri (1014-35-754)
- 10:30AM *Jet schemes of monomial schemes.* Preliminary report.
(1515) **Cornelia Oichi Yuen**, University of Michigan, Ann Arbor (1014-14-762)
- 10:30AM *A Fast Multipole Method-based Poisson Solver for Use in Fluid Simulation.* Preliminary report.
(1516) **Sarah A. Williams**, UC Davis, Graduate Group in Applied Mathematics (1014-65-771)
- 10:30AM *Continuous Dependence Results for Inhomogeneous Ill-Posed Problems.* Preliminary report.
(1517) **Beth M. Campbell Hetrick**, Bryn Mawr College (1014-47-774)
- 10:30AM *Spinning Rods: Experiments & Theory.*
(1518) **Terry Jo Leiterman***, **Richard M McLaughlin**, **Roberto Camassa**, **Leandra Vicci**, **Richard Superfine**, **Jing Hao** and **Jonathan Toledo**, University of North Carolina Chapel Hill (1014-76-980)

MAA Business Meeting

11:10 AM – 11:40 AM

Organizer: **Martha J. Siegel**, Towson University
Moderator: **Carl C. Cowen**, IUPUI

AMS Business Meeting

11:45 AM – 12:15 PM

NAM Claytor-Woodard Lecture

1:00 PM – 1:50 PM

(1519) *A Rebirth of Bochner's theory of almost automorphy of solutions to evolution equations.*
Gaston M. N'Guerekata, Morgan State University

AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates, II

1:00 PM – 5:55 PM

- Organizers: **Darren Narayan**, Rochester Institute of Technology
Carl V. Lutzer, Rochester Institute of Technology
Michael J. Fisher, California State University Fresno
Bernard Brooks, Rochester Institute of Technology
Tamas Wiandt, Rochester Institute of Technology
- 1:00PM *For King and Country: An Exploration in Sixteenth Century Cryptography.* Preliminary report.
▶ (1520) **Ryan W. Fuoss***, Taylor University, and **Amanda R. Youell**, Clemson University (1014-11-1643)
 - 1:20PM *Minimum Positive Semi-Definite Rank of a Graph.*
▶ (1521) **Kseniya Kudryavtseva***, Central Michigan University, **Janeta Marinova**, Bard College, and **Yunjiang Jiang**, University of Georgia (1014-15-115)
 - 1:40PM *Extension of groups yielding quasi p-groups.*
▶ (1522) **Joseph David Gastenveld**, Northern Kentucky University (1014-20-196)
 - 2:00PM *Modeling temperatures for a building with seven zones.* Preliminary report.
▶ (1523) **Carrie E Keel*** and **J K Denny**, Mercer University (1014-34-1589)
 - 2:20PM *Turing Pattern Dynamics for Spatiotemporal Models with Growth and Curvature.* Preliminary report.
▶ (1524) **Julijana V Gjorgjieva**, Harvey Mudd College (1014-35-1378)
 - 2:40PM *The Isoperimetric Problem in Surfaces.* Preliminary report.
▶ (1525) **Michelle Lee**, Williams College (1014-51-1116)
 - 3:00PM *A Combinatorial Approach to the Symmetries of the Icosahedron Using K-6.* Preliminary report.
▶ (1526) **Kevin Ehly**, Lafayette College (1014-51-1573)
 - 3:20PM *The Prison Warden's Dilemma: A Characterization of 3-Convexity.*
▶ (1527) **Deborah E. Berg*** and **Tyler Seacrest**, Harvey Mudd College (1014-52-1318)
 - 3:40PM *Minimal Triangulations of Products of Segments and Triangles.*
▶ (1528) **Tyler Seacrest***, Havrey Mudd College, and **Francis Edward Su**, Harvey Mudd College (1014-52-1324)

Program of the Sessions – Sunday, January 15 (cont'd.)

- 4:00PM *Honeycombs in Hyperbolic Surfaces*. Preliminary report.
▶ (1529) **Vojislav S Sesum**, Williams College (1014-53-1202)
- 4:20PM *Isoperimetric Surfaces and General Relativity*.
▶ (1530) **Brian Krummel***, University of Maryland - Baltimore County, and **Mike Greenberg**, New York University - Courant Institute of Mathematical Sciences (1014-53-1622)
- 4:40PM *Twist Numbers of Links from the Jones Polynomial*.
▶ (1531) **Mathew Williamson**, University of South Florida (1014-55-328)
- 5:00PM *Generalizing Kirk-Livingston Type 1 Link Invariants*. Preliminary report.
▶ (1532) **Karen B McCready***, The College of New Jersey, and **Matthias L Youngs**, SUNY Geneseo (1014-55-1251)
- 5:20PM *Comparing Ratio Estimators Based on Systematic Samples*. Preliminary report.
▶ (1533) **John Szarka***, James Madison University, and **Amy Jacks**, University of Missouri-Rolla (1014-62-1139)
- 5:40PM *A Modified Lotka-Volterra Competition Model with a Non-Linear Relationship Between Species*.
▶ (1534) **Amy Vess Crizer***, James Madison University, and **Austin F Taylor**, University of Alabama (1014-92-1544)

AMS-MAA-SIAM Special Session on Recent Advances in Mathematical Biology and Epidemiology, II

1:00 PM – 5:50 PM

Organizers: **Sophia Jang**, University of Louisiana at Lafayette
Linda Allen, Texas Tech University
Lih-Ing Roeger, Texas Tech University

- 1:00PM *A Juvenile-Adult Model with Periodic Vital Rates*.
▶ (1535) **J. M. Cushing**, University of Arizona (1014-92-507)
- 1:30PM *The Stochastic Beverton Holt Equation and the M. Neubert Conjecture*.
(1536) **Cymra Haskell** and **Robert J. Sacker***, University of Southern California (1014-37-1212)
- 2:00PM *Dynamics of the Discrete Model of West Nile-Like Epidemics*.
▶ (1537) **V. L. Kocic**, Xavier University of Louisiana (1014-39-204)
- 2:30PM *Discrete-Time Epidemic Model In A Seasonal Environment*. Preliminary report.
▶ (1538) **Abdul-Aziz Yakubu***, Howard University, and **John E Franke**, North Carolina State University (1014-92-428)
- 3:00PM *Predicting the Behavior of Seabirds Using Compartmental Models*.
▶ (1539) **James L. Hayward*** and **Shandelle M. Henson**, Andrews University (1014-92-521)
- 3:30PM *How does estradiol initiate the LH surge? A modeling approach*. Preliminary report.
▶ (1540) **Mary Lou Zeeman***, U. T. San Antonio, **Danielle Lyles**, **Joseph H. Tien** and **David McCobb**, Cornell University (1014-92-1644)
- 4:00PM *Understanding *Hyla cinerea* green treefrog population dynamics via modeling and field studies*. Preliminary report.
▶ (1541) **Azmy Ackleh**, University of Louisiana at Lafayette (1014-92-687)
- 4:30PM *Existence-uniqueness and monotone approximation for a phytoplankton-zooplankton aggregation model*.
(1542) **Azmy S Ackleh**, **Keng Deng***, University of Louisiana at Lafayette, and **Xubo Wang**, Macon State College (1014-35-684)

- 5:00PM *Kolmogorov's differential equations and Markov population chains*.
(1543) **Maia Martcheva**, University of Florida, **Horst R Thieme** and **Thanate Dhirasakdanon***, Arizona State University (1014-92-1002)
- 5:30PM *Winnerless Competition in Consumer-resource Interaction Models in Population Biology*. Preliminary report.
(1544) **Lih-Ing Wu Roeger***, Texas Tech University, and **Sze-Bi Hsu**, National Tsing Hua University (1014-92-759)

AMS-MAA Special Session on History of Mathematics, II

1:00 PM – 5:55 PM

Organizers: **Joseph W. Dauben**, Herbert H. Lehman College (CUNY)
Patti Hunter, Westmont College
Karen H. Parshall, University of Virginia

- 1:00PM *Did Euclid Need the Euclidean Algorithm to Prove Unique Factorization?*
▶ (1545) **David J. Pengelley***, New Mexico State University, and **Fred Richman**, Florida Atlantic University (1014-01-730)
- 1:30PM *Lagrange, Sufficient Reason, and Space*. Preliminary report.
▶ (1546) **Judith Grabiner**, Pitzer College, Claremont, California (1014-01-387)
- 2:00PM *Statesmen of British Mathematics: Scientific Society Involvement of Mathematicians in Nineteenth-Century Britain*.
▶ (1547) **Sloan Evans Despeaux**, Western Carolina University (1014-01-707)
- 2:30PM *Mathematics as Popular Science: Benjamin Peirce in 19th-Century Boston*.
▶ (1548) **Deborah Kent**, Simon Fraser University (1014-01-682)
- 3:00PM *Cardinality and Confusion in the Peircean Continuum*.
(1549) **Matthew E Moore**, Brooklyn College of the City University of New York (1014-01-542)
- 3:30PM *Proof in Islam, India, and China*. Preliminary report.
▶ (1550) **Victor J Katz**, University of the District of Columbia (1014-01-717)
- 4:00PM *The Volterra Chronicles*. Preliminary report.
▶ (1551) **Judith R Goodstein**, California Institute of Technology (1014-01-635)
- 4:30PM *Objects and Mathematics Teaching at American Colleges and Universities*.
▶ (1552) **Peggy Aldrich Kidwell***, National Museum of American History, Smithsonian, **Amy Ackerberg-Hastings**, University of Maryland University College, and **David Lindsay Roberts**, Laurel, Maryland (1014-01-616)
- 5:00PM *Flying the Platonic Flag: Philosophical and Nationalistic Ideology in Deutsche Mathematik*. Preliminary report.
▶ (1553) **Thomas Drucker**, University of Wisconsin-Whitewater (1014-01-857)
- 5:30PM *Mathematics and the Social Sciences: The Origins of Finite Mathematics*.
▶ (1554) **Walter Meyer**, Adelphi University (1014-01-65)

AMS-SIAM Special Session on Frames and Operator Theory in Analysis and Signal Processing, IV

1:00 PM – 6:05 PM

Organizers: **Peter R. Massopust**, Tuboscope Vetco Pipeline Services
David R. Larson, Texas A&M University
Manos I. Papadakis, University of Houston
Zuhair Nashed, University of Central Florida
Ahmed I. Zayed, DePaul University
Minh Chuong Nguyen, Institute of Mathematics, Hanoi Vietnam

- 1:00PM *Use of geometry and operator algebra theory in the computation of wavelet coefficients.*
 ► (1555) **Palle E. T. Jorgensen***, University of Iowa, and **Dorin E. Dutkay**, Rutgers University (1014-42-24)
- 1:30PM *Wavelets, multiresolution analysis and finite reflexion groups.*
 (1556) **Gestur Olafsson***, Louisiana State University, and **Mihaela Dobrescu**, Furman University, SC (1014-42-1271)
- 2:00PM *Operator-valued frames over Hilbert C^* -modules.*
 (1557) Preliminary report. **Victor Kaftal***, University of Cincinnati, **David Larson**, Texas A&M University, and **Shuang Zhang**, University of Cincinnati (1014-47-1628)
- 2:30PM *Haar-type orthonormal systems, data presentation as Riesz products and a prediction method on symbolic sequences.*
 (1558) **C. Karanikas*** and **N. Atreas**, Aristotle University of Thessaloniki (1014-41-1770)
- 3:00PM *Regularization functionals involving discontinuous operators.*
 (1559) **Otmar Scherzer**, Department of Computer Science - University Innsbruck (1014-49-866)
- 3:30PM *Data fidelity terms for image and signal restoration.*
 (1560) **Mila Nikolova**, CMLA UMR 8536-ENS de Cachan (1014-41-1424)
- 4:00PM *Lattice Tilings, Operator Algebras and Gabor Frames.*
 (1561) **Deguano Han**, University of Central Florida (1014-46-439)
- 4:30PM *The Feichtinger Conjecture for frames of translates.*
 (1562) **Marcin Bownik**, University of Oregon, and **Darrin Speegle***, Saint Louis University (1014-42-787)
- 4:55PM *Orthogonal Wavelet Frames.*
 (1563) **Eric Weber***, Iowa State University, **Ghanshyam Bhatt**, Rose-Hulman Institute of Technology, and **Brody Dylan Johnson**, Saint Louis University (1014-42-427)
- 5:20PM *On PCM and Sigma-Delta Quantization Errors.*
 (1564) **Yang Wang***, Georgia Institute of Technology, **Long Wang**, Southern Polytechnic State University, and **David Jimenez**, Georgia Institute of Technology (1014-42-438)
- 5:45PM *Frame Paths and Sigma-Delta Quantization.*
 (1565) **Vern I. Paulsen***, University of Houston, and **Bernhard G. Bodmann**, University of Waterloo (1014-47-1111)

AMS-SIAM Special Session on Contemporary Dynamical Systems, III

1:00 PM – 5:25 PM

Organizers: **Dmitry Zenkov**, North Carolina State University
Youngna Choi, Montclair State University
Anthony M. Bloch, University of Michigan
Todd L. Fisher, University of Maryland
Melvin Leok, University of Michigan
David S. Richeson, Dickinson College
James S. Wiseman, Agnes Scott College

- 1:00PM *Control theory without controls.* Preliminary report.
 (1566) **Andrew D Lewis**, Queen's University (1014-93-952)
- 1:25PM *Integrable Problems for Semiclassical Nonlinear Waves.* Preliminary report.
 (1567) **Peter D Miller**, University of Michigan (1014-35-844)
- 1:50PM *Variational Integrators for Nonholonomic Systems on Lie Groups.*
 (1568) **Dmitry V. Zenkov***, North Carolina State University, and **Yuri N. Fedorov**, Universitat Politecnica de Catalunya (1014-70-1347)
- 2:15PM *Lie group variational integrators and their applications to geometric control.*
 (1569) **Melvin Leok**, University of Michigan, Ann Arbor (1014-65-496)
- 2:40PM *Sub-Finsler Geometry in Dimension Three.*
 (1570) **Jeanne N Clelland**, University of Colorado at Boulder, and **Christopher G Moseley***, United States Military Academy (1014-49-1446)
- 3:05PM *Geometric Control of the Chaplygin Sleigh and Double Gimbal System.*
 (1571) **Jason M. Osborne**, North Carolina State University (1014-70-1775)
- 3:30PM *On 3-manifolds that support partially hyperbolic diffeomorphisms.* Preliminary report.
 (1572) **Kamlesh Parwani**, University of Houston (1014-37-1310)
- 3:55PM *Actions of Lie groups and Lie algebras on manifolds.*
 (1573) **Morris W. Hirsch**, University of California (Berkeley), University of Wisconsin (Madison) (1014-22-1554)
- 4:20PM *Pattern Equivariant Cohomology of Tiling Spaces, With Rotations.*
 (1574) **Betseygail Rand**, University of Texas (1014-37-1623)
- 4:45PM *Local entropy of foliations and groupoids.*
 (1575) **Steve Hurder**, University of Illinois at Chicago (1014-37-1366)
- 5:05PM Discussion

AMS-SIAM Special Session on Boundary Value Problems for Ordinary Differential Equations, II

1:00 PM – 5:50 PM

Organizers: **John R. Graef**, University of Tennessee at Chattanooga
Johnny L. Henderson, Baylor University

- 1:00PM *Absolute equal distribution of the eigenvalues of discrete Sturm-Liouville problems.*
 (1576) **William F. Trench**, Trinity University, San Antonio, TX (1014-39-167)

- 1:30PM *Singular Second Order Boundary Value Problems with Multiple Solutions*. Preliminary report.
(1577) **John V Baxley*** and **Kristen Kobylus**, Wake Forest University (1014-34-1137)
- ▶ 2:00PM *Positive Solutions of a Nonlinear Fourth Order Boundary Value Problem*.
(1578) **John R Graef**, University of Tennessee at Chattanooga, and **Bo Yang***, Kennesaw State University (1014-34-1402)
- 2:30PM *Multiple positive solutions for a singular positone problem*.
(1579) **M Chhetri**, University of North Carolina at Greensboro, and **S Robinson***, Wake Forest University (1014-34-955)
- 3:00PM *Existence of solutions for multi-point boundary value problems*. Preliminary report.
(1580) **Gary D Jones**, Murray State University (1014-34-179)
- 3:30PM *Existence of Solutions for Nonlinear Boundary Value Problems*.
(1581) **John R. Graef** and **Lingju Kong***, The University of Tennessee at Chattanooga (1014-34-571)
- ▶ 4:00PM *Nonlinear Systems of Differential Equations*.
(1582) **Haiyan Wang**, Arizona State University (1014-34-312)
- 4:30PM *Positive Solutions to an N^{th} -Order Right Focal Boundary Value Problem*.
(1583) **Mariette Maroun**, Baylor University (1014-34-930)
- 5:00PM *On Implicit Boundary Value Problems for Second Order Equations*.
(1584) **J. Hoffacker***, Clemson University, and **C. Tisdell**, The University of New South Wales (1014-34-1161)
- 5:30PM *Uniqueness Implies Uniqueness and Existence for Nonlocal Boundary Value Problems for Fourth Order Ordinary Differential Equations*.
(1585) **Ding Ma**, Baylor University (1014-34-105)

AMS-SIAM Special Session on Theory and Application of Stochastic Differential Equations, II

1:00 PM – 5:50 PM

Organizers: **Armando Arciniega**, University of Texas at San Antonio
Edward J. Allen, Texas Tech University

- 1:00PM *Stochastic Liénard Oscillators*.
(1586) **Henri Schurz**, Southern Illinois University (1014-60-1612)
- 1:30PM *On a class of reflecting stochastic differential equations*. Preliminary report.
(1587) **Janusz S Golec**, Fordham University (1014-60-1697)
- 2:00PM *Stochastic Epidemic Models with a Backward Bifurcation*. Preliminary report.
(1588) **Linda J. S. Allen***, Texas Tech University, and **P. van den Driessche**, University of Victoria (1014-60-338)
- 2:30PM *Disease Emergence in Stochastic and Deterministic Multihost SIS and SIR Models*.
(1589) **Robert K McCormack*** and **Linda J. S. Allen**, Texas Tech University (1014-92-420)
- 3:00PM *Sustained Oscillations via Coherence Resonance in SIR*.
(1590) **Rachel Kuske**, University of British Columbia, **Luis F. Gordillo** and **Priscilla E. Greenwood***, Arizona State University (1014-60-566)

- 3:30PM *Stochastic optimization models with applications to mechanics, population dynamics, aerodynamics*.
(1591) **Ana-Maria Croicu***, Florida State University, School of Computational Science and Department of Mathematics, and **M. Yousuff Hussaini**, Florida State University (1014-49-547)
- 4:00PM *Stochastic Differential Equation Models for Flow Through Porous Media and for Multigroup Reactor Kinetics*. Preliminary report.
(1592) **Edward J. Allen**, Texas Tech University (1014-60-267)
- 4:30PM *Stochastic Models of Intracellular Viral Dynamics and Stock Pricing*. Preliminary report.
(1593) **Rachel C. Koskoda**, Texas Tech University (1014-60-405)
- 5:00PM *Dynamic Fund Portfolio Optimization under Mean-Variance Preferences*. Preliminary report.
(1594) **Coskun Cetin**, Whittier College (1014-60-193)
- 5:30PM *θ -Frames in R^n* . Preliminary report.
(1595) **Sundaresan Kondagunta**, Cleveland State University (1014-15-76)

AMS-SIAM Special Session on Symbolic-numeric Computation and Applications, II

1:00 PM – 5:20 PM

Organizers: **Agnes Szanto**, North Carolina State University
Jan Verschelde, University of Illinois Chicago
Zhonggang Zeng, Northeastern Illinois University

- 1:00PM *Higher-order deflation of polynomial systems*. Preliminary report.
(1596) **Anton Leykin***, **Jan Verschelde** and **Ailing Zhao**, University of Illinois at Chicago (1014-65-392)
- 1:30PM *Finding All Real Solutions of Polynomial Systems*.
(1597) **Ye Lu***, **Andrew J Sommese**, University of Notre Dame, **Charles W Wampler**, GM, and **Daniel J Bates**, University of Notre Dame (1014-00-199)
- ▶ 2:00PM *A Comparison of Heuristics for Solving Problems in Approximate Polynomial Algebra*.
(1598) **John P May**, University of Waterloo (1014-65-1641)
- 2:30PM *Nearest Multivariate System with Given Root Multiplicities*.
(1599) **Scott R Pope*** and **Agnes Szanto**, North Carolina State University (1014-14-972)
- 3:00PM *Characterization and computation of nearby involutive polynomial and differential systems*. Preliminary report.
(1600) **Greg Reid**, University of Western Ontario (1014-12-667)
- 3:30PM *Exceptional Sets and Fiber Products*.
(1601) **Andrew J Sommese***, University of Notre Dame, and **Charles W Wampler**, General Motors Research and Development (1014-14-214)
- 4:00PM *Differential elimination for approximate PDE systems*.
(1602) **Wenyuan Wu**, University of Western Ontario (1014-35-620)
- 4:30PM *Sensitivity of Algebraic Computation with Approximate Data*.
(1603) **Zhonggang Zeng**, Northeastern Illinois University (1014-65-1732)
- 5:00PM *Computing Isolated Singularities by Newton's Method with Deflation*.
(1604) **Anton Leykin**, **Jan Verschelde** and **Ailing Zhao***, University of Illinois at Chicago (1014-65-437)

AMS-SIAM Special Session on Time Reversal Methods: Analysis and Applications, II

1:00 PM – 2:50 PM

Organizers: **Peter A. McCoy**, US Naval Academy
Reza Malek-Madani, US Naval Academy

- 1:00PM (1605) *Imaging that exploits multiple scattering from point scatterers.*
Margaret Cheney*, Rensselaer Polytechnic Institute, and **Robert J. Bonneau**, Air Force Research Laboratory (1014-35-904)
- ▶ 1:30PM (1606) *Extracting coherent information from the cross-correlations of random wavefields. A tool for time-reversal imaging without a source.*
Karim Ghazi Sabra* and **William A Kuperman**, Marine Physical Laboratory. Scripps Inst. of Ocean., UCSD (1014-00-1016)
- 2:00PM (1607) *Methods of inverse scattering/time reversal of sound waves through waveguide from perturbed partial-open space.* Preliminary report.
Yongzhi Steve Xu, University of Louisville (1014-35-756)
- 2:30PM (1608) *Time Reversal Imaging in Acoustics and Electromagnetics.*
Lawrence Carin*, Duke University, and **Luise Couchman**, Naval Research Laboratory (1014-00-1752)

AMS-SIAM Special Session on Stochastic, Large Scale and Hybrid Systems with Applications, II

1:00 PM – 1:50 PM

Organizers: **Aghalaya S. Vatsala**, University of Louisiana at Lafayette
Gangaram S. Ladde, University of Texas Arlington

- 1:00PM (1609) *Conditioned Fractional Brownian Motion and its Applications in Telecommunications.*
Yasong Jin*, **Soshant Bali**, **Tyrone Duncan** and **Victor S. Frost**, University of Kansas (1014-60-814)
- 1:30PM (1610) *An Infinite Dimensional Integral Identity for the Segal-Bargmann Transform.*
Jeremy James Becnel* and **Ambar N Sengupta**, Louisiana State University (1014-46-557)

AMS Special Session on Quantum Invariants of Knots and 3-Manifolds, II

1:00 PM – 5:50 PM

Organizers: **Patrick M. Gilmer**, Louisiana State University
Charles D. Frohman, University of Iowa

- 1:00PM (1611) *Long Virtual Strings.* Preliminary report.
Louis H. Kauffman, University of Illinois at Chicago (1014-57-425)
- 1:30PM (1612) *Patterns in the colored Jones polynomials.* Preliminary report.
Oliver Dasbach*, LSU, and **Xiao-Song Lin**, UC Riverside (1014-57-1379)
- 2:00PM (1613) *Confluence of Khovanov homology and Hochschild homology.*
Jozef Henryk Przytycki, George Washington University (1014-57-800)
- ▶ 2:30PM (1614) *BN-modules for Seifert fibred spaces.* Preliminary report.
Marta Asaeda, UC Riverside (1014-57-1599)

- 3:00PM (1615) *An Alexander type multi-variable link invariant arising from $sl(2||1)$.*
Nathan Geer, Georgia Institute of Technology (1014-57-769)
- 3:30PM (1616) *Fingerloop braids and system of Yang-Baxter type equations.* Preliminary report.
Xiao-Song Lin, University of California, Riverside (1014-57-491)
- 4:00PM (1617) *Generalized Link Homotopy and Milnor's Isotopy Invariants.* Preliminary report.
Thomas Fleming*, University of California, San Diego, and **Akira Yasuhara**, Tokyo Gakugei University (1014-57-721)
- 4:30PM (1618) *Weight systems for Milnor invariants.*
Blake Mellor, Loyola Marymount University (1014-57-192)
- 5:00PM (1619) *On several types of universal invariants of framed links and 3-manifolds derived from quantum groups.* Preliminary report.
Jianjun Paul Tian, Mathematical Biosciences Institute, the Ohio State University (1014-55-424)
- 5:30PM (1620) *Strong 3-algebras and a 2-group associated to manifolds.*
Mihai D Staic, SUNY at Buffalo (1014-57-337)

AMS Special Session on Invariant Theory

1:00 PM – 5:50 PM

Organizers: **Mara D. Neusel**, Texas Tech University
David L. Wehlau, Royal Military College

- 1:00PM (1621) *Cayley Maps and Cayley Degrees for Algebraic Groups.* Preliminary report.
Nicole M.A. Lemire, University of Western Ontario (1014-14-1146)
- 1:30PM (1622) *Multiplication of polynomials on Hermitian symmetric spaces and Littlewood-Richardson coefficients.* Preliminary report.
William Graham, University of Georgia, and **Markus Hunziker***, Baylor University (1014-22-1209)
- 2:00PM (1623) *The geometry of affine Hamiltonian varieties.* Preliminary report.
Friedrich Knop, Rutgers University (1014-14-732)
- 2:30PM (1624) *Covariant dimension of finite groups.* Preliminary report.
Hanspeter Kraft, Mathematisches Institut Basel, and **Gerald Schwarz***, Brandeis University (1014-22-584)
- 3:00PM (1625) *rational invariants for dynamical systems.* Preliminary report.
Harm Derksen, University of Michigan (1014-13-1123)
- 3:30PM (1626) *Hyperplane Sections and the Integral Closures of Ideals.*
Jooyoun Hong* and **Bernd Ulrich**, Purdue University (1014-13-852)
- ▶ 4:00PM (1627) *The Noether numbers for cyclic groups of prime order.* Preliminary report.
Peter Fleischmann, University of Kent at Canterbury, **Mufit Sezer***, Bogazici University, Istanbul, Turkey, **James Shank** and **Chris F Woodcock**, University of Kent at Canterbury (1014-13-415)
- 4:30PM (1628) *Vector invariants in arbitrary characteristic.* Preliminary report.
Frank D Grosshans, West Chester University of Pennsylvania (1014-13-533)

5:00PM *The Decomposition Series Conjecture.*
(1629) **H E A Eddy Campbell**, Memorial University
(1014-13-1390)

5:30PM *Global Structure of Algebras of Invariants over the
Steenrod Algebra and its Generalizations.*
(1630) **David J. Pengelley*** and **Frank Williams**, New
Mexico State University (1014-55-1018)

MAA Minicourse #11: Part B

1:00 PM – 3:00 PM

Teaching a course in the history of mathematics.

Organizers: **V. Frederick Rickey**, U.S. Military
Academy

Victor J. Katz, University of the District
of Columbia

MAA Minicourse #16: Part B

1:00 PM – 3:00 PM

*Fair division: From cake-cutting to dispute
resolution.*

Organizer: **Steven J. Brams**, New York University

MAA Minicourse #5: Part B

1:00 PM – 3:00 PM

*Finite group behavior: Windows software for
teaching beginning group theory.*

Organizers: **Edward C. Keppelmann**, University of
Nevada Reno

Ellen J. Maycock, Depauw University

AMS Session on Functional Analysis and Operator Theory

1:00 PM – 5:25 PM

1:00PM *A general Connes-Kakutani-Rokhlin theorem.*
(1631) Preliminary report.
Shukhrat M. Usmanov, North Dakota State
University (1014-46-677)

1:15PM *One property of the set of bounded elements in
unital barreled projective limits of real C^* - and
JB-algebras.*
(1632) **Alexander A. Katz**, St. John's University, NY, and
Oleg Friedman*, University of South Africa
(1014-46-172)

1:30PM *Some sequence spaces which include c_0 and c .*
(1633) **B. E. Rhoades**, Indiana University, Bloomington
(1014-46-314)

1:45PM *Dunford-Pettis Property, Gelfand-Phillips property
and (L)-sets.*
(1634) **Ioana Ghenciu***, University of Wisconsin-River Falls,
and **Paul W Lewis**, University of North Texas
(1014-46-779)

2:00PM *On superadditive ergodic type theorem in
non-associative Segal-Dixmier L_p -space (for finite p
> 1) affiliated with a semi-finite JBW-algebra.*
(1635) **Genady Ya Grabarnik**, IBM T. J. Watson Research
Center, **Alexander A Katz**, St. John's University, NY,
and **Laura Schwartz***, University of South Africa
(1014-46-860)

2:15PM *Isometries into section spaces of Banach bundles.*
(1636) Preliminary report.
Terje Hoim*, Florida Atlantic University, and **D. A.
Robbins**, Trinity College (1014-46-948)

2:30PM *Non-existence of Monotonically Complemented
Subspaces of $C[a, b]$.*
(1637) **Michael P. Prophet*** and **Douglas Mupasiri**,
University of Northern Iowa (1014-46-976)

2:45PM *Constructions of C^* -algebras of inverse
semigroups.* Preliminary report.
(1638) **Steven P Haataja**, University of Nebraska Lincoln
(1014-46-1339)

3:00PM *Orthogonal Polynomials in Several Non-Commuting
Variables.*
(1639) **Tiberiu Constantinescu**, University of Texas at
Dallas, and **Troy Banks***, Salisbury University
(1014-46-1385)

3:15PM *Solution of a Class of Integral Equations.*
(1640) Preliminary report.
Rod Freed, California State University at
Dominguez Hills (1014-45-998)

3:30PM Break.

4:00PM *Eigenmatrices and operators commuting with finite
rank operators.*
(1641) **Ruben A. Martinez-Avendaño**, Universidad
Autonoma del Estado de Hidalgo (1014-47-236)

4:15PM *Extension of Spectral Scales to Unbounded
Operators.* Preliminary report.
(1642) **Michael D Wills**, Whitman College (1014-47-239)

4:30PM *β -bounded composition operators that belong to
the Schatten Class $S_p(H^2)$.* Preliminary report.
(1643) **Abebaw Tadesse**, University Of Pittsburgh
(1014-47-335)

4:45PM *Using Character Groups to Construct AF Groupoids.*
(1644) **Ryan J. Zerr**, University of North Dakota
(1014-47-394)

5:00PM *Isometric Equivalence of Operators on Function
Spaces - Preliminary report.* Preliminary report.
(1645) **Nadia J Gal*** and **James Jamison**, The University of
Memphis (1014-47-699)

5:15PM *Characterization of $BMO(R)$ and the $T(1)$ Theorem.*
▶ (1646) **Wael N. AbuShamala**, Indiana University
(1014-43-411)

AMS Session on Lattices, Ordered Structures, Logic and Model Theory, II

1:00 PM – 1:40 PM

1:00PM *A method for constructing decidable expansions of
the real field by restricted transcendental analytic
functions.*
(1647) **Daniel J. Miller**, Groton, CT (1014-03-1162)

1:15PM *The Independence of the Conditions in Rado's
Generalization of Hall's Marriage Theorem: A
Problem (Attributed to Rado) from Mirsky's 1971
Monograph "Transversal Theory".*
▶ (1648) **Jonathan David Farley**, Stanford University, Center
for International Security and Cooperation
(1014-06-1687)

1:30PM *q -Demanding Topological Varieties Which Admit
Non-Abelian Fundamental groups.*
(1649) **David W Jennings**, Vanderbilt University
(1014-08-1730)

AMS Session on Number Theory, III

1:00 PM – 1:40 PM

1:00PM *Deriving The Prime Number Theorem (PNT) and
Littlewood Oscillations Using a Nonlinear
Dynamical Equation Method.* Preliminary report.
(1650) **Gengmun Eng**, Torrance, CA (1014-11-1747)

- 1:15PM *Distribution of the Zeros of the Zeta Function using Descriptive Set Theory*. Preliminary report.
 (1651) **Mohammed Yahdi**, Ursinus College (1014-11-225)
- 1:30PM *Hilbert's Eighth Problem: Riemann's Zeta Hypothesis*.
 ▶ (1652) **H. Vic Dannon**, California (1014-33-578)

MAA General Contributed Paper Session, VIII

1:00 PM – 3:40 PM

- Chair: **Eric S. Marland**
 Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University
- 1:00PM *Population Models Which Take Into Account Decay of Resources and Accumulation of Waste*. Preliminary report.
 ▶ (1653) **Joe T. Harris**, St. Andrews Presbyterian College (1014-Z1-841)
- 1:15PM *On Deviations from Expected Hardy-Weinberg Proportions*.
 ▶ (1654) **Joshua W. Collins** and **Yaping Liu***, Pittsburg State University (1014-Z1-1195)
- 1:30PM *Two Models of Oscillating Polymer Chains in E. coli*. Preliminary report.
 ▶ (1655) **Gretchen A. Koch***, Goucher College, and **Donald A. Drew**, Rensselaer Polytechnic Institute (1014-Z1-1183)
- 1:45PM *Differentiating Noisy Data*. Preliminary report.
 ▶ (1656) **Tim McDevitt**, Elizabethtown College (1014-Z1-1194)
- 2:00PM *Quality Adjusted Lifetime Hazard Function*. Preliminary report.
 (1657) **Mahmoud F Almanassra**, Wartburg College (1014-Z1-1135)
- 2:15PM *Reforming the Senior Seminar/Capstone course as an Assessment Tool*.
 ▶ (1658) **Jim Fulmer**, University of Arkansas at Little Rock (1014-Z1-1609)
- 2:30PM Break.
- 2:45PM *Manifolds With Density*. Preliminary report.
 (1659) **Frank Morgan**, Williams College (1014-Z1-525)
- 3:00PM *Homogenization of Dynamic Materials*.
 (1660) **Hansun T To**, Worcester State College, Worcester MA (1014-Z1-690)
- 3:15PM *Geophysical mass flows over erodible material*.
 (1661) **Long H. Le**, University at Buffalo (1014-Z1-1717)
- 3:30PM *Coin Tossing as a Favorite Class Experience, What is It Good For?*
 ▶ (1662) **Bill Rybolt**, Babson College (1014-Z1-1677)

MAA General Contributed Paper Session, IX

1:00 PM – 3:25 PM

- Chair: **Laurie J. Heyer**, Davidson College
 Organizers: **Stephen L. Davis**, Davidson College
Eric S. Marland, Appalachian State University
- 1:00PM *Effects of instruction on elementary and special education teachers' computational skills*. Preliminary report.
 ▶ (1663) **Cheng-Yao Lin*** and **Becker P Jerry**, Southern Illinois University at Carbondale (1014-Z1-519)
- 1:15PM *Texas A&M's Summer Educational Enrichment Program for Middle School Students*.
 ▶ (1664) **Philip B. Yasskin**, Texas A&M University (1014-Z1-1349)

- 1:30PM *Developing Questioning Skills to Enhance Students' Mathematical Thinking: A Professional Development Experience for Middle School Mathematics Teachers*. Preliminary report.
 ▶ (1665) **Jane F. Schielack**, Texas A&M University (1014-Z1-1351)
- 1:45PM *An Eighth Grade Curriculum Incorporating Logical Thinking and Active Learning*.
 ▶ (1666) **Marta Anna Kobiela**, Texas A&M University (1014-Z1-1696)
- 2:00PM Break.
- 2:15PM *Confounders as Mathematical Objects*.
 (1667) **Milo Schield***, Augsburg College, and **Tom Burnham**, Cognitive Consulting (1014-Z1-255)
- 2:30PM *Defining the Integral for Coherent Probabilities*.
 (1668) **John E. Beam**, University of Wisconsin Oshkosh (1014-Z1-1513)
- 2:45PM *Finite Symmetry Groups*.
 ▶ (1669) **Lee Ann Rayburn**, Southeastern Oklahoma State University (1014-Z1-113)
- 3:00PM *On some generalizations of Fermat's, Lucas's and Wilson's Theorems*. Preliminary report.
 ▶ (1670) **Tyler J Evans**, Humboldt State University (1014-Z1-1308)
- 3:15PM *Fugue in D_{12} Minor - Equivalence classes of Scales and Chords in Even Tempered Tunings*.
 ▶ (1671) **Michael R. Bacon**, University of South Carolina Sumter (1014-Z1-1405)

MAA Panel Discussion

1:00 PM – 2:20 PM

- Calculus for those students who have had calculus*.
 Organizers: **Jack A. Picciuto**, U.S. Military Academy
Barbra Melendez, U.S. Military Academy
- Panelists: **Bernard L. Madison**, University of Arkansas
Mike Huber, U.S. Military Academy
Michael Starbird, University of Texas
David M. Bressoud, McAlester College

MAA Panel Discussion

1:00 PM – 2:20 PM

- Evaluating curricular effectiveness: Judging the quality of K-12 mathematics evaluations*.
 Organizers: **Vicki Stohl**, Mathematical Sciences Education Board
David Mandel, Mathematical Sciences Education Board
- Moderator: **David Mandel**
- Panelists: **Jere Confrey**, Washington University, St. Louis
Carlos Castillo-Chavez, Arizona State University
Donald G. Saari, University of California Irvine

MAA SUMMA Special Presentation

1:00 PM – 2:20 PM

- MAA student research programs*.
 Organizers: **William Hawkins, Jr**, MAA and University of the District of Columbia

Robert E. Megginson, University of Michigan

AWM Workshop Panel Discussion

1:00 PM – 2:15 PM

Shaping a career in mathematics.

Moderator: **Marie Vitulli**, University of Oregon

Panelists: **Janet L. Andersen**, Hope College
Dusa McDuff, SUNY Stony Brook
Mara D. Neusel, Texas Tech University
Michelle D. Wagner, National Security Agency

2:40PM *Consistency of Martin-Lof's Intuitionistic type theory.*

Gohar Marikyan, Empire State College

3:05PM *Reflexive intermediate propositional logics.*

Nathan Carter, Bentley College

3:30PM *Simple measure analyses for more than two measures.*

Stefan Bold*, Universiteit van Amsterdam, and **Benedikt Loewe**, ILLC, Universiteit van Amsterdam

3:55PM *Interstitial and pseudo gaps in models of PA.*

Ermek S Nurkaidarov, University of Montana-Western

4:20PM *The model theory of some non-projectable l-groups.*

Brian Wynne, Colgate University

ASL Invited Address

1:10 PM – 2:00 PM

(1672) *Finite state automata and monadic definability of ordinals.*

Itay Neeman, University of California Los Angeles

AMS Session on Dynamical Systems, II

2:15 PM – 2:55 PM

2:15PM *The Henstock-Kurzeil Delta and Nabla Integral.*

▶ (1673) **Allan C. Peterson***, University of Nebraska-Lincoln, and **Bevan Thompson**, The University of Queensland (1014-39-1098)

2:30PM *On equations of limit cycles with prescribed topology.*

▶ (1674) **Anatoly B. Korzhagin**, Texas Tech University (1014-34-978)

2:45PM *Recurrent Solutions of Difference Equations.*

(1675) Preliminary report.
Zhivko S. Athanassov, Institute of Mathematics, Bulgarian Academy of Sciences (1014-39-1051)

AWM Workshop: Research Presentations by Recent Ph.D.s, II

2:30 PM – 4:20 PM

2:30PM *Tensor Decompositions and Compression.*

▶ (1688) Preliminary report.
Carla D. Moravitz Martin* and **Charles F. Van Loan**, Cornell University (1014-65-585)

3:00PM *Measuring ergodicity and mixing at different scales.*

(1689) **Sherry E. Scott**, University of North Carolina at Chapel Hill (1014-42-639)

3:30PM *Hide-and-Seek and a Geometric Spectral Invariant on Surfaces.*

▶ (1690) **Jean Steiner**, Courant Institute of Mathematical Sciences - NYU (1014-58-702)

4:00PM *The existence of a volume-preserving ergodic hyperbolic flow on any manifold of dimension at least 3.* Preliminary report.

Huyi Hu, Michigan State University, **Yakov Pesin**, Pennsylvania State University, and **Anna Talitskaya***, Northwestern University (1014-37-701)

ASL Contributed Paper Session, II

2:15 PM – 4:40 PM

2:15PM *A non-computable perfect tree T containing no non-computable branches that are wtt-reducible to T.*

John Chisholm, Western Illinois University

2:40PM *Turing degrees of isomorphism types of algebraic objects.*

Wesley Calvert*, Murray State University, **Valentina Harizanov**, George Washington University, and **Alexandra Shlapentokh**, East Carolina University

3:05PM *Reverse Mathematics and Π_2^1 comprehension.*

(1678) **Carl Mummert**, Appalachian State University

3:30PM *Automorphisms of certain filters of $\mathcal{L}^*(V_\infty)$.*

(1679) **Rumen D Dimitrov**, Western Illinois University

3:55PM *A fine structure construction of a perfectly normal non-realcompact space.*

Tetsuya Ishiu, University of Kansas

4:20PM *Pseudo-dominating families of functions.*

(1681) **Jason Aubrey**, University of Missouri

MAA CUPM Subcommittee on Curriculum Renewal Across the First Two Years Panel Discussion

2:30 PM – 3:50 PM

Reunion of participants in refocused college algebra.

Organizer: **Donald B. Small**, U.S. Military Academy

Panelists: **Laurette B. Foster**, Prairie View A&M University

William E. Haver, Virginia Commonwealth University

MAA Minicourse #6: Part B

3:30 PM – 5:30 PM

Technology tools for discrete mathematics.

Organizers: **Douglas E. Ensley**, Shippensburg University

Katherine G. McGivney, Shippensburg University

ASL Contributed Paper Session, III

2:15 PM – 4:40 PM

2:15PM *A polynomial translation of S4 into intuitionistic logic.*

(1682) **David Fernández Duque**, Stanford University

AMS Banquet Reception

6:30 PM – 7:30 PM

AMS Banquet

7:30 PM – 10:30 PM

Matthew Miller
AMS Associate Secretary
Columbia, South Carolina

James J. Tattersall
MAA Associate Secretary
Providence, Rhode Island