Program of the Sessions

San Antonio, Texas, January 13–16, 1999

Monday, January 11

AMS Short Course on Nonlinear Control

9:00 AM – 5:00 PM

Organizers: **Héctor J. Sussmann**, Rutgers University
Kevin Grasse, University of Oklahoma

MAA Short Course on Mathematics in Finance

9:00 AM – 5:00 PM

Organizer: **Robert F. Almgren**, University of Chicago

Tuesday, January 12

MAA Board of Governors

8:30 AM – 4:00 PM

AMS Short Course on Nonlinear Control

9:00 AM – 5:00 PM

Organizers: **Héctor J. Sussmann**, Rutgers University
Kevin Grasse, University of Oklahoma

MAA Short Course on Mathematics in Finance

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AMS Council

1:00 PM – 10:00 PM

Joint Meetings Registration

3:00 PM – 7:00 PM

Mathchats and Graduate Student Reception

5:30 PM – 10:00 PM

Wednesday, January 13

Joint Meetings Registration

7:30 AM – 4:00 PM

Mathematical Sciences Employment Register Registration

7:30 AM – 4:00 PM

Open for receipt of all interview request forms (forms accepted between 9:30 a.m. and 4:00 p.m.; none accepted on Thursday or Friday).

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

8:00 AM – 10:50 AM

Organizers: **William H. Barker**, Bowdoin College
Jerry L. Bona, University of Texas at Austin
Naomi Fisher, University of Illinois at Chicago
Kenneth C. Millett, University of California Santa Barbara

8:00AM ▸ (1) *The IAS-Park City mentoring program for women mathematicians.*
Chuu-Lian Terng*, Northeastern University, and **Karen Uhlenbeck**, University of Texas at Austin (939-98-669)

8:30AM (2) *The EDGE for women.* Preliminary report.
Sylvia T. Bozeman*, Spelman College, and **Rhonda Hughes**, Bryn Mawr College (939-98-1054)

9:00AM ▸ (3) *The eight undergraduate geometry courses at Cornell.*
David W. Henderson, Cornell University (939-98-666)

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 20, Issue 1 of *Abstracts of papers presented to the American Mathematical Society*, ordered according to the numbers in parentheses following the listings.

9:30AM ▸ (4) *Extending high school geometry with dynamic software.*
James R. King, University of Washington (939-97-708)

10:00AM ▸ (5) *Teaching geometry in the MASS program at Penn State.*
Svetlana Katok, The Pennsylvania State University (939-98-540)

10:30AM ▸ (6) *Continuous symmetry.* Preliminary report.
William H. Barker, Bowdoin College, and **Roger E. Howe***, Yale University (939-51-704)

AMS-ASL Special Session on Model Theory and Its Applications, I

8:00 AM – 10:55 AM

Organizer: **Anand Pillay**, MSRI and University of Illinois, Urbana

8:00AM (7) *Smooth stratification in the Pfaffian closure of an o-minimal structure.*
Jean-Maire Lion, Universite de Bourgogne, and **Patrick U. Speissegger***, University of Toronto (939-14-587)

8:30AM (8) *Complexity of the complement of a sub-Pfaffian set.* Preliminary report.
Andrei Gabrielov, Purdue University (939-03-359)

9:00AM (9) *Hardy fields of arbitrary models of polynomially bounded plus exp.*
Salma Kuhlmann* and **Franz-Viktor Kuhlmann**, University of Saskatchewan at Saskatoon (939-03-477)

9:30AM (10) *A remark on linear differential operators over the differential field of logarithmic-exponential series.*
Lou Van den Dries, University of Illinois, Urbana, Illinois (939-13-533)

10:00AM (11) *Weakly o-minimal structures: A brief survey.*
Charles I. Steinhorn, Vassar College (939-03-905)

10:30AM ▸ (12) *"Complex Analysis" over o-minimal fields.* Preliminary report.
Sergei Starchenko, University of Notre Dame (939-03-737)

AMS Special Session on Banach Spaces of Holomorphic Functions and Operators on These Spaces, I

8:00 AM – 10:50 AM

Organizers: **Benjamin A. Lotto**, Vassar College
Pamela B. Gorkin, Bucknell University

8:00AM (13) *Curves in C^2.* Preliminary report.
John Wermer, Brown University (939-32-25)

8:30AM (14) *Pure subnormal operators have cyclic adjoints.*
Nathan S. Feldman, Michigan State University (939-47-151)

9:00AM (15) *Operators determining the norm topology.*
Krzysztof Jarosz, Southern Illinois University at Edwardsville (939-46-157)

9:30AM (16) *Banach spaces of Fourier series.*
Scott F. Saccone, University of Missouri-Columbia (939-46-801)

10:00AM (17) *Function theory on model spaces.* Preliminary report.
Tavan T. Trent, University of Alabama (939-47-173)

10:30AM (18) *Interpolation bodies for a finite Riemann surface.* Preliminary report.
Brian J. Cole, Brown University (939-30-218)

AMS Special Session on Commutative Algebra, I

8:00 AM – 10:50 AM

Organizer: **Scott Thomas Chapman**, Trinity University

8:00AM (19) *Mori domains of integer-valued polynomials.* Preliminary report.
Paul-Jean Cahen, Universite d'Aix Marseille III, **Stefania Gabelli**, Univ. di Roma I, and **Evan Houston***, Univ. of North Carolina at Charlotte (939-13-322)

8:30AM (20) *PvMDs and integer-valued polynomials.*
Paul-Jean Cahen, Universite d'Aix-Marseille lll, **Alan Loper***, Ohio State University - Newark, and **Francesca Tartarone**, Universita "La Sapienza" (939-13-487)

9:00AM (21) *Interpolation domains.*
Paul-Jean Cahen, Univ. d' Aix-Marseille III, France, **Jean-Luc Chabert**, Univ. de Picardie, France, and **Sophie Frisch***, Technische Universität Graz, Austria (939-13-532)

9:30AM (22) *Interpolation subsets.* Preliminary report.
Paul-Jean Cahen*, Université d'Aix Marseille III, **Jean-Luc Chabert**, Université de Picardie, and **Sophie Frisch**, Graz Technical University (939-13-463)

10:00AM (23) *Integer-valued polynomials on a subset and Prüfer domains.*
Jean-Luc Chabert*, Université de Picardie, and **Alan Loper**, Ohio State University (939-13-367)

10:30AM (24) *Nagata transform and localizing systems.* Preliminary report.
Marco Fontana*, Universitá degli Studi, Rome III, and **Nicolae Popescu**, Académie de Roumanie (939-13-687)

AMS Special Session on Combinatorial Topology, I

8:00 AM – 10:50 AM

Organizers: **Laura M. Anderson**, Texas A&M University
Jonathan P. McCammond, Texas A&M University

8:00AM (25) *Which Artin groups are 3-manifold groups?*
Susan M. Hermiller, University of Nebraska, and **John Meier***, Lafayette College (939-20-593)

8:30AM (26) *Automorphisms of automorphism groups of free groups.* Preliminary report.
Martin R. Bridson, University of Oxford, and **Karen Vogtmann***, Cornell University (939-20-1026)

9:00AM (27) *Eigenvalues of combinatorial Laplacians.* Preliminary report.
Art Duval*, University of Texas at El Paso, and **Victor Reiner**, University of Minnesota (939-05-784)

9:30AM (28) *Fundamental groups of blow-ups of Coxeter arrangements.* Preliminary report.
Tadeusz Januszkiewicz, University of Wroclaw, and **Richard Scott***, Santa Clara University (939-57-881)

10:00AM (29) *Rigidity of right-angled Coxeter groups.*
David G. Radcliffe, University of Wisconsin-Milwaukee (939-20-58)

10:30AM (30) *Topological invariants of deduction in algebra.*
Nikolai E. Mnev, POMI, St.Petersburg (939-18-824)

AMS Special Session on The Functional and Harmonic Analysis of Wavelets, I

8:00 AM – 10:50 AM

Organizers: **Lawrence W. Baggett**, University of Colorado

David R. Larson, Texas A&M University

8:00AM (31) *A mathematical framework for tensor image processing.*
Akram Aldroubi*, Vanderbilt University, and **Peter Basser**, National Institutes of Health (939-46-54)

8:30AM (32) *Density and redundancy for Weyl-Heisenberg superframes.* Preliminary report.
Radu V, Balan, IMA-IBM (939-42-401)

9:00AM (33) *Single orthonormal wavelets in d-dimensions.* Preliminary report.
John J. Benedetto* and **Manuel Leon**, University of Maryland at College Park (939-42-191)

9:30AM (34) *The classification of tight Weyl-Heisenberg frames.*
Peter G. Casazza*, University of Missouri, and **Ole Christensen**, Mathematical Institute, Technical University of Denmark (939-46-115)

10:00AM (35) *Construction of dilation-d wavelets.*
Jennifer E. Courter, University of Colorado (939-43-867)

10:30AM (36) *Quantization of redundant expansions: the special case of oversampled bandlimited functions.*
Ingrid Daubechies, Princeton University (939-42-529)

AMS Special Session on Discrete Models and Difference Equations, I

8:00 AM – 10:50 AM

Organizers: **Saber Elaydi**, Trinity University
Gerry Ladas, University of Rhode Island

8:00AM (37) *Stochastic and deterministic discrete age-structured models.* Preliminary report.
Linda J. S. Allen* and **Garry L. Block**, Texas Tech University (939-39-723)

8:30AM ▸ (38) *Lyapunov functions for discrete population models.* Preliminary report.
J. M. Cushing, University of Arizona (939-92-658)

9:00AM (39) *Multiple attractors and resonance in periodically-forced discrete models.*
Shandelle M. Henson, University of Arizona (939-39-794)

9:30AM (40) *Extinction, weak extinction, and persistence in a discrete, competitive Lotka-Volterra model.* Preliminary report.
David M. Chan* and **John E. Franke**, North Carolina State University (939-92-122)

10:00AM (41) *Competition and predation in size-structured discrete models.* Preliminary report.
Abdul-Aziz Yakubu, Howard University (939-39-109)

10:30AM ▸ (42) *Discrete models of Lotka-Volterra type.* Preliminary report.
Saber N. Elaydi*, Trinity University, and **Pingzhou Liu**, Flinders University (939-39-585)

AMS Special Session on Recent Developments in Differential Geometry, I

8:00 AM – 10:50 AM

Organizers: **Huai-Dong Cao**, Texas A&M University
Jian Zhou, Texas A&M University

8:00AM (43) *Triunduloids: embedded constant-mean-curvature surfaces with three ends.*
John M. Sullivan*, Univ. of Illinois, **Rob Kusner**, Univ. of Massachusetts, and **Karsten Grosse-Brauckmann**, Uni. Bonn (939-53-400)

8:30AM (44) *Non-commutative Gelfand-Fuks cohomology and foliations.* Preliminary report.
Jerry M. Lodder, New Mexico State University (939-57-685)

9:00AM (45) *Symplectic 4-manifolds with torsion canonical class.*
Tian-Jun Li*, Yale University, and **Ai-Ko Liu**, MIT (939-57-812)

9:30AM (46) *Complex ASD connections and trholomorphic curves.*
Jingyi Chen, UBC and MIT (939-53-835)

10:00AM (47) *Singular Lagrangian fibrations.* Preliminary report.
Nai-Chung Conan Leung, University of Minnesota, and **Margaret F. Symington***, University of Texas (939-53-954)

10:30AM (48) *Special Lagrangian tori on a Borcea-Voisin threefold.*
Peng Lu, University of Minnesota (939-58-1201)

AMS Special Session on Singularities in Algebraic and Analytic Geometry, I

8:00 AM – 10:40 AM

Organizers: **Caroline Grant Melles**, U.S. Naval Academy
Ruth I. Michler, University of North Texas

8:00AM (49) *Isolated hypersurface singularities with "large" torsion module of differentials.* Preliminary report.
Ruth I. Michler, University of North Texas (939-14-1169)

8:30AM (50) *Berger's conjecture: A problem in which algebraic geoemetry, commutative algebra, and Hochschild homology meet.* Preliminary report.
Sue Geller, Texas A&M University (939-13-763)

9:00AM (51) *Weighted Chern-Mather classes and Milnor classes.*
Paolo Aluffi, Florida State University (939-14-715)

9:30AM (52) *Graph manifolds for algebraic plane curves.*
Eriko Hironaka, Florida State University (939-14-747)

10:00AM (53) *Cohomology of the link of a suface singularity in positive characteristic.*
Aise J. de Jong, MIT (939-14-1037)

MAA Minicourse #1: Part A

8:00 AM – 10:00 AM

Mathematics, calculus, and modeling using the TI-92.

Organizers: **Phoebe T. Judson**, Trinity University
William C. Bauldry, Appalachian State University
Richard D. West, U. S. Military Academy

MAA Minicourse #3: Part A

8:00 AM – 10:00 AM

Developing materials for liberal arts mathematics that use elementary graph theory and emphasize applications to everyday experience.

Organizer: **Helen Christensen**, Loyola University

MAA Minicourse #4: Part A

8:00 AM – 10:00 AM

The mathematics of the perfect shuffle.

Organizer: **S. Brent Morris**, National Security Agency

AMS Session on the History of Mathematics

8:00 AM – 8:55 AM

8:00AM ▸ (54) *Dynamic visualizations of historical arguments using the geometers' sketchpad.* Preliminary report. **Martin E. Flashman**, Humboldt State University (939-01-43)

8:15AM ▸ (55) *Famous trails to Paul Erdős: Distances in the collaboration graph are small.* **Jerrold W. Grossman***, Oakland University, and **Rodrigo De Castro**, Universidad Nacional de Colombia (939-01-584)

8:30AM (56) *Hardy and Ramanujan.* Preliminary report. **Baikunth P. Ambasht***, Bokaro Steel City, India, **Jamuna P. Ambasht**, Benedict College, and **Sanjay Tiwari**, Gaya, India (939-01-759)

8:45AM ▸ (57) *Pi expressed in terms of nested radicals of 2.* **Kanagarajah Prabaharan**, Southern University, Baton Rouge (939-00-1012)

AMS Session on Number Theory, I

8:00 AM – 10:40 AM

8:00AM ▸ (58) *On the extensions of Eratosthenes' sieve.* Preliminary report. **Bao Qi Feng***, Kent State University, and **Dong Ning Zhao**, Arlington, VA (939-11-34)

8:15AM (59) *A problem of continued fractions on Hausdorff dimension.* **Shiojenn Tseng***, TamKang University, and **Jyh-Ching Liang**, LeeMing Institute of Technology (939-11-188)

8:30AM (60) *An extension of Brauer and Shockley's algorithm to solve the problem of Frobenius.* Preliminary report. **Robert W. Owens**, Lewis and Clark College (939-11-190)

8:45AM (61) *Reciprocity equivalence and Witt equivalence.* Preliminary report. **Thomas C. Palfrey**, Xavier University of LA (939-11-310)

9:00AM (62) *Theta functions of quadratic forms.* **Olav K. Richter**, University of Califnornia, San Diego (939-11-455)

9:15AM ▸ (63) *Targeted searches for number fields with prescribed ramification.* **John W. Jones***, Arizona State University, and **David P Roberts**, Rutgers University (939-11-488)

9:30AM (64) *High-accuracy numerical estimates of Stieltjes constants and multiple zeta (Euler/Zagier) sums.* Preliminary report. **Rick Kreminski**, Texas A&M University - Commerce (939-11-536)

9:45AM ▸ (65) *On the mean value of an analogue of the Dedekind sum.* Preliminary report. **Jeffrey L. Meyer**, Syracuse University (939-11-604)

10:00AM (66) *Generalized Kloosterman sums over the ring of integers modulo 2^r.* **Michelle R. DeDeo**, Univ. of North Florida (939-11-621)

10:15AM (67) *Jacobi forms over number fields.* **Howard J. Skogman**, UCSD (939-11-639)

10:30AM (68) *On the nonasymptotic prime number distribution.* **Libomir Alexandrov**, Institute for Nuclear Research and Nuclear Energy (939-11-83)

AMS Session on Numerical Analysis

8:00 AM – 10:10 AM

8:00AM ▸ (69) *The method of scaling factors for non-uniform fast Fourier transforms.* **Nhu To N. Nguyen***, UTEP, and **Qing Huo Q. H. Liu**, NMSU (939-65-149)

8:15AM (70) *A new concurrent iterative method in solving symmetric Tridiagonal Eigenvalue Problems.* Preliminary report. **Qingchuan Yao**, University of Pittsburgh at Bradford (939-65-180)

8:30AM (71) *A Josephson junction in the high kappa, high field setting.* **Qiang Du**, Hong Kong Univ. of Science and Technology, and **Joan Remski***, University of Michigan-Dearborn (939-65-189)

8:45AM (72) *Future polynomial regularization of one-smoothing ill-posed Volterra problems.* Preliminary report. **Aaron C. Cinzori***, Allegheny College, and **Patricia K. Lamm**, Michigan State University (939-65-619)

9:00AM (73) *The numerical solution of mechanical systems using outer inverses.* Preliminary report. **Dan I. Coroian**, Indiana-Purdue University at Fort Wayne (939-65-647)

9:15AM (74) *An efficient high order algorithms for solving reaction-diffusion equations.* **Lilun Cao** and **Jianping Zhu***, Mississippi State University (939-65-696)

9:30AM ▸ (75) *Convergence properties of Heron recursive algorithm for roots.* Preliminary report. **Constantine E. Georgakis**, DePaul University (939-65-808)

9:45AM ▸ (76) *Particle modeling of liquid drop evaporation.* Preliminary report. **Mark S. Korlie**, Montclair State University (939-65-958)

10:00AM (77) *A collocation method for solving the exterior Neumann problem.* **Sanda Micula**, Western Oregon University (939-65-965)

MAA Session on The Use of Technology in Teaching Abstract Mathematics, I

8:00 AM – 9:55 AM

Organizer: **Douglas E. Ensley**, Shippensburg University

8:00AM ▸ (78) *Using Mathematica to explore abstract algebra.* Preliminary report. **Allen C. Hibbard**, Central College (939-A1-531)

8:15AM ▸ (79) *Using Mathematica to explore finite semirings.* **Francisco E. Alarcon**, IUP (939-A1-764)

8:30AM ▸ (80) *Teaching group theory using "Geometry SketchPad" and "Mathematica".* Preliminary report. **May C. Abboud**, Lebanese American University (939-A1-677)

8:45AM ▸ (81) *Web-based linear algebra modules for use with Maple or Mathematica.* Preliminary report. **Stephanie A. Fitchett***, **Lawrence C. Moore** and **David A. Smith**, Duke University (939-A1-1035)

9:00AM ▸ (82) *Visualizing concepts in a complex variables course.* **Paul E. Fishback**, Grand Valley State University (939-A1-1091)

9:15AM ▸ (83) *Programming projects with Mathematica.* **Kevin F. McDougal**, University of Wisconsin-Oshkosh (939-A1-1041)

9:30AM ▸ (84) *Cryptography, number theory, and Maple in the classroom.* Preliminary report.
Gregory P. Dresden, Washington & Lee Univ. (939-A1-846)

9:45AM ▸ (85) *Some uses of ISETL and Excel in abstract algebra.* Preliminary report.
Robert S. Smith, Miami University (939-A1-892)

MAA Session on Quantitative Literacy, I

8:00 AM – 10:10 AM

Organizers: **Barbara A. Jur**, Macomb Community College
Richard A. Gillman, Valparaiso University
Jimmy L. Solomon, Georgia Southern University
Allen E. Pulsion, College of Science and Technology
Linda R. Sons, Northern Illinois University

8:00AM ▸ (86) *The quantitative reasoning program at DePauw University: Nearly twenty years of experience.*
Janet E. Teeguarden, DePauw University (939-B1-1219)

8:15AM (87) *Piloting a quantitative literacy course at a liberal arts institution: Pedagogical issues, interesting projects, and assessment criteria.*
Thomas G. Wangler, Benedictine University (939-B1-1228)

8:30AM ▸ (88) *Incorporating QL widely into the curriculum.*
Barry Schiller, Rhode Island College (939-B1-387)

8:45AM ▸ (89) *A precalculus quantitative reasoning course for liberal arts students.*
William L. Briggs*, University of Colorado, and **Jeffrey O. Bennett**, University of Colorado at BOulder (939-B1-418)

9:00AM ▸ (90) *Helping students take responsibility for their learning.* Preliminary report.
Todd M. Swanson, Hope College (939-B1-998)

9:15AM ▸ (91) *Motivating quantitative literacy.* Preliminary report.
Shandy Hauk, Chapman University (939-B1-410)

9:30AM ▸ (92) *Precalculus: Labs and literacy.* Preliminary report.
Kate G. McGivney* and **Deborah Hughes Hallett**, University of Arizona (939-B1-278)

9:45AM ▸ (93) *An award-winning quantitative literacy course.*
James R. Smith* and **Holly Peters Hirst**, Appalachian State University (939-B1-1210)

10:00AM ▸ (94) *Connecting science and mathematics general education courses – one approach to quantitative literacy.* Preliminary report.
Janet L. Andersen, Hope College (939-B1-551)

MAA Session on Teaching Statistics: Teaching the Reasoning and New Technological Tools, I

8:00 AM – 10:55 AM

Organizers: **Dexter C. Whittinghill**, Rowan University
Franklin A. Wattenberg, National Science Foundation
Mary R. Parker, Austin Community College
Donald L. Bentley, Pomona College

8:00AM Introduction by Dexter C. Whittinghill.

8:05AM ▸ (95) *Computer power for your statistics calculator.*
Bill Johnston, Centre College (939-C1-210)

8:25AM ▸ (96) *Making connections in elementary statistics.*
Tena Long Golding, Southeasten Louisiana University (939-C1-862)

8:40AM ▸ (97) *Integrating the TI-83 into an introductory statistics course.*
Emmett C. Dennis, Dillard University (939-C1-535)

8:55AM ▸ (98) *Modeling binomial and multinomial experiments using virtual coins and virtual dice on the TI-83 calculator.* Preliminary report.
Gerald Busald, San Antonio College (939-C1-563)

9:10AM ▸ (99) *Testing of hypothesis on population mean and proportion using TI-83 calculator.*
Sivanandan Balakumar, Lincoln University (939-C1-497)

9:25AM ▸ (100) *Understanding type I and type II errors.*
Penelope H. Dunham, Muhlenberg College (939-C1-600)

9:45AM ▸ (101) *Use data in stock market to do a project in linear regression on TI-82.* Preliminary report.
Wenyao Zhang, Union County College (939-C1-354)

10:00AM ▸ (102) *Tuneful residuals from Opus CBL.*
Judy S. O'Neal, North Georgia College & State University (939-C1-992)

10:20AM (103) *An experiment in teaching introductory statistics.* Preliminary report.
Patricia B. Humphrey, Georgia Southern University (939-C1-491)

10:35AM ▸ (104) *Effect of calculator technology on student learning in an introductory statistics course.* Preliminary report.
Linda Brant Collins* and **Kathleen Cage Mittag**, University of Texas at San Antonio (939-C1-506)

MAA Session on Mathematics Competitions, I

8:00 AM – 10:35 AM

Organizers: **Harold B. Reiter**, University of North Carolina at Charlotte
Stephen B. Maurer, Swarthmore College
William P. Fox, U. S. Military Academy
Susan Schwartz Wildstrom, Walt Whitman High School, Bethesda, MD

8:00AM (105) *Conducting a MATHCOUNTS coaching workshop.*
Roy Barnes, Arkansas Department of Education, **Ralph S. Butcher***, **Jo Ann Royster** and **Xiaoshen Wang**, University of Central Arkansas (939-D1-485)

8:20AM ▸ (106) *The U.S.A. mathematical talent search.*
Gene A. Berg, National Security Agency (939-D1-100)

8:40AM ▸ (107) *The Michigan Mathematics Competition (MMPC).*
Ruth G. Favro, Lawrence Technological University (939-D1-973)

9:00AM ▸ (108) *The Little Hawkeye Mathematics Contest.*
Alexander F. Kleiner, Drake University (939-D1-358)

9:20AM ▸ (109) *Texas UIL Mathematics Contest.*
Donald P. Skow, University of Texas-Pan American (939-D1-959)

9:40AM ▸ (110) *Math Tournaments – hosts' and competitors' views.*
Brenda S. Carter and **David R. Stone***, Georgia Southern University (939-D1-877)

10:00AM ▸ (111) *Alfred University's High School Competition.*
Roger H. Moritz and **Robert C. Williams***, Alfred University (939-D1-423)

10:20AM (112) *The Bay Area Mathematical Olympiad and Math Circles Project.* Preliminary report.
Paul A. Zeitz, University of San Francisco (939-D1-717)

MAA Committee on the Profession Panel Discussion

8:00 AM – 9:20 AM

A dean's view of mathematics departments.

Moderator: **Bernard L. Madison**

Organizers: **Bernard L. Madison**, University of Arkansas

David J. Lutzer, College of William & Mary

Panelists: **Sheryl Smith-Kappus**, Collin County Community College District, McKinney, TX

Mary Ann Rankin, University of Texas at Austin

Jane L. Winer, Texas Tech University

MAA Special Presentation

8:00 AM – 10:55 AM

The use of history in the teaching of mathematics.

Organizers: **Florence Fasanelli**, College-University Resource Institute

V. Frederick Rickey, U. S. Military Academy

Presenters: **Robin Wilson**, The Open University

Ed Sandifer, Western Connecticut State University

V. Frederick Rickey

Victor J. Katz, University of the District of Columbia

Shirley B. Gray, California State University Los Angeles

AMS Special Session on Development of Electronic Communications in Mathematics, I

8:30 AM – 10:50 AM

Organizers: **Alfonso Castro**, University of Texas at San Antonio

Rafael De La Llave, University of Texas at Austin

8:30AM (113) *Competition and cooperation: Libraries and publishers in the transition to electronic scholarly journals.* Preliminary report.
Andrew Odlyzko, AT&T Labs - Research (939-00-676)

9:00AM (114) *Electronic journal publishing at SIAM.*
James M. Crowley, Society for Industrial and Applied Mathematics (939-99-701)

9:30AM (115) *To the new era of electronic communication with ERA-AMS.*
Svetlana Katok, The Pennsylvania State University (939-99-542)

10:00AM (116) *Software for math on the Web: An editor's view of an April Fools' Day prank.* Preliminary report.
Henry A. Warchall, University of North Texas (939-00-203)

10:30AM (117) *Electronic delivery and publishing of conference abstracts.*
Elliott Pearl*, Ohio University, **John Schommer**, University of Tennessee at Martin, **Dmitri Shakhmatov**, Ehime University, and **Stephen Watson**, York University (939-00-1183)

AMS Special Session on Hamiltonian Mechanics: Applications to Celestial Mechanics and Chemistry, I

8:30 AM – 10:50 AM

Organizers: **Michael K. Rudnev**, The University of Texas at Austin

Stephen R. Wiggins, California Institute of Technology

8:30AM (118) *Bifurcation and cantorus analysis of quantizing structures in molecular spectra.*
Michael E. Kellman, University of Oregon (939-70-1147)

9:00AM (119) *Two examples of the appearence of complex trajectories in semi-classical estimates.* Preliminary report.
Alejandro Uribe, University of Michigan (939-81-1168)

9:30AM (120) *A global analysis of the bifurcations of periodic orbits with the Hénon map as an example.*
Charles Jaffé*, West Virginia Univesity, and **Masa Tsuchiya**, Cornell Uiversity (939-70-1162)

10:00AM (121) *Periodic orbit analysis of quantum spectra of atoms and molecules.*
Gregory S. Ezra, Cornell University (939-81-266)

10:30AM (122) *Two conjectures of G. D. Birkhoff.*
Kenneth R. Meyer, University of Cincinnati (939-34-385)

AMS Special Session on Mathematics Education and Mistaken Philosophies of Mathematics, I

9:00 AM – 10:50 AM

Organizers: **Saunders Mac Lane**, University of Chicago

Richard A. Askey, University of Wisconsin-Madison

9:00AM ▸ (123) *Mathematics as illustrated in textbooks.* Preliminary report.
Richard Askey, Univ. of Wisconsin-Madison (939-97-721)

9:30AM ▸ (124) *What is (school) mathematics, really?* Preliminary report.
Anthony D. Gardiner, University of Birmingham (939-97-879)

10:00AM (125) *Some contradictions of education reform.*
Owen Thomas, Columbus, OH (939-98-896)

10:30AM (126) *Mistaken philosophies in teaching linear algebra.*
Seymour Lipschutz, Temple University (939-98-111)

MAA Special Event

9:30 AM – 10:55 AM

Presentation for chairs of mathematics departments in comprehensive universities, four-year liberal arts and two-year colleges.

Organizer: **Gerald L. Alexanderson**, Santa Clara University

Presenters: **Saeed Ghahramani**, Towson University

Catherine M. Murphy, Purdue University Calumet

A. Wayne Roberts, Macalester College

AMS Invited Address

10:05 AM – 10:55 AM

(127) *Geometry of soliton equations.* Preliminary report.
Chuu-Lian Terng, Northeastern University (939-53-548)

AMS-MAA Invited Address

11:10 AM – NOON

(128) *Phase transitions in probability theory and computer science.*
Jennifer T. Chayes, Microsoft Research (939-82-956)

Books Sales and Exhibits

NOON – 5:00 PM

AMS Colloquium Lectures: Lecture I

1:00 PM – 2:00 PM

(129) *Symplectic geometry from a dynamical systems point of view: I.*
Helmut H. Hofer, Courant Institute (939-58-494)

MAA Invited Address

2:15 PM – 3:05 PM

▸ (130) *Extending and generalizing the Pascal Triangle: An interplay of algebra and geometry.*
Jean Pedersen, Santa Clara University (939-05-09)

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

2:15 PM – 6:05 PM

Organizers: **William H. Barker**, Bowdoin College
Jerry L. Bona, University of Texas at Austin
Naomi Fisher, University of Illinois at Chicago
Kenneth C. Millett, University of California Santa Barbara

2:15PM ▸ (131) *Changes in methods for examining gender bias.*
Jere Confrey*, University of Texas at Austin, and **Catherine Good**, The University of Texas at Austin (939-98-1015)

2:45PM ▸ (132) *Why the caged bird sings: Some challenges and opportunities in the life of a mathematician.*
Carolyn R. Mahoney, CSU San Marcos (939-98-865)

3:15PM ▸ (133) *The REACH program: A summer program in mathematics and computer science for academically talented students.*
Vernise Y. Steadman, University of the District of Columbia (939-97-1006)

3:45PM ▸ (134) *The crisis in urban public school mathematics: What should college mathematics departments do?* Preliminary report.
Robert W. Case, Northeastern University (939-97-1080)

4:15PM ▸ (135) *The Math-Science honors program at Arizona State University.* Preliminary report.
Joaquin Bustoz*, **Millie M. Trotter**, **Erica R. Gonzalez**, Arizona State University, **Kristie Harris**, South Mountain High School, and **Jennifer Tom**, Humanities and Sciences Institute (939-97-722)

4:45PM ▸ (136) *Creating successful outcomes in the teaching and learning of mathematics and statistics for high school teachers and students from the inner-city of Detroit: Beating the odds.*
Martha B. Aliaga, The University of Michigan (939-97-803)

5:15PM ▸ (137) *Enlarging the pool of black mathematics Ph.D.s: What we are learning at the University of Maryland.*
Duane A. Cooper, University of Maryland (939-98-163)

5:45PM ▸ (138) *Vitality of some very old ideas.*
Arnold E. Ross, Ohio State University, and **Glenn Stevens***, Boston University (939-97-850)

AMS-ASL Special Session on Model Theory and Its Applications, II

2:15 PM – 5:40 PM

Organizer: **Anand Pillay**, MSRI and University of Illinois, Urbana

2:15PM (139) *Implicit function theorems on a free group and Tarski's problems.* Preliminary report.
Olga Kharlampovich, McGill University, Montreal, Canada (939-20-777)

2:45PM (140) *Model Theory of L_1-spaces.* Preliminary report.
C. Ward Henson, Univ. of Illinois (939-03-413)

3:15PM (141) *Pure-global dimensions of modules and their model-theoretic content .*
Philipp S. Rothmaler, University of Illinois (939-03-655)

3:45PM Break.

4:15PM (142) *Local uniformization and the model theory of valued fields in positive characteristic.*
Franz-Viktor Kuhlmann, University of Saskatchewan at Saskatoon (939-03-440)

4:45PM (143) *A new proof to the new intersection theorem.*
Hans Schoutens, Wesleyan University (939-03-434)

5:15PM (144) *Elimination of imaginaries in algebraically closed valued fields.* Preliminary report.
Deirdre Haskell*, College of the Holy Cross, **Ehud Hrushovski**, Hebrew University of Jerusalem, and **H. D. Macpherson**, University of Leeds (939-03-336)

AMS Special Session on Banach Spaces of Holomorphic Functions and Operators on These Spaces, II

2:15 PM – 6:05 PM

Organizers: **Benjamin A. Lotto**, Vassar College
Pamela B. Gorkin, Bucknell University

2:15PM (145) *The Berezin transform on the Toeplitz algebra.*
Sheldon Axler*, San Francisco State University, and **Dechao Zheng**, Vanderbilt University (939-47-206)

2:45PM (146) *Toeplitz operators on Dirichlet-type spaces.* Preliminary report.
Rick S. Chartrand, University of California, Berkeley (939-47-112)

3:15PM (147) *Zero products of Toeplitz operators on the Bergman space.* Preliminary report.
Patrick Ahern, University of Wisconsin-Madison, and **Zeljko Cuckovic***, University of Toledo (939-47-133)

3:45PM (148) *Compact Toeplitz operators on Bergman and Fock spaces.*
Karel Stroethoff, University of Montana (939-47-208)

4:15PM Informal problem session.

4:45PM (149) *Sampling, interpolation, and zero sets for the Bergman space.* Preliminary report.
Daniel H. Luecking, University of Arkansas (939-30-161)

5:15PM (150) *Essentially commuting Toeplitz operators.*
Pamela Gorkin, Bucknell University , and **Dechao Zheng***, Vanderbilt University (939-47-66)

5:45PM (151) *Hypercyclic operators that commute with the Bergman backward shift.*
Paul S. Bourdon, Washington and Lee University, Lexington, VA 24450, and **Joel H. Shapiro***, Michigan State University, East Lansing, MI 48824 (939-47-132)

AMS Special Session on Commutative Algebra, II

2:15 PM – 6:05 PM

Organizer: **Scott Thomas Chapman**, Trinity University

2:15PM (152) *Kronecker function rings and generalized integral closures.* Preliminary report.
Franz Halter-Koch, Karl-Franzens-Universität-Graz (939-13-467)

2:45PM (153) *Nagata's theorem for the class group, II.* Preliminary report.
Stefania Gabelli, University of Rome, "La Sapienza" (939-13-629)

3:15PM (154) *On Mockor's question.* Preliminary report.
Byung Gyun Kang* and **Mi-Hee Park**, Pohang Institute of Science and Technology (939-13-689)

3:45PM (155) *Finite conductor conditions in localizations of polynomial rings.* Preliminary report.
Sarah Glaz, The University of Connecticut (939-13-550)

4:15PM ▸ (156) *Relative ideals, duals and symmetry.*
Kurt D. Herzinger, U.S. Air Force Academy (939-13-469)

4:45PM (157) *The canonical module of a one-dimensional reduced local ring.*
Marco D'Anna, Università di Catania (939-13-686)

5:15PM (158) *Analytically unramified one-dimensional semilocal rings and their value semigroups.*
Valentina Barucci*, Università di Roma "La Sapienza", **Marco D'Anna**, Università di Catania, and **Ralf Froberg**, Stockholms Universitet (939-13-674)

5:45PM (159) *Normal Hilbert functions of one-dimensional local rings.*
Ralf Fröberg, Stockholm University (939-13-412)

AMS Special Session on Combinatorial Topology, II

2:15 PM – 5:05 PM

Organizers: **Laura M. Anderson**, Texas A&M University
Jonathan P. McCammond, Texas A&M University

2:15PM ▸ (160) *Morse theory and evasiveness.*
Robin Forman, Rice University (939-05-709)

2:45PM (161) *Combinatorics of topological posets.*
Rade T. Živaljević, Mathematics Institute SANU (939-55-578)

3:15PM (162) *Mod 2 cohomology of the combinatorial Grassmannians.*
Laura Anderson, Texas A&M University, and **James F. Davis***, Indiana University (939-55-1194)

3:45PM (163) *Tame combings, quasi-geodesics, and almost convexity for groups.* Preliminary report.
Susan Hermiller*, University of Nebraska Lincoln, and **John Meier**, Lafayette College (939-20-204)

4:15PM (164) *The coherence and quasiconvexity of Coxeter groups.*
Jonathan P. McCammond*, Texas A&M University, and **Daniel T. Wise**, Cornell University (939-20-778)

4:45PM (165) *On Betti numbers of quotients of order complexes of certain sublattices of a partition lattice by the action of the symmetric group.*
Dmitry N. Kozlov, Institute for Advanced Study (939-05-836)

AMS Special Session on Development of Electronic Communications in Mathematics, II

2:15 PM – 5:05 PM

Organizers: **Alfonso Castro**, University of Texas at San Antonio
Rafael De La Llave, University of Texas at Austin

2:15PM (166) *The role of eprint servers in electronic communication.*
David R. Morrison, Duke University (939-00-893)

2:45PM ▸ (167) *The Banach space archive and list.* Preliminary report.
Dale E. Alspach, Oklahoma State University (939-01-579)

3:15PM (168) *Electronic communication: Experience with MP_ARC and MPEJ.*
Hans A. Koch, The University of Texas at Austin (939-99-1140)

3:45PM (169) *Free electronic journals.*
Gregory F. Lawler, Duke University (939-00-1225)

4:15PM Open discussion.

4:45PM (170) *Summary and conclusions.*
Alfonso Castro, Univ. of Texas at San Antoni, and **Rafael de la Llave***, Univ. of Texas at Austin (939-00-1156)

AMS Special Session on The Functional and Harmonic Analysis of Wavelets, II

2:15 PM – 6:05 PM

Organizers: **Lawrence W. Baggett**, University of Colorado
David R. Larson, Texas A&M University

2:15PM (171) *An operator-theoretic approach to wavelets using the Feynman path integral.* Preliminary report.
Brian De Facio*, **Gerald W. Johnson** and **Michel Lapidus**, Professor (939-46-1189)

2:45PM (172) *Frames in Hilbert spaces, Hilbert C*-modules and C*-algebras.*
Michael Frank*, Univ. Houston, and **David R. Larson**, Texas A&M Univ. (939-46-431)

3:15PM (173) *Sampling theory for certain Hilbert spaces of band-limited functions.*
Jean-Pierre Gabardo, McMaster University (939-42-920)

3:45PM (174) *Para-products, time-frequency analysis and operator theory.*
John E. Gilbert, The University of Texas at Austin (939-42-598)

4:15PM (175) *On operator-theoretic interpolation of wavelets.* Preliminary report.
Xingde Dai, **Qing Gu***, University of North Carolina, and **David R. Larson**, Texas A&M University (939-46-1195)

4:45PM (176) *Characterization of low pass filters.*
Vladimir T. Dobrić, Lehigh University, **Richard F. Gundy***, Rutgers University, and **Pawel Hitczenko**, North Carolina State University (939-42-735)

5:15PM (177) *Frames, bases and group representations.* **Deguang Han***, McMaster University, and **David R. Larson**, Texas A&M University (939-46-1105)

5:45PM ▸ (178) *Nonatomic von Neumann algebras and the wavelet connectivity problem.* Preliminary report. **Edward Azoff**, UGA, Athens, GA, **Eugen J. Ionascu***, UGA, Athens, **David R. Larson** and **Carl M. Pearcy**, TAMU, TX (939-46-439)

AMS Special Session on Discrete Models and Difference Equations, II

2:15 PM – 6:05 PM

Organizers: **Saber Elaydi**, Trinity University
Gerry Ladas, University of Rhode Island

2:15PM (179) *Effects of temporal heterogeniety in the Baumol-Wolff productivity growth model.* **Hassan Sedaghat**, Virginia Commonwealth University (939-39-277)

2:45PM ▸ (180) *Properties of a certain Lyness equation.* **Catherine Darwen** and **William T. Patula***, Southern Illinois University (939-39-62)

3:15PM (181) *On the behavior of solutions of* $x(n+1) = a + x(n-1)/x(n)$. **E. A. Grove***, **G. Ladas**, **A. M. Amleh**, University of Rhode Island, and **D. A. Georgiou**, Democritus University of Thrace (939-39-242)

3:45PM ▸ (182) *Global stability of* $x_{n+1} = \frac{A}{x_n^p} + \frac{1}{x_{n-1}^{1/p}}$. **Richard C. DeVault** and **Lisa R. Galminas***, Northwestern St. Univ. of LA (939-39-105)

4:15PM ▸ (183) *On the recursive sequence* $x(n+1) = (Ax(n) + Bx(n-1))/(Cx(n) + Dx(n-1))$. **M. R. S. Kulenovic***, **G. Ladas**, University of Rhode Island, and **W. Sizer**, Moorhead State University (939-39-276)

4:45PM (184) *Global behavior of a nonlinear second order difference equation.* **Vlajko L. Kocic*** and **Donna Stutson**, Xavier University of Louisiana (939-39-492)

5:15PM (185) *On the nonautonomous equation* $x[n+1] = max1/x[n], A[n]/x[n-1]$. Preliminary report. **William J. Briden**, **Edward A. Grove**, The University of R.I., **Candace M. Kent***, Virginia Commonwealth University, and **Gerry Ladas**, Kingston, RI (939-39-768)

5:45PM (186) *Stability of solutions of systems of linear difference equations with almost periodic, near constant coefficients.* Preliminary report. **Alexei V. Bourd**, QUALCOMM, Inc. (939-39-640)

AMS Special Session on Mathematics Education and Mistaken Philosophies of Mathematics, II

2:15 PM – 3:35 PM

Organizers: **Saunders Mac Lane**, University of Chicago
Richard A. Askey, University of Wisconsin-Madison

2:15PM (187) *Social constructivism as a philosophy of mathematics.* **Saunders Mac Lane**, The University of Chicago (939-98-110)

2:45PM ▸ (188) *How can the constructivist critique be used to make introduction to real analysis more accessible.* Preliminary report. **Bogdan M. Baishanski**, Ohio State University (939-98-72)

3:15PM (189) *Between Platonism and constructivism: Is there a mathematics acquisition device?* Preliminary report. **Carl Winsløw**, Royal Dan. School of Ed. St. (939-00-143)

AMS Special Session on Recent Developments in Differential Geometry, II

2:15 PM – 5:45 PM

Organizers: **Huai-Dong Cao**, Texas A&M University
Jian Zhou, Texas A&M University

2:15PM (190) *Recent applications of global geometry to anomalies.* Preliminary report. **Daniel S. Freed**, University of Texas at Austin (939-58-1022)

2:45PM (191) *On Quantum de Rham Theory.* **Huai-Dong Cao*** and **Jian Zhou**, Texas A&M University (939-53-869)

3:15PM (192) *Counting curves on K3 and Abelian surfaces.* **Jim A. Bryan***, Tulane University, and **Conan Leung**, University of Minnesota (939-14-906)

3:45PM (193) *Counting curves on irrational surfaces.* **Naichung C. Leung***, University of Minnesota, and **Jim Bryan**, Tulane University (939-53-1040)

4:15PM (194) *Extremal Kahler metrics in conical surface.* **Xiuxiong Chen**, Princeton University (939-58-922)

4:45PM (195) *Modular class, holonomy on Poisson manifolds, and Poisson (co)homology.* Preliminary report. **Viktor L. Ginzburg**, University of California Santa Cruz (939-58-940)

5:15PM Discussion.

AMS Special Session on Singularities in Algebraic and Analytic Geometry, II

2:15 PM – 5:40 PM

Organizers: **Caroline Grant Melles**, U.S. Naval Academy
Ruth I. Michler, University of North Texas

2:15PM (196) *Canonical resolution of quasi-ordinary surface singularities.* Preliminary report. **Chunsheng Ban** and **Lee J. McEwan***, Ohio State University (939-14-44)

2:45PM (197) *Deforming Artin Gorenstein algebras, and singularities.* Preliminary report. **Anthony A. Iarrobino Jr.**, Northeastern University (939-13-945)

3:15PM (198) *Valuations and binomial ideals.* Preliminary report. **Bernard H. Teissier**, C.N.R.S. (939-14-859)

4:15PM (199) *Euler obstruction and indices of vector fields.* Preliminary report. **Jean-Paul Brasselet***, **Dũng Tráng Lê**, Directeur de Recherche CNRS, and **Jose Seade**, Professor (939-14-1184)

5:15PM (200) *The weak subintegral closure of a monomial ideal.* **Les Reid**, Southwest Missouri University, and **Marie A. Vitulli***, University of Oregon (939-13-762)

AMS Special Session on Hamiltonian Mechanics: Applications to Celestial Mechanics and Chemistry, II

2:15 PM – 5:05 PM

Organizers: **Michael K. Rudnev**, The University of Texas at Austin
Stephen R. Wiggins, California Institute of Technology

2:15PM (201) *Ergodic properties of particle systems .* Preliminary report.
Marek R. Rychlik* and **Maciej P. Wojtkowski**, University of Arizona (939-70-1045)

2:45PM (202) *Scar formation and the transition from order to chaos in the vibrations of molecular systems.*
Florentino Borondo*, **Francisco J. Arranz**, Universidad Autonoma de Madrid, Spain, and **Rosa M. Benito**, Universidad Politecnica de Madrid, Spain (939-81-1010)

3:15PM (203) *On nontwist Hamiltonian flows and symplectic maps of the plane.*
Philip J. Morrison, The University of Texas at Austin (939-70-997)

3:45PM (204) *Three-dimensional, volume-preserving flows and maps.*
Igor Mezic, University of California, Santa Barbara (939-76-934)

4:15PM (205) *Horseshoes near normally hyperbolic invariant manifolds.* Preliminary report.
Richard B. Moeckel, University of Minnesota (939-70-886)

4:45PM (206) *Double resonances in four dimensional symplectic maps.* Preliminary report.
Arturo Olvera, IIMAS, UNAM (939-58-883)

MAA Minicourse #10: Part A

2:15 PM – 4:15 PM

Facilitating active learning: Concrete ways to foster student participation.

Organizer: **Sandra L. Rhoades**, Keene State College

MAA Minicourse #13: Part A

2:15 PM – 4:15 PM

Getting students involved in undergraduate research.

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

MAA Minicourse #2: Part A

2:15 PM – 4:15 PM

Mathematical finance.

Organizer: **Walter R. Stromquist**, Berwyn, PA

MAA Minicourse #8: Part A

2:15 PM – 4:15 PM

Teaching a course in the history of mathematics.

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

AMS Session on Commutative Algebra

2:15 PM – 4:40 PM

2:15PM ▸ (207) *Trigonometric identities are algorithmic.* Preliminary report.
Russell E. Goodman, University of Oklahoma (939-13-369)

2:30PM (208) *Prime ideals in Noetherian rings.* Preliminary report.
Sylvia M. Wiegand and **Azime S. Saydam***, University of Nebraska-Lincoln (939-13-424)

2:45PM (209) *Quasi-projective modules over integral domains.* Preliminary report.
Dmitri M. Alexeev, Tulane University (939-13-444)

3:00PM (210) *On the expected cardinality of minimal generating sets for submodules of free modules over special principal ideal rings.* Preliminary report.
Grady D. Bullington, University of Tennessee (939-13-490)

3:15PM (211) *Weak Henselizations and strongly Etale neighborhoods.* Preliminary report.
Frank DeMeyer, Colorado State University, **Thomas McKenzie***, Bradley University, and **Kim Schneider**, Mesa State University (939-13-624)

3:30PM (212) *Another algorithm for the Quillen-Suslin theorem for polynomial rings.* Preliminary report.
Cynthia J. Woodburn, Pittsburg State University (939-13-726)

3:45PM (213) *A graded analog to the torsion free covering of* $Z/(p)$. Preliminary report.
William T. Ashby, Charleston Southern University (939-13-863)

4:00PM (214) *A characterization of nonsingular pairs of quadratic forms.* Preliminary report.
David B. Leep, University of Kentucky, and **Laura Mann Schueller***, Whitman College (939-12-366)

4:15PM (215) *Galois extensions via polynomial iteration in characteristic p.* Preliminary report.
Paul A. Loomis, Purdue University (939-12-953)

4:30PM (216) *Limitations in the cage method of Choi, Lam, and Reznick for computing* $P(\mathbb{R}[x_1, \ldots, x_n)$. Preliminary report.
Colin L. Starr, Stephen F. Austin State University (939-12-1131)

AMS Session on Complex Analysis

2:15 PM – 5:25 PM

2:15PM (217) *On the factorizations of f(p).* Preliminary report.
Chung-chun Yang, Hong Kong University of Science and Technology (939-30-96)

2:30PM (218) *On a strengthened version of Julia's Lemma.*
Peter R. Mercer, SUNY College - Buffalo (939-30-164)

2:45PM (219) *A quadratic approximation to the Sendov radius near the unit circle.*
Michael J. Miller, Le Moyne College (939-30-172)

3:00PM ▸ (220) *Traveling through parameter space for groups of Möbius transformations.* Preliminary report.
David J. Pinchbeck, Saint Joseph's College of Maine (939-30-347)

3:15PM (221) *Discrete and continuous sampling in several variables.*
Peter A. McCoy, U.S. Naval Academy (939-30-373)

3:30PM (222) *Composition and pullbacks on families of Cauchy transforms.*
Yusuf I. Abu Muhanna, American University of Sharjah (939-30-546)

3:45PM (223) *Integral representations for the Hadamard product of harmonic convex functions.* Preliminary report.
Mary R. Goodloe, University of Kentucky (939-30-694)

4:00PM (224) *The Szegő kernel in triply connected domains.* Preliminary report.
Thomas J. Tegtmeyer, Purdue University (939-30-770)

4:15PM ▸ (225) *Approximation by rational functions.* Preliminary report.
N. V. Rao, University of Toledo (939-30-792)

4:30PM (226) *Hyperbolic capacity and its distortion under conformal mapping.*
Peter L. Duren, University of Michigan, Ann Arbor, and **John A. Pfaltzgraff***, University of North Carolina, Chapel Hill (939-30-891)

4:45PM (227) *Harmonic univalent maps and minimal surfaces.* Preliminary report.
Michael J. Dorff, Univ. of Missouri - Rolla (939-30-1020)

5:00PM (228) *Invariant mappings under Koebe transforms of the ball.* Preliminary report.
John A. Pfaltzgraff, University of North Carolina, Chapel Hill, 27599, and **Ted J. Suffridge***, University of Kentucky (939-32-821)

5:15PM ▸ (229) *A monotonicity property involving ${}_3F_2$ and comparisons of classical approximations of elliptical arc length.*
Roger W. Barnard*, **Kent Pearce**, Texas Tech University, and **Kendall C. Richards**, Southwestern University (939-33-742)

AMS Session on Number Theory, II

2:15 PM – 4:55 PM

2:15PM (230) *Sign codes from number fields.* Preliminary report.
Maura Murray, University of Massachusetts, Amherst (939-11-648)

2:30PM (231) *The universal Kummer congruences.*
Arnold Adelberg, Grinnell College (939-11-752)

2:45PM ▸ (232) *Divisibility properties of numerators of sums of reciprocals. II.* Preliminary report.
Scott H. Hochwald, University of North Florida (939-11-793)

3:00PM (233) *On the residues of certain digital sums.*
Robert E. Kennedy* and **Curtis N. Cooper**, Central Missouri State University (939-11-848)

3:15PM (234) *An explicit expression for digital sum sums in base B expansions.*
Curtis N. Cooper* and **Robert E. Kennedy**, Central Missouri State University (939-11-849)

3:30PM ▸ (235) *Block product sequences.* Preliminary report.
Abigail Hoit, University of Illinois at Urbana-Champaign (939-11-894)

3:45PM (236) *Renormalization and special values of certain triple product L-functions.* Preliminary report.
Jennifer E. Beineke, Trinity College (939-11-908)

4:00PM (237) *How many points are there on that CM elliptic curve?* Preliminary report.
Wendy L. Miller, UC San Diego (939-11-937)

4:15PM (238) *On determining class numbers of certain biquadratic fields.* Preliminary report.
Michael W. Mastropietro, University of California, San Diego (939-11-962)

4:30PM ▸ (239) *Sums of powers of integers via inner products.* Preliminary report.
Carl A. Libis, AMS (939-11-1099)

4:45PM (240) *Bounds for the class numbers of cyclotomic function fields.*
Joseph J. Palen, Univ. of Michigan (939-11-1198)

AMS Session on Group Theory

2:15 PM – 5:40 PM

2:15PM (241) *On pregroups.* Preliminary report.
Seymour Lipschutz*, Temple University, and **Wujie Shi**, Southwest-China Normal University (939-20-40)

2:30PM (242) *Moufang loops of order 2m.*
Orin Chein, Temple University (939-20-155)

2:45PM (243) *Subnormality conditions in non-torsion groups.*
Luise-Charlotte Kappe*, SUNY at Binghamton, and **Gunnar Traustason**, University of Bath (939-20-194)

3:00PM (244) *On restricting representations of the symmetric group to certain embeddings.* Preliminary report.
Jagat K. Sheth, University of Oregon (939-20-220)

3:15PM (245) *Commutative nilsemigroups with zero cohomology.*
P. A. Grillet, Tulane University (939-20-471)

3:30PM (246) *Infinite metacyclic groups and their nonabelian tensor squares.*
James R. Beuerle* and **Luise-Charlotte Kappe**, SUNY at Binghamton (939-20-474)

3:45PM (247) *On some generalized characters of Thompson.* Preliminary report.
Stephen M. Gagola Jr.* and **Mark L. Lewis**, Kent State University (939-20-476)

4:00PM (248) *Conditions for which Fischer F-subgroups in finite solvable groups are F-injectors.*
Arnold D. Feldman, Franklin & Marshall College (939-20-638)

4:15PM ▸ (249) *A presentation for the unipotent group over rings with identity.* Preliminary report.
Samit Dasgupta*, Harvard University, and **Daniel K. Biss**, Massachusetts Institute of Technology (939-20-652)

4:30PM (250) *Classification of radical semigroups.* Preliminary report.
David A. Feil, Rhodes College (939-20-788)

4:45PM (251) *Identifying group automorphisms with graph automorphisms.*
Debra L. Boutin, Trinity College (939-20-823)

5:00PM (252) *Locally nilpotent groups with weak chain conditions.* Preliminary report.
Vonn Walter, Allegheny College (939-20-910)

5:15PM ▸ (253) *Perfect order subsets.* Preliminary report.
Carrie F. Weiman* and **Lenny K. Jones**, Shippensburg University (939-20-980)

5:30PM (254) *Algebraic structures in the projective system of semigroups $Z_{3n} \times Z_{3n}$.* Preliminary report.
Y. Phoebe Ho, Central Missouri State University (939-20-1101)

MAA Session on Innovations in Teaching Abstract Algebra

2:15 PM – 5:25 PM

Organizers: **Vesna Kilibarda**, University of Alaska Southeast
Allen C. Hibbard, Central College
Ellen Maycock Parker, DePauw University

2:15PM ▸ (255) *Using Pascal's triangle to visualize abstract algebra concepts.* Preliminary report.
Michael J. Bardzell*, Salisbury State University, and **Kathleen M. Shannon**, Salisbury State University (939-E1-300)

2:30PM (256) *Active learning in three classes.* Preliminary report.
Sarah-Marie Belcastro, University of Norther Iowa, **Laurie J. Burton***, Central Washington University, and **Moira A. McDermott**, Gustavus Adolphus College (939-E1-654)

2:45PM ▸ (257) *Enhancing introductory group theory through symmetry: A collection of multimedia tutorials.* Preliminary report.
Darren D. Wick, Millsaps College (939-E1-1120)

3:00PM ▸ (258) *Unsolvability of quintics without nonsense.* Preliminary report.
Robert A. Bix, University of Michigan-Flint (939-E1-196)

3:15PM (259) *Active learning in abstract algebra.*
Nancy L. Hagelgans, Ursinus College (939-E1-330)

3:30PM ▸ (260) *Teaching group theory with games and puzzles.* Preliminary report.
Chung-wu Ho, Southern Illinois University at Edwardsville (939-E1-181)

3:45PM ▸ (261) *A few basic algebraic aspects of elliptic curves, viewed interrelationally.*
Simon R. Quint, Richard Stockton College of New Jersey (939-E1-501)

4:00PM ▸ (262) *SO(3), in pictures: A good example of lots of things.* Preliminary report.
Rick Kreminski, Texas A&M University (939-E1-534)

4:15PM ▸ (263) *A successful student research project.* Preliminary report.
Suzanne Doree, Augsburg College, Minneapolis, MN (939-E1-1138)

4:30PM ▸ (264) *Polynomial number magic.*
Garret E. Sobczyk, Universidad de Las Americas (939-E1-192)

4:45PM ▸ (265) *Star algebra.*
Jerry D. Taylor, MAA (939-E1-750)

5:00PM ▸ (266) *The lights out problem: An application of finite fields.*
John H. Wilson, Centre College (939-E1-307)

5:15PM ▸ (267) *Centralizers and centers: A natural site for reinforcing ideas about definitions, conjectures, proofs.* Preliminary report.
Mary T. Treanor, Valparaiso University (939-E1-657)

MAA Session on Ethical, Humanistic, and Artistic Mathematics, I

2:15 PM – 5:55 PM

Organizers: **Alvin M. White**, Harvey Mudd College
Robert P. Webber, Longwood College
Stefanos P. Gialamas, Illinois Institute of Art

2:15PM Discussion.

2:30PM ▸ (268) *Integrating mathematics and culture in a developing nation.*
Deane E. Arganbright*, University of Papua New Guinea, and **Susan C. Arganbright**, Gonzaga University (939-F1-437)

2:45PM ▸ (269) *Abstractions emerging from mathematics and interpeted literature.*
Phyllis L. Pustilnik*, Bronx Community College (CUNY), and **Seymour W. Pustilnik**, New York City Technical College (CUNY) (939-F1-473)

3:00PM Discussion.

3:30PM ▸ (270) *Information, data, and decisions.* Preliminary report.
Deborah Hughes Hallett, University of Arizona (939-F1-955)

3:45PM (271) *A guide to blazing a math trail.*
Mary-Margaret Shoaf, Baylor University (939-F1-324)

4:00PM ▸ (272) *Art and geometry: Proportion and similarity.*
Catherine A. Gorini, Maharishi University of Management (939-F1-200)

4:15PM ▸ (273) *Does the evidence of authority prevail over the authority of evidence?* Preliminary report.
Shandy Hauk*, Chapman Unviersity, and **Mark K. Davis**, Educational Testing Service (939-F1-409)

4:30PM ▸ (274) *A course called pattern.*
Dorothy I. Wallace* and **Pippa Drew**, Dartmouth College (939-F1-334)

4:45PM ▸ (275) *Putting the 'hunch' back where it belongs: Intuition in the classroom.*
Janet Heine Barnett, University of Southern Colorado (939-F1-185)

5:00PM ▸ (276) *A collection of ideas on systems and their extensions.* Preliminary report.
Paul Fjelstad, St. Olaf (emeritus) (939-F1-438)

5:15PM ▸ (277) *Mathematics, metaphor, and metonomy.*
Lawrence A. D'Antonio, Ramapo College of New Jersey (939-F1-565)

5:30PM ▸ (278) *Matrix model, fertility rate, and human population.* Preliminary report.
Mohammad Moazzam*, Salisbury State University, and **Richard Schwartz**, The College of Staten Island (939-F1-226)

5:45PM ▸ (279) *Using writing to connect with our mathematics students.*
Ann M. Sitomer, Grossmont College (939-F1-1000)

MAA Invited Address

3:20 PM – 4:10 PM

▸ (280) *The symmetries of things: Real and conceptual.*
John H. Conway, Princeton University (939-51-80)

AWM Panel Discussion

3:20 PM – 4:20 PM

The education of women in mathematics: An international perspective.

Organizers: **Sylvia Wiegand**, University of Nebraska
Bettye Anne Case, Florida State University

Panelists: **Claire Baribaud**, EPF, Lausanne, Switzerland
Ingrid Daubechies, Princeton University
Anna Guerrieri, University of L'Aquila, Italy
Gloria C. Hewitt, University of Montana
Gail Ratcliff, University of Missouri at St. Louis
Hema Srinivasan, University of Missouri at Columbia
Chuu-Lian Terng, Northeastern University

AWM Business Meeting

4:20 PM – 4:50 PM

MAA Minicourse #1: Part B

4:30 PM – 6:30 PM

Mathematics, calculus, and modeling using the TI-92.

Organizers: **Phoebe T. Judson**, Trinity University
William C. Bauldry, Appalachian State University
Richard D. West, U. S. Military Academy

MAA Minicourse #3: Part B

4:30 PM – 6:30 PM

Developing materials for liberal arts mathematics that use elementary graph theory and emphasize applications to everyday experience.
Organizer: **Helen Christensen**, Loyola University

MAA Minicourse #5: Part A

4:30 PM – 6:30 PM

Building custom classroom capsules with Maple programming.
Organizer: **Douglas E. Ensley**, Shippensburg University

MAA Minicourse #7: Part A

4:30 PM – 6:30 PM

Finding motivation for upper division mathematics through original sources.
Organizers: **Jerry M. Lodder**, New Mexico State University
David J. Pengelley, New Mexico State University

MAA Section Officers

4:30 PM – 6:30 PM

Reception for First-Time Participants

6:00 PM – 7:00 PM

MAA Dramatic Presentation

7:00 PM – 8:00 PM

The mathematics of Lewis Carroll.
Presenter: **Robin Wilson**, The Open University

Young Mathematicians Network Discussion

7:15 PM – 8:15 PM

Concerns of young mathematicians: A town meeting.

AMS Josiah Willard Gibbs Lecture

8:30 PM – 9:30 PM

(281) *We got rhythm: Dynamical systems of the nervous system.*
Nancy J. Kopell, Boston University

AWM Reception

9:30 PM – 11:00 PM

Thursday, January 14

Joint Meetings Registration

7:30 AM – 4:00 PM

MAA Session on Geometry in the Classroom in the Next Millennium, I

7:30 AM – 10:55 AM

Organizers: **Colm K. Mulcahy**, Spelman College
David W. Henderson, Cornell University
Barry Schiller, Rhode Island College

7:30AM ***Geometry is Alive.***
▸ (282) *Consciousness: The last frontier of geometry.* **Catherine A. Gorini**, Maharishi University of Management (939-H1-199)
▸ (283) *Geometry and the arts.* **Ann Robertson*** and **Stanley J. Wertheimer**, Connecticut College (939-H1-660)
▸ (284) *Geometry is alive - long live geometry!* **Colm K. Mulcahy**, Spelman College (939-H1-1143)
8:20AM Discussion.
8:40AM ***Geometry in the World.***
▸ (285) *Teaching the geometry needed for communication industry technologies.* **Joseph Malkevitch**, York College(CUNY) (939-H1-428)
▸ (286) *Discrete geometry as applied mathematics.* Preliminary report. **Walter J. Whiteley**, York University (939-H1-507)
▸ (287) *Geometry in computer graphics.* Preliminary report. **Ahlam E.H. Tannouri*** and **Sam F. Tannouri**, Morgan State University (939-H1-615)
▸ (288) *Symmetry, rigid motions, and a fourth dimension.* **John McCuan**, UC Berkeley (939-H1-743)
9:40AM Discussion.
10:00AM ***Multiple Aspects of Teaching Geometry.***
▸ (289) *Integrating approaches to geometry.* **Thomas Q. Sibley**, St. John's University (939-H1-246)
▸ (290) *Internet mentoring for isolated geometry professors.* **David E. Boliver**, Univ. of Central Oklahoma (939-H1-362)
▸ (291) *What's going on in Rhode Island high school geometry.* **Ann E. Moskol**, Rhode Island College (939-H1-493)
▸ (292) *Geometry–a multiple perspective approach.* **Ockle E. Johnson**, Keene State College (939-H1-645)
10:40AM Discussion.

MAA Session on Teaching Statistics: Teaching the Reasoning and New Technological Tools, II

7:40 AM – 10:55 AM

Organizers: **Dexter C. Whittinghill**, Rowan University
Franklin A. Wattenberg, National Science Foundation
Mary R. Parker, Austin Community College
Donald L. Bentley, Pomona College

7:40AM Introduction by Mary Parker.
7:45AM *Census 2000, a statistical opportunity.*
▸ (293) **Stanley E. Seltzer*** and **John C. Maceli**, Ithaca College (939-C1-1215)
8:05AM *Life's a risk! An interdisciplinary and interactive*
▸ (294) *statistics course.* **Linda C. Thiel**, Ursinus College (939-C1-296)

8:25AM *Data analysis in environmental studies.*
▸ (295) **Stuart F. Boersma*** and **Gordon L. Godshalk**, Alfred University (939-C1-581)

8:40AM *The role of formulas in teaching statistical*
(296) *reasoning.*
Lawrence M. Lesser, University of Northern Colorado (939-C1-293)

8:55AM *Sequencing topics in introductory statistics: a*
▸ (297) *debate on what to teach when.*
Beth L. Chance, University of the Pacific, and **Allan J. Rossman***, Dickinson College (939-C1-235)

9:15AM *Common misconceptions about scatterplots,*
▸ (298) *correlation, and linear regression.*
Curtis C. McKnight, University of Oklahoma (939-C1-1043)

9:30AM *Statistical reasoning for health care professionals.*
▸ (299) **Ginger Holmes Rowell**, MAA (939-C1-924)

9:45AM *Using technology to improve statistical reasoning.*
▸ (300) Preliminary report.
Joan B. Garfield*, **Robert delMas**, University of Minnesota, and **Beth Chance**, University of the Pacific (939-C1-644)

10:05AM *Acquiring data from the class for the class.*
(301) **J. Charles Jacobson**, Assistant Professor (939-C1-727)

10:20AM *Technology and coin tossing.*
▸ (302) **Leonard J. Lipkin**, University of North Florida (939-C1-351)

10:35AM *Using MAPLE to Find p.d.f.'s of sums of random*
▸ (303) *variables.*
Elliot A. Tanis, Hope College (939-C1-521)

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

8:00 AM – 11:50 AM

Organizers: **William H. Barker**, Bowdoin College
Jerry L. Bona, University of Texas at Austin
Naomi Fisher, University of Illinois at Chicago
Kenneth C. Millett, University of California Santa Barbara

8:00AM *Alignment of mathematics tests and mathematics*
▸ (304) *reforms.* Preliminary report.
Norman L. Webb, University of WI-Madison, Wisconsin Center for Education Research (939-97-1024)

8:30AM *Standardized tests: What do they tell you about*
▸ (305) *students? What do they tell students (teachers, parents, school boards, and administrators) about mathematics?* Preliminary report.
Cathy Kessel, University of California, Berkeley, CA (939-98-703)

9:00AM *Gender differences in problem solving strategies.*
▸ (306) Preliminary report.
Ann Gallagher and **Mary Morley***, Educational Testing Service (939-98-1047)

9:30AM *Let's evaluate education 'reforms', past and*
▸ (307) *present.* Preliminary report.
Andrew M. Gleason, Harvard University (939-98-913)

10:00AM *Seven years of calculus reform at the University of*
(308) *Michigan.*
Morton Brown, University of Michigan (939-98-594)

10:30AM *Calculus reform at Maryland–past and future.*
▸ (309) **Ron Lipsman**, University of Maryland (939-98-398)

11:00AM *Moving ahead together.*
(310) **William J. Davis**, The Ohio State University (939-98-1017)

11:30AM *Strategies for mathematics departments to prepare*
▸ (311) *future teachers.*
Marjorie Enneking, Portland State University, Portland, Oregon (939-98-1142)

AMS-ASL Special Session on Model Theory and Its Applications, III

8:00 AM – 11:55 AM

Organizer: **Anand Pillay**, MSRI and University of Illinois, Urbana

8:00AM *The model theory of partial differential fields.*
(312) **Tracey Baldwin McGrail**, Marist College (939-03-588)

8:30AM *Ordinal dimensions of the theory of differentially*
(313) *closed fields.* Preliminary report.
Wai Yan Pong, University of Illinois at Chicago (939-03-313)

9:00AM *Countable models for random discrete structures.*
(314) **Joel H. Spencer**, Courant Institute (939-03-315)

9:30AM Break.

10:00AM *Difference subgroups of commutative algebraic*
(315) *groups over finite fields.*
José F. Voloch, University Texas (939-11-125)

10:30AM *Diophantine geometry of the torsion of a Drinfeld*
(316) *module.*
Thomas W. Scanlon, University of California, Berkeley (939-11-785)

11:00AM *Stable theories with a new predicate.*
(317) **Enrique Casanovas***, University of Barcelona, and **Martin Ziegler**, University of Freiburg (939-03-365)

11:30AM *Finite and infinite model theory.* Preliminary report.
(318) **John T. Baldwin**, University of Illinois at Chicago (939-03-292)

AMS Special Session on Banach Spaces of Holomorphic Functions and Operators on These Spaces, III

8:00 AM – 11:50 AM

Organizers: **Benjamin A. Lotto**, Vassar College
Pamela B. Gorkin, Bucknell University

8:00AM *Angular distribution of mass by Bergman functions.*
(319) **Donald E. Marshall***, University of Washington, and **Wayne Smith**, University of Hawaii (939-30-168)

8:30AM *Interpolating sequences in the spectrum of* H^∞.
(320) **Raymond R. Mortini**, Universite de Metz (France) (939-46-45)

9:00AM *A peak point theorem.* Preliminary report.
(321) **Alexander J. Izzo***, Bowling Green State University, and **John T. Anderson**, College of the Holy Cross (939-46-603)

9:30AM *Bourgain and minimal envelope algebras of Douglas*
(322) *algebras.*
Carroll Guillory, University of Southwestern Louisiana (939-46-216)

10:00AM *A distance estimate for finitely generated ideals in*
(323) *Douglas algebras.*
Daniel Suarez, University of Buenos Aires (939-46-179)

10:30AM *Vertical variation of harmonic functions.*
(324) **Michael D. O'Neill**, University of Texas, El Paso (939-30-139)

11:00AM *Weak infinite powers of Blaschke products.*
(325) **Keiji Izuchi**, Niigata University, Japan (939-46-145)

11:30AM *Interpolating sequences in spaces with complete*
(326) *Nevanlinna-Pick kernels.*
Jim Agler, UC San Diego, and **John E. McCarthy***, Washington University (939-46-166)

AMS Special Session on Commutative Algebra, III

8:00 AM – 11:50 AM

Organizer: **Scott Thomas Chapman**, Trinity University

8:00AM (327) *Lifting trees of prime ideals to Bezout extension domains.*
David E. Dobbs*, University of Tennessee, and **Marco Fontana**, Universita degli Studi, Roma Tre (939-13-35)

8:30AM (328) *Distinguished domains.* Preliminary report.
Daniel D. Anderson* and **Muhammad Zafrullah**, The University of Iowa (939-13-234)

9:00AM (329) *A bracket power characterization of analytic spread one ideals.*
Louis J. Ratliff and **David E. Rush***, University of California (939-13-449)

9:30AM (330) *Divisibility in $A+XB[X]$ domains.* Preliminary report.
David F. Anderson, University of Tennessee (939-13-498)

10:00AM (331) *Sets of lengths.* Preliminary report.
Alfred Geroldinger, Karl-Franzens-Universität-Graz (939-13-340)

10:30AM (332) *Elasticity of finitely generated domains.* Preliminary report.
Florian Kainrath, Institut f. Mathematik, Universitaet Graz (939-13-591)

11:00AM (333) *Some combinatorial problems related to arithmetic properties of Krull domains.* Preliminary report.
Weidong Gao, University of Petroleum, Beijing (939-13-379)

11:30AM (334) *An application of homology to the group of divisibilty.* Preliminary report.
Jim B. Coykendall, North Dakota State University (939-13-899)

AMS Special Session on Combinatorial Topology, III

8:00 AM – 11:50 AM

Organizers: **Laura M. Anderson**, Texas A&M University
Jonathan P. McCammond, Texas A&M University

8:00AM (335) *Secondary 2-complexes and link invariants.* Preliminary report.
Mike Dyer, University of Oregon, **Jens Harlander**, JWG-Universitat Frankfurt, **Michael P. Hitchman***, Lewis & Clark College, and **Jim Howie**, Heriot-Watt University (939-57-933)

8:30AM ▸ (336) *Nontrival embeddings of polygonal intervals and unknots in 3-space.*
Heather M. Johnston*, Rutgers University, and **Jason H. Cantarella**, University of Pennsylvania (939-57-729)

9:00AM ▸ (337) *Geometric embeddings of simplicial complexes in a Euclidean space.*
Isabella Novik, The Hebrew University (939-05-544)

9:30AM (338) *On new lower bound theorems for polytopes and combinatorial manifolds.*
Eric Sparla, Universitaet Stuttgart (939-52-1180)

10:00AM (339) *Recoverable subgroups of the Hawaiian earring group.*
William A. Bogley*, Oregon State University, and **Allan J. Sieradski**, University of Oregon (939-57-733)

10:30AM (340) *On the cohomology of orbit configuration spaces.*
Eva-Maria E. Feichtner*, Institute for Advanced Study, and **G"unter M. Ziegler**, Technische Universit"at Berlin (939-55-923)

11:00AM ▸ (341) *Tessellations of moduli spaces and the dissections of polygons.*
Satyan L. Devadoss, Johns Hopkins University (939-55-127)

11:30AM ▸ (342) *Syzygies among row operations and Stasheff polytopes.*
Mikhail M. Kapranov*, Northwestern University, and **Masahico Saito**, University of South Florida (939-20-950)

AMS Special Session on The Functional and Harmonic Analysis of Wavelets, III

8:00 AM – 11:50 AM

Organizers: **Lawrence W. Baggett**, University of Colorado
David R. Larson, Texas A&M University

8:00AM (343) *Ruelle operators: Functions which are harmonic with respect to a transfer operator.*
Palle E.T. Jorgensen, The University of Iowa (939-41-114)

8:30AM (344) *Generalized multiresolution analyses and wavelets.* Preliminary report.
Lawrence W. Baggett, University of Colorado, **Herbert A. Medina**, Loyola Marymount University, and **Kathy D. Merrill***, Colorado College (939-43-606)

9:00AM (345) *On the dimension function of orthonormal wavelets.* Preliminary report.
Manos Papadakis, University of Athens (939-41-1181)

9:30AM (346) *On certain paths of wavelets.*
Carl M. Pearcy*, **David Larson**, Texas A&M Univ., and **Eugen Ionascu**, U. of Georgia (939-42-1111)

10:00AM (347) *Square-integrable representations and integrable actions.*
Marc A. Rieffel, University of California, Berkeley (939-46-446)

10:30AM (348) *Completeness in the set of wavelets.*
Gustavo Garrigos, Washington U. in Saint Louis, and **Darrin Speegle***, Saint Louis University (939-43-27)

11:00AM (349) *Compactly supported refinable functions with infinite masks.*
Gilbert Strang, Massachusetts Institute of Technology, **Vasily Strela***, Dartmouth College, and **Ding-Xuan Zhou**, City University of Hong Kong (939-41-95)

11:30AM (350) *Wavelet decompositions arising from dilations of the Heisenberg group.*
Keith F. Taylor, University of Saskatchewan (939-43-318)

AMS Special Session on Discrete Models and Difference Equations, III

8:00 AM – 11:50 AM

Organizers: **Saber Elaydi**, Trinity University
Gerry Ladas, University of Rhode Island

8:00AM (351) *Inclusion principle for discrete dynamic systems.* Preliminary report.
Dragoslav D. Siljak*, Santa Clara University, and **Srdjan S. Stankovic**, University of Belgrade (939-93-457)

8:30AM (352) *Difference equations and discriminants for discrete orthogonal polynomials.* Preliminary report.
Mourad E. H. Ismail, University of South Florida (939-33-131)

9:00AM ▸ (353) *Numerical approximations using Chebyshev polynomial expansions.* Preliminary report.
Bogdan Mihaila, University of NH, and **Ioana Mihaila***, Coastal Carolina University (939-65-305)

9:30AM ▸ (354) *Explicit discretizations of first-order ODEs.*
Ronald E. Mickens, Clark Atlanta University (939-39-193)

10:00AM ▸ (355) *The variational equation for finite difference equations and some biological applications.* Preliminary report.
David A. Sanchez, Texas A&M University (939-39-107)

10:30AM ▸ (356) *Successive differences on vectors of integers.* Preliminary report.
Charles J. Kicey*, Valdosta State University, **Christopher J. Lennard**, University of Pittsburgh, and **Jun Ji**, Valdosta State University (939-11-48)

11:00AM ▸ (357) *An elementary approach to transversality conditions for bifurcation.* Preliminary report.
Mario U. Martelli*, **Sindi Suzanne** and **Gareguin Mikaelian**, CSU Fullerton (939-39-36)

11:30AM ▸ (358) *Trigonometric transformations of symplectic difference systems.*
Martin J. Bohner*, University of Missouri–Rolla, and **Ondřej Došlý**, Masaryk University and Czech Academy of Sciences (939-39-201)

AMS Special Session on Recent Developments in Differential Geometry, III

8:00 AM – 11:20 AM

Organizers: **Huai-Dong Cao**, Texas A&M University
Jian Zhou, Texas A&M University

8:00AM (359) *Virasoro constraints for quantum cohomology.*
Xiaobo Liu* and **Gang Tian**, MIT (939-53-269)

8:30AM ▸ (360) *Frobenius manifolds And Virasoro constraints.*
Boris Dubrovin, International School For Advanced Studies, Trieste, and **Youjin Zhang***, Kyoto University (939-53-567)

9:00AM (361) *DGBV algebras of Calabi-Yau manifolds and mirror symmetry.*
Huai-Dong Cao and **Jian Zhou***, Texas A&M University (939-53-872)

9:30AM (362) *Kalkman localization in generalized equivariant cohomology theories.*
David S. Metzler, Rice University (939-53-898)

10:00AM (363) *On the equivalence of multiplicative structures in Floer homology and quantum homology.*
Gang Liu*, UCLA, and **Gang Tian**, MIT (939-53-931)

10:30AM (364) *On fundamental groups of positively curved manifolds.*
Karsten Grove and **Krishnan Shankar***, University of Maryland (939-53-420)

11:00AM (365) *An obstruction to the conformal compactification of Riemannian manifolds.*
Seongtag Kim, SungKyunKwan University, South Korea (939-53-1173)

AMS Special Session on Singularities in Algebraic and Analytic Geometry, III

8:00 AM – 11:55 AM

Organizers: **Caroline Grant Melles**, U.S. Naval Academy
Ruth I. Michler, University of North Texas

8:00AM (366) *An explicit construction of complete Kahler Saper metrics by means of desingularization.*
Caroline Grant Melles*, U. S. Naval Academy, and **Pierre Milman**, University of Toronto (939-14-814)

8:30AM (367) *Stratification conditions, plane sections and equisingularity.*
Terence J. Gaffney, Northeastern University (939-32-352)

9:00AM (368) *Resolution of singularities and its history.*
Shreeram S. Abhyankar, Purdue University (939-14-32)

10:00AM (369) *"Weakly" elliptic Gorenstein singularities of surfaces.*
Andras Nemethi, The Ohio State University (939-14-119)

11:00AM (370) *A resolution algorithm for a special class of hypersurface singularities.* Preliminary report.
András Némethi and **Ágnes Szilárd***, The Ohio State University (939-14-144)

11:30AM (371) *Minimal models and boundedness of stable varieties.* Preliminary report.
Kalle Karu, Boston University (939-14-664)

MAA Minicourse #2: Part B

8:00 AM – 10:00 AM

Mathematical finance.
Organizer: **Walter R. Stromquist**, Berwyn, PA

MAA Minicourse #8: Part B

8:00 AM – 10:00 AM

Teaching a course in the history of mathematics.
Organizers: **Victor J. Katz**, University of the District of Columbia
V. Frederick Rickey, U. S. Military Academy

AMS Session on Associative Algebras

8:00 AM – 10:55 AM

8:00AM (372) *A note on the radical of a convolution algebra.*
Jason P. Huffman*, University of Southwestern Louisiana, and **Henry E. Heatherly**, AMS (939-16-236)

8:15AM (373) *Weighted quantum planes and Veronese embeddings.*
Darin R. Stephenson, Hope College (939-16-429)

8:30AM ▸ (374) *Quantum projective three spaces which embed weighted quantum planes.* Preliminary report.
Geoffrey D. Dietz*, University of Dayton, **Ryan S. Higginbottom***, Bucknell University, and **Darin R. Stephenson**, Hope College (939-16-432)

8:45AM (375) *Lie isomorphisms in *-prime GPI rings.*
Philip S., Blau*, College of General Studies, Boston University, and **W. S. Martindale, III**, University of Massachusetts (939-16-461)

9:00AM ▸ (376) *Images of quadratic functions on the ring* $\mathbf{Z}_{pq}$*.* Preliminary report.
Lenny K. Jones and **Gary C. Hull***, Shippensburg University (939-16-479)

9:15AM ▸ (377) *Rings that contain exactly one zero divisor.* Preliminary report.
Lenny K. Jones and **Beth A. Stockslager***, Shippensburg University (939-16-480)

9:30AM (378) *Global dimension four extensions of Artin-Schelter regular algebras.*
Thomas Cassidy, University of Oregon (939-16-628)

9:45AM (379) *On Artin-Schelter regular algebras of global dimension four with finite point schemes.* Preliminary report.
Christopher J. Brazfield, University of Oregon (939-16-916)

10:00AM (380) *Square-free D-algebras.* **Barbara K. D'Ambrosia**, John Carroll University (939-16-1023)

10:15AM (381) *π-regular band graded rings of bounded index.* **Hema Gopalakrishnan**, University of Wisconsin-Milwaukee (939-16-1053)

10:30AM (382) *Primitive ideals in Hopf algebra extensions.* **Mark C. Wilson**, Northern Illinois University (939-16-1188)

10:45AM (383) *Relative algebraic structures.* **Amir M. Rahimi**, Sacramento, CA (939-08-754)

AMS Session on Fourier Analysis

8:00 AM – 9:25 AM

8:00AM (384) *Determining sets for trigonometric series.* **J. Marshall Ash***, DePaul University, and **Sh. T. Tetunashvili**, Georgian Technical University (939-42-775)

8:15AM (385) *Constructing multicoiflets.* **David K. Ruch**, Sam Houston State University (939-42-123)

8:30AM (386) *Singular integrals related to block spaces.* **Abdelnaser J. Al-Hasan***, University of Wisconsin-Whitewater, and **Dashan Fan**, University of Wisconsin-Milwaukee (939-42-526)

8:45AM ▸ (387) *Projective Fourier analysis for patterns.* **Jacek Turski**, University of Houston-Downtown (939-42-653)

9:00AM (388) *Limiting cases of Sobolev inequalities.* Preliminary report. **Michael Pearson**, Mississippi State University (939-42-693)

9:15AM (389) *Compression of stereo data with vector-valued wavelets.* Preliminary report. **Magdalena Mosbo**, Kansas State University (939-42-897)

AMS Session on Sequences and Series

8:00 AM – 10:25 AM

8:00AM (390) *Absolute comparison theorems for double weighted mean and double Cesaro means.* **Billy E. Rhoades**, Indiana University (939-40-82)

8:15AM (391) *Conditional convergence of infinite products.* **William F. Trench**, Trinity University, San Antonio, TX (939-40-135)

8:30AM (392) *Four dimensional characterization of double sequences limit points.* **Richard F. Patterson**, Duquesne University (939-40-700)

8:45AM (393) *Matrix transformations of statistical cores of complex sequences.* Preliminary report. **Jinlu Li**, Shawnee State University, and **John A. Fridy***, Kent State University (939-40-711)

9:00AM ▸ (394) *When Ermakoff meets Dini.* Preliminary report. **Joseph G. Gaskin***, Oswego State University, and **William F. Ford**, NASA, Lewis, CSD (939-40-1050)

9:15AM ▸ (395) *Closed-form summation: interplay between discrete and continuous.* Preliminary report. **Joseph Wiener** and **Miguel Paredes***, University of Texas-Pan American (939-98-94)

9:30AM ▸ (396) *DeMoivre's theorem in summation and integration formulas.* Preliminary report. **Bella Wiener*** and **Joseph Wiener**, University of Texas-Pan American (939-98-103)

9:45AM ▸ (397) $x_{n+1} = \frac{A}{x_{n-1}} - \frac{1}{x_n}$. Preliminary report. **Richard C. DeVault***, Northwestern St, Univ. of LA, and **Lisa R. Galminas**, Northwestern St. Univ. of LA (939-39-106)

10:00AM ▸ (398) *Deriving binomial coefficient identities by recurrence relations.* Preliminary report. **Lung Feng Chen**, Brigham Young University (939-39-159)

10:15AM ▸ (399) *Sections and lacunary sums of linearly recurrent sequences. W.* **Luis Verde-Star**, Universidad Autonoma Metropolitana, Mexico City (939-39-1048)

AMS Session on Geometry

8:00 AM – 11:55 AM

8:00AM ▸ (400) *An extension of Harvey's formula.* **Robert J. Gregorac**, Iowa State University (939-51-225)

8:15AM ▸ (401) *Two propositions related to Stiener-Lehmus theorem.* **Rahim G. Karimpour**, Southern Illinois University (939-51-478)

8:30AM (402) *Isoperimetric inequalities for some types of polygons.* Preliminary report. **Alane S. Ferland**, University of Massachusetts(Amherst) (939-51-1025)

8:45AM ▸ (403) *Quantified resolutions: topological properties and geometric applications.* Preliminary report. **Stephen H. Harnish**, Bluffton College (939-51-1178)

9:00AM (404) *Fluctuation of sectional curvature for closed hypersurfaces.* Preliminary report. **Marius Overholt**, University of Tromso (939-53-41)

9:15AM (405) *Vector fields on non orientable Klein surfaces.* Preliminary report. **Dorin Ghisa***, York University, Toronto, Canada, and **Ilie Barza**, Lulea University, Lulea, Sweden (939-53-147)

9:30AM (406) *Gauge transformations and Thomas-Whitehead projective connections.* **Craig William Roberts**, Southeast Missouri State University (939-53-215)

9:45AM (407) *Finiteness theorems for fiber bundles.* **Kristopher R. Tapp**, University of Pennsylvania (939-53-389)

10:00AM (408) *Product submanifolds of almost r-paracontact Riemannian manifolds.* **Andrew J. Bucki**, OSSM (939-53-451)

10:15AM (409) *The geometry of foliations.* Preliminary report. **Richard Escobales Jr.**, Canisius College (939-53-627)

10:30AM (410) *The isoperimetric problem for curl.* Preliminary report. **Jason H. Cantarella**, University of Pennsylvania (939-53-672)

10:45AM (411) *Asymptotically flat eight dimensional manifolds.* Preliminary report. **Raquel E. Maderazo**, The University of California, Los Angeles (939-53-738)

11:00AM ▸ (412) *Self-linking and convexity of space curves.* **Edgar J. Fuller Jr**, University of Georgia (939-53-996)

11:15AM (413) *Simple closed elastic curves in hyperbolic 2-space.* **Daniel H. Steinberg**, Oberlin College (939-53-1108)

11:30AM ▸ (414) *Area minimization and holonomy on the Veronese surface.* Preliminary report. **Luke A. Higgins**, Brigham Young University (939-49-1104)

11:45AM *Tailored calibrations for proving area minimization.*
▸ (415) Preliminary report.
Gary R. Lawlor, Brigham Young University (939-49-1114)

MAA Session on Discrete Mathematics Revisited, I

8:00 AM – 10:55 AM

Organizers: **Richard K. Molnar**, Macalester College
Suzanne M. Molnar, College of St. Catherine

8:00AM (416) *Discrete math revisited–why, when, and how?*
Richard K. Molnar, Macalester College, and **Suzanne M. Molnar***, College of St. Catherine (939-J1-680)

8:20AM ▸ (417) *Discrete mathematics, then and now.* Preliminary report.
Stephen B. Maurer, Swarthmore College (939-J1-538)

8:40AM (418) *Linkages, applications, and challenges in teaching discrete math.*
Michael J. Bradley and **Thomas C. Hull***, Merrimack College (939-J1-500)

9:00AM ▸ (419) *An entry-level discrete dynamical systems course.*
Dick J. Jardine, USMA (939-J1-817)

9:20AM ▸ (420) *The role of difference equations as a precursor to calculus and differential equations courses.*
Sheldon P. Gordon, SUNY at Farmingdale (939-J1-519)

9:40AM ▸ (421) *Epidemic modeling: MATLAB exercises for an undergraduate course in mathematical methods in biology.*
Elizabeth S. Allman, UNCA (939-J1-839)

10:00AM ▸ (422) *Using the MATLAB software package to teach the discrete mathematics needed by computer science majors.*
Dick A. Wood, Seattle Pacific University (939-J1-539)

10:20AM ▸ (423) *Infusion of algorithms, recursion, and induction into a discrete mathematics course.*
Robert C. Mers*, **Albert C. Esterline**, and **Shearon A. Brown**, North Carolina A&T State University (939-J1-900)

10:40AM (424) *A prerequisite discrete math course for prospective master's students in computer science.*
Richard Johnsonbaugh, DePaul University (939-J1-302)

MAA Women and Mathematics Network Poster Session

8:00 AM – 10:00 AM

Outreach programs for women and girls in mathematics.
Organizer: **Kathleen A. Sullivan**, Seattle University

Project NExT Panel Discussion

8:00 AM – 9:30 AM

Summer research opportunities for faculty in industry and government.
Moderator: **Joseph A. Gallian**
Organizer: **Joseph A. Gallian**, University of Minnesota-Duluth
Panelists: **Alfred Hales**, Center for Communications, San Diego
M. Leigh Lunsford, Alabama A&M University
William Y. Velez, University of Arizona

Mathematical Sciences Employment Register

8:15 AM – 7:30 PM

Interviews only.

AMS Special Session on Hamiltonian Mechanics: Applications to Celestial Mechanics and Chemistry, III

8:30 AM – 11:20 AM

Organizers: **Michael K. Rudnev**, The University of Texas at Austin
Stephen R. Wiggins, California Institute of Technology

8:30AM ▸ (425) *Geometric approaches to low-dimensional manifolds in chemical systems approaching equilibrium.* Preliminary report.
Michael J. Davis*, Chemistry Division, Argonne National Laboratory, and **Rex T. Skodje**, University of Colorado (939-70-852)

9:00AM (426) *Altering the course of Hamiltonian dynamics.*
Herschel Rabitz, Princeton University (939-49-847)

9:30AM (427) *Molecular gyroscopes: Model studies of torsion-rotation interaction in molecules.*
John H. Frederick*, University of Nevada, and **James T. Vivian**, University of California, Davis (939-70-630)

10:00AM (428) *Simultaneous binary collision singularities.*
Mohamed S. ElBialy, University of Toledo (939-70-626)

10:30AM (429) *Geometric structures and diffusions.*
Rafael de la Llave, University of Texas (939-34-602)

11:00AM (430) *The anisotropic Manev problem.*
Florin Diacu, University of Victoria (939-70-607)

AWM Emmy Noether Lecture

9:00 AM – 9:50 AM

▸ (431) *Aperiodic dynamical systems.*
Krystyna M. Kuperberg, Auburn University (939-58-599)

MAA Special Presentation on the Legacy of R. L. Moore

9:00 AM – 9:00 PM

Organizers: **Albert C. Lewis**, Indiana University-Purdue University Indianapolis
Ben G. Fitzpatrick, North Carolina State University
Donald J. Albers, MAA

Books Sales and Exhibits

9:30 AM – 5:30 PM

MAA Invited Address

10:05 AM – 10:55 AM

▸ (432) *The history of mathematics and its future.*
John Fauvel, The Open University (939-01-912)

MAA Minicourse #13: Part B

10:15 AM – 12:15 PM

Getting students involved in undergraduate research.

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

MAA Minicourse #4: Part B

10:15 AM – 12:15 PM

The mathematics of the perfect shuffle.

Organizer: **S. Brent Morris**, National Security Agency

MAA Minicourse #5: Part B

10:15 AM – 12:15 PM

Building custom classroom capsules with Maple programming.

Organizer: **Douglas E. Ensley**, Shippensburg University

AMS Colloquium Lectures: Lecture II

1:00 PM – 2:00 PM

(433) *Symplectic geometry from a dynamical systems point of view: II.*
Helmut H. Hofer, Courant Institute (939-58-495)

AMS Invited Address

2:15 PM – 3:05 PM

▸ (434) *Alterations in algebraic geometry.* Preliminary report.
Aise Johan de Jong, MIT (939-14-1073)

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

2:15 PM – 4:05 PM

Organizers: **William H. Barker**, Bowdoin College
Jerry L. Bona, University of Texas at Austin
Naomi Fisher, University of Illinois at Chicago
Kenneth C. Millett, University of California Santa Barbara

2:15PM ▸ (435) *A regional partnership.*
Ramesh Gangolli, University of Washington (939-97-960)

2:45PM ▸ (436) *A new approach to "math for elementary teachers".*
Patricia Baggett, New Mexico State University (939-96-512)

3:15PM (437) *Changes in collegiate math instruction: Broadening the experience.* Preliminary report.
Richard H. Herman, University of Illinois (939-98-1106)

3:45PM (438) *Between a rock and a hard place.* Preliminary report.
Ronald G. Douglas, Texas A&M University (939-00-325)

AMS-ASL Special Session on Model Theory and Its Applications, IV

2:15 PM – 4:10 PM

Organizer: **Anand Pillay**, MSRI and University of Illinois, Urbana

2:15PM (439) *Differential algebraic groups.*
Phyllis J. Cassidy, Smith College (939-12-1034)

2:45PM (440) *Stability in simplicity.*
ByungHan Kim, MIT (939-03-932)

3:15PM (441) *Some novel aspects of the computation of the uncountable spectrum.*
Bradd Hart, McMaster University (939-03-1133)

3:45PM (442) *Generalized forking: some definitions and examples.* Preliminary report.
Steven A. Buechler, University of Notre Dame (939-03-766)

AMS Special Session on Banach Spaces of Holomorphic Functions and Operators on These Spaces, IV

2:15 PM – 4:05 PM

Organizers: **Benjamin A. Lotto**, Vassar College
Pamela B. Gorkin, Bucknell University

2:15PM (443) *Proofs of conjugation theorems in complex iteration theory.* Preliminary report.
Theodore W. Gamelin, UCLA (939-46-860)

2:45PM (444) *Commuting analytic self-maps of the ball.*
Barbara D. MacCluer, University of Virginia (939-32-153)

3:15PM ▸ (445) *Compactness criteria for holomorphic composition operators on the Hardy and Bergman spaces of the unit ball.*
Dana D. Clahane, University of California, Irvine (939-32-101)

3:45PM (446) *Circular symmetry among composition operators on H^2.* Preliminary report.
Carl C. Cowen, Purdue University (939-47-205)

AMS Special Session on Commutative Algebra, IV

2:15 PM – 4:05 PM

Organizer: **Scott Thomas Chapman**, Trinity University

2:15PM (447) *Lengths of factorizations in Dedekind domains.* Preliminary report.
Michael A. Freeze II, UNC Chapel Hill (939-13-710)

2:45PM ▸ (448) *Generalized semigroup rings.* Preliminary report.
Chawne M. Kimber, University of Florida (939-06-28)

3:15PM (449) *Factorization and ring-theoretic properties in subrings of $K[x]$ and of $K[[x]]$.* Preliminary report.
Patricia L. Kiihne, University of Tennessee-Knoxville (939-13-445)

3:45PM (450) *Star operations induced by overrings.*
Sylvia J. Cook* and **D. D. Anderson**, The University of Iowa (939-13-295)

AMS Special Session on Combinatorial Topology, IV

2:15 PM – 4:05 PM

Organizers: **Laura M. Anderson**, Texas A&M University
Jonathan P. McCammond, Texas A&M University

2:15PM (451) *On the isoperimetric spectrum for finitely presented groups.*
Noel P. Brady*, University of Oklahoma, and **Martin R. Bridson**, Oxford University (939-20-1118)

2:45PM (452) *Annular Dehn functions of groups.*
Stephen G. Brick, University of South Alabama, and **Jon M. Corson***, University of Alabama (939-20-730)

3:15PM (453) *Stratified approach in combinatorics.*
Min Yan* and **Bei-Fang Chen**, HKUST, Hong Kong (939-05-407)

3:45PM (454) *The space of tetrahedra.* Preliminary report.
Eric Kendall Babson, UW (939-05-1170)

AMS Special Session on The Functional and Harmonic Analysis of Wavelets, IV

2:15 PM – 4:05 PM

Organizers: **Lawrence W. Baggett**, University of Colorado
David R. Larson, Texas A&M University

2:15PM (455) *Arbitrarily smooth nonseparable wavelets in higher dimensions.*
Yang Wang* and **Eugene Belogay**, Georgia Institute of Technology (939-42-1214)

2:45PM (456) *Some applications of the wavelet multiplicity function.* Preliminary report.
Eric S. Weber, University of Colorado (939-43-622)

3:15PM (457) *Algebras of singular integral operators.*
David B. Weiland, Univ. of Texas, Austin (939-42-1186)

3:45PM (458) *Characterizations of filters, scaling sets and related topics.*
Manos Papadakis, **Hrvoje Sikic** and **Guido Weiss***, Washington University (939-41-274)

AMS Special Session on Discrete Models and Difference Equations, IV

2:15 PM – 4:05 PM

Organizers: **Saber Elaydi**, Trinity University
Gerry Ladas, University of Rhode Island

2:15PM (459) *Multiple symmetric positive solutions for discrete lidstone boundary value problems.*
Johnny Henderson, Auburn University (939-39-31)

2:45PM (460) *Comparison of solutions of difference inequalities.*
Paul W. Eloe, University of Dayton (939-39-118)

3:15PM ▸ (461) *A variable step second order time reversible symplectic integrator for Hamiltonian systems generated from Lagrangians.*
Calvin D. Ahlbrandt, University of Missouri, Columbia, Missouri (939-39-116)

3:45PM ▸ (462) *A self-adjoint differential equation on a time scale.* Preliminary report.
Allan C. Peterson, University of Nebraska (939-39-92)

AMS Special Session on Singularities in Algebraic and Analytic Geometry, IV

2:15 PM – 3:55 PM

Organizers: **Caroline Grant Melles**, U.S. Naval Academy
Ruth I. Michler, University of North Texas

3:15PM (463) *Monomialization and factorization of morphisms.* Preliminary report.
Steven Dale Cutkosky, University of Missouri (939-14-705)

AMS Special Session on Hamiltonian Mechanics: Applications to Celestial Mechanics and Chemistry, IV

2:15 PM – 4:05 PM

Organizers: **Michael K. Rudnev**, The University of Texas at Austin
Stephen R. Wiggins, California Institute of Technology

2:15PM (464) *Quantum propagation on classically invariant structures.*
Wolfgang Schweizer*, **Wilfried Jans**, Theoretical Astrophysics, Tuebingen, and **Turgay Uzer**, Georgia Institute of Technology (939-81-576)

2:45PM (465) *Some recent results in multiphase averaging theory for ODEs.*
H. Scott Dumas, University of Cincinnati (939-34-1125)

3:15PM ▸ (466) *On the problem of estimating the entropy of the Chirikov Standard map.* Preliminary report.
Oliver R. Knill, University of Texas (939-58-1154)

3:45PM ▸ (467) *Rydberg atoms in crossed external fields: Order, chaos, and non-dispersive wavepackets.* Preliminary report.
Turgay Uzer*, Georgia Institute of Technology, **David Farrelly**, Utah State University, and **Jan von Milczewski**, Georgia Institute of Technology (939-70-99)

MAA Minicourse #12: Part A

2:15 PM – 4:15 PM

Writing and the teaching of mathematics.
Organizers: **John E. Meier**, Lafayette College
Thomas W. Rishel, Cornell University

MAA Minicourse #16: Part A

2:15 PM – 4:15 PM

Using hand-held CAS throughout the mathematics curriculum.
Organizers: **Wade Ellis**, West Valley College
L. Carl Leinbach, Gettysburg College
Bert K. Waits, Ohio State University

MAA Minicourse #7: Part B

2:15 PM – 4:15 PM

Finding motivation for upper division mathematics through original sources.
Organizers: **Jerry M. Lodder**, New Mexico State University
David J. Pengelley, New Mexico State University

MAA Minicourse #9: Part A

2:15 PM – 4:15 PM

Exploring abstract algebra through interactive labs.
Organizers: **Allen C. Hibbard**, Central College
Kenneth M. Levasseur, University of Massachusetts, Lowell

AMS Session on Set Theory and Foundations

2:15 PM – 3:25 PM

2:15PM ▸ (468) *On the automated hiding of quantifiers in Gödel's class theory.*
Johan G. F. Belinfante, Georgia Institute of Technology (939-04-537)

2:30PM (469) *Cohen algebras and nowhere dense ultrafilters.*
Aleksander Blaszczyk, Silesian University, and **Andrzej A. Szymanski***, Slippery Rock University (939-04-868)

2:45PM (470) *Generalized extension principle and operations of fuzzy numbers.*
Zengxiang Tong* and **Zhen Huang**, Otterbein (939-99-921)

3:00PM (471) *Essential steps in the proof of a theorem.*
William H. Rowan, Electron Mantra Research (939-03-569)

3:15PM (472) *Semiotic impediments to formalizations.*
Miriam A. Lipschutz-Yevick, Rutgers University (939-03-858)

AMS Session on Integral Equations and Transforms

2:15 PM – 3:40 PM

2:15PM (473) *The influence of two moving heat sources on blow-up in a reactive-diffusive medium.*
Colleen M. Kirk* and **W. E. Olmstead**, Northwestern University (939-45-328)

2:30PM (474) *Meyer wavelet regularization.* Preliminary report.
Xiaoping Shen, University of St. Thomas (939-45-699)

2:45PM (475) *Solution of inverse scattering problem by a spectral method.*
Mohsen Razzaghi* and **Falih Ahmad**, Mississippi State University (939-45-1167)

3:00PM (476) *Two dimensional heat equations involving Laplace transform and Green's function.*
R. S. Dahiya, Iowa State University (939-44-261)

3:15PM (477) *The Phragmen-Mikusinski inversion for the Laplace transform.*
Boris Baeumer, University of Nevada, Reno (939-44-1002)

3:30PM (478) *Wavelet transforms of distributions and applications.*
George K. Yang, Sam Houston State University (939-44-1100)

AMS Session Real Analysis

2:15 PM – 3:55 PM

2:15PM (479) *Extensions of Grüss' inequality.*
A. M. Fink, Iowa State University (939-26-372)

2:30PM (480) *Sampling theorems in n-dimensional space.*
Nasser Dastrange, Buena Vista University (939-26-470)

2:45PM (481) *Composition of functions.* Preliminary report.
Kandasamy Muthuvel, University of Wisconsin-Oshkosh (939-26-1028)

3:00PM (482) *New generalizations of Hardy-Hilbert inequality.*
Lokenath Debnath*, University of Central Florida, and **Yang Bicheng**, Guangdong Education College (939-26-1221)

3:15PM (483) *The monotonic property of $L^{s(\mu)}$ -averaging domains and weighted weak reverse Holder inequality.* Preliminary report.
Bing Liu*, College of St. Scholastica, and **Shusen Ding**, University of Minnesota, Duluth (939-28-213)

3:30PM ▸ (484) *Finite staircase Z^d actions .* Preliminary report.
Jeffrey A. Kaye, **Cesar Silva** and **Alexandre L. Wolfe***, Williams College (939-28-1127)

3:45PM (485) *Some local properties for mean- bounded operators.* Preliminary report.
Driss Drissi, Kuwait University (939-47-1216)

AMS Session on Codes and Ordered Structures

2:15 PM – 3:40 PM

2:15PM ▸ (486) *Basic interval orders.* Preliminary report.
Amy N. Myers, Dartmouth College (939-06-460)

2:30PM (487) *Lattice-ordered groups associated to whales in a boolean algebra.* Preliminary report.
Jason D. Holland, Abilene Christian University (939-06-789)

2:45PM (488) *A family of unit parallelogram orders of dimension at least four.* Preliminary report.
Kenneth P. Bogart, Dartmouth College (939-06-909)

3:00PM (489) *A method for bounding poset dimension and a family of unit parallelogram orders of dimension exactly four.*
Stephen P. Ryan, Dartmouth College (939-06-917)

3:15PM (490) *The dual of cyclic codes over Z_m.*
Taher A. Abu Al-Rub, The American University of Sharjah (939-94-288)

3:30PM (491) *An impulsively initialized, digital chaotic communication scheme.*
Andrew T. Parker* and **Kevin M. Short**, University of New Hampshire (939-94-1055)

MAA Session on Projects That Work in Applied Mathematics Courses, I

2:15 PM – 3:55 PM

Organizers: **Alexandra Kurepa**, North Carolina A&T State University
Henry A. Warchall, University of North Texas

2:15PM ▸ (492) *Projects in linear algebra.* Preliminary report.
Gilbert Strang, MIT (939-K1-259)

2:45PM ▸ (493) *Discovering wavelets.*
Edward F. Aboufadel* and **Steven Schlicker**, Grand Valley State University (939-K1-304)

3:15PM ▸ (494) *Fourier series for high school students.* Preliminary report.
Aaron T. Ekstrom and **Alexander R. Perlis***, The University of Arizona (939-K1-559)

3:45PM ▸ (495) *Jerks don't jump: Mathematical modelling with an impact.*
Douglas B. Meade, University of South Carolina (939-K1-902)

4:05PM ▸ (496) *Teaching the first steps in modeling problems in applied calculus.* Preliminary report.
Agnes M. Rash*, St. Joseph's University, and **Jean Marie McDill**, Calif. Polytechnic State University (939-K1-907)

MAA Session on Innovative Use of Distance Learning Techniques to Teach Post-Secondary Mathematics, I

2:15 PM – 3:55 PM

Organizers: **Brian E. Smith**, McGill University
Marcelle Bessman, Jacksonville University

2:15PM (497) *Teaching linear algebra and abstract algebra with two way video and audio.*
Edward G. Reinke, Concordia University, Nebraska (939-L1-714)

2:30PM ▸ (498) *Teaching Calculus III and IV over the Rochester area interactive television network.*
Marcia K. Birken, Rochester Institute of Technology (939-L1-406)

2:45PM ▸ (499) *Investigative hypertext materials supporting distance courses.*
Larry Copes, Institute for Studies in Educational Mathematics and Augsburg College (939-L1-408)

3:00PM ▸ (500) *A distance education course using Java Applets and computer whiteboards.*
William Hammack, Nova Southeastern Univ. (939-L1-281)

3:15PM ▸ (501) *Role models and information about careers in mathematics: A distance-learning approach.*
Mary K. Porter, Saint Mary's College (939-L1-961)

3:30PM ▸ (502) *Using a computer algebra system to produce WEB notes, Preliminary Report.* Preliminary report.
Paul R. Patten, North Georgia College & State University (939-L1-333)

3:45PM ▸ (503) *A Web based calculus course.* Preliminary report.
G. Donald Allen, **Maury Rahe**, **Michael Stecher***, Texas A&M University, and **Philip B. Yasskin**, Texas A&M University (939-L1-357)

MAA Session on Integrating Mathematics and Other Disciplines, I

2:15 PM – 4:10 PM

Organizers: **William G. McCallum**, University of Arizona
Nicholas T. Losito, SUNY at Farmingdale
Yajun Yang, SUNY at Farmingdale

2:15PM ▸ (504) *Using chemical kinetics in the teaching of calculus and differential equations.*
Michel Helfgott, University of Wyoming (939-M1-637)

2:30PM ▸ (505) *Linearity I and II: Connected learning of differential equations, linear algebra, and multivariable calculus.* Preliminary report.
Sarah B. James, **Kelly J. Black** and **Lee L. Zia***, University of New Hampshire (939-M1-1137)

2:45PM ▸ (506) *The effects of earthquakes on mathematicians and engineers.* Preliminary report.
Ethan J. Berkove* and **Richard J. Marchand**, U.S. Military Academy (939-M1-1136)

3:00PM (507) *A course and text integrating calculus and physics.*
Martin Jackson* and **Andrew Rex**, University of Puget Sound (939-M1-1018)

3:15PM ▸ (508) *Mathematics across the curriculum.* Preliminary report.
Jerry A. Johnson, University of Nevada, Reno (939-M1-433)

3:30PM ▸ (509) *Mathematics in action: Social and industrial problems.*
Morteza Shafii-Mousavi* and **Paul Kochanowski**, Indiana University South Bend (939-M1-416)

3:45PM ▸ (510) *"The science of art".*
Catherine A. Roberts, Northern Arizona University (939-M1-382)

4:00PM ▸ (511) *An interdisciplinary algebra/science course.*
Karla J. Oty* and **Brett M. Elliott**, Southeastern Oklahoma State University (939-M1-396)

MAA CUPM Subcommittee on Calculus Reform and the First Two Years Panel Discussion

2:15 PM – 3:45 PM

College algebra reform.

Organizer: **Donald B. Small**, U. S. Military Academy

Panelists: **Sandi Athanassiou**, University of Missouri, Columbia
General G. Marshall, Huston-Tillotson College
Kathleen Heid, Pennsylvania State University
Philip Quartararo, Southern University

MAA Panel Discussion

2:15 PM – 3:45 PM

Discovery-based teaching of undergraduate mathematics courses.

Moderators: **William T. Mahavier**
James P. Ochoa

Organizers: **William T. Mahavier**, Nichols State University
James P. Ochoa, Hardin-Simmons University

Panelists: **Stuart J. Anderson**, Texas A&M at Commerce
Steve Armentrout, Pennsylvania State University
Mary Ellen Rudin, University of Wisconsin, Madison
Jerome Dancis, University of Maryland, College Park
Tom Ingram, University of Missouri at Rolla

MAA Committee on the Participation of Women Panel Discussion

2:15 PM – 3:45 PM

Exemplary women in mathematical careers.

Organizer: **Carolyn C. Connell**, Westminster College

ASA-MAA Committee on Statistics Panel Discussion

2:15 PM – 3:45 PM

Involving undergraduate students in industrial consulting experiences.

Organizers: **Mary R. Parker**, Austin Community College
Dexter C. Whittinghill, Rowan University

Panelists: **Donald L. Bentley**, Pomona College
Cary Marcot, CardioGenesis Corporation
Julie Buring, Harvard University

MAA Committee on Computers in Mathematics Education Poster Session

2:15 PM – 4:10 PM

Using the Web in teaching undergraduate mathematics.

Organizers: **V. S. Ramamurthi**, University of North Florida
Rebecca E. Hill, Rochester Institute of Technology

MAA Committee on Computers in Mathematics Education Panel Discussion

2:15 PM – 3:45 PM

Using the web as a tool for teaching calculus: What we've learned; successes and problem areas.

Organizers: **Lawrence S. Husch**, University of Tennessee at Knoxville
Earl D. Fife, Calvin College
Eugene A. Klotz, Swarthmore College

MAA Session on Mathematics Competitions, II

2:20 PM – 4:15 PM

Organizers: **Harold B. Reiter**, University of North Carolina at Charlotte
Stephen B. Maurer, Swarthmore College
William P. Fox, U. S. Military Academy
Susan Schwartz Wildstrom, Walt Whitman High School, Bethesda, MD

2:20PM ▸ (512) *Enhancing the MCM experience for undergraduates.* **Edward A. Connors**, United States Military Academy and University of Massachusetts Amherst (939-D1-253)

2:40PM ▸ (513) *The North Central Section Team Contest.* **Gerald A. Heuer**, Concordia College (939-D1-248)

3:00PM ▸ (514) *Math bowls at Long Island Colleges.* **Raymond N. Greenwell**, Hofstra University (939-D1-254)

3:20PM ▸ (515) *A Web-based weekly mathematics competition.* **Christopher Eastburg**, **Richard Johnson**, **Thomas H. Meyer*** and **Joseph D. Myers**, U.S. Military Academy (939-D1-260)

3:40PM ▸ (516) *The Michigan autumn take home challenge.* **Timothy A. Sipka**, Alma College (939-D1-746)

4:00PM ▸ (517) *The mathematical contest in modeling (MCM).* **William P. Fox**, COMAP (939-D1-719)

AMS Invited Address

3:20 PM – 4:10 PM

▸ (518) *Midpoints.* Preliminary report.
Alan D. Weinstein, University of California, Berkeley (939-00-17)

Joint Prize Session and Reception

4:25 PM – 6:00 PM

MAA Reception for Two-Year Colleges

5:45 PM – 7:00 PM

MAA Committee on the Mathematical Education of Teachers Poster Session

6:00 PM – 8:00 PM

Innovations in mathematics programs which benefit future teachers.

Organizer: **Marjorie Enneking**, Portland State University

AMS Special Session on Singularities in Algebraic and Analytic Geometry, V

6:30 PM – 9:30 PM

Organizers: **Caroline Grant Melles**, U.S. Naval Academy
Ruth I. Michler, University of North Texas

6:30PM (519) *A valuation theoretic approach to local uniformization.* **Franz-Viktor Kuhlmann**, University of Saskatchewan at Saskatoon (939-14-442)

7:30PM Discussions on and open problems in resolution or uniformization of singularities.

MER Banquet

6:30 PM – 10:00 PM

AMS Special Session on Discrete Models and Difference Equations, V

7:00 PM – 9:20 PM

Organizers: **Saber Elaydi**, Trinity University
Gerry Ladas, University of Rhode Island

7:00PM ▸ (520) *Global behavior of solutions of the period 7 Max equation.* **Jeffrey J. Feuer***, Merrimack College, **Edward J. Janowski**, **Gerry Ladas** and **Chris Teixeira**, University of Rhode Island (939-39-595)

7:30PM (521) *Global stability of a difference equation.* **Edward Grove**, **Gerry Ladas** and **Soudabeh Valicenti***, University of Rhode Island (939-39-229)

8:00PM (522) *Using recurrence relations in Ramsey theory.* Preliminary report. **Aaron J. Robertson*** and **Doron Zeilberger**, Temple University (939-05-57)

8:30PM (523) *On the nonautonomous difference equation* $x(n+1) = \max x(n), a(n)/x(n)x(n-1)$. Preliminary report. **William J. Briden***, **Gerry Ladas** and **Tim Nesemann**, University of Rhode Island (939-39-297)

9:00PM (524) *Convergence theorems for iterative processes.* **Zhivko S. Athanassov**, Bulgarian Academy of Sciences, Sofia (939-39-1191)

MAA-ARUME Special Presentation

7:00 PM – 9:30 PM

Research on undergraduate mathematics education.

Organizer: **Thomas P. Dick**, Oregon State University

MAA-Young Mathematicians Network Panel Discussion

7:00 PM – 8:30 PM

Solving the two body problem.
Moderator: **Gregory P. Dresden**
Organizers: **Philip E. Gustafson**, Mesa State College
Gregory P. Dresden, Washington and Lee University
Panelists: **Jean E. Taylor**, Rutgers University
Elizabeth G. Yanik, Emporia State University
Albert W. Schueller, Whitman College

MAA Musical Presentation

7:30 PM – 9:00 PM

Eine Kleine (Mathematische) Nachtmusik.
Panelists: **Eric Neuwirth**, University of Vienna

MAA Special Presentation

7:30 PM – 9:00 PM

Student reports: Explorations in using the World Wide Web to enhance the teaching of mathematics.
Organizer: **Donald B. Small**, U. S. Military Academy

Friday, January 15

Joint Pi Mu Epsilon and MAA Student Chapter Advisors' Breakfast

7:00 AM – 8:00 AM

Joint Meetings Registration

7:30 AM – 4:00 PM

MAA Session on The Use of Technology in Teaching Abstract Mathematics, II

7:30 AM – 9:55 AM

Organizer: **Douglas E. Ensley**, Shippensburg University

7:30AM ▸ (525) *Using Maple animations to show how linear transformations "morph" R3.*
John F. Putz, Alma College (939-A1-435)

7:45AM ▸ (526) *Visualizing fundamental linear algebra concepts.*
Steven Schlicker, Grand Valley State University (939-A1-683)

8:00AM ▸ (527) *Geometric intuition in complex variables a la Mathematica.* Preliminary report.
Bradford J. Kline, U.S. Air Force Academy (939-A1-769)

8:15AM ▸ (528) *Can your computer do complex analysis?*
Helmer Aslaksen, National Univ. of Singapore (939-A1-464)

8:30AM ▸ (529) *Illustrating the contraction mapping principle using Mathematica.* Preliminary report.
Bruce W. Atkinson, Samford University (939-A1-422)

8:45AM ▸ (530) *Scientific Notebook as an instructional tool in the teaching of analysis.*
Jonathan Lewin, Kennesaw State University (939-A1-152)

9:00AM ▸ (531) *Using CAS's in teaching introductory abstract analysis.*
Phil Novinger, Florida State University (939-A1-732)

9:15AM ▸ (532) *Introducing Fourier analysis via sound.* Preliminary report.
John W. Davenport*, Georgia Southern University, and **Sharon M. Barrs**, Georgia Southern Univerity (939-A1-217)

9:30AM ▸ (533) *Visualizing a distribution of primes.* Preliminary report.
Tomas M. Kalmar, California State University Monterey Bay (939-A1-1092)

9:45AM ▸ (534) *Cryptography for high school students.* Preliminary report.
Aaron T. Ekstrom* and **Alexander R. Perlis**, The University of Arizona (939-A1-560)

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

8:00 AM – 10:50 AM

Organizers: **John E. Meier**, Lafayette College
Leonard A. VanWyk, James Madison University

8:00AM ▸ (535) *Cwatsets and groups - some parallels.* Preliminary report.
Matthew Lepinski*, Rose-Hulman Institute of Technology, **Carolyn Girod**, University of Chicago, **Joseph R. Mileti**, Carnegie Mellon University, and **Jennifer R. Paulhus**, College of the Holy Cross (939-20-338)

8:30AM ▸ (536) *Digit loops, a curiosity of numbers extended to higher powers.* Preliminary report.
Jeremy M. Dill* and **Timothy W. Flood**, Pittsburg State University (939-11-751)

9:00AM (537) *A length inequality for complete semigroup rings.*
Leanne C. Leer*, Bucknell University, Hope College REU, and **Raluca M. Muntean**, Western Michigan University, Hope College REU (939-13-150)

9:30AM ▸ (538) *Constructing chains of excellent rings with local generic formal fibers.*
Mark A. Florenz, **Davina Kunvipusilkul*** and **Junghee Yang**, Williams College (939-13-89)

10:00AM ▸ (539) *Galois embedding problems and rational points on conics.* Preliminary report.
F. Nathaniel E. Thiem, Macalester College (939-12-283)

10:30AM ▸ (540) *Fun with Gröbner bases: A new look at three old triangle theorems.*
Joshua I. Hughes*, Lander University, and **Kevin De Guelle**, St. Norbert's College (939-13-171)

AMS-AWM Special Session on Geometry in Dynamics, I

8:00 AM – 10:50 AM

Organizer: **Krystyna Kuperberg**, Auburn University

8:00AM (541) *The homeomorphisms of generalized Knaster continua and possible application to a problem posed by Ingram.* Preliminary report.
James E. Keesling, University of Florida (939-58-748)

9:00AM (542) *Shift dynamics and topology.* Preliminary report.
Judy A. Kennedy, University of Delaware (939-58-388)

9:30AM (543) *Blowup and fixed points, II (Preliminary report).* Preliminary report.
Christopher W. Stark, National Science Foundation and University of Florida (939-57-1122)

10:00AM (544) *Examples of Hamiltonian systems with or without periodic orbits.* Preliminary report.
Viktor L. Ginzburg, University of California Santa Cruz (939-58-941)

10:30AM (545) *Regions of instability for non-twist maps.*
John M. Franks*, Northwestern University, and **Patrice Le Calvez**, University of Paris 13 (939-58-1185)

AMS Special Session on Several Complex Variables, I

8:00 AM – 10:50 AM

Organizers: **Emil J. Straube**, Texas A&M University
Harold P. Boas, Texas A&M University
Marshall A. Whittlesey, Texas A&M University

8:00AM (546) *Curvature, special $\bar{\partial}$-problems, and "phantom Levi-foliations".* Preliminary report.
David E. Barrett, University of Michigan (939-32-1014)

8:30AM (547) *Properties of the Bergman kernel and metric on Reinhardt domains.* Preliminary report.
Siqi Fu, University of Wyoming (939-32-843)

9:00AM (548) *L_p and Hoelder regularity for the Cauchy-Riemann operator on q-convex intersections in C_n.*
Lan Ma, Universitaet Bonn, and **Sophia Vassiliadou***, Univ. of Michigan (939-32-791)

9:30AM (549) *Isometric embedding of vector bundles.*
David W. Catlin, Purdue University (939-32-504)

10:00AM (550) *A class of finite type domains.* Preliminary report.
Jiye Yu, University of Wisconsin (939-32-566)

10:30AM (551) *On estimates for convex polynomials of finite type.* Preliminary report.
R. Michael Range, SUNY at Albany (939-32-257)

AMS Special Session on Probabilistic Combinatorics, I

8:00 AM – 10:50 AM

Organizers: **Béla Bollobás**, University of Memphis
Jeong Han Kim, Microsoft

8:00AM (552) *One deletion and on average $1+\epsilon$ insertions, of prime factors, suffices to convert a uniformly chosen random integer to one whose prime factors have independent multiplicities .*
Richard A. Arratia, Univ. Southern California (939-11-1008)

8:30AM (553) *Exponentially slow mixing for Monte Carlo Markov chains.*
Christian Borgs*, **Jennifer Tour Chayes**, Microsoft Research, **Alan Frieze**, Carnegie Mellon, **Jeong Han Kim**, Microsoft Research, **Prasad Tetali**, Georgia Tech, **Eric Vigoda**, UC Berkeley, and **Van H. Vu**, Institute for Advanced Study (939-60-995)

9:00AM (554) *The subgaussian constant and concentration.* Preliminary report.
Prasad Tetali V. Tetali, Georgia Tech (939-05-984)

9:30AM (555) *Large deviations for integer partitions.*
Amir Dembo, Stanford University (939-05-1039)

10:00AM ▸ (556) *Packing random rectangles.*
Joel H. Spencer, Courant Institute (939-05-831)

10:30AM (557) *The size of hereditary properties of graphs.* Preliminary report.
Jozsef Balogh, The University of Memphis (939-05-1160)

AMS Special Session on Commutative Algebra and Algebraic Geometry, I

8:00 AM – 10:50 AM

Organizers: **Roger A. Wiegand**, University of Nebraska and Purdue University
Susan Elaine Morey, Southwest Texas State University

8:00AM (558) *Linkage classes and tensor products of algebras.* Preliminary report.
Mark R. Johnson, University of Arkansas (939-13-665)

8:30AM (559) *Filtrations of modules, the Chow group and the Grothendieck group.*
C-Y. Jean Chan, University of Utah (939-13-728)

9:00AM (560) *Applications of Goodwillie calculus in commutative algebra.* Preliminary report.
Miriam Ruth Kantorovitz, University of Illinois (939-13-625)

9:30AM (561) *Finite projective dimension and ideals over isolated singularities.* Preliminary report.
David A. Jorgensen, University of Texas at Arlington (939-13-757)

10:00AM (562) *Cohomology and cohomological varieties over complete intersections.*
Luchezar L. Avramov*, Purdue University, and **Ragnar-Olaf Buchweitz**, University of Toronto (939-13-790)

10:30AM (563) *Computations of Buchsbaum-Rim multiplicities.* Preliminary report.
Elizabeth Jones, University of Utah (939-13-661)

AMS Special Session on Computational Algebraic Geometry for Curves and Surfaces, I

8:00 AM – 10:50 AM

Organizers: **Mika K. Seppala**, Florida State University
Emil J. Volcheck, National Security Agency

8:00AM (564) *The algebraic closure of the Laurent series field in characteristic p.* Preliminary report.
Kiran Kedlaya, MIT (939-14-975)

8:30AM (565) *An algorithm for determining possible zeta functions of curves over finite fields.*
Kristin E. Lauter, University of Michigan (939-14-1097)

9:00AM Break.

9:30AM (566) *Computing Cartier points on curves.*
Matthew H. Baker, UC Berkeley (939-14-381)

10:00AM (567) *Factoring polynomials over local fields.*
David Cantor, CCR-La Jolla (939-14-1153)

10:30AM (568) *Third order splitting of genus two hyperelliptics.* Preliminary report.
Harvey Cohn, Center for Computing Sciences (939-14-376)

AMS Special Session on The Mathematics of the Navier-Stokes Equations, I

8:00 AM – 10:45 AM

Organizers: **Peter A. Perry**, University of Kentucky
Zhong-Wei Shen, University of Kentucky

8:00AM (569) *Structural analysis of 2D incompressible flows.*
Shouhong Wang, Indiana University (939-35-146)

8:30AM (570) *Zero viscosity limit of incompressible channel flow in the presence of wall.*
Roger M. Temam, Indiana University, and **Xiaoming Wang***, Iowa State University (939-76-349)

9:00AM (571) *The global attractor for the Navier-Stokes equations of compressible fluid flow in one space dimension I.*
David Hoff*, Indiana University, and **Mohammed Ziane**, Texas A&M University (939-35-391)

9:30AM (572) *The global attractor for the Navier-Stokes equations of compressible fluid flow in one space dimension II.*
David Hoff, Indiana University, and **Mohammed B. Ziane***, Texas A&M University (939-35-353)

10:00AM (573) *Robust control of Navier-Stokes equations.*
Roger M. Temam, Indiana University (939-35-414)

MAA Minicourse #10: Part B

8:00 AM – 10:00 AM

Facilitating active learning: Concrete ways to foster student participation.
Organizer: **Sandra L. Rhoades**, Keene State College

MAA Minicourse #9: Part B

8:00 AM – 10:00 AM

Exploring abstract algebra through interactive labs.
Organizers: **Allen C. Hibbard**, Central College
Kenneth M. Levasseur, University of Massachusetts, Lowell

AMS Session on Algebraic Geometry

8:00 AM – 9:40 AM

8:00AM (574) *Double meanders of real projective M-curves of degree 5.* Preliminary report.
Anatoly B. Korchagin, Texas Tech University (939-14-79)

8:15AM (575) *Complexity estimates of the Schmudgen positivstellensatz.*
Elizabeth K. Mauch* and **Gilbert Stengle**, Lehigh University (939-14-209)

8:30AM (576) *Weierstrass pairs and minimum distance of Goppa codes.*
Gretchen L. Matthews, Louisiana State University (939-14-258)

8:45AM (577) *Examples of differential operators on noncommutative rings.* Preliminary report.
Uma N. Iyer, Indiana University (939-14-465)

9:00AM (578) *A description of certain affine open subschemes that form an open covering of* $\mathrm{Hilb}^n_{\mathbb{A}^2_k}$.
Mark E. Huibregtse, Skidmore College (939-14-530)

9:15AM (579) *A generic cubic surface contains no involutive curves.* Preliminary report.
Timothy C. McCune, Indiana University (939-14-543)

9:30AM (580) K_1 *of curves over finite fields.* Preliminary report.
Andrew E. Nestler, University of Southern California (939-19-561)

AMS Session on Linear Algebra

8:00 AM – 10:25 AM

8:00AM ▸ (581) *The reduced echelon form of a matrix.*
Gilbert Strang, M.I.T. (939-15-126)

8:15AM ▸ (582) *Systems of linear congruences with individual moduli.*
David C. Torney*, Theoretical Division, and **Jun Wang**, Institute of Mathematical Sciences (939-15-238)

8:30AM ▸ (583) *More cyclically-ordered sets.* Preliminary report.
Michael I. Aissen, Rutgers University (939-15-475)

8:45AM ▸ (584) *Layers of matrices: The conjunctivity-similarity equivalence class of matrices.* Preliminary report.
Mark A. Mills, Iowa State University (939-15-582)

9:00AM ▸ (585) *On the stability of matrices.*
Michael Y. Li* and **Liancheng Wang**, Mississippi State University (939-15-620)

9:15AM ▸ (586) *Simple comtrans algebras of invariant operators.* Preliminary report.
Xiaorong Shen, Merrimack College (939-15-667)

9:30AM ▸ (587) *Classes of Schur D-stable matrices.*
Sivaram K. Narayan, Central Michigan University (939-15-713)

9:45AM (588) *Matrix completions over principal ideal rings and good matrices.* Preliminary report.
William H. Gustafson, Texas Tech University, **R. Bruce Richter**, Carleton University, **Donald W. Robinson**, Brigham Young University, and **William P. Wardlaw***, U. S. Naval Academy (939-15-855)

10:00AM (589) *Rectanormal sets and complex symmetric matrices.* Preliminary report.
Dipa S. Choudhury, Loyola College in Maryland (939-15-1021)

10:15AM ▸ (590) *A theoretical algorithm for the closest matrices in the space of doubly stochastic matrices.*
Raja N. Khoury, Collin County Community College (939-15-19)

AMS Session on Combinatorics, I

8:00 AM – 10:40 AM

8:00AM (591) *An included-minor result for* 3*-connected graphs with contractible edges.*
Galen Ellsworth Turner III, Louisiana State University (939-05-47)

8:15AM ▸ (592) *On classifying edge colored graphs with two transitive automorphism groups. Preliminary Report.* Preliminary report.
Thomas Q. Sibley, St. John's University (939-05-67)

8:30AM ▸ (593) *Binary De Bruijn cycles under different equivalence relations.* Preliminary report.
Stephen G. Hartke, University of Dayton (939-05-182)

8:45AM (594) *α-valuations of disconnected graphs.*
Charles Vanden Eynden* and **Saad El-Zanati**, Illinois State University (939-05-271)

9:00AM ▸ (595) *Graph isospectrality and representation equivalence.* Preliminary report.
Gregory T. Quenell, Vassar College (939-05-290)

9:15AM ▸ (596) *The opposition number of a quadrangulation of the 2-sphere.*
Louis P. Zulli, Union College (939-05-316)

9:30AM ▸ (597) *What is the correct way to seed a knockout tournament?*
Allen J. Schwenk, Western Michigan University (939-05-331)

9:45AM ▸ (598) *Maximal sets of Hamilton cycles in complete multipartite graphs.* Preliminary report.
Mike Daven* and **C.A. Rodger**, Auburn University (939-05-335)

10:00AM (599) *Inclusion-exclusion formulas used in lottery drawings.* Preliminary report.
Joseph E. Chance, University of Texas-Pan American (939-05-377)

10:15AM *Domination graphs of tournaments.*
▸ (600) **David R. Guichard**, Whitman College (939-05-397)

10:30AM *Planar universal graphs.*
▸ (601) **Neal Brand***, University of North Texas, and **Margaret Morton**, University of New Zealand (939-05-484)

AMS Session on Applications, I

8:00 AM – 10:10 AM

8:00AM *On a nonlinear functional differential equation for*
▸ (602) *an age structured populatuion with non constant delay.* Preliminary report.
Sanjay Rai, Texas A&M International University (939-92-197)

8:15AM *On the asymmetric May-Leonard model of three*
(603) *competing species.*
Chia-Wei Chi, Tsing Hua University, Hsin-Chu, Taiwan, **Sze-Bi Hsu**, Tsing Hua University, Hsin-Chu, Taiwan, and **Lih-Ing Wu***, Purdue University, West Lafayette (939-92-247)

8:30AM *The discrete Frenet frames and the study of protein*
▸ (604) *structure, Part I: Theoretical aspects.* Preliminary report.
Jeffrey K. Denny and **John R. Quine***, Florida State University (939-92-522)

8:45AM *The discrete Frenet Frame and Protein Structure,*
▸ (605) *Part II: Applications to coiled proteins.* Preliminary report.
Jeffrey K. Denny* and **John R. Quine**, Florida State University (939-92-523)

9:00AM *Multiple time scales in ventricular fibrillation.*
(606) **Omer Hotomaroglu**, **Harold M. Hastings***, **Flavio H. Fenton**, Hofstra University, **Steven J. Evans**, Long Island Jewish Medical Center, **Alan Garfinkel**, UCLA School of Medicine, **Uriel Avalos**, **Sabrina G. Novick**, **John Nilson**, Hofstra University, and **Fred J. Winter**, Hofstra University and Suffolk Community College (939-92-1044)

9:15AM *Topological mechanics of protein structures, and*
(607) *their fibrillations.* Preliminary report.
Okan Gurel*, IBM, and **Demet Gurel**, Touro College (939-58-1089)

9:30AM *Estimating stresses in a partially inflated high*
(608) *altitude balloon using a relaxed energy approach.* Preliminary report.
William G. Collier Jr, George Washington University (939-73-800)

9:45AM *Equilibrium solutions of a nolinear beam equation.*
▸ (609) **William G. Newman**, Creighton University (939-73-1130)

10:00AM *Mathematical modeling of fabrics, including explicit*
▸ (610) *static deflection solution.* Preliminary report.
James D. Walker, Southwest Research Institute (939-73-1196)

MAA Session on Quantitative Literacy, II

8:00 AM – 10:55 AM

Organizers: **Barbara A. Jur**, Macomb Community College
Richard A. Gillman, Valparaiso University
Jimmy L. Solomon, Georgia Southern University
Allen E. Pulsion, College of Science and Technology
Linda R. Sons, Northern Illinois University

7:40AM *Moving beyond the first stage: Developing links to*
(611) *other academic disciplines.*
Judith F. Moran* and **Helen S. Lang**, Trinity College (939-B1-1209)

8:00AM *Quantitative literacy through "Math across the*
▸ (612) *curriculum".* Preliminary report.
Jerry A. Johnson, University of Nevada, Reno (939-B1-402)

8:20AM Discussion.

8:40AM *Introducing quantitative literacy at Dominican*
(613) *University.*
Paul R. Coe, Dominican University (939-B1-1199)

9:00AM *Learning communities and computer based*
▸ (614) *assignments for improving quantitative literacy among college freshmen.*
Lyle Hallowell* and **Arnold R. Silverman**, Nassau Community College (939-B1-1193)

9:20AM *An integrated introductory mathematics and*
(615) *computer science course.*
Mark L. Klespis* and **Peter A. Cooper**, Sam Houston State University (939-B1-642)

9:40AM *Moving beyond the first stage: Developing links to*
(616) *other QL programs and other academic disciplines.*
Judith F. Moran*, Trinity College, and **Gove W. Effinger**, Skidmore (939-B1-1208)

10:00AM *An appropriate culminating mathematics course.*
▸ (617) **William E. Haver**, Virginia Commonwealth University (939-B1-605)

10:20AM *Web-based intermediate algebra minicourse.*
▸ (618) **Harris S. Shultz**, California State University, Fullerton (939-B1-425)

10:40AM *Precollege preparation for college mathematics: A*
▸ (619) *survey of South Carolina faculty.*
J. Christopher Tisdale III, **Danny W. Turner*** and **Gary T. Brooks**, Winthrop University (939-B1-392)

MAA Session on Teaching Statistics: Teaching the Reasoning and New Technological Tools, I

8:00 AM – 10:55 AM

Organizers: **Dexter C. Whittinghill**, Rowan University
Franklin A. Wattenberg, National Science Foundation
Mary R. Parker, Austin Community College
Donald L. Bentley, Pomona College

8:00AM Introduction by Frank Wattenberg.

8:10AM *Distance learning courses in statistics.*
(620) **John D. McKenzie Jr.**, Babson College (939-C1-1001)

8:25AM *Integration of multiple technologies in introductory*
(621) *statistics.*
Gina F. Reed, Gainesville College (939-C1-332)

8:45AM *Teaching statistics in a hi-tech classroom.*
▸ (622) **Brian E. Smith**, McGill University (939-C1-482)

9:00AM *Statistical thinking: A course in statistical reasoning*
▸ (623) *using a laboratory approach.* Preliminary report.
Barbara A. Wainwright* and **Robert M. Tardiff**, Salisbury State University (939-C1-339)

9:15AM *Learning statistics through the use of interactive*
▸ (624) *Web tools.*
Sue B. Schou*, Idaho State University, and **Teri S. Peterson**, Idah State University (939-C1-1161)

9:30AM *A statistics teaching and resource library (STAR*
▸ (625) *library) on the WWW.*
Deborah J. Rumsey, Kansas State University (939-C1-221)

9:50AM *An internet database for teaching statistics.*
▸ (626) **Thomas W. Judson*** and **Lori J. Peterson**, University of Portland (939-C1-323)

10:05AM *Teaching the practice of statistics through student*
▸ (627) *research and the use of popular media.*
Nkechi M. Agwu, Borough of Manhattan Community College (939-C1-240)

10:20AM *Statistical sampling over the Web for classroom*
▸ (628) *examples.*
Daniel H. Steinberg, Oberlin College (939-C1-1085)

10:35AM *Using Web applets to assist statistics instruction.*
▸ (629) **Robin H. Lock**, St. Lawrence University (939-C1-856)

MAA CUPM Subcommittee on Calculus Reform and the First Two Years-NSF Panel Discussion

8:00 AM – 9:20 AM

Forming the crystal ball for calculus.
Moderator: **Chris Arney**, U. S. Military Academy
Organizer: **Donald B. Small**, U. S. Military Academy
Panelists: **Paul Zorn**, St. Olaf College
David A. Smith, Duke University
Franklin A. Wattenberg, NSF
Donald B. Small

MAA Committee on Two-Year Colleges Panel Discussion

8:00 AM – 9:20 AM

Dual credit for mathematics courses taken in high school.
Moderator: **Wade Ellis**, West Valley College
Organizer: **Mary Robinson**, University of New Mexico-Valencia Campus Branch
Panelists: **Gary L. Britton**, University of Wisconsin-Washington County
Philip M. Cheifetz, Nassau Community College
Ann Davidian, McArthur High School, Levittown, NY
Kathleen K. Berver, New Mexico State University
Raymond J. Cannon Jr., Baylor University

MAA Panel Discussion

8:00 AM – 10:50 AM

Innovations in teaching assistant training.
Organizers: **Teri Jo Murphy**, University of Oklahoma
Suzanne M. Lenhart, University of Tennessee
Panelists: **Patricia Shure**, University of Michigan
James Epperson, Texas Tech University
Ethel Wheland, University of Akron
Iris B. Fetta, Clemson University

Project NeXT-Young Mathematicians Network Poster Session

8:00 AM – 10:00 AM

Organizers: **Kenneth A. Ross**, University of Oregon
Kevin E. Charlwood, Washburn University

PME Council

8:00 AM – 11:00 AM

Mathematical Sciences Employment Register

8:15 AM – 7:30 PM

Interviews only.

AMS-MAA Special Session on The History of Mathematics, I

8:30 AM – 10:50 AM

Organizers: **Karen H. Parshall**, University of Virginia
Victor J. Katz, University of the District of Columbia

8:30AM *G. H. Hardy's Oxford Years (1920-1931).*
▸ (630) **Robin J. Wilson**, The Open University (939-01-187)

9:00AM *The problems submitted by Ramanujan to the*
(631) *Journal of the Indian Mathematical Society.* Preliminary report.
Bruce C. Berndt*, **Youn-Seo Choi** and **Soon-Yi Kang**, University of Illinois at Urbana-Champaign (939-11-231)

9:30AM *Foundation issues in the 19th century British*
▸ (632) *school: negative and complex numbers.*
Patricia R. Allaire, Queensborough Community College, The City University of New York (939-01-202)

10:00AM *On the development of certain numerical methods.*
(633) **E. Kreyszig**, Carleton University (939-01-375)

10:30AM *The role and development of analysis and synthesis*
(634) *in ancient Greece and Medieval islam.*
Glen R. Van Brummelen, The King's University College (939-01-553)

AMS Special Session on Bergman Spaces and Related Topics, I

8:30 AM – 10:50 AM

Organizers: **Peter L. Duren**, University of Michigan, Ann Arbor
Michael Stessin, SUNY at Albany

8:30AM *Aspects of the Friedrichs operator.* Preliminary
(635) report.
Harold S. Shapiro, Royal Institute of Technology, Stockholm (939-30-86)

9:00AM *Weights and majorants of Hilbert spaces of entire*
(636) *functions.*
Yurii I. Lyubarskii and **Kristian Seip***, Norwegian University of Science and Technology (939-30-575)

9:30AM *Best approximation in the mean by analytic and*
(637) *harmonic functions.* Preliminary report.
Dmitry Khavinson*, University of Arkansas, **John E. McCarthy**, Washington University, and **Harold S. Shapiro**, Royal Institute of Technology (939-41-21)

10:00AM *Interpolating sequences in Bergman spaces and an*
(638) *example of non-corona for operators.*
Eric M. Amar* and **Chantal M. Menini**, University of Bordeaux I (939-32-244)

10:30AM *Multipliers for entire functions and an interpolation*
(639) *problem of Beurling.*
Joaquim Ortega, Cerdà*, University of Barcelona, and **Kristian Seip**, Norwegian University of Science and Technology, Trondheim (939-30-138)

AMS Special Session on Operator Algebras and Applications, I

8:30 AM – 10:50 AM

Organizers: **Allan P. Donsig**, University of Nebraska–Lincoln
Nik Weaver, Washington University

8:30AM (640) *Finite rank approximation and semidiscreteness for linear operators.* Preliminary report.
Christian G. Le Merdy, University of Houston (939-46-321)

9:00AM ▸ (641) *Wavelets in Banach algebras, harmonic analysis of operators, and non-commutative geometry.*
Vladimir V. Kisil, IMEM of Odessa Univ. (Ukraine) (939-46-87)

9:30AM (642) *Nudel'man interpolation for noncommutative analytic Toeplitz algebras.* Preliminary report.
Gelu Fanica Popescu, Univ. Texas San Antonio (939-46-134)

10:00AM (643) *Von Neumann inequalities.*
Jim Agler, UC San Diego, and **John E. McCarthy***, Washington University (939-47-165)

10:30AM (644) *A survey of Effros-Marechal topology.*
Cark Winsløw, Royal Dan. School of Ed. St. (939-46-142)

MAA Session on The Integral Role of the Two-Year College in the Preservice Preparation of Elementary School Teachers, I

8:30 AM – 10:55 AM

Organizers: **Mercedes A. McGowen**, William Rainey Harper College
Joanne V. Peeples, El Paso Community College
William E. Haver, Virginia Collaborative for Excellence in the Preparation of Teachers

8:30AM ▸ (645) *A collaborative model for a teacher preparation institution and two year community colleges.* Preliminary report.
Cheryl A. Lubinski* and **Albert D. Otto**, Illinois State University, Normal, Illinois (939-N1-1146)

8:50AM (646) *Coalition for the Mathematical Preparation of Elementary Teachers (CoMPET).*
Mark L. Klespis*, Sam Houston State University, **Margaret R. Crider**, Tomball College, **James Polito**, North Harris College, and **Patricia M. Stone**, Tomball College (939-N1-649)

9:10AM (647) *The building of a seamless transition from Henry Ford Community College to the University of Michigan - Dearborn for preservice elementary school teachers.*
Deborah Zopf*, Henry Ford Community College, and **Roger Verhey**, University of Michigan - Dearborn (939-N1-999)

9:30AM ▸ (648) *The mathematics preparation of prospective elementary teachers: A summary of 13 case studies.*
Denisse R. Thompson, University of South Florida (939-N1-1016)

9:50AM (649) *Mathematics and science teacher education program: Collaboration for the recruitment and education of prospective elementary school teachers.* Preliminary report.
Barbara J. Pence and **Randall Charles***, San Jose State University (939-N1-558)

10:10AM ▸ (650) *Collaborating to improve mathematics for prospective teachers.*
Julie M. DePree*, University of New Mexico-Valencia, and **Michele K. Diel**, University of New Mexico-Valencia (939-N1-767)

10:30AM (651) *Report from the National Science Foundation.*
James H. Lightbourne, Ntional Science Foundation (939-N1-927)

AMS Presentation

8:30 AM – 9:30 AM

e-MATH on the World Wide Web.
Organizers: **Ralph E. Youngen**, AMS
Wendy A. Bucci, AMS

AMS Invited Address

9:00 AM – 9:50 AM

(652) *Combinatorics and analysis in the theory of subfactors.*
Sorin Popa, University of California Los Angeles (939-05-02)

AMS Special Session on Dynamical, Spectral, and Arithmetic Zeta-Functions, I

9:00 AM – 10:50 AM

Organizers: **Michel L. Lapidus**, University of California, Riverside
Machiel van Frankenhuysen, Institut des Hautes Études Scientifiques

9:00AM (653) *A residue product for algebraic function fields over a number field.* Preliminary report.
Xian-Jin Li, American Institute of Mathematics (939-11-128)

9:30AM (654) *Complements to Li's criterion for the Riemann hypothesis.* Preliminary report.
Enrico Bombieri, Institute for Advanced Study, and **Jeffrey C. Lagarias***, AT&T Labs (939-11-177)

10:00AM (655) *Fast computation of the Riemann zeta function to arbitrary accuracy.* Preliminary report.
William F. Galway, University of Illinois at Urbana-Champaign (939-11-1129)

10:30AM ▸ (656) *The 10^{21}-st zero of the Riemann zeta function.* Preliminary report.
Andrew Odlyzko, AT&T Labs - Research (939-11-675)

MAA Special Presentation on the Legacy of R. L. Moore

9:00 AM – 9:00 PM

Organizers: **Albert C. Lewis**, Indiana University-Purdue University Indianapolis
Ben G. Fitzpatrick, North Carolina State University
Donald J. Albers, MAA

Book Sales and Exhibits

9:30 AM – 5:30 PM

MAA Committee on Calculus Reform and the First Two Years Panel Discussion

9:35 AM – 10:55 AM

The effect of calculus reform on student performance in subsequent courses.

Organizers: **Jack Bookman**, Duke University
Susan L. Gantner, Worcester Polytechnic University and AAHE
Herbert E. Kasube, Bradley University

Panelists: **Susan L. Gantner**
Jack Bookman
Judith Lee Baxter, University of Illinois at Chicago
John C. Polking, Rice University
Norman L. Webb, Wisconsin Center for Educational Research
Herbert E. Kasube

MAA Open Forum

9:35 AM – 10:55 AM

Educational Testing Service: Testing with technology—Sharing ideas to meet the challenges that lie ahead.

Organizer: **Gloria S. Dion**, Educational Testing Service

Presenters: **Carol Jackson**, ETS
Chancey O. Jones, ETS
Patricia Klag, ETS
Craig L. Wright, ETS

MAA-AMS-NCTM Panel Discussion

9:35 AM – 10:55 AM

The draft of the updated NCTM standards for school mathematics: An opportunity for your feedback.

Moderator: **Joan Ferrini-Mundy**, National Research Council

Panelists: **Kathleen Heid**, Pennsylvania State University
Judith Roitman, University of Kansas
Alan Schoenfeld, University of California-Berkeley

AMS Presentation

10:00 AM – 10:55 AM

Math e-journals and beyond.

Organizers: **Ralph E. Youngen**, AMS
Wendy A. Bucci, AMS

AMS Invited Address

10:05 AM – 10:55 AM

(657) *Geometric physics.*
Cumrun Vafa, Harvard University (939-00-130)

AMS-MAA Invited Address

11:10 AM – NOON

(658) *Massive graphs: Algorithms, applications, and open problems.*
Joan Feigenbaum, AT&T Labs (939-00-01)

AMS Colloquium Lectures: Lecture III

1:00 PM – 2:00 PM

(659) *Symplectic geometry from a dynamical systems point of view: III.*
Helmut H. Hofer, Courant Institute (939-58-496)

ASL Invited Address

1:00 PM – 1:50 PM

(660) *Title to be announced.*
Chris Laskowski, University of Maryland

AMS-MAA Special Session on The History of Mathematics, II

1:00 PM – 4:50 PM

Organizers: **Karen H. Parshall**, University of Virginia
Victor J. Katz, University of the District of Columbia

1:00PM ▸ (661) *The first undergraduate prize in mathematics? Robert Smith and his prize competition at Cambridge University.*
June E. Barrow-Green, The Open University (939-01-245)

1:30PM ▸ (662) *Wilhelm Blaschke: The mathematician as political academic.*
Sanford L. Segal, University of Rochester (939-01-212)

2:00PM ▸ (663) *Leonard Dickson (1874-1954): An american legacy in mathematics. A celebration of the 125th anniversary of his birth.*
Della D. Fenster, University of Richmond (939-01-468)

2:30PM ▸ (664) *R. L. Moore and innovations in mathematics education.*
Albert C. Lewis, Indiana University, Indianapolis (939-01-417)

3:00PM (665) *The Gottingen context of Von Neumann's work on Hilbert space.* Preliminary report.
Matthew Frank, University of Chicago (939-01-673)

3:30PM ▸ (666) *Some aspects of visualization in 19th century mathematics and its teaching.* Preliminary report.
Eisso J. Atzema, University of Maine (939-01-93)

4:00PM ▸ (667) *Cayley's invariant-theoretic solutions of polynomial equations.* Preliminary report.
Paul R. Wolfson, West Chester University (939-01-499)

4:30PM ▸ (668) *Augustus De Morgan: The forgotten historian.*
Adrian C. Rice, University of Virginia (939-01-169)

AMS-AWM Special Session on Geometry inDynamics, II

1:00 PM – 5:50 PM

Organizer: **Krystyna Kuperberg**, Auburn University

1:00PM (669) *Conformal iterated function systems.* Preliminary report.
R. Daniel Mauldin, University of North Texas (939-58-1187)

2:00PM (670) *Sudden changes in basins of attraction.*
James A. Yorke* and **Helena E. Nusse**, University of Maryland (939-00-1027)

2:30PM (671) *Knotted solutions to the Euler equations.* Preliminary report.
John B. Etnyre, Stanford University, and **Robert W. Ghrist***, Georgia Institute of Technology (939-58-411)

3:00PM (672) *The role of tangencies in global bifurcations of planar maps.*
Kathleen Alligood, George Mason University (939-58-978)

3:30PM ▸ (673) *Periodic billiard orbits and extremal polygons.*
Eugene Gutkin, USC (939-51-656)

4:00PM (674) *Topology of 1-d substitution tilings.* Preliminary report.
Marcy Barge, Montana State University (939-54-736)

4:30PM ▸ (675) *Finite dimensional Grassmannians and higher rank KP.*
Alex Kasman, Mathematical Sciences Research Institute, Berkeley (939-70-55)

5:00PM (676) *Damped Boussinesq equation in a circular domain: The influence of geometry.*
Vladimir V. Varlamov, National University of Columbia, Bogotá, Columbia (939-35-18)

5:30PM (677) *Chaotic homeomorphisms and indecomposable subcontinua.*
Christopher G. Mouron, University of Delaware (939-54-510)

AMS Special Session on Bergman Spaces and Related Topics, II

1:00 PM – 5:20 PM

Organizers: **Peter L. Duren**, University of Michigan, Ann Arbor
Michael Stessin, SUNY at Albany

1:00PM (678) *A condition for index two invariant subspaces.* Preliminary report.
Alexandru Aleman, Fernuniversitaet Hagen, **Stefan Richter***, University of Tennessee, Knoxville, and **Carl Sundberg**, University of Tennessee (939-47-415)

1:30PM (679) *Boundary behavior and the division property for invariant subspaces of Bergman spaces.* Preliminary report.
Alexandru Aleman*, Fernuniversitaet Hagen, **Stefan Richter** and **Carl Sundberg**, University of Tennessee, Knoxville (939-30-371)

2:00PM (680) *Carleson measures on Besov spaces.* Preliminary report.
Nicola Arcozzi, University of Bologna, **Richard Rochberg***, Washington University, and **Eric Sawyer**, Indiana Univ-Purdue Univ Indianapolis (939-46-405)

2:30PM (681) *An extension of the Hardy-Littlewood theorem.*
Joseph A. Cima*, UNC, and **Alexandru Aleman**, Fern University (939-30-37)

3:00PM (682) *An Hadamard maximum principle for biharmonic operators with applications to the Bergman spaces.* Preliminary report.
Haakan P. Hedenmalm, Lund University (939-35-577)

3:30PM (683) *Reproducing kernels in weighted Bergman spaces and Dirichlet type spaces.*
Serguei M. Shimorin, Lund University (939-46-740)

4:00PM (684) *Finite interpolation with minimum uniform norm in* $\mathbb{C}^n$.
Eric Amar, Universite Bordeaux I, and **Pascal J. Thomas***, Universite Paul Sabatier (939-32-91)

4:30PM (685) *The backward shift operator on the Bergman spaces.*
William T. Ross, University of Richmond (939-30-162)

5:00PM (686) *Extremal problems for inclusions into weighted Bergman spaces.* Preliminary report.
Dragan Vukotić, Univ. Autonoma de Madrid (939-47-230)

AMS Special Session on Probabilistic Combinatorics, II

1:00 PM – 4:20 PM

Organizers: **Béla Bollobás**, University of Memphis
Jeong Han Kim, Microsoft

1:00PM (687) *A first look at multi-type percolation.* Preliminary report.
John C. Wierman, Johns Hopkins University (939-05-832)

1:30PM (688) *Dependent percolation.* Preliminary report.
Paul N. Balister, **Béla Bollobás***, University of Memphis, and **Alan M. Stacey**, University of Cambridge (939-60-1157)

2:00PM (689) *Scaling limits for minimal and random spanning trees in two dimensions.*
Michael Aizenman, Princeton University, **Almut Burchard**, University of Virginia, **Charles M. Newman**, Courant Institute, and **David B. Wilson***, Microsoft (939-60-972)

2:30PM (690) *Total path length for random recursive trees.*
Robert P. Dobrow*, Truman State University, and **James A. Fill**, The Johns Hopkins University (939-05-88)

3:00PM (691) *Small complete arcs on finite projective planes.* Preliminary report.
Jeong Han Kim, Microsoft Research, and **Van H. Vu***, Institute for Advance Study (939-05-874)

3:30PM (692) *The structure of random sum-free sets.*
Neil J. Calkin*, Clemson University, and **Peter J. Cameron**, Queen Mary and Westfield College (939-05-871)

4:00PM (693) *Random walks on groups: How fast they mix and how to speed them up.*
Igor Pak, Yale University (939-60-1148)

AMS Special Session on Commutative Algebra and Algebraic Geometry, II

1:00 PM – 5:50 PM

Organizers: **Roger A. Wiegand**, University of Nebraska and Purdue University
Susan Elaine Morey, Southwest Texas State University

1:00PM (694) *The algebraic geometry of a variety over a ring.* Preliminary report.
Robert G. Underwood, Auburn University Montgomery (939-14-447)

1:30PM (695) *Splitting of module-finite ring extensions and unmixedness of group cohomology.*
Nandini Ranganathan, University of Michigan (939-13-947)

2:00PM (696) *The tight integral closure of a set of ideals.*
Melvin Hochster, Univ. of Michigan, Ann Arbor (939-13-930)

2:30PM (697) *Algebraic fundamental group of a cuve singularity.*
Hema Srinivasan* and **Steven D. Cutkosky**, University of Missouri (939-13-844)

3:00PM (698) *Test ideals in diagonal hypersurface rings of small prime characteristic.* Preliminary report.
Moira A. McDermott, Gustavus Adolphus College (939-13-828)

3:30PM (699) *An algebraic approach to reductions of ideals, modules and algebras.* Preliminary report.
Wolmer V. Vasconcelos, Rutgers University, New Brunswick (939-13-175)

4:00PM (700) *On the irregularity of polarized surfaces of degree four whose adjoint bundles are not spanned.* Preliminary report.
Gian Mario Besana*, Eastern Michigan University, and **Sandra Di Rocco**, Royal Institute of Technology (939-14-117)

4:30PM (701) *Sequence of valuation ideals associated to simple integrally closed ideals of small order.* Preliminary report.
Sunsook Noh, Ewha Womans University (939-13-1013)

5:00PM (702) *The Izumi-Rees theorem.*
Irena Swanson, New Mexico State University (939-13-993)

5:30PM (703) *Gorenstein modules and rings of finite Cohen-Macaulay type.* Preliminary report.
Graham J. Leuschke, University of Nebraska (939-13-1042)

AMS Special Session on Operator Algebras and Applications, II

1:00 PM – 5:50 PM

Organizers: **Allan P. Donsig**, University of Nebraska–Lincoln
Nik Weaver, Washington University

1:00PM (704) *On the local structure of von Neumann algebraic preduals.*
Edward G. Effros*, UCLA, and **Zhong-Jin Ruan**, University of Illinois (939-46-779)

1:30PM (705) *The well-posed matrix completion problem.* Preliminary report.
Don W. Hadwin, University of New Hampshire, **David R. Larson***, Texas A&M University, and **Dan Timotin**, Institute of Mathematics, Romanian Academy of Science (939-47-1172)

2:00PM (706) *Meet irreducible ideals and nest representations.*
Alan Hopenwasser, University of Alabama (939-47-291)

2:30PM (707) *The curvature invariant of multivariable operator theory.*
William B. Arveson, UC Berkeley (939-47-124)

3:15PM Break.

4:00PM (708) *The maximal C*-algebra generated by an operator algebra, and application to modules of operators and Morita equivalence.* Preliminary report.
David P. Blecher, University of Houston (939-46-273)

4:30PM (709) *Kernel estimates for generalized Segal-Bargmann spaces.* Preliminary report.
Richard Rochberg, Washington University (939-47-805)

5:00PM (710) *Hochschild cohomology for von Neumann algebras with Cartan subalgebras.*
Allan M. Sinclair, University of Edinburgh, and **Roger R. Smith***, Texas A&M University (939-46-739)

5:30PM (711) *Local lifting property for operator spaces.*
Seung-Hyeok Kye, Seoul National University, and **Zhong-Jin Ruan***, University of Illinois (939-46-243)

AMS Special Session on Computational Algebraic Geometry for Curves and Surfaces, II

1:00 PM – 5:20 PM

Organizers: **Mika K. Seppala**, Florida State University
Emil J. Volcheck, National Security Agency

1:00PM (712) *Counting points on an elliptic curve on a low-memory device.*
Janos A. Csirik, UC Berkeley (939-14-1149)

1:30PM (713) *Torsion points on bielliptic curves.* Preliminary report.
Roland B. Dreier, Oklahoma State University (939-14-851)

2:00PM (714) *On absolute factorization of bivariate polynomials.* Preliminary report.
Gaetan Hache, Concordia University (939-14-1164)

2:30PM (715) *Computing a parametrization for rational algebraic curves.*
Mark Van Hoeij, Florida State University (939-14-1141)

3:00PM Break.

3:30PM (716) *Producing networks of curves on 2-dim toric hypersurfaces.* Preliminary report.
Sarah-Marie Belcastro, Univ. of Northern Iowa (939-14-977)

4:00PM (717) *Homotopy methods for effective schubert calculus.*
Birkett T. Huber*, M.S.R.I., **Frank Sottile**, M.S.R.I, and **Bernd Sturmfels**, University of California (939-14-1139)

4:30PM (718) *Sums of squares in affine R-algebras -some algorithmic aspects.* Preliminary report.
Thorsten Woermann, FSU (939-14-1163)

5:00PM (719) *Closed geodesics on pairs of pants.*
Claire Baribaud, EPF Lausanne (939-53-1166)

AMS Special Session on the Mathematics of the Navier-Stokes Equations, II

1:00 PM – 4:50 PM

Organizers: **Peter A. Perry**, University of Kentucky
Zhong-Wei Shen, University of Kentucky

1:00PM (720) *The normal form of the Navier-Stokes equations and decaying turbulence.*
Ciprian Foias, Indiana University (939-35-167)

2:00PM ▶ (721) *Uniform estimates on 3-D incompressible Navier-Stokes equations.* Preliminary report.
Gang Tian, MIT, and **Zhouping Xin***, Courant Institute & CUHK (939-35-361)

2:30PM (722) *Long-time behavior of the Stommel-Charney model of the Gulf Stream.*
Shandy Hauk*, Chapman Unviersity, and **Edriss S. Titi**, University of California, Irvine (939-35-503)

3:00PM (723) *Renormalization group method. Application to a slightly compressible fluid model.*
Ioana Moise*, Indiana University, and **Mohammed Ziane**, Texas A&M University (939-35-356)

3:30PM (724) *Navier-Stokes equations in non-smooth manifolds.* Preliminary report.
Marius S. Mitrea, University of Missouri (939-35-515)

4:00PM (725) *Zero dissipation limits of dissipative PDEs.*
Jiahong Wu, University of Texas at Austin (939-35-184)

4:30PM (726) *Large-time behavior for solutions of equations modeling the low-speed flow of a highly compressible fluid.* Preliminary report.
Diane L. Denny, James Madison University (939-35-383)

MAA Minicourse #11: Part A

1:00 PM – 3:00 PM

Creating interactive texts in Mathematica.
Organizer: **John R. Wicks**, North Park University

MAA Minicourse #12: Part B

1:00 PM – 3:00 PM

Writing and the teaching of mathematics.
Organizers: **John E. Meier**, Lafayette College
Thomas W. Rishel, Cornell University

MAA Minicourse #6: Part A

1:00 PM – 3:00 PM

Cooperative learning in undergraduate mathematics education.
Organizers: **Barbara E. Reynolds**, Cardinal Stritch University
William E. Fenton, Bellarmine College

AMS Session on Probability and Statistics

1:00 PM – 5:25 PM

1:00PM (727) *A numerical ODE to DeMoivre/Laplace.*
James L. Rulla, Lyon College (939-60-64)

1:15PM (728) *The envelope of an oscillatory harmonizable process.*
Randall J. Swift, Western Kentucky University (939-60-113)

1:30PM (729) *Some counterexamples in reproducing kernels.*
Milan N. Lukić, University of Wisconsin-Oshkosh (939-60-174)

1:45PM (730) *Heavy traffic limit theorems for the closed Lu-Kumar network.* Preliminary report.
J. L. Steichen, University of Illinois at Urbana-Champaign (939-60-303)

2:00PM (731) *Convergence and stability analysis of large scale parabolic systems under Markovian structural perturbations.* Preliminary report.
Mahmoud J. Anabtawi*, **S. S. Sathananthan**, Tennessee State University, and **G. S. Ladde**, The University of Texas at Arlington (939-60-509)

2:15PM (732) *Stochastic heat equation on Lie groups.* Preliminary report.
Frederi G. Viens*, University of North Texas, and **Samy Tindel**, Unversite de Paris XIII (939-60-574)

2:30PM (733) *Waiting times and linear automata.* Preliminary report.
Ronald W. Gatterdam, University of Alaska Fairbanks (939-60-948)

2:45PM (734) *Construction of multi-dimensional random probability measures via sequential barycenter arrays.* Preliminary report.
Michael G. Monticino*, University of North Texas, and **Theodore Hill**, Georgia Institute of Technology (939-60-964)

3:00PM (735) *Analytical properties of multi-dimensional random probability measures.* Preliminary report.
LeRoy I. Valdes*, **Michael G. Monticino**, University of North Texas, and **Theodore Hill**, Georgia Tech (939-60-1003)

3:15PM (736) *Large deviation estimates in ruin theory.*
Jinhua Jean Tao, Central Missouri State University (939-60-1103)

3:30PM (737) *Stochastic differential models for genetic algorithms.* Preliminary report.
German Hernandez* and **Fernando Nino**, University of Memphis (939-60-1171)

3:45PM (738) *A counterexample to a conjecture concerning stochastically increasing random variables.*
Roger B. Nelsen*, Lewis & Clark College, **José Juan Quesada-Molina**, Universidad de Granada, **José Antonio Rodríguez-Lallena** and **Manuel Úbeda-Flores**, Universidad de Almería (939-62-71)

4:00PM (739) *Shrinkage estimation in problems of less than full rank.*
Lawrence J. Crone*, **David S. Crosby** and **I-Lok Chang**, American University (939-62-311)

4:15PM (740) *Applications of the two-parameter Poisson-Dirichlet distribution.*
Matthew A. Carlton, UCLA (939-62-140)

4:30PM (741) *Analysis of seasonal variation in multiple groups.*
Osvaldo Marrero, Villanova University (939-62-513)

4:45PM (742) *Was my opponent (too) lucky?* Preliminary report.
Chris Edwards, University of Wisconsin Oshkosh (939-62-731)

5:00PM (743) *Properties of the Bertino family of copulas.* Preliminary report.
Gregory A. Fredricks* and **Roger B. Nelsen**, Lewis & Clark College (939-62-1009)

5:15PM (744) *Monitoring and detecting changes in the periodic behavior of unevenly sampled time series data.*
Kevin M. Short* and **Laura A. McSweeney**, University of New Hampshire (939-62-1107)

AMS Session on Multi-Education

1:00 PM – 5:55 PM

1:00PM (745) *Helping students solve their own problems: Teaching the entire process of problem solving and mathematical modeling using student-generated projects in applied mathematics courses.*
Bruce Pollack-Johnson* and **Audrey F. Borchardt**, Villanova University (939-98-59)

1:15PM (746) *The uses of Maple in teaching abstract algebra.* Preliminary report.
Kevin E. Charlwood, Washburn University (939-98-345)

1:30PM (747) *Discovering number theory.*
Jeffrey J. Holt*, Randolph-Macon College, and **John W. Jones**, Arizona State University (939-98-386)

1:45PM (748) *The Missouri undergraduate mathematics faculty enhancement project.*
Terry A. Goodman* and **Rhonda L. McKee**, Central Missouri State University (939-98-427)

2:00PM (749) *Retention of concepts and skills in traditional and reformed applied calculus.*
Bradley E Garner*, University of Houston Clear Lake, and **Lynn E. Garner**, Brigham Young University (939-98-580)

2:15PM (750) *Division algorithm and Taylor polynomials.*
M. Sayrafiezadeh, Medgar Evers College/CUNY (939-98-636)

2:30PM (751) *History makes mathematics alive.*
Daina Taimina, University of Latvia and Cornell University (939-98-668)

2:45PM (752) *A longitudinal study of the effects of integrating developmental algebra with college algebra.* Preliminary report.
Timothy W. Flood, Pittsburg State University (939-98-681)

3:00PM (753) *A mathematical structure for the chinese zodiac.*
John F. Lamb Jr., University of Mary Hardin-Baylor (939-98-783)

3:15PM (754) *Using financial calculators in a business mathematics course.*
William H. Heller* and **Monty B. Taylor**, University of Texas-Pan American (939-98-804)

3:30PM (755) *The importance of R. L. Moore's calculus course.* **Joseph W. Eyles**, IBM, Austin, Texas (939-98-813)

3:45PM (756) *Possible uses of "reaction" and "reflection" problems in calculus classes.* Preliminary report. **Al Shenk**, UCSD (939-98-889)

4:00PM (757) *Seniors with scissors and string: Building historical objects in a mathematics class.* Preliminary report. **Heather Ames Lewis**, Nazareth College (939-98-944)

4:15PM (758) *Helping students discover periodic behavior: A geometric approach.* **Laura A. McSweeney*** and **Kevin M. Short**, University of New Hampshire (939-98-1102)

4:30PM (759) *Fair dice from curtain rods.* Preliminary report. **Helmut Doll**, Bloomsburg University (939-98-1155)

4:45PM (760) *The University of Washington Instructional Center - Helping disadvantaged students succeed.* Preliminary report. **Rebecca C. Tyson**, University of Washington (939-98-1159)

5:00PM (761) *Report on a statistical study on the performance of remedial vs. non-remedial students in college algebra.* Preliminary report. **Jennifer J. Flannery**, University of the Incarnate Word (939-98-1182)

5:15PM (762) *Student projects in elementary statistics.* **Bathi Kasturiarachi**, Kent State University (939-98-1190)

5:30PM (763) *In-service teachers, graphing calculators, and mathematical modeling.* Preliminary report. **James A. Telese**, University of Texas at Brownsville, and **Mufid A. Abudiab***, Texas A&M University-Corpus Christi (939-97-798)

5:45PM (764) *Using writing in college mathematics classes.* Preliminary report. **Javad Abdalkhani*** and **Ramakrishnan Menon**, The Ohio State University (939-00-758)

AMS Session on Functional Analysis and Approximation Theory

1:00 PM – 4:55 PM

1:00PM (765) *Some inequalities of double and single exponential type.* Preliminary report. **David E. Edmunds**, University of Sussex, and **Ritva M. Hurri-Syrjanen***, University of Helsinki (939-46-53)

1:15PM (766) *Blaschke inductive limits.* Preliminary report. **Suren A. Grigoryan**, Kazan State University, and **Thomas V. Tonev***, The University of Montana - Missoula (939-46-98)

1:30PM (767) *The product of a composition operator with the adjoint of a composition operator.* **John H. Clifford***, Michigan State University, and **Dechao Zheng**, Vanderbilt University (939-46-255)

1:45PM (768) *Transformation group C^*-algebras with bounded trace.* Preliminary report. **Astrid an Huef**, Dartmouth College (939-46-270)

2:00PM (769) *Remarks on Banach-Mazur problem about spaces with transitive group of isometries.* Preliminary report. **Beata Randrianantoanina**, Miami University (939-46-306)

2:15PM (770) *Applications of a Schauder decomposition in $X \otimes_\lambda Y$.* Preliminary report. **Elizabeth M. Bator**, University of North Texas, and **Dawn R. Slavens***, Mount Union College (939-46-319)

2:30PM (771) *Properties of representing measures.* Preliminary report. **Elizabeth M. Bator***, University of North Texas, and **Dawn R. Slavens**, Mount Union College (939-46-320)

2:45PM (772) *Holomorphic idempotents and retracts in C^*-algebras.* Preliminary report. **Jerry R. Muir Jr**, University of Kentucky (939-46-698)

3:00PM (773) *Relative Chebyshev centers in Hilbert space.* **Robert Huotari**, San Francisco State Univ., and **Michael P. Prophet***, Murray State University (939-46-786)

3:15PM (774) *Order continuous operators between partially ordered vector spaces.* **Jamie L. Summerville**, Morehead State University (939-46-842)

3:30PM (775) *The fixed point property for asymptotically nonexpansive mappings.* Preliminary report. **Paddy Dowling**, Miami University, **Chris Lennard***, University of Pittsburgh, and **Barry Turett**, Oakland University (939-46-957)

3:45PM (776) *A finite disjointness property for operators on Banach lattices.* Preliminary report. **William A. Feldman**, University of Arkansas (939-46-1197)

4:00PM (777) *Discontinuity of best harmonic approximants.* **David Legg** and **Yifei Pan***, Indiana University-Purdue University (939-41-23)

4:15PM (778) *An algorithm for solving a nonlinear integro-differential equation.* Preliminary report. **Elias Y. Deeba*** and **Shishen S. Xie**, University of Houston-Downtown (939-41-129)

4:30PM (779) *On some shift invariant integral operators, univariate case, revisited.* Preliminary report. **George Anastassiou***, The University of Memphis, and **Sorin G. Gal**, University of Oradea, Romania (939-41-380)

4:45PM (780) *Protoconvex functions.* **Thurai Kugendran**, John Jay College of Criminal Justice (939-49-384)

AMS Session on Partial Differential Equations

1:00 PM – 5:25 PM

1:00PM (781) *L^p estimates for the mixed boundary problem on a Lipschitz graph domain.* Preliminary report. **Jeffery D. Sykes**, University of Kentucky (939-35-60)

1:15PM (782) *Large amplitude torsional oscillations in the Tacoma Narrows Bridge.* Preliminary report. **Kristen S. Moore**, University of Connecticut (939-35-75)

1:30PM (783) *Bounded solutions of a nonlinear diffusion equation with time delay.* Preliminary report. **Joseph Wiener** and **Hushang Poorkarimi***, University of Texas-Pan American (939-35-156)

1:45PM (784) *Weighted integral inequalities for solutions to the conjugate A-harmonic equation.* Preliminary report. **Shusen Ding**, University of Minnesota (939-35-183)

2:00PM (785) *Diffractive nonlinear geometric optics for short pulses.* Preliminary report. **Deborah Alterman*** and **Jeffrey Rauch**, University of Michigan (939-35-219)

2:15PM (786) *Blow-up of solutions of some nonlinear hyperbolic systems.* **Keng Deng**, University of Southwestern Louisiana (939-35-251)

2:30PM (787) *An inverse boundary value problem for a prestressed polycrystalline aggregate.* **Robert L. Robertson**, Texas A&M International University (939-35-308)

2:45PM (788) *An existence result for a class of superlinear p-laplacian semipositone systems.* **Hai Dang**, **Maya Chhetri*** and **Ratnasingham Shivaji**, Mississippi State University (939-35-395)

3:00PM (789) *Beyond quenching for singular degenerate semilinear reaction-diffusion equations.* **C. Y. Chan*** and **Jian Yang**, University of Southwestern Louisiana (939-35-452)

3:15PM (790) *Quenching in infinite time for singular degenerate semilinear reaction-diffusion equations.* **C. Y. Chan** and **Jian Yang***, University of Southwestern Louisiana (939-35-453)

3:30PM ▸ (791) *A method of lines analysis of pump propagation in solid state lasers.* Preliminary report. **Lila F. Roberts**, Georgia Southern University (939-35-483)

3:45PM (792) *Progress in a two-dimensional inverse spectral problem.* Preliminary report. **C. Maeve McCarthy**, Murray State University (939-35-650)

4:00PM (793) *Transport equations and velocity averages.* Preliminary report. **Guergana Petrova Petrova**, USC, Columbia, SC (939-35-724)

4:15PM (794) *A note on the positivity of nonnegative solutions for semipositone problems.* **Alfonso Castro**, University of Texas at San Antonio, **Maya Chhetri** and **Ratnasingham Shivaji***, Mississippi State University (939-35-866)

4:30PM (795) *A priori estimates for a semilinear elliptic partial differential equation.* Preliminary report. **Joseph A. Iaia**, University of North Texas (939-35-1005)

4:45PM ▸ (796) *Polynomial motions of partial differential equations.* Preliminary report. **Andrzej W. Kedzierawski***, SUNY Geneseo, and **N. R. Nandakumar**, Delaware State University (939-35-1096)

5:00PM (797) *A phase field modelwith memory.* Preliminary report. **Sergiu Aizicovici**, Ohio University, **Maurizio Grasselli**, Politecnico di Milano, and **Mark McKibben***, Ohio University (939-35-1218)

5:15PM (798) *A symmetry construction for the singular Yamabe problem.* Preliminary report. **David L. Finn**, Goucher College (939-58-108)

MAA Session on Mathematics Competitions, III

1:00 PM – 3:55 PM

Organizers: **Harold B. Reiter**, University of North Carolina at Charlotte
Stephen B. Maurer, Swarthmore College
William P. Fox, U. S. Military Academy
Susan Schwartz Wildstrom, Walt Whitman High School, Bethesda, MD

1:00PM ▸ (799) *The Virginia Tech Regional Mathematics Contest.* **James E. Shockley**, VA Tech (939-D1-552)

1:20PM ▸ (800) *The Indiana College Mathematics Competition.* **Elton Graves**, Rose-Hulman Institute of Technology (939-D1-827)

1:40PM Discussion.

2:00PM ▸ (801) *Florida's Sunshine State Scholars Competition.* Preliminary report. **William H. Caldwell**, Univ. of North Florida (939-D1-935)

2:20PM ▸ (802) *Competitions in Mu Alpha Theta.* **Stanley B. Eliason**, University of Oklahoma (939-D1-374)

2:40PM ▸ (803) *The Wisconsin MAA High School Math Contest.* Preliminary report. **John J. Koker**, Univ. of WI Oshkosh (939-D1-707)

3:00PM (804) *The Annual WPI High School Mathematics Meet.* **J. J. Malone**, Worcester Polytechnic Institute (939-D1-873)

3:20PM ▸ (805) *The Illinois Council of Teachers of Mathematics Contest for High School Students.* **Leona L. Mirza**, North Park University (939-D1-811)

3:40PM ▸ (806) *The American Regions Mathematics League: The Growth of a National Network.* **Mark E. Saul***, Bronxville Schools, Bronxville, NY, **Linda Berman**, Bronx High School of Science, Bronx, NY, and **Martin Badoian**, Canton High School, Canton, MA (939-D1-875)

MAA Session on Ethical, Humanistic, and Artistic Mathematics, II

1:00 PM – 2:50 PM

Organizers: **Alvin M. White**, Harvey Mudd College
Robert P. Webber, Longwood College
Stefanos P. Gialamas, Illinois Institute of Art

1:00PM ▸ (807) *Mathematics and the four great philosophical questions.* **Jerry P. King**, Lehigh University (939-F1-390)

1:30PM ▸ (808) *Senior seminar: Preparing computer and mathematical sciences students for the future.* Preliminary report. **Ron Barnes*** and **Ken Oberhoff**, University of Houston-Downtown (939-F1-403)

1:45PM ▸ (809) *The ethical dilemma of mathematics teaching.* Preliminary report. **Jerry P. King**, Lehigh University (939-F1-1064)

2:00PM ▸ (810) *Introducing liberal arts students to the beauty of abstract mathematics via computer graphics, groups, and Pascal's triangle (Preliminary Report).* Preliminary report. **Kathleen M. Shannon*** and **Michael J. Bardzell**, Salisbury State University (939-F1-301)

2:30PM ▸ (811) *Teaching ethics in mathematics classes: Why and how.* **Bonnie J. Shulman**, Bates College (939-F1-222)

MAA Session on Proof in Mathematical Education

1:00 PM – 5:55 PM

Organizers: **G. Joseph Wimbish**, Huntingdon College
Gary E. Davis, University of Southampton

1:00PM ▸ (812) *Student derivation of standard integral formulas.* **Jerome Dancis**, Univ of MD (939-G1-651)

1:15PM ▸ (813) *Why should students learn the proof of the mean value theorem in Calculus I– how should we assess?* Preliminary report. **Theresa L. Friedman**, Bendictine University (939-G1-1200)

1:30PM ▸ (814) *Making the transition from algorithm to proof: What can history tell us?* Preliminary report. **Janet Heine Barnett**, University of Southern Colorado (939-G1-176)

1:45PM (815) *Teaching the logical paradoxes: On mathematical insight or is there a non-algorithmic element in Gödel's second theorem?*
Myrna L. Estep, University of the Incarnate Word (939-G1-170)

2:00PM ▸ (816) *Student views of proof: What we found.*
Helen E. Salzberg* and **Barry Schiller**, Rhode Island College (939-G1-265)

2:15PM ▸ (817) *Using the game Minesweeper to introduce students to proofs.*
Patti Frazer Lock*, St. Lawrence University, and **Allan A. Struthers**, Michigan Technological University (939-G1-360)

2:30PM ▸ (818) *What is an elegant proof? The case of tic tac toe.* Preliminary report.
Tomas M. Kalmar, California State University Monterey Bay (939-G1-1098)

2:45PM Break.

3:00PM ▸ (819) *Proof for the general education student.* Preliminary report.
G. Edgar Parker, James Madison University (939-G1-211)

3:15PM ▸ (820) *It's their transition—You can't make it for them.*
Carol S. Schumacher, Kenyon College (939-G1-486)

3:30PM ▸ (821) *Making the transition from calculus to abstract mathematics.* Preliminary report.
Connie M. Campbell, Millsaps College (939-G1-876)

3:45PM ▸ (822) *Toward proof.*
Jeffery T. McLean, University of St. Thomas (939-G1-317)

4:00PM ▸ (823) *What is "Quality" in a mathematical proof?*
Robert D. McMillan, Oklahoma Christian University of Science and Arts (939-G1-298)

4:15PM ▸ (824) *Common misconceptions.*
May F. Hamdan, Lebanese American University (939-G1-816)

4:30PM ▸ (825) *Teaching the techniques of proof.*
Holly P. Hirst* and **Jeffry L. Hirst**, Appalachian State University (939-G1-249)

4:45PM ▸ (826) *Proof as a convincing communication that answers – why?*
David W. Henderson, Cornell University (939-G1-663)

5:00PM (827) *What are the sources of student conviction?* Preliminary report.
Melanie A. Wahlberg, The College of New Jersey (939-G1-695)

5:15PM ▸ (828) *Proof and learning styles in arithmetic and supportive verbalization.*
Seymour W. Pustilnik*, New York City Technical College (CUNY), and **Phyllis L. Pustilnik**, Bronx Community College (CUNY) (939-G1-472)

5:30PM Discussion.

5:45PM (829) *"Action Proof" in a dynamic geometry for prospective elementary school teachers: Structure of intuitive explorations.* Preliminary report.
Barbara J. Pence, San Jose State University (939-G1-555)

MAA Panel Discussion

1:00 PM – 2:30 PM

What math do teachers need to know?

Organizer: **W. James Lewis**, Univeristy of Nebraska

MAA CUPM Subcommittee on Calculus Reform and the First Two Years Poster Session

1:00 PM – 3:00 PM

College algebra reform.

Organizers: **Donald B. Small**, U. S. Military Academy
Sara Bush, Wiley College
Eugene J. Taylor, Grambling State University

AMS Special Session on Several Complex Variables, II

1:30 PM – 5:20 PM

Organizers: **Emil J. Straube**, Texas A&M University
Harold P. Boas, Texas A&M University
Marshall A. Whittlesey, Texas A&M University

1:30PM (830) *Holomorphic images of C^n.*
Berit Stensones, Univ. of Michigan (939-32-837)

2:00PM (831) *Proper holomorphic mappings from domains with S^1-action.*
Bernard Coupet, **Alexander Sukhov**, LATP, Universite de Provence, and **Yifei Pan***, Indiana University-Purdue Univeristy Fort Wayne (939-32-24)

2:30PM (832) *A general theory of shears.*
Dror Varolin, University of Michigan (939-32-573)

3:00PM (833) *Regularity of twisted Laplacians and biholomorphic maps.*
Jeffery D. McNeal, Ohio State University, Columbus (939-32-589)

3:30PM (834) *Polynomial approximation on submanifolds of strictly pseudoconvex hypersurfaces.*
John T. Anderson*, College of the Holy Cross, and **Alexander J Izzo**, Bowling Green State University (939-32-70)

4:00PM (835) *Analytic structure in fibered polynomial hulls.* Preliminary report.
Marshall A. Whittlesey, Texas A&M University (939-32-1090)

4:30PM (836) *Teichmüller space of a closed subset of the Riemann sphere.*
Sudeb Mitra, Cornell University (939-32-1082)

5:00PM (837) *Cohomological hulls and supports of Dolbeault cohomology classes.*
Robert Bakula, SUNY at Stony Brook (939-32-1145)

ASL Invited Address

2:00 PM – 2:30 PM

(838) *A barely Σ^0_2 degree.*
Geoffrey L. LaForte, University of West Florida

AMS Special Session on Dynamical, Spectral, and Arithmetic Zeta-Functions, II

2:00 PM – 5:00 PM

Organizers: **Michel L. Lapidus**, University of California, Riverside
Machiel van Frankenhuysen, Institut des Hautes Études Scientifiques

2:00PM (839) *Universality of correlations of zeros of random waves.* Preliminary report.
Steve Zelditch, Johns Hopkins (939-81-688)

2:30PM (840) *Artin L-functions of graph coverings.* Preliminary report.
Audrey A. Terras* and **Harold M. Stark**, U.C.S.D. (939-11-568)

3:00PM (841) *The Zeta function of an elliptic operator in vector bundle over the circle* . Preliminary report.
Dan Burghelea, OSU (939-47-1004)

3:30PM (842) *The calculation of mass wave forms.* Preliminary report.
Harold M. Stark, UCSD (939-11-1086)

4:00PM Discussion/open problems.

(843) *Determinants of geometric operators.* Preliminary report.
Kate Okikiolu, University of California, San Diego (939-51-1217)

MAA Session on Integrating Mathematics and Other Disciplines, I

2:00 PM – 3:55 PM

Organizers: **William G. McCallum**, University of Arizona
Nicholas T. Losito, SUNY at Farmingdale
Yajun Yang, SUNY at Farmingdale

2:00PM ▸ (844) *Bridging the gap between business calculus and economics with interactive computer illustrations.*
Jean Marie McDill*, Cal Poly, and **Agnes Rash**, St. Joseph's University (939-M1-929)

2:15PM ▸ (845) *Chaos in economics.*
James A. Walsh, Oberlin College (939-M1-692)

2:30PM ▸ (846) *Collaboration with business school colleagues and non-academics to redesign a course on business calculus, matrices, and linear programming.* Preliminary report.
Bruce Pollack-Johnson* and **Audrey F. Borchardt**, Villanova University (939-M1-1124)

2:45PM ▸ (847) *Linking mathematics and the sciences via in-class experiments.*
Sheldon P. Gordon*, SUNY at Farmingdale, and **Florence S. Gordon**, New York Institute of Technology (939-M1-520)

3:00PM ▸ (848) *A calculus course for biology students.*
Charles W. Mullins, University of Central Arkansas (939-M1-765)

3:15PM ▸ (849) *Connecting mathematics, computer science and science: A computational science approach.*
Ignatios E. Vakalis, Capital University (939-M1-541)

3:30PM ▸ (850) *Computer programming courses using Maple and Mathematica.* Preliminary report.
David E. Betounes* and **Mylan E. Redfern**, University of Southern Mississippi (939-M1-517)

3:45PM ▸ (851) *Mathematical methods of image processing - A progress report on course development.* Preliminary report.
Sean A. Broughton* and **Edward R. Doering**, Rose-Hulman Institute Of Technology (939-M1-853)

MAA Invited Address

2:15 PM – 3:05 PM

▸ (852) *The role of research in improving school mathematics.*
Jeremy Kilpatrick, University of Georgia (939-97-554)

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

2:15 PM – 5:00 PM

Moderator: **William A. Massey**, Lucent Technology, Bell Labs

RMMC Board of Directors

2:15 PM – 4:10 PM

ASL Invited Address

2:40 PM – 3:30 PM

(853) *What you can and can't define in a model.*
Michael Benedikt, Bell Laboratories

MAA Minicourse #14: Part A

3:15 PM – 5:15 PM

An introduction to wavelets.
Organizer: **Colm K. Mulcahy**, Spelman College

MAA Minicourse #15: Part A

3:15 PM – 5:15 PM

Music and mathematics.
Organizer: **Leon Harkelroad**, Bard College

MAA Panel Discussion

3:15 PM – 4:45 PM

Models for intervention projects.
Organizers: **Robert E. Megginson**, University of Michigan
Manuel P. Berriozábal, University of Texas at San Antonio
Panelists: **Manuel P. Berriozábal**
Florence Fasanelli, College-University Resource Institute, Inc.
William A. Hawkins Jr., SUMMA
Robert E. Megginson
Irvin E. Vance, Michigan State University
Charlene Morrow, Mount Holyoke College

MAA Teaching Awards Presentations

3:20 PM – 5:00 PM

Presenters: **Joel V. Brawley**, Clemson University
Robert W. Case, Northeastern University
Joan P. Hutchinson, Macalester College

MAA Session on Geometry in the Classroom in the Next Millennium, II

4:00 PM – 7:00 PM

Organizers: **Colm K. Mulcahy**, Spelman College
David W. Henderson, Cornell University
Barry Schiller, Rhode Island College

4:00PM ***Geometry Problem Solving Activities for Elementary Teachers.***

▸ (854) *Geometry for elementary education majors.* Preliminary report.
Elizabeth D. Gray, Southeastern Louisiana University (939-H1-262)

(855) *Dynamic geometry for prospective elementary school teachers: construction of investigations.* Preliminary report.
Barbara J. Pence, San Jose State University (939-H1-557)

▸ (856) *Using dynamic geometry software in courses for the preparation of elementary teachers.*
Vincent P. Schielack Jr., Texas A&M University (939-H1-1084)

▸ (857) *Students constructing geometry - Teaching without lecturing.* Preliminary report.
John E. Wolfe, Oklahoma State University (939-H1-1112)

4:40PM Discussion.

5:00PM ***Geometry for K–8 Teachers Using History and Symmetry.***

▸ (858) *Was Pythagoras Chinese?*
David E. Zitarelli, Temple University (939-H1-421)

▸ (859) *Geometry: Let's give our K-8 teachers perspective.* Preliminary report.
Helen Gerretson, University of Northern Colorado (939-H1-456)

(860) *Eratosthenes' measurement of the Earth: A module for classroom use.*
Kenneth R. Berg*, University of Maryland, and **Karen Z. Benbury**, Bowie State University (939-H1-633)

▸ (861) *Symmetry as a unifying concept in geometry for middle school teachers.* Preliminary report.
David E. Kullman, Miami University (939-H1-679)

5:40PM Discussion.

6:00PM ***Writing and Investigations in Geometry.***

▸ (862) *Geometry through constructions.*
James A. Nickel, U Texas of the Permian Basin (939-H1-350)

▸ (863) *Using journals in college geometry.* Preliminary report.
Deborah A. Sherman-Denvir, Marshall University (939-H1-690)

▸ (864) *The use of writing projects in teaching geometry.* Preliminary report.
Sarah J. Greenwald, Appalachian State University (939-H1-895)

▸ (865) *Encouraging diverse geometric perspectives among in-service teachers.*
Kelly Gaddis, SUNY College at Buffalo (939-H1-915)

6:40PM Discussion.

MAA Poster Session

4:00 PM – 7:00 PM

Undergraduate research by students.

Organizers: **Aparna W. Higgins**, University of Dayton
Mario U. Martelli, California State University-Fullerton

ASL Session for Contributed Papers

4:00 PM – 5:20 PM

ASL Session for Contributed Papers

4:00 PM – 5:20 PM

AMS Committee on Science Policy Government Speaker

4:20 PM – 5:10 PM

(866) *The new age of exploration.*
Rita Colwell, National Science Foundation

MAA Informal Session

5:00 PM – 7:00 PM

Actuarial education.

Organizers: **James W. Daniel**, University of Texas
Matthew J. Hassett, Arizona State University

NAM Banquet and Cox-Talbot Address

5:30 PM – 6:20 PM

(867) *The end of one era, the dawn of another.*
Johnny L. Houston, Elizabeth City State University

AMS Special Event

6:00 PM – 7:00 PM

Mathematical Reviews reception.

MAA-ARUME Special Presentation

7:00 PM – 10:00 PM

Research on undergraduate mathematics education.

Organizer: **Thomas P. Dick**, Oregon State University

MAA Formal Discussion

7:00 PM – 9:00 PM

Isolated teachers of statistics.

Organizer: **Dexter C. Whittinghill**, Rowan University

MAA Presentation

7:15 PM – 9:15 PM

An evening of poetry.

Organizer: **Alvin M. White**, Harvey Mudd College

MAA Student Lecture

7:30 PM – 8:20 PM

▸ (868) *Pianos and continued fractions.*
Edward G. Dunne, American Mathematical Society (939-00-30)

AMS Special Session on Singularities in Algebraic and Analytic Geometry, VI

7:30 PM – 9:30 PM

Organizers: **Caroline Grant Melles**, U.S. Naval Academy
Ruth I. Michler, University of North Texas

7:30PM Discussions on and open problems in resolution or uniformization of singularities.

Saturday, January 16

Joint Meetings Registration

7:30 AM – 2:00 PM

MAA Session on Geometry in the Classroom in the Next Millennium, I

7:30 AM – 10:55 AM

Organizers: **Colm K. Mulcahy**, Spelman College
David W. Henderson, Cornell University
Barry Schiller, Rhode Island College

7:30AM ***Using Dynamic Geometry Software with Majors and Preservice Secondary Teachers, I.***

▸ (869) *Presenting proofs using technology in geometry.* Preliminary report.
Martin E. Flashman, Humboldt State University (939-H1-363)

▸ (870) *Using technology to connect the empirical and deductive aspects of the college geometry course.*
Jean J. McGehee, University of Central Arkansas (939-H1-643)

▸ (871) *Triangles, evolutes, and computers.*
Alan McRae, Washington and Lee University (939-H1-781)

8:00AM Discussion.

8:15AM ***Using Dynamic Geometry Software with Majors and Preservice Secondary Teachers, II.***

(872) *Enhancing "Modern Geometries" with technology.*
Mary J. Winter, Michigan State University (939-H1-186)

▸ (873) *Designing a dynamic geometry course.*
James M. Parks, SUNY-Potsdam (939-H1-547)

▸ (874) *Forging a more connected, and scientific geometry curriculum through student investigations of locus problems and geometrical curve drawing devices using the computer software Geometer's Sketchpad.* Preliminary report.
David Dennis, Univ. of Texas at El Paso (939-H1-774)

8:45AM Discussion.

9:00AM ***Teaching Non-Euclidean Geometry with Technology.***

▸ (875) *Using polyhedral models and Java applets to teach spherical geometry.* Preliminary report.
John M. Sullivan, Univ. of Illinois (939-H1-399)

▸ (876) *Exploring hyperbolic geometry with Poincaredraw.*
Robert L. Foote, Wabash College (939-H1-570)

▸ (877) *Exploring geometry through Java-based software.*
Michael D. Hvidsten, Gustavus Adolphus College (939-H1-806)

▸ (878) *High and low technology in the geometry classroom.*
Daniel H. Steinberg, Oberlin College (939-H1-1077)

9:40AM Discussion.

10:00AM ***Teaching Non-Euclidean Geometry without Technology Emphasis.***

▸ (879) *A second geometry course: Discussion-based classes and informal texts.*
Sarah-Marie Belcastro, University of Northern Iowa (939-H1-562)

▸ (880) *Analytic taxicab geometry.*
Jerry D. Taylor, Campbell University (939-H1-755)

▸ (881) *Geometry of the surface of the sphere for K-12 teachers.*
Alice Mae Guckin, College of St. Scholastica (939-H1-1081)

▸ (882) *A course in hyperbolic geometry and the topology and geometry of surfaces.*
David Gay, University of Arizona (939-H1-1121)

10:40AM Discussion.

AMS-AWM Special Session on Geometry in Dynamics, III

8:00 AM – 10:40 AM

Organizer: **Krystyna Kuperberg**, Auburn University

8:00AM (883) *Hausdorff measures versus equilibrium states of conformal infinite iterated function systems.*
Mariusz Urbanski, University of North Texas (939-58-514)

8:30AM (884) *Semi-invariants of finite reflection groups.*
Anne V. Shepler, University of California, San Diego (939-51-776)

9:00AM (885) *Continuous sections in the action spectrum and applications.*
Matthias Schwarz, Univ. of Chicago (939-58-753)

9:30AM (886) *The Euler equation and contact structures on solid tori.*
John B. Etnyre*, Stanford University, and **Robert Ghrist**, Georgia Institute of Technology (939-57-796)

10:00AM (887) *Holomorphic curves and global systems of surfaces of section.* Preliminary report.
Helmut H. Hofer, Courant Institute (939-58-141)

AMS Special Session on Several Complex Variables, III

8:00 AM – 10:50 AM

Organizers: **Emil J. Straube**, Texas A&M University
Harold P. Boas, Texas A&M University
Marshall A. Whittlesey, Texas A&M University

8:00AM (888) *Lyapunov exponents for birational maps.* Preliminary report.
Jeffrey A. Diller, University of Notre Dame (939-32-160)

8:30AM (889) *On the dynamics of S^1-actions on Stein manifolds.*
Eugen Mihailescu, University of Michigan (939-32-1151)

9:00AM (890) *Branching structure of basins of attraction of the complex Henon map.*
Estela A. Gavosto, Univeristy of Kansas (939-32-761)

9:30AM (891) *Uniformly perfect sets, rational semigroups, Kleinian Groups and Itereated functions systems.*
Rich L. Stankewitz, Texas A&M University (939-30-227)

10:00AM (892) *A connection on loop space.* Preliminary report.
Brian J. Birgen, Purdue University (939-32-104)

10:30AM (893) *Cartan connections on CR manifolds and secondary characteristic classes.*
Anbo Le, Ohio State University (939-32-612)

AMS Special Session on Commutative Algebra and Algebraic Geometry, III

8:00 AM – 10:50 AM

Organizers: **Roger A. Wiegand**, University of Nebraska and Purdue University
Susan Elaine Morey, Southwest Texas State University

8:00AM (894) *Some progress on a conjecture of Lech.*
Douglas A. Hanes, Univ. of Michigan (939-13-939)

8:30AM (895) *On the primary decomposition of the Jacobian ideal of trilinear forms.*
Anna Guerrieri*, Universita' di L'Aquila, and **Irena Swanson**, New Mexico State University (939-13-822)

9:00AM (896) *On the core of an ideal.* Preliminary report.
Claudia Polini, Hope College (939-13-782)

9:30AM (897) *Symbolic powers and integral closures of ideals in regular rings.* Preliminary report.
Craig Huneke, University of Kansas (939-13-46)

10:00AM (898) *A generalization of the Hilbert function.* Preliminary report.
J. Bruce Fields, University of Michigan (939-13-659)

10:30AM (899) *Bézout's theorem for quantum $\mathbb{P}^2$s.*
Izuru Mori, The University of Texas at Arlington (939-16-256)

AMS Special Session on Computational Algebraic Geometry for Curves and Surfaces, III

8:00 AM – 10:50 AM

Organizers: **Mika K. Seppala**, Florida State University
Emil J. Volcheck, National Security Agency

8:00AM (900) *About the numerical uniformization of real hyperelliptic curves.* Preliminary report.
Peter Buser, EPF, Lausanne (939-53-1158)

8:30AM (901) *Equations for real hyperelliptic hyperbolic surfaces.* Preliminary report.
Robert Silhol, Université de Montpellier II (939-14-1075)

9:00AM Break.

9:30AM (902) *Experiments with polynomials having prescribed branch values.* Preliminary report.
Kenneth Stephenson, University of Tennessee, Knoxville (939-30-634)

10:00AM (903) *Numerical uniformization of piecewise flat surfaces.* Preliminary report.
Philip L. Bowers*, FSU, and **Kenneth Stephenson**, UTK (939-14-1109)

10:30AM (904) *Using circle packings to approximate conformal weldings.*
George Brock Williams, University of Tennessee (939-52-65)

AMS Special Session on the Mathematics of the Navier-Stokes Equations, III

8:00 AM – 10:45 AM

Organizers: **Peter A. Perry**, University of Kentucky
Zhong-Wei Shen, University of Kentucky

8:00AM ▸ (905) *Determining degrees of freedom for the Navier-Stokes equations.*
Don A. Jones, Arizona State University (939-76-508)

8:30AM (906) *Additive turbulent decomposition of the Navier-Stokes equations: Structure and mathematical questions.*
James M. McDonough, University of Kentucky (939-76-264)

9:00AM (907) *The additive turbulent decomposition method for the incompressible Navier-Stokes equations on thin three-dimensional domains.*
Douglas A. Riley, University of Kentucky (939-65-617)

9:30AM (908) *Strong solutions to the incompressible Navier-Stokes equations in the half-space.*
Marco Cannone, **Fabrice Planchon**, Université Paris VII, and **Maria Elena Schonbek***, University of California Santa Cruz (939-76-430)

10:00AM (909) *Approximation dynamics and the Navier-Stokes equations.*
George R. Sell, University of Minnesota (939-35-263)

MAA Minicourse #11: Part B

8:00 AM – 10:00 AM

Creating interactive texts in Mathematica.
Organizer: **John R. Wicks**, North Park University

MAA Minicourse #16: Part B

8:00 AM – 10:00 AM

Using hand-held CAS throughout the mathematics curriculum.
Organizers: **Wade Ellis**, West Valley College
L. Carl Leinbach, Gettysburg College
Bert K. Waits, Ohio State University

AMS Session on Topological Groups and Lie Groups

8:00 AM – 10:25 AM

8:00AM ▸ (910) *Inductive algebras for* SL(2, $\mathbb{R}$).
Murali K. Vemuri*, Colgate University, and **Tim Steger**, Università degli studi di Sassari (939-22-178)

8:15AM (911) *Path-connected topological groups.*
Laurie A. Edler, University of Southwestern Louisiana (939-22-608)

8:30AM (912) *Right simple subsemigroups and right subgroups of compact convergence semigroups.*
Shing S. So, Central Missouri State University (939-22-885)

8:45AM (913) *Efficient bases for adjoint representations of semisimple Lie algebras.*
Robert G. Donnelly, Murray State University (939-22-1083)

9:00AM (914) *Duality for flag domains.* Preliminary report.
Joseph A. Wolf, University of California (939-22-1175)

9:15AM ▸ (915) *Wave graph bases of tensor invariants of classical Lie groups and algebras.*
Aleksandrs Mihailovs, SUNY College at Oneonta (939-22-1177)

9:30AM ▸ (916) *LCA groups with splitting subgroup of all compact elements and Pontrjagin duality.* Preliminary report.
Peter Loth, Sacred Heart University (939-22-52)

9:45AM (917) *On level two representations of $A_7^{(2)}$.*
Robert T. Harger, High Point University (939-17-78)

10:00AM (918) *A unification of several results on nilpotent Lie algebras.* Preliminary report.
Bill Yankosky, North Carolina State University (939-17-346)

10:15AM (919) *Müntz-Szasz theorems for nilpotent Lie groups.*
Darwyn C. Cook, Daniel Webster College (939-43-56)

AMS Session on Operator Theory

8:00 AM – 10:55 AM

8:00AM (920) *The abstract banc method in extension problems for almost periodic matrix functions.* Preliminary report.
Leiba Rodman*, **Ilya M. Spitkovsky** and **Hugo J. Woerdeman**, College of William and Mary (939-47-33)

8:15AM (921) *Essential norm estimates of composition operators on the Bloch and Besov spaces.*
Robert L. Donaway, University of Virginia (939-47-90)

8:30AM (922) *Hankel operators between Bergman spaces.*
Ruhan Zhao, Kyoto University, Japan (939-47-207)

8:45AM (923) *Toeplitz operators on the Bergman and Hardy spaces.* Preliminary report.
Kathryn M. Lewis, Purdue University (939-47-228)

9:00AM (924) *Boundary multiplicity and filling a hole in the essential spectrum.* Preliminary report.
George R. Exner*, Bucknell University, and **Bernard Chevreau**, Universite de Bordeaux I (939-47-458)

9:15AM (925) *Composition operators acting between Hardy spaces.*
Thomas E. Goebeler Jr., University of Virginia (939-47-614)

9:30AM (926) *A degree-theoretic approach for a variational inequality of Von Kármán type.*
Dan D. Pascali, Courant Institute, NYU (939-47-749)

9:45AM (927) *Real C*-algebras, united K-theory, and the Künneth formula.* Preliminary report.
Jeffrey L. Boersema, University of Oregon (939-47-802)

10:00AM (928) *Introversion operators.* Preliminary report.
Amir A. Maleki, Howard University (939-47-878)

10:15AM (929) *Derivations of limit algebras.*
Randall Crist*, Creighton University, **Allan Donsig**, University of Nebraska-Lincoln, **Timothy Hudson** and **Elias Katsoulis**, East Carolina University (939-47-888)

10:30AM (930) *Semigroups of isometries of the Bergman space.* Preliminary report.
William E. Hornor*, University of Southern Mississippi, and **James E. Jamison**, University of Memphis (939-47-1135)

10:45AM (931) *Grunsky transformation for the upper half plane.*
Subhajit Ghosechowdhury, University of Missouri (939-47-1150)

AMS Session on Combinatorics, II

8:00 AM – 10:40 AM

8:00AM (932) *Large sets often have large partition regular structures.* Preliminary report.
Vitaly Bergelson, Ohio State University, and **Neil Hindman***, Howard University (939-05-505)

8:15AM (933) *Some properties of the conjugacy classes of the hyperoctahedral group.* Preliminary report.
Robert V. Gill, Illinois Wesleyan University (939-05-516)

8:30AM (934) *Construction of partial difference sets using Galois rings.* Preliminary report.
John B. Polhill Jr., University of Virginia (939-05-613)

8:45AM (935) *Permutations enumerated by The Schröder numbers.*
Darla J. Kremer, Murray State University (939-05-623)

9:00AM ▸ (936) *O, IO, ICO matroids.* Preliminary report.
Vadim Ponomarenko, University of Wisconsin, Madison (939-05-745)

9:15AM (937) *Turan problems for weighted Graphs .*
Andre Kundgen* and **Zoltan Furedi**, University of Illinois (939-05-773)

9:30AM (938) *Vertex partitions in directed graphs with bounded indegree.*
Eric W. Aurand, Texas A&M-Commerce (939-05-795)

9:45AM ▸ (939) *Root sets of polynomials modulo prime powers.*
Davesh Maulik, Harvard University (939-05-809)

10:00AM ▸ (940) *Extremal problems on weighted graphs.* Preliminary report.
John Allen Kuchenbrod, University of Kentucky (939-05-810)

10:15AM (941) *Complexity of vertex transitive graphs.* Preliminary report.
Milan Randić, Drake University (939-05-840)

10:30AM (942) *Hypergraphical designs.*
Cheryl L. Olsen, Shippensburg University (939-05-845)

AMS Session on Applications, II

8:00 AM – 9:40 AM

8:00AM ▸ (943) *An algorithmic version of Kuhn's lone-divider method of fair division.*
Bryan Dawson, Union University (939-90-312)

8:15AM (944) *Potential, recursive definitions and reduction to Shapley value, for values of cooperative T.U. games.*
Irinel C. Dragan, University of Texas Arlington (939-90-426)

8:30AM ▸ (945) *Group decisions and preference ranking based on fuzzy expert information.*
Alexey L. Sadovski, Texas A&M University-Corpus Christi (939-90-596)

8:45AM (946) *An extremum problem with application to vibration suppression in a beam.* Preliminary report.
N. G. Medhim*, Clark Atlanta University, and **M. Sambandham**, Morehouse College (939-49-864)

9:00AM (947) *Suppression of coupled parallel structural vibration systems via velocity feedback controllers.*
Mahmoud Najafi, Kent State University (939-00-1119)

9:15AM ▸ (948) *Grand Canyon River Trip Simulator Project.* Preliminary report.
Catherine A. Roberts, Northern Arizona University (939-00-919)

9:30AM (949) *Nonlinear waves of a two layer compressible fluid.* Preliminary report.
Jeongwhan Choi, Korea University, Seoul, Korea (939-76-1213)

MAA Session on Discrete Mathematics Revisited, II

8:00 AM – 10:55 AM

Organizers: **Richard K. Molnar**, Macalester College
Suzanne M. Molnar, College of St. Catherine

8:00AM (950) *Discrete mathematics: One person's view of the present and the future.*
William A. Marion, Valparaiso University (939-J1-299)

8:20AM (951) *Discrete mathematics: Queen and servant of computer science.*
Wayne M. Dymacek, Washington and Lee University (939-J1-489)

8:40AM (952) *Discrete mathematics for mathematics and computer science students.*
Nancy L. Hagelgans, Ursinus College (939-J1-337)

9:00AM ▸ (953) *Introduction to discrete mathematics with ISETL.* Preliminary report.
William E. Fenton, Bellarmine College (939-J1-250)

9:20AM ▸ (954) *Teaching and learning discrete mathematics through undergraduate research.* Preliminary report.
Anant P. Godbole, Michigan Tech University (939-J1-214)

9:40AM ▸ (955) *Establishing a summer program in discrete mathematics.* Preliminary report.
Glenn Acree* and **Tosha Stanley**, Belmont University (939-J1-1126)

10:00AM ▸ (956) *Constructivist hypertext support materials for post-secondary discrete mathematics courses aimed at retraining secondary teachers.*
Nancy Casey, Institute for Studies in Educational Mathematics and University of Idaho (939-J1-1088)

10:20AM ▸ (957) *Discrete mathematics: A basis and gateway for learning mathematics.*
Tabitha T. Mingus, Western Michigan University, and **Richard M. Grassl***, University of Northern Colorado (939-J1-682)

10:40AM Discussion.

MAA Panel Discussion

8:00 AM – 9:20 AM

Life after retirement.
Organizer: **Andrew Sterrett Jr.**, Denison University

AWM Workshop

8:20 AM – 4:00 PM

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

8:30 AM – 10:50 AM

Organizers: **John E. Meier**, Lafayette College
Leonard A. VanWyk, James Madison University

8:30AM ▸ (958) *Chaotic attractors and evolving planar symmetry.*
Jeffrey P. Dumont*, Lafayette College, **Flynn J. Heiss**, SUNY Geneseo, and **Kevin C. Jones**, Univ. Illinois at Chicago (939-58-275)

9:00AM ▸ (959) *Computing homoclinic bifurcations.* Preliminary report.
Suzanne Michelle Shontz, University of Northern Iowa (939-34-294)

9:30AM ▸ (960) *Lengths of geodesics on Klein's quartic curve.* Preliminary report.
Ryan Derby-Talbot, Pomona College (939-14-1174)

10:00AM ▸ (961) *The geometry for $PSL_2(Z[i])$.* Preliminary report.
Mary Elizabeth Cassells, Lafayette College (939-20-744)

10:30AM ▸ (962) *Investigations in polynomial knots.*
Melanie Pivarski*, Carnegie Mellon University, **Eva P. Curry**, University of Maine, **Eli Bohmer Lebow**, Harvard University, **Bryant Mathews**, Simon's Rock College, and **Sang Pahk**, Williams College (939-55-1032)

AMS-MAA Special Session on The History of Mathematics, III

8:30 AM – 10:50 AM

Organizers: **Karen H. Parshall**, University of Virginia
Victor J. Katz, University of the District of Columbia

8:30AM ▸ (963) *The least time principle.* Preliminary report.
James J. McCarry, Laredo Community College (939-01-524)

9:00AM ▸ (964) *Charles Hermite and Franco-German relations in mathematics, 1870-1885.*
Thomas Archibald, Acadia University (939-01-69)

9:30AM ▸ (965) *Arthur Cayley, Ernst Schröder and Newton's method.* Preliminary report.
Daniel S. Alexander, Drake University (939-01-441)

10:00AM (966) *Some confusion surrounding early notions of convergence.* Preliminary report.
Mark McKinzie*, University of Wisconsin, and **Curtis Tuckey**, Bell Laboratories (939-01-528)

10:30AM ▸ (967) *Why do we use 'm' for slope?* Preliminary report.
Rickey A. Kolb, and **V. Frederick Rickey***, U. S. Military Academy (939-01-911)

AMS Special Session on Bergman Spaces and Related Topics, III

8:30 AM – 10:50 AM

Organizers: **Peter L. Duren**, University of Michigan, Ann Arbor
Michael Stessin, SUNY at Albany

8:30AM (968) *Zero-free invariant subspaces in weighted Bergman spaces.*
Alexander Borichev, CNRS, University of Bordeaux I (939-46-329)

9:00AM (969) *On a theorem of W.K. Hayman.* Preliminary report.
Boris Korenblum, University at Albany, SUNY (939-30-68)

9:30AM (970) *Analytic functions having bounded variations of radial and orthogonal projections .* Preliminary report.
Thomas H. MacGregor, University at Albany, SUNY (939-30-63)

10:00AM (971) *Multiple interpolation and extremal functions in Bergman spaces.*
Haakan Hedenmalm, Lund University, **Mark Krosky**, University of Michigan, and **Alexander Schuster***, Washington University (939-30-342)

10:30AM (972) *Wandering property in the Bergman space.* Preliminary report.
Brent J. Carswell*, SUNY at Albany, **Peter L. Duren**, University of Michigan, and **Michael I. Stessin**, SUNY at Albany (939-30-76)

AMS Special Session on Operator Algebras and Applications, III

8:30 AM – 10:50 AM

Organizers: **Allan P. Donsig**, University of Nebraska–Lincoln
Nik Weaver, Washington University

8:30AM (973) *Analytic crossed products of Cuntz-Krieger algebras.*
Miron E. Shpigel, University of Waterloo (939-47-341)

9:00AM (974) *Epimorphisms of nest algebras.*
Kenneth R. Davidson*, University of Waterloo, **Kenneth J. Harrison**, Murdoch University, and **John L. Orr**, University of Nebraska (939-47-1029)

9:30AM (975) *Some primitive triangular operator algebras, their structure spaces and their epimorphisms.*
Elias G. Katsoulis, East Carolina University (939-47-309)

10:00AM (976) *Outer automorphisms of TAF algebras (joint work with Steve Power).* Preliminary report.
Justin R. Peters, Iowa State University (939-47-158)

10:30AM (977) *Cohomology of topological graphs and Pimsner algebras.* Preliminary report.
Valentin Deaconu*, **Alexander Kumjian**, University of Nevada, Reno, and **Paul S. Muhly**, University of Iowa (939-46-404)

AWM Presentations by Recent Women Ph.D.s, I

8:30 AM – 10:20 AM

8:30AM (978) *Complete sets of orthogonal frequency hypercubes and their connections to affine resolvable designs.*
Ilene H. Morgan, University of Missouri-Rolla

9:00AM (979) *Unexpectedly linear behavior for the Cahn-Hilliard equation.*
Evelyn Sander, George Mason University

9:30AM (980) *Subfactors and an algebra of paths on trees.*
Bina Bhattacharyya, University of Ottawa/University of Rome

10:00AM (981) *Subgroup separability: A blending of number theory, geometry, and topology.*
Elizabeth S. Allman, University of North Carolina, Asheville

MAA-National Alliance of State Science and Mathematics Coalitions Panel Discussion

8:30 AM – 10:00 AM

State standards.
Moderator: **Henry Alder**, University of California-Davis
Organizers: **Kenneth A. Ross**, University of Oregon
Joan F. Donahue, NASSMC
Panelists: **Alice Gill**, American Federation of Teachers
Ralph A. Raimi, University of Rochester
Presenters: **Rolf Blank**, Council of Chief State School Officers
Joseph Rosenstein, New Jersey Mathematics Coalition

MAA Invited Address

9:00 AM – 9:50 AM

▸ (982) *Convex polytopes and partially ordered sets.*
Rodica Simion, The George Washington University (939-05-1019)

ASL Invited Address

9:00 AM – 9:50 AM

(983) *Understanding automorphisms using templates.*
Robert I. Soare, University of Chicago

AMS Special Session on Dynamical, Spectral, and Arithmetic Zeta-Functions, III

9:00 AM – 10:50 AM

Organizers: **Michel L. Lapidus**, University of California, Riverside
Machiel van Frankenhuysen, Institut des Hautes Études Scientifiques

9:00AM (984) *On zeros of linear combinations of Euler products.*
Dennis A. Hejhal, University of Minnesota and Uppsala University (939-11-1202)

9:30AM (985) *The transfer operator approach to Selberg's zeta function for subgroups of the modular group.* Preliminary report.
Dieter H. Mayer, University of Clausthal (939-58-370)

10:00AM (986) *Patterson's conjecture and the divisor of Selberg's zeta function for Kleinian groups.*
Samuel J. Patterson, Universität Göttingen, and **Peter A. Perry***, University of Kentucky (939-58-443)

10:30AM ▸ (987) *Dynamical zeta functions in Nielsen theory and Reidemeister torsion.*
Alexander L Fel'shtyn, E.-M.-Arndt-Universitat Greifswald (939-58-697)

MAA/ARUME Poster Session

9:00 AM – 11:00 AM

Organizers: **Julie Clark**
Annie Selden, Tenessee Technological University
John Selden, MERC

MAA Special Presentation on the Legacy of R. L. Moore

9:00 AM – 9:00 PM

Organizers: **Albert C. Lewis**, Indiana University-Purdue University Indianapolis
Ben G. Fitzpatrick, North Carolina State University
Donald J. Albers, MAA

NAM Panel Discussion

9:00 AM – 10:00 AM

Effective networking and research dialogue via teleconferences/telecommunication.
Moderator: **Leon C. Woodson**, Morgan State University
Panelists: **James C. Turner**, Arizona State University

Mathematical Sciences Employment Register

9:00 AM – NOON

Interviews only.

Book Sales and Exhibits

9:00 AM – NOON

MAA Presentation

9:30 AM – 10:50 AM

Planning for retirement.
Organizer: **Carol Shaw**, MAA

NAM Business Meeting

10:00 AM – 10:55 AM

MAA Invited Address

10:05 AM – 10:55 AM

(988) *Experimental mathematics: Insight from computation.*
Jonathan M. Borwein, Simon Fraser University (939-68-81)

ASL Invited Address

10:20 AM – 11:10 AM

(989) *Aspects of nonlocal compactness.*
Slawomir J. Solecki, University of Indiana

AWM Graduate Student Poster Session

10:30 AM – 11:00 AM

10:30AM Posters will remain on display all morning:

(990) *The gain of regularity for the KP-II equation.*
Julie L. Benson, Brown University

(991) *Isothermic tori with planar lines of curvature.*
Holly E. Bernstein, Washington University in St. Louis

(992) *Twisted torsion on compact hyperbolic spaces.*
Maria G. Fung, Cornell University

(993) *On Artin's conjecture for icosahedral representations.*
Theresa Girardi, Rutgers University

(994) *Hecke C*-Algebras.*
Rachel W. Hall, Pennsylvania State University

(995) *Norms of powers and a central limit theorem for complex-valued probabilities.*
Natalia A. Humphreys, Ohio State University

(996) *Stochastic models of physical systems.*
Edna W. James, Iowa State University

(997) *Adams operations and the Dennis trace map.*
(Miriam) Ruth Kantoravitz, University of Illinois at Urbana-Champaign

(998) *The influence of two moving heat sources on blow-up in a reactive-diffusive medium.*
Colleen Margarita Kirk, Northwestern University

(999) *The behavior of relative entropy in the hydrodynamic scaling limit.*
Elena Kosygina, Courant Institute of Mathematical Sciences/NYU

(1000) *Another reason why exceptional Weyl groups are exceptional.*
Amy E. Ksir, University of Pennsylvania

(1001) *The relaxation limit in a biodegradation model.*
Regan E. Murray, University of Arizona

(1002) *Transport equations and velocity averages.*
Guergana Petrova, University of South Carolina

(1003) *Positivity preserving numerical schemes for lubrication type equations.*
Liya Zhornitskaya, Duke University

MAA Business Meeting

11:10 AM – 11:40 AM

AMS Business Meeting

11:45 AM – 12:15 PM

ASL Invited Address

12:30 PM – 1:20 PM

(1004) *Simple theories.*
Anand Pillay, University of Illinois at Urbana-Champaign

AWM Workshop Panel Discussion

12:30 PM – 2:00 PM

Launching a career in mathematics.
Moderator: **Catherine A. Roberts**, Northern Arizona State University
Panelists: **Susan C. Geller**, Texas A&M University
Deborah Frank Lockhart, National Science Foundation
Elizabeth W. McMahon, Lafayette College

NAM William W.S. Claytor Lecture

1:00 PM – 2:00 PM

▸ (1005) *Maximum cliques and minimum colorings in graphs.*
Earl R. Barnes, Georgia Institute of Technology (939-05-1030)

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

1:00 PM – 3:40 PM

Organizers: **John E. Meier**, Lafayette College
Leonard A. VanWyk, James Madison University

1:00PM ▸ (1006) *Weight distributions for certain codes.* Preliminary report.
Sukaina Alarakhia*, Mount Holyoke College, **Paul Lambert**, Furman University, **Tom Wexler**, Amherst College, and **Liangyi Zhao**, Rutgers University (939-11-718)

2:00PM ▸ (1007) *Minimal volume maximal cusps.*
Colin C. Adams, Williams College, **David P. Biddle***, SUNY Binghamton, **Carol A. Gwosdz**, University of Dallas, **Katherine A. Paur**, MIT, and **Scott B. Reynolds**, Williams College (939-57-928)

3:00PM ▸ (1008) *The topological fundamental group and generalized covering spaces.*
Daniel Biss, Harvard University (939-22-1206)

AMS-AWM Special Session on Geometry in Dynamics, IV

1:00 PM – 5:50 PM

Organizer: **Krystyna Kuperberg**, Auburn University

1:00PM (1009) *Fixed-point problems in continuum theory.*
Charles L. Hagopian, California State University, Sacramento (939-54-450)

2:00PM (1010) *Some problems on 0-dimensional subsets of hyperspaces.*
Alejandro Illanes, Universidad Nacional Autónoma de México (939-54-974)

2:30PM (1011) *Induced Maps on Knaster Continua.* Preliminary report.
Piotr Minc, Auburn Univewsity (939-54-838)

3:00PM (1012) *Flowbox manifolds and homogeneous continua containing an arc and no simple triod.* Preliminary report.
Janusz R. Prajs, Opole University, Texas Tech University (939-54-760)

3:30PM (1013) *More monotone open homogeneous locally connected plane continua.*
Carl R. Seaquist, Texas Tech University (939-54-691)

4:00PM (1014) *Symmetric producs and Q-manifolds.*
Alejandro Illanes, **Sergio Macias***, National University of Mexico, and **Sam B. Nadler Jr.**, West Virginia University (939-54-267)

4:30PM (1015) *Pseudo-arcs, category, and probability.* Preliminary report.
Wayne Lewis, Texas Tech University (939-54-829)

5:00PM ► (1016) *Shape and Morse theory of attractors.*
Lev Kapitanski and **Igor Rodnianski***, Kansas State University (939-58-1007)

5:30PM (1017) *Almost periodic foliations.* Preliminary report.
Alex D. Clark, University of North Texas (939-58-826)

AMS Special Session on Bergman Spaces and Related Topics, IV

1:00 PM – 3:20 PM

Organizers: **Peter L. Duren**, University of Michigan, Ann Arbor
Michael Stessin, SUNY at Albany

1:00PM (1018) *Relative asymptotic behavior of Cauchy and Poisson integrals of singular measures.*
Alexei G. Poltoratski, Texas A&M (939-30-344)

1:30PM (1019) *Norm convergence of normalized iterates and the growth of Koenigs maps.*
Pietro Poggi-Corradini, Kansas State University (939-30-22)

2:00PM (1020) *Horowitz products in Bergman spaces.* Preliminary report.
Anton K. Kim, The University of Michigan (939-30-807)

2:30PM (1021) *Radial behavior of analytic functions with growth restrictions.* Preliminary report.
Catherine A. Beneteau, University at Albany (939-30-641)

3:00PM (1022) *Bieberbach polynomials and Bergman kernel methods in conformal mapping.*
Igor E. Pritsker, Case Western Reserve University (939-30-564)

AMS Special Session on Commutative Algebra and Algebraic Geometry, IV

1:00 PM – 4:50 PM

Organizers: **Roger A. Wiegand**, University of Nebraska and Purdue University
Susan Elaine Morey, Southwest Texas State University

1:00PM (1023) *A variation of a theorem off Vasconcelos.*
Daniel A. Smith, University of Illinois (939-13-73)

1:30PM ► (1024) *On the equations of the edge cone of a graph and some applications.*
Rafael H. Villarreal, CINVESTAV-IPN (939-13-198)

2:00PM (1025) *Asymptotic behaviour of Castelnuovo-Mumford regularity.*
Steven Dale Cutkosky*, University of Missouri, **Juergen Herzog**, University of Essen, Germany, and **N. V. Trung**, University of Hanoi, Vietnam (939-13-702)

2:30PM (1026) *A length inequality for one-dimensional local rings.* Preliminary report.
Donatella Delfino, Hope College, Holland, MI 49422 (939-13-635)

3:00PM (1027) *Hilbert functions and homogeneous generic forms.*
Vesselin N. Gasharov, Cornell University (939-13-572)

3:30PM (1028) *Computing local cohomology with monomial supports.* Preliminary report.
David Eisenbud*, MSRI and UC Berkeley, **Mircea Mustata**, UC Berkeley, and **Mike Stillman**, Cornell University (939-13-556)

4:00PM (1029) *Monomial resolutions.* Preliminary report.
Irena V. Peeva, Cornell University (939-13-571)

4:30PM (1030) *Socle dimensions in quotients of monomial rings.* Preliminary report.
Carolyn A. Yackel, Indiana University (939-13-97)

AMS Special Session on Operator Algebras and Applications, IV

1:00 PM – 4:20 PM

Organizers: **Allan P. Donsig**, University of Nebraska–Lincoln
Nik Weaver, Washington University

1:00PM (1031) *Operator algebras, interpolation and computability.* Preliminary report.
Vern Ival Paulsen, University of Houston (939-47-841)

2:00PM (1032) *Regularity revisited.* Preliminary report.
Charles A. Akemann*, UC Santa Barbara, and **Soren Eilers**, Copenhagen University (939-46-348)

2:30PM (1033) *Structure theory of higher order Hankel forms.* Preliminary report.
Sarah H. Ferguson*, Wayne State University, and **Richard Rochberg**, Washington University (939-47-942)

3:00PM (1034) *Continuous maps between ideals spaces of C*-algebras.*
May M. Nilsen, University of Nebraska-Lincoln (939-46-938)

3:30PM (1035) *Hochschild cohomolgy of operator algebras and duality.* Preliminary report.
Corran Webster, Texas A&M Univeristy (939-47-1038)

4:00PM (1036) *Problems and progress in non-self adjoint operator algebras.*
David R. Pitts, University of Nebraska (939-47-1144)

AMS Special Session on Computational Algebraic Geometry for Curves and Surfaces, IV

1:00 PM – 3:00 PM

Organizers: **Mika K. Seppala**, Florida State University
Emil J. Volcheck, National Security Agency

1:00PM Discussion and software demonstrations.

AMS Special Session on The Mathematics of the Navier-Stokes Equations, IV

1:00 PM – 3:20 PM

Organizers: **Peter A. Perry**, University of Kentucky
Zhong-Wei Shen, University of Kentucky

1:00PM (1037) *Regularity of solutions of the Navier-Stokes system in a rotating frame.*
Anatoli V. Babin, University of California at Irvine (939-35-590)

1:30PM (1038) *Large time asymptotic expansion of solutions of the Navier-Stokes equations on R^d.*
Daniel B. Dix, University of South Carolina (939-35-502)

2:00PM (1039) *Heat transport in rotating convection.*
Peter Constantin, **Chris Hallstrom*** and, **Vachtang Putkaradze**, University of Chicago (939-35-233)

2:30PM (1040) *Homoclinic orbits to multi-pulsed traveling-wave solutions of a Boussinesq system.* Preliminary report.
Min F. Chen, Penn State (939-65-904)

2:50PM Discussion.

MAA Minicourse #14: Part B

1:00 PM – 3:00 PM

An introduction to wavelets.
Organizer: **Colm K. Mulcahy**, Spelman College

MAA Minicourse #15: Part B

1:00 PM – 3:00 PM

Music and mathematics.
Organizer: **Leon Harkelroad**, Bard College

MAA Minicourse #6: Part B

1:00 PM – 3:00 PM

Cooperative learning in undergraduate mathematics education.
Organizers: **Barbara E. Reynolds**, Cardinal Stritch University
William E. Fenton, Bellarmine College

AMS Session on Ordinary Differential Equations and Dynamical Systems

1:00 PM – 3:40 PM

1:00PM ▸ (1041) *Modal decomposition of hopping states in cellular flames.*
Antonio Palacios, University of Houston (939-34-74)

1:15PM (1042) *Coexistence of a strange attractor and periodic orbits for the Duffing equation.* Preliminary report.
Ching Lu, Southern Illinois University at Edwardsville (939-34-224)

1:30PM (1043) *Triple positive symmetric solutions for a lidstone boundary value problem.*
John M. Davis* and **Johnny Henderson**, Auburn University (939-34-327)

1:45PM (1044) *Dynamics of automata networks.*
S. Sivasundaram*, Embry-Riddle Aeronautical University, and **S. Vassilyev**, Inst. of System Dynamics and Control Theory (939-34-378)

2:00PM (1045) *Extremal properties of eigenvalues.* Preliminary report.
Charlotte A. Knotts-Zides, University of Tennessee at Knoxville (939-34-678)

2:15PM ▸ (1046) *Shock layer solutions for a semilinear class of boundary value problems.*
Stephen J. Kirschvink, San Diego State University (939-34-780)

2:30PM (1047) *On neutral stochastic functional differential equations with casual operators.*
Zephyrinus C. Okonkwo*, Alabama State University, and **James C. Turner Jr.**, Arizona State University (939-34-870)

2:45PM (1048) *Existence of positive solutions of nonlinear third order differential systems.* Preliminary report.
Denise T. Reid, Valdosta University, and **William K.C. Yin***, LaGrange College (939-34-914)

3:00PM (1049) *Stabilization of nonholonomic systems using isospectral flows.*
Anthony M. Bloch, Univ. of Michigan, **Sergey V. Drakunov**, Tulane University, and **Michael K. Kinyon***, Indiana University South Bend (939-93-646)

3:15PM ▸ (1050) *Smooth dependence of solutions of dynamical systems on measure chains.* Preliminary report.
Bonita A. Lawrence, University of South Carolina - Beaufort Campus (939-93-734)

3:30PM (1051) *Multiple valued dynamics of shift and complementation on the unit interval.* Preliminary report.
Richard E. Lampe, Emory and Henry College (939-58-1113)

AMS Session on Topology

1:00 PM – 4:25 PM

1:00PM (1052) *A Lefschetz-type coincidence theorem.*
Peter Saveliev, University of Illinois at Urbana-Champaign (939-55-121)

1:15PM (1053) *Coincidences of maps into homogeneous spaces.*
Peter N. Wong, Bates College (939-55-223)

1:30PM (1054) *On the $RO(G)$-graded equivariant ordinary cohomology of generalized G-cell complexes for $G = \mathbb{Z}/p$.*
Kevin K. Ferland, Syracuse University (939-55-241)

1:45PM (1055) *The Hopf ring for the spectrum bo.* Preliminary report.
Dena S. Cowen, John Carroll University (939-55-716)

2:00PM (1056) *Duals of stable summands of $B\mathbf{Z}/p$.*
David J. Hunter, North Central College (939-55-741)

2:15PM (1057) *Positionings of essential tori in link complements.* Preliminary report.
Val Pinciu, Southern Connecticut State University (939-55-1134)

2:30PM ▸ (1058) *Visualizing space-filling curves with fractals and web publishing.*
Mark D. Meyerson, U.S. Naval Academy (939-54-137)

2:45PM (1059) *On Sorgenfrey's half-open square convergence.* Preliminary report.
Jamuna P. Ambasht, Benedict College (939-54-756)

3:00PM (1060) *Some contractible manifolds with disjoint spines.* Preliminary report.
Manuel J. Sanders III, University of Tennessee (939-57-583)

3:15PM (1061) *Group-categories and their field theories.*
Frank Quinn, Virginia Tech (939-57-861)

3:30PM (1062) *Applications of the disjoint homotopies property to products of generalized manifolds with the line.* Preliminary report.
Denise M. Halverson, University of Tennessee at Knoxville (939-57-880)

3:45PM (1063) *Generating expessions for finite type invariants from oriented trivalent graphs.* Preliminary report.
Daylene Zielinski, Bellarmine College (939-57-1117)

4:00PM (1064) *New invariants for dynamical systems on disconnected topologies.*
Paul Feit, University of Texas of the Permian Basin (939-18-77)

4:15PM (1065) *Parity quasi-complexes and non-abelian cohomology.*
Lucian M. Ionescu, Kansas State University (939-18-326)

AMS Session on Combinatorics, III

1:00 PM – 3:25 PM

1:00PM ▸ (1066) *The average connectivity of a graph.*
Lowell W. Beineke*, Indiana University Purdue University Fort Wayne , **Ortrud R. Oellermann**, The University of Winnipeg, and **Raymond E. Pippert**, Indiana University Purdue University Fort Wayne (939-05-857)

1:15PM ▸ (1067) *Chromatic polynomials and their extreme graphs.* Preliminary report.
Italo Simonelli, Texas A&M University-Commerce (939-05-882)

1:30PM ▸ (1068) *Asymptotic comparisons of forbidden patterns.* Preliminary report.
Alexander Burstein, University of Rhode Island (939-05-949)

1:45PM ▸ (1069) *Avoidable sets in groups, and another special property of the Fibonacci sequence.*
Michael L. Develin, Harvard University (939-05-1036)

2:00PM ▸ (1070) *Rectangle-visibility layouts of unions and products of trees.*
Alice M. Dean*, Skidmore College, and **Joan P. Hutchinson**, Macalester College (939-05-1049)

2:15PM ▸ (1071) *Some new Z-cyclic Whist tournaments.* Preliminary report.
Norman J. Finizio and **Adele J. Merritt***, University of Rhode Island (939-05-1067)

2:30PM (1072) *Some specializations of pitch tournament designs.*
Norman J. Finizio and **Scott J. Lewis***, University of Rhode Island (939-05-1115)

2:45PM ▸ (1073) *Candies and dollars.* Preliminary report.
Saad M. Adnan, MVSU, Itta Bena, MS (939-05-1204)

3:00PM (1074) *Limiting distributions for characteristics of random interval graphs and random coincidence graphs.*
Bernard Harris, University of Wisconsin, Madison (939-05-1205)

3:15PM ▸ (1075) *Vertex-neighbor-integrity of expanders, magnifiers, and hypercubes.*
Marci J. Gambrell, University of Chicago (939-05-289)

AMS Session on Convex Geometry

1:00 PM – 1:40 PM

1:00PM (1076) *On the geometry of locally nonconical convex sets.*
Glenn C. Shell, Lincoln University of Missouri (939-52-29)

1:15PM (1077) *Secondary polytopes of two-dimensional point sets with few interior points.* Preliminary report.
Wendy A. Weber, University of Kentucky (939-52-684)

1:30PM ▸ (1078) *The Moon, the Sun, and convexity.*
Noah S. Brannen, Samford University (939-52-237)

MAA Session on Projects That Work in Applied Mathematics Courses, II

1:00 PM – 5:15 PM

Organizers: **Alexandra Kurepa**, North Carolina A&T State University
Henry A. Warchall, University of North Texas

1:00PM ▸ (1079) *Applications projects as course threads.*
Dick Jardine, U.S. Military Academy (939-K1-819)

1:30PM ▸ (1080) *Quaking mathematics.* Preliminary report.
Richard J. Marchand, U.S. Military Academy (939-K1-671)

2:00PM (1081) *A mathematical investigation in physics: PDEs and the hydrogen atom.*
Terry T. Crow, **Kelley B. Mohrmann*** and **Joseph D. Myers**, U.S. Military Academy (939-K1-232)

2:30PM ▸ (1082) *Interdisciplinary projects in numerical analysis.*
Richard D. West, U. S. Military Academy (939-K1-419)

3:00PM ▸ (1083) *Data rich projects from geo-, aero- and bio-sciences.*
Bruce N. Lundberg, University of Southern Colorado (939-K1-148)

3:15PM ▸ (1084) *Losing your head in linear algebra—Using computer graphics to enjoy linear transformations.*
Elsa J. Newman, Marymount University (939-K1-272)

3:30PM ▸ (1085) *Helping students solve their own problems: Teaching the entire process of problem solving and mathematical modeling using student-generated projects in applied mathematics courses.* Preliminary report.
Audrey F. Borchardt* and **Bruce Pollack-Johnson**, Villanova University (939-K1-1132)

3:45PM ▸ (1086) *Real-data projects in elementary and intermediate algebra.*
Elaine M. Hubbard, Kennesaw State University (939-K1-239)

4:00PM ▸ (1087) *Calculus and blood hematocrit.* Preliminary report.
Phil Gustafson, Mesa State College (939-K1-952)

4:15PM (1088) *Using hotel, restaurant, tourism administration applications to increase interest in calculus.*
Ronald J. Harshbarger and **Jane T. Upshaw***, University of South Carolina Beaufort (939-K1-797)

4:30PM ▸ (1089) *Project based teaching and learning mathematics for nonmathematics majors.*
Paul Kochanowski* and **Morteza Shafii-Mousavi**, Indiana University South Bend (939-K1-252)

4:45PM ▸ (1090) *Interdisciplinary undergraduate research projects.* Preliminary report.
Elias Deeba, **Andre deKorvin**, and **Xie Shishen***, University of Houston-Downtown (939-K1-1192)

5:00PM ▸ (1091) *Special topics in applied mathematics.* Preliminary report.
Alexandra Kurepa, North Carolina A&T State University (939-K1-586)

MAA Session on Innovative Use of Distance Learning Techniques to Teach Post-Secondary Mathematics, II

1:00 PM – 5:05 PM

Organizers: **Brian E. Smith**, McGill University
Marcelle Bessman, Jacksonville University

1:00PM ▸ (1092) *An experience to share: A hard beginning but worth it.*
Jose H. Giraldo, Texas A&M University-Corpus Christi (939-L1-618)

1:15PM (1093) *S.H.O.W.M.E.: SpearHeading Online Work in Mathematics Education.*
Gene D. Abrams* and **Jeremy A. Haefner**, University of Colorado at Colorado Springs (939-L1-725)

1:30PM (1094) *Distance learning from my perspective.*
Dick J. Clark, Portland Community College (939-L1-787)

1:45PM (1095) *Introduction to learning communities using an educational object economy.*
Daniel H. Steinberg, Oberlin College (939-L1-1152)

2:00PM (1096) *Interactive computer tools for distance learning of calculus for business and economics.*
Chris W. Doble*, **Jean Marie McDill**, Cal Poly, and **Agnes Rash**, St. Joseph's University (939-L1-926)

2:15PM (1097) *A successful interactive distance learning model for calculus.*
Cynthia A. Gonzalez* and **Sharon M. Barrs**, Georgia Southern University (939-L1-884)

2:30PM (1098) *NetMath at Illinois.*
J. J. Uhl, University of Illinois at Urbana (939-L1-631)

2:50PM (1099) *The connected curriculum project: Engineering mathematics.*
Lawrence C. Moore* and **David A. Smith**, Duke University (939-L1-772)

3:10PM (1100) *The connected curriculum project: Linear algebra.*
Stephanie Fitchett, **Lawrence C. Moore** and **David A. Smith***, Duke University (939-L1-771)

3:30PM (1101) *Immersive environments: The next step in interactivity.* Preliminary report.
William J. Mueller, Salem State College (939-L1-459)

3:50PM (1102) *Teaching mathematics in a classroom for the Twenty-first Century.*
Marcelle Bessman, Jacksonville University (939-L1-951)

4:10PM (1103) *Using a Trig review in distance learning.* Preliminary report.
Joan H. McCarter, Arizona State University (939-L1-720)

4:30PM (1104) *Mathematics courses via interactive television.*
Ellen M. Fischer* and **Sharon E. Taylor**, Georgia Southern University (939-L1-481)

4:50PM (1105) *Math drills and quizzes on the Internet.*
Philip B. Yasskin*, **Michael Stecher**, **G. Donald Allen** and **Maurice H. Rahe**, Texas A&M Univ. (939-L1-670)

MAA Session on Integrating Mathematics and Other Disciplines, III

1:00 PM – 5:25 PM

Organizers: **William G. McCallum**, University of Arizona
Nicholas T. Losito, SUNY at Farmingdale
Yajun Yang, SUNY at Farmingdale

1:00PM (1106) *Partnerships: Interdisciplinary workshops for faculty in mathematics and partner disciplines.* Preliminary report.
Tina H. Straley, Kennesaw State University, and **Brian J. Winkel***, U.S. Military Academy (939-M1-1116)

1:15PM (1107) *Science and technology core: An integration of math, physics and computing skills.* Preliminary report.
David R. Burns, West Virginia Wesleyan College (939-M1-1046)

1:30PM (1108) *S.C. ATE - pre engineering technology curriculum - an integrated approach.*
Elizabeth T. Higgins* and **Michael H. Farmer**, Greenville Technical College (939-M1-903)

1:45PM (1109) *An integrated pre-engineering curriculum.* Preliminary report.
Phillip L. Zenor* and **Thomas Shumpert**, Auburn University (939-M1-901)

2:00PM (1110) *Integrating mathematics and environmental engineering.*
Dick J. Jardine, U.S. Military Academy (939-M1-818)

2:15PM (1111) *The integrated engineering curriculum at Louisiana Tech University.*
Bernd Siegfried Walter Schröder* and **Jenna Price Carpenter**, Louisiana Tech University, Ruston, LA (939-M1-454)

2:30PM (1112) *A math, science, and technology interdisciplinary lively application of mathematics at the United States Military Academy.*
S. B. Horton*, **A. A. Napoli**, **W. Jerzak**, **E. J. Berkove** and **N. Prins**, U.S. Military Academy (939-M1-597)

2:45PM (1113) *Integrated math/physics at Union College.* Preliminary report.
Julius B. Barbanel, Union College (939-M1-511)

3:00PM (1114) *Moving beyond moving beyond myths.*
George T. Rublein, College of William and Mary (939-M1-1033)

3:15PM (1115) *Incorporation of industry applications with classroom instruction.*
Patty G. Monroe* and **Elizabeth T. Higgins**, Greenville Technical College (939-M1-890)

3:30PM (1116) *Formal demography in the classroom.*
Lyn H. Geisler III, Randolph-Macon College (939-M1-825)

3:45PM (1117) *Joint projects in a general education program.*
Philip S. Blau, College of General Studies, Boston University (939-M1-799)

4:00PM (1118) *Physics does not equal math, but talking helps.*
Jon L. Johnson* and **Marie Baehr**, Elmhurst College (939-M1-601)

4:15PM (1119) *A truly interdisciplinary mathematics/ science course.* Preliminary report.
Phillip E. McNeil, Norfolk State University (939-M1-549)

4:30PM (1120) *An interdisciplinary science course for the non-science major.*
Linda C. Thiel, Ursinus College (939-M1-527)

4:45PM (1121) *Linking mathematics and business.*
Florence S. Gordon*, **Sharon Petrushka** and **Anna Silverstein**, New York Institute of Technology (939-M1-518)

5:00PM (1122) *Integrating mathematics and electrical engineering technology: Workshops for students in electric circuits I.*
Yajun Yang*, **Arlene Kleinstein**, **Yelleshpur Dathatri** and **Marjaneh Issapour**, SUNY-Farmingdale (939-M1-662)

5:15PM (1123) *Symbolic dynamics for Math, CS, and EE.*
Brian P. Hopkins, Seattle University (939-M1-946)

MAA Session on The Integral Role of the Two-Year College in the Preservice Preparation of Elementary School Teachers, II

1:00 PM – 5:05 PM

Organizers: **Mercedes A. McGowen**, William Rainey Harper College
Joanne V. Peeples, El Paso Community College

William E. Haver, Virginia Collaborative for Excellence in the Preparation of Teachers

1:00PM (1124) *Investing in tomorrow's teachers: The integral role of two-year colleges.*
Sadie C. Bragg, American Mathematical Association of Two-Year Colleges (939-N1-1179)

1:30PM (1125) *A successful two-year/four-year college collaborative for the preparation of new teachers: J. Sargeant Reynolds Community College and Virginia Commonwealth University .*
Susan S. Wood, J. Sargeant Reynolds Community College (939-N1-1051)

1:50PM (1126) *Results of research: A means to effect changes in preservice teachers' attitudes and understanding.*
Mercedes A. McGowen* and **Nancy Vrooman**, William Rainey Harper College (939-N1-815)

2:10PM (1127) *The integral role of Borough of Manhattan Community College in the mathematics preparation of prospective teachers.*
June L. Gaston, Borough of Manhattan CC (939-N1-462)

2:30PM (1128) *Increasing the number and quality of preservice teachers in mathematics and science: A community college/university partnership.* Preliminary report.
Lucy H. Michal, **Emil J. Michal**, **Joanne Peeples**, El Paso Community College, **Connie K. Della-Piana*** and **V. Anne Tubb**, University of Texas at El Paso (939-N1-943)

2:50PM (1129) *"ITSMET" (Introduction to Teaching Science, Math, Engineering, and Technology)–Shiprock Campus of Diné College.* Preliminary report.
Robin L. Sellen* and **Mark C. Bauer**, Diné College, Shiprock Campus, Shiprock, NM (939-N1-1165)

3:10PM (1130) *2-Year and 4-Year college partnerships in teacher preparation.*
Mark Greenhalgh*, Fullerton College, **Judy Kasabian**, El Camino College, **Fran Manion**, Santa Monica College, and **Michael A. McDonald**, Occidental College (939-N1-963)

3:30PM (1131) *Training teachers with manipulatives and technology.*
Gladys G. Whitehead, **Deborah Zankofski*** and **Catherine B. Cant**, AMATYC (939-N1-936)

3:50PM (1132) *Strengthening the mathematics preparation of prospective elementary teachers: A Texas state systemic initiative action supported by NSF and FIPSE funding.*
Jane F. Schielack*, Texas A&M University, and **Jamie Whitehead Ashby**, Texarkana College (939-N1-1087)

4:10PM (1133) *Revitalizing teacher education through advanced technologies.* Preliminary report.
Reginald K.U. Luke, Middlesex County College, Edison, NJ (939-N1-1211)

4:30PM (1134) *Measuring, analysizing and communicating for elementary science teachers.*
Michael H. Farmer*, Greenivlle Technical College, and **Elizabeth T. Higgins**, Greenville Technical College (939-N1-854)

4:50PM (1135) *Collaborative learning materials.*
Raymond F. Coughlin, Temple University (939-N1-616)

MAA Committee on the Teaching of Undergraduate Mathematics Panel Discussion

1:00 PM – 2:20 PM

Teaching collaborations between graduate departments, in mathematics at four-year institutions, and community colleges.

Organizer: **Pamela E. Matthews**, American University

Panelists: **Paul Latiolais**, Portland State University
Janet P. Ray, Seattle Central Community College
Ginger Warfield, University of Washington

MAA Committee on the Mathematical Education of Teachers Panel Discussion

1:00 PM – 2:20 PM

Improved teacher preparation: What mathematics departments can do.

Organizer: **James Loats**, Metropolitan State College of Denver

SUMMA Special Presentation

1:00 PM – 2:20 PM

Intervention programs for minority precollege students.

Organizer: **William A. Hawkins Jr.**, SUMMA

Presenters: **Manuel Berriozábal**, University of Texas-San Antonio
Claudette Bradley-Kawagley, University of Alaska-Fairbanks
Max Warshauer, Southwest Texas State University

MAA Workshop

1:00 PM – 3:00 PM

Integrating active learning techniques into lectures.

Organizer: **Sandra L. Rhoades**, Keene State College

ASL Invited Address

1:30 PM – 2:20 PM

(1136) *Computable aspects of ordered groups.*
Reed Solomon, University of Wisconsin

AMS Special Session on Several Complex Variables, IV

1:30 PM – 4:20 PM

Organizers: **Emil J. Straube**, Texas A&M University
Harold P. Boas, Texas A&M University
Marshall A. Whittlesey, Texas A&M University

1:30PM (1137) *The holomorphic extension of H^p - CR functions on tube submanifolds.*
Albert Boggess, Texas A&M University (939-32-706)

2:00PM (1138) *Szegő projection for spaces of Clifford algebras-valued functions.* Preliminary report.
Loredana Lanzani, The University of Arkansas at Fayetteville (939-31-268)

2:30PM (1139) *Sobolev estimates for the d-bar Neumann problem on some domains in C^2 where the infinite type points form a regularly closed set in the boundary.* Preliminary report.
Marcel K. Sucheston, Texas A&M University (939-32-1011)

3:00PM (1140) *The Bergman kernel on monomial polyhedra.*
Chieh-Hsien Tiao, Purdue University (939-32-285)

3:30PM (1141) *Sobolev estimates for the d-bar Neumann problem on pseudoconvex Lipschitz domains.*
Mei-Chi Shaw, Univ. of Notre Dame (939-32-712)

4:00PM (1142) *A Riemann zeta function associated to sub-Laplacian on the unit sphere in $\mathbb{C}^n$.* Preliminary report.
Der-Chen E. Chang*, University of Maryland, College Park, and **Song-Ying Li**, University of California, Irvine (939-32-466)

Special Poster Session

1:30 PM – 3:30 PM

Guided student exploration as a means of learning mathematics.
Organizer: **Harriet Pollatsek**, Mount Holyoke College

AMS Special Session on Dynamical, Spectral, and Arithmetic Zeta-Functions, IV

2:00 PM – 5:00 PM

Organizers: **Michel L. Lapidus**, University of California, Riverside
Machiel van Frankenhuysen, Institut des Hautes Études Scientifiques

2:00PM (1143) *Complex dimensions of self-similar fractal strings.*
Michel L. Lapidus and **Machiel van Frankenhuysen***, University of California, Riverside (939-58-84)

2:30PM (1144) *Zeros of the Riemann zeta-function, complex dimensions of fractal strings, and geometric and spectral oscillations.*
Michel L. Lapidus* and **Machiel van Frankenhuysen**, University of California, Riverside (939-58-85)

3:00PM (1145) *Approximately self-similar measures and their zeta-functions.* Preliminary report.
Gabor Elek*, Mathematical Institute of the Hungarian Academy of Sciences, and **Michel L. Lapidus**, University of California at Riverside (939-28-154)

3:30PM (1146) *Small eigenvalues and Hausdorff dimension of sequences of hyperbolic 3-manifolds.*
Carol E. Fan*, Pepperdine University, and **Jay Jorgenson**, Oklahoma State University (939-58-343)

4:00PM Discussion/open problems.

AWM Presentations by Recent Women Ph.D.s, II

2:00 PM – 3:50 PM

2:00PM (1147) *Hecke structure of spaces of modular forms.*
Sharon M. Frechette, Wellesley College

2:30PM (1148) *Curves over finite fields and applications in modern technology.*
Kristin Lauter, University of Michigan

3:00PM (1149) *Test ideals and computations in tight closure.*
Moira McDermott, Gustavus Adolphus College

3:30PM (1150) *Gauss maps of minimal hypersurfaces with finite total scalar curvature.*
Helen Moore, Stanford University/Bowdoin College

AMS Invited Address

2:15 PM – 3:05 PM

(1151) *Undercompressive shocks in thin film flow.*
Andrea L. Bertozzi, Duke University (939-35-42)

MAA Special Presentation

2:30 PM – 4:10 PM

Mobilization to support higher achievement in mathematics.
Organizer: **Linda P. Rosen**, U.S. Department of Education

ASL Invited Address

2:40 PM – 3:30 PM

(1152) *Club sets and large cardinals.*
William J. Mitchell, University of Florida

ASL Sesson for Contributed Papers

4:00 PM – 5:20 PM

ASL Session for Contributed Papers

4:00 PM – 5:50 PM

AMS Banquet

6:30 PM – 10:00 PM

Susan J. Friedlander
AMS Associate Secretary
Chicago, Illinois

James J. Tattersall
MAA Associate Secretary
Providence, Rhode Island