Program of the Sessions

New Orleans, Louisiana, January 10–13, 2001

Monday, January 8

AMS Short Course on Mathematical Biology

9:00 AM – 4:00 PM

Organizer: **James Sneyd**, Massey University, New Zealand

9:00AM (1) *Dynamics of neuronal networks.*
David Terman, Ohio State University

10:00AM Discussion.

10:30AM Break.

11:00AM (2) *Mathematical aspects of vision.*
Daniel Tranchina, New York University

NOON Discussion.

2:30PM (3) *Arrhythmias by dimension.*
J. P. Keener, University of Utah

3:30PM Discussion.

MAA Short Course on Knots in Science

9:15 AM – 5:15 PM

Organizer: **De Witt L. Sumners**, Florida State University

9:15AM (4) *Introduction to knots.*
Colin C. Adams, Williams College

10:30AM Break.

11:00AM (5) *Knots in physics.*
Louis H. Kauffman, University of Illinois at Chicago

2:15PM (6) *Physical knots.*
Jonathan Simon, University of Iowa, Iowa City

3:30PM Break.

4:00PM (7) *Ideal knots.*
Andrzej Stasiak, University of Lausanne

Tuesday, January 9

MAA Board of Governors

8:30 AM – 4:00 PM

AMS Short Course on Mathematical Biology

9:00 AM – 4:00 PM

Organizer: **James Sneyd**, Massey University, New Zealand

9:00AM (8) *Calcium excitability: The dynamics of calcium homeostasis.*
James Sneyd, Massey University, New Zealand

10:00AM Discussion.

10:30AM Break.

11:00AM (9) *Application of population isolates in gene mapping.*
Kenneth Lange, University of California Los Angeles

NOON Discussion.

2:30PM (10) *Modeling viral infection.*
Alan Perelson, Los Alamos National Laboratory

3:30PM Discussion.

MAA Short Course on Knots in Science

9:15 AM – 5:15 PM

Organizer: **De Witt L. Sumners**, Florida State University

9:15AM (11) *Knots in polymers.*
Stuart G. Whittington, Department of Chemistry, University of Toronto

10:30AM Break.

11:00AM (12) *Vortex and magnetic knots in fluid systems.*
Renzo L. Ricca, University College, London

2:15PM (13) *Knots in DNA.*
De Witt L. Sumners, Florida State University

3:30PM Break.

4:00PM Panel Discussion on Knots in Science.

AMS Council

1:00 PM – 10:00 PM

Joint Meetings Registration

3:00 PM – 7:00 PM

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

Wednesday, January 10

Joint Meetings Registration

7:30 AM – 4:00 PM

Employment Center

7:30 AM – 6:00 PM

Registration, orientation, and interview center (see article for specific hours).

MAA Session on Redefining What a Modern "College Algebra" Experience Means, I

7:55 AM – 10:55 AM

Organizers: **Sheldon P. Gordon**, SUNY at Farmingdale
Florence S. Gordon, New York Institute of Technology
Arlene H. Kleinstein, SUNY at Farmingdale
Mary Robinson, University of New Mexico, Valencia
Linda H. Boyd, Georgia Perimeter College
Barbara A. Jur, Macomb Community College

7:55AM Introductory remarks.

8:00AM ▶ (14) *College Algebra as a Preparation for Students' Majors.*
Scott R Herriott, Maharishi University of Management (962-D1-419)

8:20AM ▶ (15) *Providing Large Numbers of Students a Meaningful Alternative to the Traditional College Algebra Course.*
William E Haver, Virginia Commonwealth University (962-D1-406)

8:40AM ▶ (16) *Mathematical Modeling and College Algebra.*
William P Fox, Francis Marion University (962-D1-445)

9:00AM (17) *College algebra in context: An interdisciplinary approach.*
Ronald J. Harshbarger*, Univ of South Carolina, and **Lisa S Yocco**, Georgia Southern Univ (962-D1-85)

9:20AM (18) *College Algebra and Mathematical Reasoning.*
Kay M. Gura* and **Gabriella B. Wepner**, Ramapo College of New Jersey (962-D1-458)

9:40AM (19) *A Modeling Alternative to College Algebra: A New Look at Familiar Topics.*
Mary Ellen Davis, Georgia Perimeter College (962-D1-530)

10:00AM ▶ (20) *An Alternative to College Algebra - An Introductory Modeling Course for Freshmen Liberal Arts Majors.* Preliminary report.
Silvia P Heubach, California State University Los Angeles (962-D1-612)

10:20AM (21) *Re-defining college algebra: Math for Biology.*
Tamara B Veenstra* and **Catherine M Miller**, University of Northern Iowa (962-D1-102)

10:40AM ▶ (22) *Traditional College Algebra/Trig versus a Modeling Approach: Comparing Student Performance.*
Florence S Gordon, New York Institute of Technology (962-D1-522)

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

8:00 AM – 10:50 AM

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

8:00AM (23) *Studying Mathematics to Improve Teaching.*
Al Cuoco* and **Nancy Antonellis**, Center for Mathematics Education, EDC (962-97-1159)

8:30AM ▶ (24) *A Collaborative Approach to Professional Development Through Problem Solving.*
Kenneth M Levasseur, UMass Lowell-EDC (962-97-323)

9:00AM ▶ (25) *PROMYS for TEACHERS: Learning in the Spirit of Exploration.*
Glenn H Stevens, Boston University (962-97-1205)

9:30AM ▶ (26) *MST@UNH: A Mathematics Degree for Mathematics Teachers.*
Steven R Benson*, Education Development Center, and **Karen J Graham**, University of New Hampshire (962-97-707)

10:00AM ▶ (27) *The Professional Master's Degree in Graduate Education.*
Naomi D. Fisher, University of Illinois at Chicago Chicago (962-97-698)

10:30AM (28) *Professional M.S. Programs in Mathematics at Texas A&M.*
Thomas B Schlumprecht, Texas A&M University (962-97-994)

AMS Special Session on Geometric Group Theory, I

8:00 AM – 10:50 AM

Organizers: **Stephen G. Brick**, University of South Alabama
Igor Mineyev, University of South Alabama
Jon M. Corson, University of Alabama

8:00AM (29) *Semi-Direct Products of Graphs of Groups.*
Debra L Boutin*, Hamilton College, and **Thomas A Stiadle**, Wells College (962-20-138)

8:30AM (30) *Algebraic extensions of free groups.* Preliminary report.
Alexei Miasnikov, The City College of CUNY (962-20-1228)

9:00AM (31) *On asymptotic dimension of discrete groups.* Preliminary report.
Alexander N Dranishnikov, University of Florida (962-20-944)

9:30AM ▶ (32) *Translation lengths in $Out(F_n)$.*
Emina Alibegovic, University of Utah (962-20-1424)

10:00AM (33) *Splittings of mapping tori of free group automorphisms.* Preliminary report.
Peter Brinkmann, University of Illinois at Urbana-Champaign (962-20-1055)

10:30AM (34) *Top-dimensional homology of automorphism groups of free groups.* Preliminary report.
Karen L Vogtmann, Cornell University (962-20-1071)

AMS Special Session on Discovery Learning: The Moore Method in American Mathematics

8:00 AM – 10:50 AM

Organizers: **John W. Neuberger**, University of North Texas
Judy A. Kennedy, University of Delaware

8:00AM *Confessions of a Heretic.*
▶ (35) **Carol S Schumacher**, Kenyon College (962-97-1170)

8:30AM (36) *The Influence of R. L. Moore on Mathematics Education.* Preliminary report.
Glenda Lappan, Michigan State University (962-97-661)

9:00AM *The R. L. Moore Method at the Secondary Level.*
▶ (37) Preliminary report.
H. W. Straley* and **David McRae**, Woodberry Forest School (962-97-887)

9:30AM *Moore Methods and Spaces.* Preliminary report.
▶ (38) **G. M Reed**, Oxford University (962-97-952)

10:00AM *A Moore Method Course in Analysis.*
▶ (39) **Robert M Kauffman**, University of Alabama at Birmingham (962-97-643)

10:20AM Discussion.

AMS Special Session on Integrals and Series throughout Mathematics, I

8:00 AM – 10:50 AM

Organizers: **Victor H. Moll**, Tulane University
George Boros, University of New Orleans

8:00AM *Multi-variable sinc integrals and the volumes of*
▶ (40) *polyhedra.*
Jonathan M Borwein*, CECM, Simon Fraser University, **David Borwein**, University of Western Ontario, and **Bernard J Mares**, Brown University (962-42-736)

8:30AM *Some integrals associated with the Barnes*
▶ (41) *G-function.* Preliminary report.
Victor S Adamchik, Carnegie Mellon University (962-33-1049)

9:00AM (42) *A tale of three integrals.* Preliminary report.
Larry M Glasser, Clarkson University (962-33-336)

9:30AM (43) *Exact Constructions of Square-Root Helmholtz Operator Symbols.*
Louis Fishman*, Naval Research Laboratory/University of New Orleans, **M. V. de Hoop**, Colorado School of Mines, and **P. M. Jordan**, Naval Research Laboratory (962-35-672)

10:00AM *The Euler-Maclaurin summation formula.*
▶ (44) Preliminary report.
Ranjan Roy, Beloit College (962-11-685)

10:30AM *Rational Landen transformations.* Preliminary
▶ (45) report.
Victor H Moll, Tulane University (962-33-1363)

AMS Special Session on Asymptotic Behavior of Difference Equations with Applications, I

8:00 AM – 10:50 AM

Organizers: **Vlajko L. Kocic**, Xavier University
Abdul-Aziz Yakubu, Howard University
Gerasimos Ladas, University of Rhode Island

8:00AM (46) *Global Dynamics of Some Periodically Forced, Monotone Difference Equations.*
J. M. Cushing*, University of Arizona, and **Shandelle M. Henson**, The College of William and Mary (962-39-717)

8:25AM *Partial Differential Equations on Time Scales.*
▶ (47) **Calvin D Ahlbrandt***, University of Missouri–Columbia, and **Christina Morian**, Lincoln University (962-35-878)

8:50AM (48) *Hybrid Systems on Time Scales.* Preliminary report.
Aghalaya S Vatsala, University of Louisiana at Lafayette (962-34-872)

9:15AM *Dynamic Equations on a Measure Chain.* Preliminary
▶ (49) report.
Allan C Peterson, University of Nebraska-Lincoln (962-39-1427)

9:40AM (50) *Oscillation Results for Second Order Dynamic Equations on Time Scales.*
Billur Kaymakcalan, Georgia Southern University (962-34-1096)

10:05AM *Associativity and the Secant Method.*
▶ (51) **Sam Northshield**, SUNY-Plattsburgh (962-39-129)

10:30AM (52) *Twin Solutions of Boundary Value Problems for Differential Equations on Measure Chains.*
Chuan Jen Chyan, Tamkang University, and **Johnny Henderson***, Auburn University (962-34-43)

AMS Special Session on Commutative Rings and Monoids, I

8:00 AM – 10:50 AM

Organizers: **Scott T. Chapman**, Trinity University
Evan G. Houston, University of North Carolina at Charlotte

8:00AM (53) *Non-standard commutative rings.* Preliminary report.
Bruce M Olberding* and **A. Serpil Saydam**, The University of Louisiana at Monroe (962-13-771)

8:30AM (54) *Rings, conditional expectations and localizations.* Preliminary report.
Thomas G Lucas, University of North Carolina Charlotte (962-13-1132)

9:00AM (55) *Condensed Rings.*
Daniel D Anderson*, The University of Iowa, and **Tiberiu Dumitrescu**, Universitatea Bucureşti (962-13-279)

9:30AM (56) *Homological Characterizations of Gaussian Rings.* Preliminary report.
Sarah Glaz, University of Connecticut (962-13-975)

10:00AM (57) *On the lengths of maximal chains of intermediate fields in a field extension.*
David E Dobbs*, University of Tennessee, and **Bernadette Mullins**, Birmingham Southern College (962-13-32)

10:30AM (58) *LCM-Splitting Sets in Some Ring Extensions.*
Tiberiu Dumitrescu, Universitatea Bucuresti, and **Muhammad Zafrullah***, Idaho State University (962-13-728)

AMS Special Session on Function Theory, Differential Equations and Functional Equations, I

8:00 AM – 10:50 AM

Organizers: **Gary G. Gundersen**, University of New Orleans
Ilpo Laine, University of Joensuu
Enid M. Steinbart, University of New Orleans

8:00AM (59) *Some comparison problems for harmonic measure in the plane.* Preliminary report.
Albert Baernstein, II, Washington University (962-30-763)

8:30AM (60) *On the Eigenproblems of $\mathcal{PT}$-Symmetric Oscillators.*
Kwang C Shin, University of Illinois at U-C (962-34-642)

9:00AM (61) *Boundary value problems for functions analytic in the closed unit disc.*
Richard Fournier*, Montreal (Canada), and **Stephan Ruscheweyh**, Wuerzburg (Germany) (962-30-434)

9:30AM (62) *Solutions to Differential Equations with Slow Growth Coefficients.* Preliminary report.
Djamel Benbourenane, Northern Illinois University (962-30-732)

10:00AM (63) *Non-real Zeros of Derivatives of Real Entire Functions and the Pólya - Wiman Conjectures.* Preliminary report.
Stephanie P Edwards*, Bemidji State University, and **Simon Hellerstein**, University of Wisconsin-Madison (962-30-756)

10:30AM (64) *Some applications of value distribution theory.* Preliminary report.
Chung-Chun Yang, Hong Kong University of Science & Technology (962-30-649)

AMS Special Session on Operator Theory on Function Spaces, I

8:00 AM – 10:50 AM

Organizers: **Zhijian Wu**, University of Alabama
Dechao Zheng, Vanderbilt University

8:00AM (65) *Higher-order Hankel forms on the ball.*
Sarah H Ferguson*, Wayne State University, and **Richard Rochberg**, Washington University - St. Louis (962-47-632)

8:30AM (66) *Positiveness of a class of generalized Hankel operators.*
Rubén A Martínez-Avendaño, Michigan State University (962-47-1047)

9:00AM (67) *Commutators on the Unit Ball of R^n.*
Jie Miao, Arkansas State University (962-46-1180)

9:30AM (68) *Standard Deviation and Schatten Class Hankel Operators on the Segal-Bargmann Space.*
Jingbo Xia*, SUNY at Buffalo, and **Dechao Zheng**, Vanderbilt University (962-47-807)

10:00AM (69) *Gabor localization and Berezin-Toeplitz operators.* Preliminary report.
Lewis A Coburn, SUNY at Buffalo (962-43-381)

10:30AM (70) *Analytic model of some operators with finite rank of self-commutators.* Preliminary report.
Daoxing Xia, Vanderbilt University (962-47-297)

AMS Special Session on Nonlinear Evolution Equations and Applications, I

8:00 AM – 10:50 AM

Organizers: **Ralph A. Saxton**, University of New Orleans
David H. Wagner, University of Houston
Katarzyna Saxton, Loyola University

8:00AM (71) *Inverse Problems for Excitable Fibers.*
Steven J Cox*, Rice University, and **Lin Ji**, RPI (962-35-901)

8:30AM (72) *Conservation Laws without Hyperbolicity: the Dynamics of Singular Shocks.* Preliminary report.
Barbara L Keyfitz, University of Houston (962-35-764)

9:00AM (73) *Dispersive turbulence.*
Peter D. Lax, Courant Institute/NYU (962-35-950)

9:30AM (74) *On the Navier Stokes Equations for Compressible Reacting Flow with Large Discontinuous Initial Data.*
Gui-Qiang Chen, Northwestern University, **David Hoff**, Indiana University, and **Konstantina Trivisa***, University of Maryland (College Park) (962-35-951)

10:00AM (75) *Viscous structure of singular shocks.* Preliminary report.
Michael Sever, The Hebrew University of Jerusalem (962-35-145)

10:30AM (76) *Singularities in Nonlinear Dispersive Wave Equations.*
Jerry L Bona, University of Texas at Austin (962-35-1217)

MAA Minicourse #12: Part A

8:00 AM – 10:00 AM

Contemporary college algebra: A reform program.
Organizers: **Donald B. Small**, U.S. Military Academy
Dorothy Hunter, Huston-Tillotson College

MAA Minicourse #1: Part A

8:00 AM – 10:00 AM

Creating materials using 'real-world' data.
Organizers: **Janet L. Andersen**, Hope College
Todd M. Swanson, Hope College
Elliot A. Tanis, Hope College

MAA Minicourse #7: Part A

8:00 AM – 10:00 AM

Cwatsets: A research experience for undergraduates.
Organizer: **Gary J. Sherman**, Rose-Hulman Institute of Technology

AMS Session on Group Theory

8:00 AM – 10:55 AM

8:00AM ▶ (77) *Groups with their commutator subgroup unequal to the set of commutators.* Preliminary report.
Luise-Charlotte Kappe, SUNY at Binghamton (962-20-924)

8:15AM (78) *Clifford-Fischer Matrices and Representations of Group Extensions.*
Jamshid Moori, University of Natal, South Africa (962-20-1057)

8:30AM (79) *Constructive Recognition of the Classical Groups.* Preliminary report.
Peter A Brooksbank, University of Oregon (962-20-1204)

8:45AM (80) *Diassociative A-loops are Moufang.*
Michael K Kinyon, Indiana University South Bend, **Ken Kunen**, University of Wisconsin, and **J.D. Phillips***, Saint Mary's College of California (962-20-1213)

9:00AM (81) *Regular Languages and Semiretracts.*
James A Anderson*, University of South Carolina Spartanburg, and **Wit Forys**, Jagiellonian University (962-20-149)

9:15AM (82) *Computing Isotypic Projections for Finite Groups.* Preliminary report.
Michael E Orrison, Dartmouth College (962-20-204)

9:30AM (83) *Amalgamation bases for nilpotent groups of class two and odd exponent.*
Arturo Magidin, Instituto de Matematicas, UNAM (962-20-49)

9:45AM (84) *On the Power Structure of Finite 2-Groups.*
Friedrich L Kluempen, SUNY at Binghamton (962-20-676)

10:00AM (85) *Subgroups that Permute with all Sylow Subgroups.*
Joseph Evan, King's College (962-20-682)

10:15AM (86) *Distributive Elements in Endomorphism Near-rings and Rings.*
Gregory M Boudreaux, University of Louisiana at Lafayette (962-20-916)

10:30AM ▶ (87) *Planar Groups.* Preliminary report.
Colin L Starr* and **Galen E Turner**, Stephen F. Austin State University (962-20-1011)

10:45AM (88) *Norms, Folding and the Bieri-Neumann-Strebel Invariant.* Preliminary report.
Reva S Kasman, University of Illinois at Chicago (962-20-955)

AMS Session on Calculus of Variations

8:00 AM – 9:10 AM

8:00AM (89) *Image performance for spacial nonlinear systems.* Preliminary report.
Yefim Vladimirsky, Rockville, Maryland (962-49-122)

8:15AM (90) *Approximation-solvability of general variational inequalities and associated algorithms.*
Ram U Verma, University of Toledo (962-49-1428)

8:30AM (91) *Partially Relaxed Monotone Mappings in Approximation-solvability of Nonlinear Variational Inequalities.*
R. N. Mohapatra*, University of Central Florida, and **Ram U. Verma**, University of Toledo (962-49-1429)

8:45AM (92) *Area Minimizing Surfaces through Conical Singularities.* Preliminary report.
Frank Morgan, Williams College (962-49-708)

9:00AM (93) *Rational Interpolating Functions Whose Zeros and Poles are Constrained by Conditions Arising in Control.*
Rebecca L Sparks, University of Rhode Island (962-49-768)

AMS Session on Applied Mathematics

8:00 AM – 10:25 AM

8:00AM (94) *Schroeder trees and loopless algorithms.*
James Korsh, **Paul LaFollette** and **Seymour Lipschutz***, Temple University (962-68-151)

8:15AM ▶ (95) *Existence and Uniqueness of a Local (in Time) Solution for the Prigogine- Herman Kinetic Equation of Vehicular Traffic.* Preliminary report.
Alexandros Sopasakis, Chalmers Institute, Goteborgs University (962-70-674)

8:30AM (96) *Transition Layer Dynamics of Viscoelastic System using the Time Discretization Method.* Preliminary report.
Hyeona Lim, Michigan State University (962-74-1036)

8:45AM (97) *A two-dimensional elastic-viscoplastic model for determining optimal patterns of suturing wounds in skin.*
Dawn A Lott-Crumpler* and **Hans R Chaudhry**, NJ Institute of Technology (962-74-1364)

9:00AM ▶ (98) *Hyperbolic Waves in a Thermoelastic Half-space.*
Jun Wang, Alabama State University (962-74-177)

9:15AM ▶ (99) *Stability of Two Superposed Homogeneous Fluids Under Uniform Magnetic Field.*
Ramprakash Singh, Ewing Christian College (962-76-152)

9:30AM (100) *Linear Complementarity and Minimization in the One- and Two-Norms.* Preliminary report.
Caroline N Haddad, SUNY Geneseo (962-15-991)

9:45AM (101) *Localization for One Dimensional, Continuum, Bernoulli-Anderson Models.*
David Damanik, California Institute of Technology, **Robert Sims*** and **Gunter Stolz**, University of Alabama at Birmingham (962-81-1203)

10:00AM ▶ (102) *Statistical Mechanics and Lattice Paths: "Order Decreasing Mappings", Electric Fields, and a Van der Waals Two-Component Plasma.*
Dov N Chelst, Devry Institute - New Jersey (962-82-1412)

10:15AM (103) *Solvability of a Nonlinear Conjugate Eigenvalue Problem.*
John M Davis, Baylor University, **Johnny Henderson**, **Rajendra Prasad**, Auburn University, and **William Yin***, LaGrange College (962-34-934)

MAA Session on Great Theorems of Mathematics, I

8:00 AM – 10:55 AM

Organizers: **Cheryl L. Olsen**, Shippensburg University
Douglas E. Ensley, Shippensburg University

8:00AM ▶ (104) *Implementing Newton's Method.* Preliminary report.
Kent M Neuerburg, Southeastern Louisiana University (962-A1-27)

8:20AM ▶ (105) *Heron's Formula via Proofs Without Words.*
Roger B. Nelsen, Lewis and Clark College (962-A1-21)

8:40AM ▶ (106) *Ideal Numbers, Unique Factorization, and Ideals.*
Mike Siddoway, Colorado College (962-A1-44)

9:00AM ▶ (107) *A lemma in linear algebra, with application in elementary Galois Theory.*
Jonathan L Merzel, Soka University of America (962-A1-375)

9:20AM ▶ (108) *The Continuum Hypothesis, Independence and Consistency.*
Janet H Barnett, University of Southern Colorado (962-A1-503)

9:40AM (109) *Frobenius-Peirce Theorem.*
Harold Davenport, Mesa State College (962-A1-272)

10:00AM ▶ (110) *The Gauss-Markov Theorem: A Luminous "Two-fer".*
George W. Cobb, Mount Holyoke College (962-A1-325)

10:20AM ▶ (111) *The Central Limit Theorem: Its History and Proof.*
Homer W Austin, Salisbury State University (962-A1-405)

10:40AM ▶ (112) *The Glivenko-Cantelli Theorem and its generalizations.*
Anant P Godbole, East Tennessee State University (962-A1-1140)

MAA Session on Courses and Programs That Illustrate Recommendations of the Mathematical Education of Teachers Document, I

8:00 AM – 10:50 AM

Organizer: **Judith L. Covington**, LSU-Shreveport

8:00AM ▶ (113) *Math- Science-Technology for the 21st Century An Integrated Math, Science and Technology sequence for Students Preparing To be Elementary School Teachers.* Preliminary report.
Patricia E Sullivan, Mt. St. Mary College (962-F1-598)

8:30AM (114) *Developing Pedagogical Content Knowledge in a Modern Geometry Course.* Preliminary report.
Catherine M Miller, University of Northern Iowa (962-F1-88)

9:00AM ▶ (115) *Coordinating Mathematical and Pedagogical Content in Preservice Teacher Education.*
Peter S Wiles, University of Wisconsin-Madison (962-F1-404)

9:30AM (116) *Mathematics Modeling for Pre-Service Elementary School Teachers.*
John G Harvey, University of Wisconsin-Madison (962-F1-538)

10:00AM ▶ (117) *Mathematics and the Imagination: A course for middle school teachers.*
Brendan J Foreman, Case Western Reserve University (962-F1-355)

10:30AM ▶ (118) *Foundations of school mathematics for middle school teachers.*
Pat L. Jones, University of Louisiana Lafayette (962-F1-523)

MAA Session on ARUME, I

8:00 AM – 10:55 AM

Organizers: **Julie M. Clark**, Emory & Henry College
Chris Rasmussen, Purdue University Calumet
Rina Zazkis, Simon Fraser University

8:00AM (119) *Procedures, Cognitive Units and Cognitive Structure.*
Lillie F Crowley, Lexington Community College (962-S1-1274)

8:20AM ▶ (120) *Constructing Graphs to Meet Specified Conditions: A Generalizability Study.*
Linda Braddy, East Central University (962-S1-1337)

8:40AM ▶ (121) *Generative Learning Theory: A Practical Cousin to Constructivism.*
Kathleen L. Bonn*, Michigan Technological University, and **Barbara L. Grabowski**, Pennsylvania State University (962-S1-498)

9:00AM (122) *Comparing the Use of Daily Writing Tasks with Interviews and Course Exams as Assessments of Students' Understanding of the Derivative.* Preliminary report.
Gwen L Fisher, University of Wisconsin, Madison, WI (962-S1-497)

9:20AM (123) *Students' and Instructors' Different Views of the Mathematics Classroom.*
Pao-sheng Hsu, University of Maine, Orono (962-S1-1028)

9:40AM (124) *Connecting beliefs and teaching practices: Case studies of teaching assistants in collegiate reform calculus courses.*
Natasha M Speer, University of California at Berkeley (962-S1-1202)

10:00AM (125) *The role of insufficient pre-calculus knowledge on students failing calculus.*
Keith Howard Weber* and **Russell C Walker**, Carnegie Mellon University (962-S1-1260)

10:20AM (126) *Exploring Student's Intuitions in Differential Equations.*
Chris L Rasmussen, Purdue University Calumet (962-S1-1317)

10:40AM ▶ (127) *The effect of unconventional teaching strategies on college women's attitudes and persistence in mathematics.*
Betty Mayfield* and **Kerry J. Strand**, Hood College (962-S1-155)

AMS Special Session on Braid Groups and Configuration Spaces, I

8:30 AM – 10:50 AM

Organizers: **Daniel C. Cohen**, Louisiana State University
Neal W. Stoltzfus, Louisiana State University

8:30AM (128) *Comparing braid group representations.*
Theodore Stanford, New Mexico State University (962-20-1344)

9:00AM (129) *Low-Dimensional Braid Representations.*
Imre Tuba, University of California, Santa Barbara (962-81-1354)

9:30AM (130) *Braid group linearity and the BMW algebra.*
Matthew G Zinno, Columbia University (962-20-1134)

10:00AM (131) *A Geometric and Algebraic Description of Circular Braids.*
David E Peifer* and **Richard P Kent**, UNC-Asheville (962-20-640)

10:30AM (132) *The fundamental group of an arrangement of geodesic hyperplanes in complex hyperbolic space.*
Jim Carlson*, University of Utah, **Daniel Allcock**, Harvard University, and **Domingo Toledo**, University of Utah (962-20-1331)

MAA Session on Chaotic Systems and Fractal Geometry, I

8:30 AM – 10:45 AM

Organizers: **Denny Gulick**, University of Maryland, College Park
Jon W. Scott, Montgomery College

8:30AM (133) *Tangential Homoclinic Intersections in* $\mathbf{R}^n$. Preliminary report.
Victoria Rayskin, Boston University (962-B1-48)

8:50AM (134) *Kaleidoscopic images and piecewise self similarity.*
Byungik I Kahng, University of Illinois, Urbana-Champaign (962-B1-246)

9:10AM ▶ (135) *A Multi-Track Three Body Problem.*
Mark Kramer, **Gamaliel Lodge** and **James A Walsh***, Oberlin College (962-B1-296)

9:30AM ▶ (136) *Many Faces of the Doubling Function.* Preliminary report.
Danrun Huang, St. Cloud State University (962-B1-341)

9:50AM ▶ (137) *Groups, Fractal Patterns, and the Dynamics of Cellular Automata.* Preliminary report.
Michael J Bardzell* and **Kathleen M Shannon**, Salisbury State University (962-B1-347)

10:10AM ▶ (138) *A study of the Tent and Logistic Function as a Two Parameter Family of Functions and Their Iterates.*
Prashant S Sansgiry, Coastal Carolina University (962-B1-354)

10:30AM ▶ (139) *Java Applets for Teaching Chaotic Dynamical Systems.*
Robert L Devaney, Boston University (962-B1-185)

MAA Panel Discussion

9:00 AM – 10:30 AM

The muse of history: Writing biographies of mathematicians.

Organizer: **Ronald Calinger**, Catholic University of America

Panelists: **Joseph Dauben**, City University of New York
Joan Richards, Brown University
Ronald Calinger, Catholic University of America

MAA Panel Discussion

9:00 AM – 10:30 AM

CBMS report on the mathematics education of teachers.

Organizer: **Ronald C. Rosier**, Conference Board of the Mathematical Sciences

Panelists: **W. James Lewis**, University of Nebraska
Alan C. Tucker, SUNY at Stony Brook
Roger E. Howe, Yale University
Carole B. Lacampagne, U.S. Department of Education

MAA Committee on Computers in Mathematics Education Panel Discussion

9:00 AM – 10:30 AM

On line assessment.

Organizers: **Earl D. Fife**, Calvin College
Lawrence S. Husch, University of Tennessee, Knoxville

Panelists: **John Orr**, University of Oklahoma
Gerardo A. Mendoza, Temple University
Robby Robson, Oregon State University

AMS Session on Category Theory and K Theory

9:30 AM – 10:10 AM

9:30AM (140) *Chain Numbers of Modules.* Preliminary report.
Chris T Bullock, University of Kentucky (962-18-1139)

9:45AM (141) *The Integral Novikov Conjecture for Normal Subgroups of a certain class of groups.*
Ron E Sperber, Binghamton University (962-19-1280)

10:00AM (142) *Finiteness results for the torsion of Chow groups.*
Matei N Stroila, University of Southern California (962-19-897)

AMS Invited Address

10:05 AM – 10:55 AM

(143) *Twists of K-theory.*
Michael J. Hopkins, Massachusetts Institute of Technology (962-55-04)

AMS-MAA Invited Address

11:10 AM – NOON

(144) *Measuring the universe.*
Jeffrey R. Weeks, Canton, N.Y. (962-85-05)

Book Sales and Exhibits

NOON – 5:30 PM

AMS Colloquium Lecture: Lecture I

1:00 PM – 2:00 PM

(145) *Large rationally connected varieties, I.*
János Kollár, Princeton University (962-14-03)

MAA Invited Address

2:15 PM – 3:05 PM

(146) *Neither Sherlock Holmes nor Babylon: A reassessment of Plimpton 322.*
Eleanor Robson, University of Oxford (962-A0-39)

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

2:15 PM – 5:35 PM

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

2:15PM ▶ (147) *Hints on establishing an Industrial Mathematics program.*
Charles R MacCluer, Michigan State University (962-97-879)

2:45PM ▶ (148) *Professional Master's Program in Math at New Mexico Tech.*
William D Stone, New Mexico Institute of Mining & Technology (962-97-759)

3:15PM ▶ (149) *Professional Masters Programs at Arizona State University, M.S. Statistics, M.N.S. High School Certification, and the M.N.S.* Preliminary report.
Dieter Armbruster and **Rosemary A Renaut***, Arizona State University (962-97-911)

3:45PM ▶ (150) *The Curriculum Foundations Project: What Do Our Partner Disciplines Need?* Preliminary report.
William H Barker, Bowdoin College (962-97-1339)

4:15PM ▶ (151) *Technical Mathematics for Tomorrow: Recommendations and Exemplary Programs.* Preliminary report.
Mary Ann Hovis*, Lima Technical College, **John C Peterson**, Chattanooga State Technical Community College, and **Robert L Kimball**, Wake Technical Community College (962-97-997)

4:45PM ▶ (152) *Statistics: The Curriculum Foundations Workshop.* Preliminary report.
Thomas L Moore, Grinnell College (962-97-1374)

5:15PM ▶ (153) *Curriculum Foundations Workshop in Interdisciplinary Instruction at West Point.*
Don Small* and **Kathleen G. Snook**, U.S. Military Academy (962-97-1410)

AMS Special Session on Geometric Group Theory, II

2:15 PM – 5:35 PM

Organizers: **Stephen G. Brick**, University of South Alabama
Igor Mineyev, University of South Alabama
Jon M. Corson, University of Alabama

2:15PM (154) *Generalizing Diagram Groups.* Preliminary report.
John R Stallings, University of California, Berkeley (962-20-858)

2:45PM (155) *Finiteness and CAT(0) properties of diagram groups.*
Daniel S Farley, Penn State University (962-20-1045)

3:15PM (156) *Closed surface subgroups of free-by-cyclic groups.* Preliminary report.
Noel P Brady*, University of Oklahoma, **Graham Niblo**, University of Southampton, and **Eric Swenson**, Brigham Young University (962-20-1107)

3:45PM (157) *Large Tits' boundary diameter implies rank 1.*
Eric L Swenson*, BYU, and **Kim Ruane**, Tufts (962-20-902)

4:15PM (158) *A Freiheitssatz for Semi-Staggered Relative Presentations.*
Julia D Fredericks, John Carroll University (962-20-843)

4:45PM (159) *Quasiconvexity in nonpositively curved spaces with isolated flats.*
Christopher Hruska, Cornell University (962-20-1395)

5:15PM (160) *Why do certain CAT(0) groups have unique boundary?* Preliminary report.
Kim E Ruane*, Tufts University, and **Mike Mihalik**, Vanderbilt University (962-20-1389)

AMS Special Session on Integrals and Series throughout Mathematics, II

2:15 PM – 5:35 PM

Organizers: **Victor H. Moll**, Tulane University
George Boros, University of New Orleans

2:15PM (161) *[Coefficients of Eisenstein Series] An unsolved problem of Ramanujan on the coefficients of the reciprocal of a certain Eisenstein series.*
Bruce C. Berndt, University of Illinois at Urbana-Champaign (962-11-665)

2:45PM (162) *On some definite integrals involving the Hurwitz Zeta Function.*
Olivier R Espinosa*, Universidad Técnica Federico Santa María, Valparaíso, Chile., and **Victor H Moll**, Tulane University (962-33-719)

3:15PM (163) *Bailey Chains and Trees.*
George E Andrews, Penn State (962-33-396)

3:45PM (164) *Series acceleration and irrationality proofs.*
Tewodros Amdeberhan, DeVry Institute of Technology (962-40-1408)

4:15PM (165) *MultInt, a Maple Package for Multiple Integration by the WZ Method.*
Akalu Tefera, Grand Valley State University (962-05-224)

4:45PM (166) *Series Evaluations via Identities/Transformation Formulae for Special Functions.* Preliminary report.
David M Bradley, University of Maine (962-33-219)

5:15PM (167) *Some Integrals and Series Associated with the Riemann Zeta Function.* Preliminary report.
Hari M. Srivastava, University of Victoria (962-11-369)

AMS Special Session on Asymptotic Behavior of Difference Equations with Applications, II

2:15 PM – 5:55 PM

Organizers: **Vlajko L. Kocic**, Xavier University
Abdul-Aziz Yakubu, Howard University
Gerasimos Ladas, University of Rhode Island

2:15PM (168) *Asymptotic Solutions to a Discrete Airy Equation.*
Ronald E Mickens, Clark Atlanta University (962-39-1430)

2:40PM (169) *Oscillation and Global Asymptotic Stability.*
Dimitar P. Mishev and **William T. Patula***, Southern Illinois University (962-39-132)

3:05PM (170) *Global Behavior of Some Nonautonomous Nonlinear Second-Order Difference Equations.* Preliminary report.
Vlajko L Kocic, Xavier University of Louisiana (962-39-1106)

3:30PM (171) *Global Stability of X(n+1)= (a+bX(n-k))/(AX(n)+BX(n-k)).* Preliminary report.
Richard DeVault, Northwestern State University, **Witold Kosmala**, Appalachian State University, **Gerry Ladas**, University of Rhode Island, and **Stephen Schultz***, Providence College (962-39-1390)

3:55PM (172) *Asymptotic Behavior of a Class of Nonlinear Delay Difference Equations from Economics.*
Hassan Sedaghat*, Virginia Commonwealth University, and **Wendi Wang**, Southwest Normal University (962-39-758)

4:20PM (173) *On the difference equation x[n+1]=A[0]/x[n]+A[1]/x[n-1]+.....+A[k-1]/x[n-k+1], n=0,1,...*
Edward A Grove*, **El-Metwally Hamdi**, **Gerry Ladas**, University of Rhode Island, and **H D Voulov**, Truman State University (962-39-834)

4:45PM (174) *Positive solutions of a class of neutral difference equations.*
John R. Graef, University of Tennessee at Chattanooga, **Chuanxi Qian*** and **Bo Yang**, Mississippi State University (962-39-1252)

5:10PM (175) *On the Recursive Sequence* $x_{n+1} = p + \frac{x_{n-1}}{x_n}$. Preliminary report.
Richard DeVault*, Northwestern State University of Louisiana, **Elias Camouzis**, American College of Greece, and **Gerry Ladas**, University of Rhode Island (962-39-710)

5:35PM (176) *On the Dynamics of* $[x_{n+1} = \frac{\alpha+\beta x_n}{A+Bx_n+Cx_{n-1}}]$.
M. R. S. Kulenovic, **Gerry Ladas**, University of Rhode Island, **L. F. Martins** and **Ieda Rodrigues***, Cleveland State University (962-39-1418)

AMS Special Session on Commutative Rings and Monoids, II

2:15 PM – 5:35 PM

Organizers: **Scott T. Chapman**, Trinity University
Evan G. Houston, University of North Carolina at Charlotte

2:15PM (177) *Universal property of the Kaplansky ideal transform and affineness of the open subsets of an affine scheme.* Preliminary report.
Marco Fontana*, Universita degli Studi "Roma Tre", and **Nicolae Popescu**, Academie de Roumanie (962-13-1059)

2:45PM (178) *Conguence monoids.* Preliminary report.
Franz Halter-Koch, Univ. Graz, Austria (962-13-821)

3:15PM (179) *On the Cale Property in Integral Domains and Monoids.*
Ulrich Krause*, Universität Bremen, Bremen, Germany, and **Scott T. Chapman**, Trinity University (962-13-753)

3:45PM (180) *On Diophantine Monoids and Their Class Groups.*
Scott T. Chapman, Trinity University, **Ulrich Krause** and **Eberhard Oeljeklaus***, University of Bremen, Germany (962-20-781)

4:15PM (181) *Elasticity and length functions on atomic monoids.* **Scott T Chapman**, Trinity University, **Juan I Garcia-Garcia**, **Pedro A Garcia-Sanchez*** and **Jose C Rosales**, Universidad de Granada (962-20-886)

4:45PM (182) *Arithmetic of Krull monoids.* **Alfred Geroldinger**, University Graz, Austria (962-13-1073)

5:15PM (183) *Bad Dimension and Stability Behavior for Power Series Rings.* **Jim Coykendall**, North Dakota State University (962-13-755)

AMS Special Session on Braid Groups and Configuration Spaces, II

2:15 PM – 5:35 PM

Organizers: **Daniel C. Cohen**, Louisiana State University
Neal W. Stoltzfus, Louisiana State University

2:15PM (184) *Braids and configuration spaces motivated by robotics.* **Robert W Ghrist**, Georgia Institute of Technology (962-57-1266)

2:45PM ▶ (185) *Configuration Spaces and Braid Groups of Graphs.* **Aaron D Abrams**, University of Georgia (962-57-1042)

3:15PM (186) *Milnor fibers of hyperplane arrangements.* Preliminary report. **Richard Randell**, University of Iowa (962-57-683)

3:45PM (187) *Equivariant Euler characteristics of some braid groups.* **Graham C Denham*** and **Nicole M Lemire**, University of Oregon (962-20-1332)

4:15PM (188) *Orbit configuration spaces and G-equivariant loop spaces.* **Miguel A Xicotencatl**, CINVESTAV, Mexico city (962-55-1244)

4:45PM (189) *On "braid-like" groups for manifolds of dimension at least 3.* **Frederick R. Cohen***, University of Rochester, and **Takeshi Sato**, Okayama University (962-55-987)

5:15PM ▶ (190) *Combinatorics of Real Moduli Spaces.* **Satyan L Devadoss**, Ohio State University (962-55-962)

AMS Special Session on Operator Theory on Function Spaces, II

2:15 PM – 5:35 PM

Organizers: **Zhijian Wu**, University of Alabama
Dechao Zheng, Vanderbilt University

2:15PM (191) *Carleson Measures for Besov Spaces.* **Nicola Arcozzi**, Universita di Bologna, **Richard Rochberg***, Washington University, St. Louis, and **Eric Sawyer**, McMaster University, Ontario (962-46-875)

2:45PM (192) *An $H^2(\mathbf{D}^2)$-corona Theorem for Infinitely many Functions on the Bidisk.* Preliminary report. **Tavan T Trent**, University of Alabama (962-47-957)

3:15PM (193) *Algebraic and Spectral Properties of Dual Toeplitz Operators.* **Karel Stroethoff***, University of Montana, and **Dechao Zheng**, Vanderbilt University (962-47-862)

3:45PM (194) *Carleson measures and multipliers for $D(\mu)$.* **Rick Chartrand**, University of Illinois at Chicago (962-46-264)

4:15PM (195) *On Meromorphic Approximation and the AAK Theorem.* **Vasiliy A Prokhorov**, University of South Alabama (962-47-1241)

4:45PM (196) *Zero sets, Carleson measures, and interpolation in Bergman spaces.* Preliminary report. **Daniel H Luecking**, University of Arkansas (962-30-1035)

5:15PM (197) *The sharp bound of the continuous square function in $L^2(w)$.* **Janine E Wittwer**, Williams College (962-42-1297)

AMS Special Session on Graduate and Postdoctoral Education in Arithmetical Algebraic Geometry: The Arizona Winter School, I

2:15 PM – 4:50 PM

Organizers: **Douglas L. Ulmer**, University of Arizona
William G. McCallum, University of Arizona

2:15PM Remarks on the Arizona Winter School.

2:30PM (198) *Thue equations and the method Chabauty-Coleman.* **Thomas J Tucker**, University of Georgia (962-11-1052)

3:00PM (199) *Brauer Points on Fermat Curves.* **William G McCallum**, University of Arizona (962-11-870)

3:30PM (200) *The affine line modulo isogeny.* **Mugurel A Barcau**, University of New Mexico (962-11-1120)

4:00PM (201) *Applications of p-derivations to Arithmetic Algebraic Geometry.* Preliminary report. **Chris Hurlburt**, Northern Illinois University (962-11-1367)

4:30PM (202) *Mysterious formulae involving the numbers of points in some families of elliptic curves.* **Frank D Calegari**, UC Berkeley (962-14-985)

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
Stephan G. Hartke, Rutgers University

MAA Minicourse #2: Part A

2:15 PM – 4:15 PM

WeBWorK, an Internet-based system for generating and delivering homework problems to students.

Organizers: **Arnold K. Pizer**, University of Rochester
Michael E. Gage, University of Rochester
Vicki Roth, University of Rochester

MAA Minicourse #8: Part A

2:15 PM – 4:15 PM

Teaching graduate students how to teach using case studies.

Organizers: **Solomon Friedberg**, Boston College

Deborah Hughes Hallett, University of Arizona
William G. McCallum, University of Arizona

AMS Session on Topology

2:15 PM – 5:55 PM

2:15PM (203) *Convergencial Properties.* Preliminary report.
Jamuna P Ambasht, Benedict College (962-54-1177)

2:30PM (204) *Half Lines Having a Common Continuum with Span Zero as Remainder.* Preliminary report.
Clarke W Proctor, Stephen F. Austin State University (962-54-1184)

2:45PM (205) *A Simple Extension on Convergence Spaces.*
Shing S So, Central Missouri State University (962-54-1197)

3:00PM (206) *Some Fixed Point Theorems in Star-shaped Sets.* Preliminary report.
Jinlu Li, Shawnee State University (962-54-1258)

3:15PM (207) *Selectively Confluent Mappings of Continua.*
Pamela D Roberson, Stephen F. Austin State University (962-54-1262)

3:30PM (208) *Metrizability of trees.*
Akira Iwasa, University of South Carolina (962-54-1270)

3:45PM ▶ (209) *Spaces Related to Base-paracompact Space.* Preliminary report.
John E Porter* and **Gary F Gruenhage**, Auburn University (962-54-331)

4:00PM ▶ (210) *On boundary avoiding continuous selections.*
Jan J. Dijkstra and **Stoyu T. Barov***, The University of Alabama (962-54-692)

4:15PM (211) *On the structure of n-point sets.*
Khalid Bouhjar, Vrije Universiteit, and **Jan J Dijkstra***, University of Alabama (962-54-704)

4:30PM (212) *Limits in the Uniform Ultrafilters.*
Joni E Baker* and **Kenneth Kunen**, University of Wisconsin-Madison (962-54-767)

4:45PM (213) *Arcwise connectivity in C-continua.*
Leland E Rogers, Pepperdine University (962-54-904)

5:00PM (214) *Real Stunted Projective Spaces and the Root Invariant.*
Inga A Johnson, University of Oregon (962-55-1133)

5:15PM (215) *Rigidity of Elliptic Genera on Homogeneous Spaces.* Preliminary report.
Scott J Simmons, Texas A&M International University (962-55-1369)

5:30PM (216) *Rational homotopy Lie algebra of classifying spaces for fibrations.*
Samuel B Smith, St. Joseph's University (962-55-648)

5:45PM (217) *Proof of an Exponent Conjecture of Bousfield.*
Michael J Fisher, Lehigh University (962-55-700)

AMS Session on Manifolds and Global Analysis

2:15 PM – 3:25 PM

2:15PM (218) *The fundamental group of a visual boundary versus the fundamental group at infinity.* Preliminary report.
Gregory R Conner, Brigham Young University, and **Hanspeter Fischer***, Ball State University (962-57-1030)

2:30PM (219) *Constructing Algebraic Links for Low Edge Numbers.*
Cynthia L McCabe, Univ. of WI - Stevens Point (962-57-1206)

2:45PM ▶ (220) *Spatial Characteristics of Optimal Polygonal Knots.* Preliminary report.
Kenneth C. Millett, University of California, Santa Barbara, and **Eric J. Rawdon***, Chatham College (962-57-59)

3:00PM (221) *The fundamental theorem of multivariable calculus and its applications.*
Mel S. Berger, Massachusetts Institute of Technology (962-58-711)

3:15PM (222) *On the Genus of Random Riemann Surface.*
Alex P Gamburd, MSRI, and **Eran Makover***, Dartmouth College (962-58-883)

AMS Session on Algebraic Systems

2:15 PM – 4:10 PM

2:15PM (223) *Lattice Ordered Effect Algebras.*
Scott R Sykes, State University of West Georgia (962-06-1142)

2:30PM (224) *Musical and Mathematical Applications of Composite Interval Cycle Sets.*
Robert W Peck, Louisiana State University (962-08-87)

2:45PM (225) *Essentially powers filtration transforms of Noether lattices.*
Johnny A Johnson, University of Houston, and **Monty B Taylor***, University of Texas-Pan American (962-06-1189)

3:00PM (226) *Heyting and MV-Algebras (Preliminary Report).* Preliminary report.
Nathan R Ritter, University of Massachusetts at Amherst (962-06-1209)

3:15PM (227) *Unities and Double Negation: Some Problems from "Mathematical Essays in Honor of Gian-Carlo Rota".*
Jonathan D Farley, Vanderbilt University (962-06-1324)

3:30PM ▶ (228) *Four-generator partial Boolean algebras in orthomodular lattices.*
Derek A Smith, Lafayette College (962-06-1397)

3:45PM (229) *A property of totally ordered monoids of rank 2.* Preliminary report.
Gretchen W. Whipple, Hartwick College (962-06-65)

4:00PM ▶ (230) *Quadratic Formulas for Quaternions.*
Liping Huang, Xiangtan Polytechnic University, and **Wasin So***, San Jose State University (962-08-231)

MAA Session on Innovative Uses of the World Wide Web in Teaching Mathematics, I

2:15 PM – 6:50 PM

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

2:15PM ▶ (231) *Teaching & Tutoring Mathematics Online: Via a Live Synchronous White Board.* Preliminary report.
Kirk Benningfield, Smarthinking, Inc. (962-C1-577)

2:35PM ▶ (232) *WWW-documents with interactive animations as learning material.*
Martti E Pesonen, University of Joensuu (962-C1-506)

2:55PM ▶ (233) *Interactive Web-Based Materials for Calculus Using LiveMath.* Preliminary report.
Brian T Gill, Seattle Pacific University (962-C1-548)

3:15PM ▶ (234) *A Web-based simulation of collaborative group learning.* Preliminary report.
Larry Copes, ISEM (962-C1-1438)

3:35PM ▶ (235) *Sample Activities from the Mathwright Library and Project WELCOME.*
Dan Kalman*, American University, and **Samuel Masih**, Albany State University (962-C1-436)

3:55PM ▶ (236) *Delivering Interactive and Dynamic Instruction with MathWright: Operation Lakes.*
Ravinder Kumar*, Alcorn State University, MS, and **Mike Pepe**, Central Seattle Community College (962-C1-476)

4:15PM ▶ (237) *MAA Project WELCOME: Interactive Internet Math and Underrepresented Student Populations.*
James E White, President, Bluejay Lispware and Director, Project WELCOME (962-C1-435)

4:35PM ▶ (238) *WebCT Quizzes in Precalculus and Calculus.*
Jeffry L Hirst, Appalachian State University (962-C1-426)

4:55PM ▶ (239) *Group Journal Writing Using Blackboard CourseInfo.* Preliminary report.
Kris H Green, St. John Fisher College (962-C1-511)

5:15PM ▶ (240) *Engaging Students: A National Library of Web-based Interactive Manipulatives for Learning Mathematics.* Preliminary report.
Robert Heal*, **Larry Cannon**, Utah State University, and **Richard Wellman**, Westminster College (962-C1-1440)

5:35PM ▶ (241) *Interactive Visualization across the Curriculum.*
Matthias Kawski, Arizona State University (962-C1-1439)

5:55PM ▶ (242) *A Brief Tour of Mathlets: Web Applets for Calculus Visualizations.*
Thomas E Leathrum, Jacksonville State Univ. (962-C1-256)

6:15PM ▶ (243) *A Web-Based History of Math Course.* Preliminary report.
Charles Lindsey, Florida Gulf Coast University (962-C1-1437)

6:35PM ▶ (244) *Interactive Mathematics Courses at the MathSoft Learning Site.*
William J Mueller, MathSoft (962-C1-31)

MAA Session on The Undergraduate Seminar in Mathematics, I

2:15 PM – 5:10 PM

Organizers: **Barry J. Arnow**, Kean University of New Jersey
George A. Avirappattu, Kean University of New Jersey

2:15PM (245) *The Undergraduate Seminar in Mathematics - Objectives and Obstacles.*
Barry J Arnow, Kean University (962-I1-298)

2:30PM ▶ (246) *Senior Seminar: Topics and Formats.* Preliminary report.
Karen D Bolinger*, **Roger A Engle**, **Stephen I Gendler** and **Michael J McConnell**, Clarion University (962-I1-565)

2:45PM ▶ (247) *A Department Colloquium for Sophomores.*
Robert L Brabenec, Wheaton College (962-I1-247)

3:00PM ▶ (248) *The Senior Seminar in Mathematics at Union University.*
Bryan Dawson, Union University (962-I1-172)

3:15PM ▶ (249) *First-Year Seminar - Engaging and Preparing Mathematics Students.*
Julian F Fleron, Westfield State College (962-I1-578)

3:30PM ▶ (250) *The Senior Seminar: Bringing 20th Century Mathematics to the Fore.*
Philip K Hotchkiss, Westfield State College (962-I1-582)

3:45PM ▶ (251) *The Senior Seminar in Mathematics.*
Dale K. Hathaway, Olivet Nazarene University, Bourbonnais IL (962-I1-206)

4:00PM ▶ (252) *From Calculus to Topology: Lecture-Free Seminar Courses Throughout the Curriculum.* Preliminary report.
Daniel King, Sarah Lawrence College (962-I1-293)

4:15PM ▶ (253) *Everybody Wins: The Faculty-Student Seminar at Ball State University.*
John D Lorch, Ball State University (962-I1-123)

4:30PM (254) *Practice Makes Almost Perfect.*
Jean Mastrangeli, immaculata college (962-I1-604)

4:45PM ▶ (255) *A Non Textbook-based, Writing Intensive Senior Seminar.*
Suzanne M Molnar, College of St. Catherine (962-I1-28)

5:00PM ▶ (256) *A Design for an Undergraduate Capstone Seminar in the History of Mathematics.* Preliminary report.
Charlie L Smith, Park University (962-I1-110)

MAA Session on Topics in Teaching, Learning, and Exploring Proof

2:15 PM – 6:40 PM

Organizers: **Connie M. Campbell**, Millsaps College
Draga D. Vidakovic, Georgia State College
G. Joseph Wimbish, Huntingdon College

2:15PM (257) *What, in our brains, enables us to construct proofs?*
Gary E. Davis, University of Southampton, UK (962-P1-1433)

2:30PM ▶ (258) *A supplementary tool for learning about proofs.* Preliminary report.
John Selden*, Mathematics Education Resources Co., and **Annie Selden**, Tennessee Technological University (962-P1-610)

2:45PM (259) *Using experience as a prelude to proof.* Preliminary report.
Jeff Connor, Ohio University (962-P1-553)

3:00PM ▶ (260) *Mathematical proof: How to make it accessible to students.* Preliminary report.
Mary T Treanor, Valparaiso University (962-P1-605)

3:15PM ▶ (261) *Helping Students to Read, Understand, and Construct Mathematical Proofs.* Preliminary report.
Connie M Campbell, Millsaps College (962-P1-512)

3:30PM ▶ (262) *Teaching and Learning Proof Using a "Genetic" Approach.*
Charles P. Funkhouser, University of Wyoming, Laramie (962-P1-19)

3:45PM (263) *On the Teaching and Learning of Proof.* Preliminary report.
Rebecca L Lewin LeDocq* and **David W Bange**, University of Wisconsin-La Crosse (962-P1-164)

4:00PM ▶ (264) *Bridge Over the River Abstract: A Course in Mathematical Experimentation.*
Judith H Morrel, Butler University (962-P1-16)

4:15PM ▶ (265) *A Teaching Experiment in Number Theory.* Preliminary report.
Carmen J Schabel, Portland State University (962-P1-802)

4:30PM ▶ (266) *The Impact of Group Process Behaviors in the Development of Mathematical Thinking.* Preliminary report.
Diane F Baker* and **Connie M Campbell**, Millsaps College (962-P1-478)

4:45PM (267) *Counterexamples in Good Teaching.*
Douglas E. Ensley, Shippensburg University (962-P1-524)

5:00PM (268) *Cooperative Learning and Technology Use in the Teaching of Modern Algebra.* Preliminary report.
Kevin E Charlwood, Washburn University (962-P1-945)

5:15PM ▶ (269) *Handshaking problems: Paths to generalization and proof.* Preliminary report.
Diane M. Spresser, National Science Foundation (962-P1-425)

5:30PM ▶ (270) *Teaching Mathematical Reading.* Preliminary report.
Jane Friedman, University of San Diego (962-P1-1299)

5:45PM ▶ (271) *Introducing Proof in the First Grade: The Sum of Even Numbers is Even.*
Ockle E Johnson, Keene State College (962-P1-558)

6:00PM ▶ (272) *Creativity through Mathematics Proof Writing Tasks.*
Fu-Shiang P. Tsen, National Chiao-Tung University (962-P1-508)

6:15PM ▶ (273) *Adventures in Proofs with Sixth Graders.*
Una Bray, Skidmore College (962-P1-607)

6:30PM ▶ (274) *Triangles Produce Squares and Cubes?*
Jacqueline A Hall, Longwood College (962-P1-368)

MAA Session on General Contributed Papers, I

2:15 PM – 5:40 PM

Organizers: **Howard L. Penn**, United States Naval Academy
Elizabeth M. Mayfield, Hood College
Jay A. Malmstrom, Oklahoma City Community College
William P Wardlaw, United States Naval Academy

2:15PM ▶ (275) *Chairing and Teaching in a University Mathematics Department in a Developing Nation.*
Deane E Arganbright, University of Tennessee-Martin (962-T1-92)

2:30PM ▶ (276) *Backgrounds of Prospective Elementary Teachers: A Case Study from Mathematics for Elementary Teachers at Rhode Island College.* Preliminary report.
Ann E. Moskol, Rhode Island College (962-T1-554)

2:45PM (277) *Designing Professional Development for Inservice Teachers.*
Joyce H Saxon*, **Vivian F Cyrus** and **Rodger Hammons**, Morehead State University (962-T1-571)

3:00PM ▶ (278) *Preparing Our Preservice Teachers for Reform-Based Instruction.*
Diana Underwood*, **Rose Dubec** and **Catherine Murphy**, Purdue University Calumet (962-T1-310)

3:15PM ▶ (279) *Creating the "Ideal" Math Student Using Online Discussion.* Preliminary report.
Michelle D Wagner, University of Wisconsin-La Crosse (962-T1-722)

3:30PM ▶ (280) *Time On Task Versus Student Performance.* Preliminary report.
Darwyn C Cook, Alfred University (962-T1-154)

3:45PM (281) *Directed reading: A strategy for teaching students to read mathematics.*
Nancy Ann Neudauer, Pacific Lutheran University (962-T1-505)

4:00PM ▶ (282) *Afternoon Workshops in Math Study Skills: Giving Students the Tools For Success in Their Math Courses.*
Keri A Kornelson, University of Colorado-Boulder (962-T1-367)

4:15PM ▶ (283) *Building Community among Mathematics and Related Majors through a Freshman Orientation Experience.* Preliminary report.
Robert N. Talbert* and **Kirk E. Weller**, Bethel College (IN) (962-T1-215)

4:30PM (284) *Remedial courses: Unadopted babies.*
Satish C Bhatnagar, University of Nevada, Las Vegas (962-T1-625)

4:45PM ▶ (285) *Components of successful education.*
Radoslav M. Dimitric, Berkeley City College (962-T1-222)

5:00PM ▶ (286) *Math Express: Review instead of remediation.*
Sharon E Persinger, Marymount College (962-T1-418)

5:15PM ▶ (287) *Representation of Fibonacci Numbers as Sums of Consecutive Factorials.* Preliminary report.
Mark Bollman, Albion College (962-T1-334)

5:30PM ▶ (288) *Mathematics: More than numbers.* Preliminary report.
Theodore S Erickson*, Wheeling Jesuit University, and **Margaret D Erickson**, Mount de Chantal Academy (962-T1-415)

MAA Committee on Minority Participation in Mathematics Panel Discussion

2:15 PM – 3:45 PM

Increasing minority representation in mathematics through GAANN.

Organizers: **Lawrence S. Husch**, University of Tennessee
Robert Rogers, Virginia Polytechnic Institute and State University
Krishan M. Agrawal, Virginia State University

Panelists: **Robert F. Olin**, University of Alabama
Robert Rogers
Ping Zhang, Western Michigan University
Timothy L. Lance, SUNY at Albany
Krishan M. Agrawal
Alan C. Tucker, SUNY at Stony Brook
Alexandra Kurepa, North Carolina A&T State University
David C. Manderscheid, University of Iowa, Iowa City

MAA Committees Panel Discussion

2:15 PM – 3:45 PM

Redefining "college algebra" courses.

Organizer: **Sheldon P. Gordon**, SUNY at Farmingdale

Panelists: **Thomas A. Berger**, Colby College
Donald B. Small, U.S. Military Academy
Arlene Kleinstein, SUNY at Farmingdale
Alexander H. Fluellen, Clark Atlanta University
Bruce C. Crauder, Oklahoma State University

MAA Panel Discussion

2:15 PM – 3:45 PM

The Journal of Online Mathematics and Its Applications (JOMA).

Organizers: **Lawrence C. Moore, Jr.**, Duke University
Thomas W. Roby, Californiia State University, Hayward
David A. Smith, Duke University

Panelists: **Donald J. Albers**, MAA
Lawrence C. Moore, Jr.
Thomas W. Roby
David A. Smith

MAA-MSEB Panel Discussion

2:15 PM – 3:45 PM

Articulation among secondary and postsecondary mathematics programs.

Organizer: **Bradford R. Findell**, Mathematical Sciences Education Board

Panelists: **Richelle M. Blair**, Lakeland Community College
Christian R. Hirsch, Western Michigan University
Gail F. Burrill, Mathematical Sciences Education Board

AMS Special Session on Representation Theory of Finite and Algebraic Groups, I

2:30 PM – 5:20 PM

Organizers: **Zongzhu Lin**, Kansas State University
Daniel K. Nakano, Utah State University
Cornelius Pillen, University of South Alabama

2:30PM (289) *Units in Hecke Algebras.* Preliminary report.
Randall R Holmes*, Auburn University, and **Frank A Casabianca**, Agnes Scott College (962-20-964)

3:00PM (290) *On double Ringel-Hall algebras.*
Bangming Deng, Beijing Normal University, and **Jie Xiao***, Tsinghua University, China (962-17-992)

3:30PM (291) *Involutions on Algebraic Groups and Modular Harish-Chandra Modules.*
Terrell L Hodge, Western Michigan University (962-20-969)

4:00PM (292) *Generators and relations for Schur algebras.* Preliminary report.
Stephen Doty, Loyola University Chicago (962-16-1423)

4:30PM (293) *Extensions for finite Chevalley groups and Frobenius kernels.*
Christopher P Bendel*, University of Wisconsin-Stout, **Daniel K Nakano**, Utah State University, and **Cornelius Pillen**, University of South Alabama (962-20-481)

5:00PM (294) *Torsion Endotrivial Modules.* Preliminary report.
Jon F Carlson*, University of Georgia, and **Jacques Thévenaz**, Université de Lausanne (962-20-695)

AMS Special Session on PDE Models in Population Biology and Epidemiology, I

2:30 PM – 5:50 PM

Organizers: **J. M. Cushing**, University of Arizona
Eric T. Funasaki, Georgia Southern University
Shandelle M. Henson, College of William and Mary
Anna Maria Spagnuolo, Oakland University

2:30PM (295) *Inverse Problems for Random Effects Models of HIV.*
H. T Banks*, **David M Bortz**, Center for Research in Scientific Computation, North Carolina State University, and **Sarah Holte**, Fred Hutchinson Cancer Research Center (962-92-1319)

3:00PM ▶ (296) *Models of vancomycin resistant enterococci epidemics in dialysis clinics.* Preliminary report.
Glenn F Webb, Vanderbilt University (962-92-849)

3:30PM (297) *Disease Persistence in an Evolutionary Influenza Model.* Preliminary report.
Horst R Thieme* and **Jinling Yang**, Arizona State University (962-92-638)

4:00PM (298) *Endemic models for the spread of infectious diseases with arbitrarily distributed disease stages.*
Zhilan Feng*, Purdue University, and **Horst R Thieme**, Arizona State University (962-92-966)

4:30PM (299) *Two-Strain Influenza Models with Mutation.* Preliminary report.
Jia Li, University of Alabama in Huntsville (962-92-1100)

5:00PM (300) *Homogeneous dynamical systems and the age-structured SIR model with proportionate mixing.*
Mimmo Iannelli, Universita di Trento, and **Maia Martcheva***, Polytechnic University (962-92-923)

5:30PM (301) *Homoclinic Bifurcation in an $SIQR$ Model for Childhood Diseases.*
Lih-Ing Wu*, Berea College, and **Zhilan Feng**, Purdue University (962-34-346)

Special Poster Session

2:30 PM – 4:00 PM

Guided student exploration as a means of learning mathematics.

Organizer: **Harriet S. Pollatsek**, Mount Holyoke College

AWM Panel Discussion

2:45 PM – 4:05 PM

AWM and K–8 education: What should we do?

Organizers: **Suzanne Lenhart**, University of Tennessee, Knoxville
Jean E. Taylor, Rutgers University

Panelists: **Shirley Malcom**, AAAS
Judith Roitman, University of Kansas
Erica D. Voolich, Solomon Schechter Day School
Virginia M. Warfield, University of Washington

MAA Invited Address

3:20 PM – 4:10 PM

▶ (302) *Using mathematics in teaching: What do teachers and mathematicians need to learn?*
Hyman Bass* and **Deborah Loewenberg Ball***, University of Michigan, Ann Arbor (962-A0-36)

Young Mathematicians Network-Project NExT Panel Discussion

4:00 PM – 5:30 PM

Keeping active in research.
Organizers: **J. Lyn MIller**, Western Kentucky University
Sharon M. Frechette, College of the Holy Cross
Panelists: **Janet L. Andersen**, Hope College
Cristina M. Ballantine, Dartmouth College
Randall J. Swift, Western Kentucky University
Ann N. Trenk, Wellesley College
Emil J. Volcheck, National Security Agency

Joint Committee on Employment Opportunities Panel Discussion

4:00 PM – 6:00 PM

The job market.
Organizer: **Thomas W. Rishel**, MAA
Panelists: **Debra L. Boutin**, Hamilton College
Richard J. Cleary, Cornell University
Dennis M. Luciano, Western New England College
Carla Martin, Cornell University
Thomas W. Rishel

MAA Special Presentation

4:00 PM – 6:00 PM

The British Open University: 30 years on.
Organizers: **Robin J. Wilson**, British Open University
John Fauvel, British Open University

AWM Business Meeting

4:05 PM – 4:25 PM

MAA Minicourse #6: Part A

4:30 PM – 6:30 PM

Computation and discovery in the number theory classroom.
Organizer: **Clifford A. Reiter**, Lafayette College

AMS Session on Number Theory, I

4:30 PM – 5:40 PM

4:30PM ▶ (303) *Systems of Finite Arithmetic Progressions and Integer Partitions.*
Jasmer Singh, Boulogne, France (962-11-737)

4:45PM (304) *Witt kernels of inseparable quartic extensions.*
Hamza Y Ahmad, Lincoln University (962-11-793)

5:00PM (305) *Densities of 4-ranks of K_2 of rings of integers.*
Robert B Osburn, Louisiana State University (962-11-995)

5:15PM ▶ (306) *Solving Generalized Fermat-Pell Equations by Matrix Methods.* Preliminary report.
Ronald E Rietz, Gustavus Adolphus College (962-11-927)

5:30PM (307) *P-orderings: the metric viewpoint and the non-existence of simultaneous orderings in imaginary quadratic number rings.*
Melanie E Wood, Duke University (962-11-958)

MAA Section Officers

4:30 PM – 6:30 PM

Reception for Graduate Students

5:00 PM – 6:30 PM

MAA-GAANN Poster Session

5:15 PM – 7:15 PM

Sharing of results by future mathematicians from under-represented areas.
Organizer: **Robert F. Olin**, Virginia Polytechnic Institute and State University

Mathematical Sciences Institutes Reception

5:30 PM – 7:30 PM

Reception for First-Time Participants

6:00 PM – 7:00 PM

MAA Special Presentation

6:30 PM – 8:00 PM

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

Young Mathematicians Network Discussion

7:15 PM – 8:15 PM

Concerns of young mathematicians: A town meeting
Organizer: **Kevin E. Charlwood**, Washburn University

AMS Josiah Willard Gibbs Lecture

8:30 PM – 9:30 PM

(308) *The Steiner Problem.*
Ronald L. Graham, University of California San Diego (962-52-09)

AWM Reception

9:30 PM – 11:00 PM

Thursday, January 11

Employment Center

7:00 AM – 7:30 PM

Distribution of schedules, scheduled interviews, and interview center (see article October 2000 issue, page 1218).

Committee on MAA/Department Liaisons Breakfast

7:00 AM – 8:30 AM

Joint Meetings Registration

7:30 AM – 4:00 PM

MAA Session on Redefining What a Modern "College Algebra" Experience Means, II

7:55 AM – 11:55 AM

Organizers: **Sheldon P. Gordon**, SUNY at Farmingdale
Florence S. Gordon, New York Institute of Technology
Arlene H. Kleinstein, SUNY at Farmingdale
Mary Robinson, University of New Mexico, Valencia
Linda H. Boyd, Georgia Perimeter College
Barbara A. Jur, Macomb Community College

7:55AM Introductory remarks.

8:00AM ▶ (309) *Three Versions of College Algebra at Portland Community College.*
Jerry R Kissick, Portland Community College (962-D1-608)

8:15AM ▶ (310) *In-Class Collaborative Learning for a 60-student "College Algebra" Class for Business Students.*
Sarah-Marie Belcastro, University of Northern Iowa (962-D1-288)

8:30AM ▶ (311) *Integrating Projects Into the College Algebra Curriculum.* Preliminary report.
Jay A Malmstrom* and **Chris Chris Oehrlein**, Oklahoma City Community College (962-D1-318)

8:45AM ▶ (312) *A Precalculus Technology Course with Mathematica.*
Barry Cherkas, Hunter College (CUNY) (962-D1-269)

9:00AM ▶ (313) *Computer Algebra Systems and Pedagogically Unsound Automated Procedures.* Preliminary report.
Michael J. Bosse' and **N. R. Nandakumar***, Delaware State University (962-D1-449)

9:15AM ▶ (314) *Putting "College" back into College Algebra.* Preliminary report.
Michelle R DeDeo, University of North Florida (962-D1-218)

9:30AM ▶ (315) *Revitalizing Precalculus Using Problem-Based Learning.* Preliminary report.
Sonya S Stanley, Samford University (962-D1-599)

9:45AM (316) *Fostering Active Engagement and Learning in College Algebra courses through Writing, Collaborative Learning, and Modeling.*
Harel Barzilai, Salisbury State University (962-D1-333)

10:00AM ▶ (317) *Enhancing College Algebra Instruction.*
Hengli Jiao, Jackson State University (962-D1-427)

10:15AM (318) *Mathematical Literacy in the 21st Century: A Comparison of Student Learning in Contemporary and Traditional College Algebra Courses.*
Christine L Ebert* and **Patrick Mwerinde**, University of Delaware (962-D1-583)

10:30AM ▶ (319) *Precalculus with Parallel Review.*
Rafael Martinez-Planell*, **Darrell Hajek**, **Daniel McGee**, University of Puerto Rico at Mayaguez, and **Sarah E Torres-Ruiz**, Interamerican University (962-D1-232)

10:45AM ▶ (320) *Taking Variables Seriously.* Preliminary report.
Aaron G Montgomery, Central Washington University (962-D1-243)

11:00AM (321) *Cryptography as a Theme in a Course on Functions (Preliminary Report).* Preliminary report.
Aaron T Ekstrom*, Alfred University, and **Jennifer C Smith**, University of Arizona (962-D1-533)

11:15AM ▶ (322) *43.095 General Mathematics - Symbolic Manipulation and More.*
Sarah L Mabrouk, Framingham State College (962-D1-620)

11:30AM ▶ (323) *College Algebra within Calculus!*
Donovan H Van Osdol, University of New Hampshire (962-D1-128)

11:45AM ▶ (324) *Politics, Placement, Peer Study and Performance in College Algebra.*
Paul Chacon* and **Tamara Watkins**, University of Southern Colorado (962-D1-569)

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

8:00 AM – 11:50 AM

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

8:00AM (325) *The Mathematical Preparation of Teachers: Issues for Mathematics Departments.*
Joan Ferrini-Mundy, Michigan State University (962-97-1346)

8:30AM ▶ (326) *Are students learning the necessary concepts of calculus? A comparative study of Japanese and American High School Students.*
Thomas W Judson*, University of Portland, and **Toshiyuki Nishimori**, Hokkaido University (962-97-194)

9:00AM ▶ (327) *Ten years of calculus renewal: A report on evaluation efforts and national impact.*
Susan L Ganter, Clemson University (962-97-1165)

9:30AM ▶ (328) *CAMP/CTFMS Mathematics Teaching Internships.* Preliminary report.
Kenneth C Millett, UCSB (962-97-1263)

10:00AM (329) *Project ENACT: An MAA program to increase the number of Native American mathematics teachers.*
Robert E. Megginson, University of Michigan (962-97-1021)

10:30AM ▶ (330) *UCLA Teacher Preparation Program in Mathematics.* Preliminary report.
Philip C Curtis Jr., UCLA (962-97-1261)

11:00AM ▶ (331) *Mathematically enabling students in the Boston Public Schools.* Preliminary report.
Maurice E Gilmore, Northeastern University (962-97-1302)

11:30AM ▶ (332) *Some Programs that Promote Mathematics Teaching Careers.* Preliminary report.
Kenneth C Millett, UCSB (962-97-1265)

AMS Special Session on Geometric Group Theory, III

8:00 AM – 11:50 AM

Organizers: **Stephen G. Brick**, University of South Alabama
Igor Mineyev, University of South Alabama
Jon M. Corson, University of Alabama

8:00AM (333) *Plane Polynomial Crystallographic Groups.*
Karel Dekimpe, Katholieke Universiteit Leuven, Campus Kortrijk (962-20-652)

8:30AM (334) *Developments in coset enumeration.*
George Havas* and **Colin Ramsay**, The University of Queensland (962-20-856)

9:00AM (335) *An algorithm to detect a nonpositively-curved metric simplical complex.*
Jon McCammond* and **Murray Elder**, Texas A&M University (962-20-787)

9:30AM (336) *Subgroup structure of word-hyperbolic groups.*
Ilya Kapovich*, University of Illinois at Urbana-Champaign, and **Richard Weidmann**, Ruhr-Universitat at Bochum (962-20-866)

10:00AM ▶ (337) *Graph products and Cannon pairs.*
Joseph Loeffler*, The College of New Jersey, **John Meier**, Lafayette College, and **James Worthington**, Binghamton University (962-20-1198)

10:30AM ▶ (338) *The geometry of the space of semi-labelled binary trees, and an application to computational biology.*
Louis Billera, Cornell University, **Susan Holmes***, Stanford University, and **Karen Vogtmann**, Cornell University (962-92-743)

11:00AM (339) *Subgroup separability in tree groups and other graph groups.*
Tim Hsu*, Pomona College, and **Daniel T. Wise**, Brandeis University (962-20-1058)

11:30AM (340) *Non-amenable finitely presented groups without free subgroups.* Preliminary report.
Alexander Olshanskii, Vanderbilt University, Moscow State University, and **Mark Sapir***, Vanderbilt University (962-20-859)

AMS Special Session on Model Theory, I

8:00 AM – NOON

Organizers: **Steven A. Buechler**, University of Notre Dame
Sergei Starchenko, University of Notre Dame

8:00AM (341) *Some Model Theory of Compact Complex Spaces.* Preliminary report.
Rahim N Moosa, University of Illinois at Urbana-Champaign (962-03-1022)

8:30AM (342) *Classifying minimal groups in separably closed fields.* Preliminary report.
Elisabeth Bouscaren* and **Francoise Delon**, CNRS - University Paris 7 (962-03-706)

9:20AM (343) *On a result of Rosenlicht.* Preliminary report.
Wai Yan Pong, Univerisity of Illinois at Urbana Champaign (962-12-1157)

9:50AM (344) *Homogeneity of locally modular geometry.*
Byunghan Kim, MIT, Cambridge, MA (962-03-888)

10:20AM (345) *Real-closed analytic proper subfields of the reals have Hausdorff dimension zero.* Preliminary report.
Gerald A Edgar and **Chris Miller***, The Ohio State University (962-03-1015)

10:50AM (346) *When flat covers of pure-injective modules are pure-injective.*
Philipp S Rothmaler, Wesleyan University (962-16-1321)

11:20AM (347) *Galois groups of first order theories.*
Anand Pillay, Univ. of Illinois at Urbana-Champaign (962-03-1253)

AMS Special Session on Representation Theory of Finite and Algebraic Groups, II

8:00 AM – 11:50 AM

Organizers: **Zongzhu Lin**, Kansas State University
Daniel K. Nakano, Utah State University
Cornelius Pillen, University of South Alabama

8:00AM (348) *Decomposing Tensor Products by Counting Polytopes.*
Jared E Anderson, University of Massachusetts, Amherst (962-22-820)

8:30AM (349) *Low-dimensional representations of $Sp_{2n}(q)$ and $SU_n(q)$ in cross-characteristic.* Preliminary report.
Robert M. Guralnick, University of Southern California, **Kay Magaard**, Wayne State University, **Jan Saxl**, University of Cambridge, and **Pham Huu Tiep***, University of Florida (962-20-566)

9:00AM (350) *The Ext^1 quiver for completely splittable modules of the symmetric group.*
David J Hemmer, University of Chicago (962-20-360)

9:30AM (351) *The Case for the Modular Frobenius Symbol.* Preliminary report.
Ben Ford, Sonoma State University (962-20-1298)

10:00AM (352) *Representations of the supergroup Q(n).* Preliminary report.
Jonathan W Brundan, University of Oregon (962-20-880)

10:30AM (353) *The symmetric group in the search for more general weight conjectures.* Preliminary report.
Harald E Ellers, Northern Illinois University (962-20-1305)

11:00AM (354) *New results on representations of double covers of symmetric groups.* Preliminary report.
Alexander S Kleshchev, University of Oregon (962-20-196)

11:30AM (355) *Representations on extraspecial groups applied to the classification of quasithin groups.* Preliminary report.
Stephen D Smith, U. Illinois-Chicago (962-20-72)

AMS Special Session on Integrals and Series throughout Mathematics, III

8:00 AM – 11:50 AM

Organizers: **Victor H. Moll**, Tulane University
George Boros, University of New Orleans

8:00AM (356) *New classes of exact definite integrals derivable from Laplace transform methods.*
Pedro M Jordan*, Naval Research Laboratory, **Pratap Puri** and **George Boros**, University of New Orleans (962-44-716)

8:30AM (357) *Asymptotic formulas for two continued fractions in Ramanujan's lost notebook.*
Jaebum Sohn* and **Bruce C Berndt**, University of Illinois at Urbana-Champaign (962-11-853)

9:00AM (358) *A Tauberian Style Theorem for Two-Dimensional Walsh Series.* Preliminary report.
Douglas S Daniel, Wake Forest University (962-42-1349)

9:30AM (359) *Matrix Transformations: From Absolutely Convergent Series To Convergent Sequences.* Preliminary report.
Jinlu Li, Shawnee State University (962-40-1254)

10:00AM (360) *Automatic generation of enumerating series for Wilf classes.* Preliminary report.
Mohamud G Mohammed* and **Doron Zeilberger**, Temple University (962-05-205)

10:30AM ▶ (361) *Multiple zeta series via box splines.*
Karl Dilcher and **Kirk Haller***, Dalhousie University (962-11-301)

11:00AM (362) *Multiple harmonic sums and quasi-symmetric functions.* Preliminary report.
Michael E. Hoffman, U.S. Naval Academy (962-16-286)

11:30AM (363) *A new formula for Ramanujan's tau function.*
Stephen C Milne, The Ohio State University (962-11-143)

AMS Special Session on Asymptotic Behavior of Difference Equations with Applications, III

8:00 AM – 12:05 PM

Organizers: **Vlajko L. Kocic**, Xavier University
Abdul-Aziz Yakubu, Howard University
Gerasimos Ladas, University of Rhode Island

8:00AM ▶ (364) *Open problems and conjectures.* Preliminary report.
Gerry Ladas, University of Rhode Island (962-39-1308)

8:25AM (365) *Convergence of Solutions in a Nonhyperbolic Case When the Equilibrium Is Positive.* Preliminary report.
Candace M Kent, Virginia Commonwealth University (962-37-211)

8:50AM (366) *Nonlinear Discrete-Time Pair Formation Models.* Preliminary report.
Carlos Castillo-Chavez*, Cornell University, and **Abdul-Aziz Yakubu**, Howard University & Cornell University (962-92-826)

9:15AM ▶ (367) *Dispersal, Disease and Discrete-Time Models.*
Carlos Castillo-Chavez, Cornell University, and **Abdul-Aziz Yakubu***, Howard University & Cornell University (962-92-824)

9:40AM ▶ (368) *On the Rational Difference Equation of Second Order.* Preliminary report.
Carol H Gibbons, **M. R.S. Kulenovic*** and **Gerry Ladas**, University of Rhode Island (962-39-75)

10:05AM (369) *On asymptotic representation of solutions of perturbed systems of linear difference equations.* Preliminary report.
Sigrun Bodine, University of Puget Sound (962-39-1366)

10:30AM (370) *On A Rational Difference Equation.* Preliminary report.
Edward A Grove, **Gerasimos Ladas**, **Lynn C McGrath***, University of Rhode Island, and **Christopher Teixeira**, Rhode Island College (962-39-663)

10:55AM (371) *On the Difference Equation* $x_{[}n+1] = a + bx_{[}n-1]e^{-x_{[}n]}, n = 0, 1, 2, ...$
Michael A Radin*, **Hamdi El-Metwally**, **Edward A Grove**, **Gerry Ladas**, Univ. of Rhode Island, and **Richard Levins**, Harvard University (962-39-46)

11:20AM (372) *Dynamics of a nonlinear, second order, rational difference equation.*
Witold Kosmala*, Appalachian State University, **Mustafa Kulenovic**, **Gerry Ladas** and **Chris Teixeira**, Univ. of Rhode Island (962-39-513)

11:45AM ▶ (373) *On the Recursive Sequence x(n+1)=(a+b(x(n))/(Bx(n)+Cx(n-1)).* Preliminary report.
Kim Cunningham, **Mustafa Kulenovic**, **Gerry Ladas** and **Soudabeh Valicenti***, University of Rhode Island (962-37-108)

AMS Special Session on Function Theory, Differential Equations and Functional Equations, II

8:00 AM – 10:50 AM

Organizers: **Gary G. Gundersen**, University of New Orleans
Ilpo Laine, University of Joensuu
Enid M. Steinbart, University of New Orleans

8:00AM (374) *Potential theory of T-automorphic domains and entire functions of completely regular growth.*
David Drasin*, Purdue University, **Pietro Poggi-Corradini**, Kansas State Univ., Manhattan KS, and **Vladamir Azarin**, Bar-Ilan University, Israel (962-31-1137)

8:30AM (375) *Hayman Directions for Meromorphic Functions.*
P C Fenton, University of Otago, and **John F Rossi***, Virginia Tech (962-30-629)

9:00AM (376) *On a question of Hellerstein and Rossi regarding the equation $y'' + P(z)y = 0$.*
Yik-Man Chiang*, Hong Kong University of Science and Technology, and **Shupei Wang**, Houston, Texas (962-34-1230)

9:30AM (377) *Holomorphic solutions of certain functional and functional differential equations.* Preliminary report.
Ludwig P Reich, University of Graz, Austria (962-30-675)

10:00AM (378) *Value distribution theory and some functional equations.*
Katsuya Ishizaki, Nippon Institute of Technology (962-30-689)

10:30AM (379) *Functional equations and spherical functions.*
Henrik Stetkaer, Aarhus University, Denmark (962-39-705)

AMS Special Session on Operator Theory on Function Spaces, III

8:00 AM – 11:50 AM

Organizers: **Zhijian Wu**, University of Alabama
Dechao Zheng, Vanderbilt University

8:00AM (380) *On the λ-commutativity of Volterra operators.* Preliminary report.
Srdjan Petrovic*, Western Michigan University, **Alan Lambert** and **Animikh Biswas**, University of North Carolina Charlotte (962-47-1171)

8:30AM (381) *On the invertibility of some operators on Hilbert Spaces.* Preliminary report.
Ramesh V Garimella*, **Voldymyr Hrynkiv** and **Yung-Way Liu**, Tennessee Technological University (962-47-832)

9:00AM (382) *Properties of Weakly Compact Operators on VMOA.* Preliminary report.
Joseph A Cima*, UNC, Chapel Hill, N.C., and **Alec Matheson**, Lamar Univ. (962-30-20)

9:30AM (383) *Inverses in single generated algebras.* Preliminary report.
Gabriel T Prajitura, Bucknell University (962-47-1077)

10:00AM (384) *Decomposability and the cyclic behavior of composition operators.*
Joel H Shapiro, Michigan State University (962-47-784)

10:30AM ▶ (385) *Weighted composition operators between Hardy and Bloch spaces.*
Shûichi Ohno, Nippon Institute of Technology (962-47-55)

11:00AM (386) *The Role of the Spectrum in the Cyclic Behavior of Composition Operators.*
Eva A. Gallardo-Gutierrez*, Universidad Cadiz, and **Alfonso Montes-Rodriguez**, Universidad de Sevilla (962-47-501)

11:30AM (387) *Spectra of Linear Fractional Composition Operators in Several Variables.* Preliminary report.
Carl C. Cowen, Purdue University (962-47-626)

AMS Special Session on PDE Models in Population Biology and Epidemiology, II

8:00 AM – 11:50 AM

Organizers: **J. M. Cushing**, University of Arizona
Eric T. Funasaki, Georgia Southern University
Shandelle M. Henson, College of William and Mary
Anna Maria Spagnuolo, Oakland University

8:00AM (388) *Optimal Control of Boundary Habitat Hostility for Interacting Species.*
Suzanne Lenhart, University of Tennessee (962-35-942)

8:30AM (389) *Optimal Control of a Chemotaxis System.* Preliminary report.
K. Renee Fister* and **C. Maeve McCarthy**, Murray State University (962-35-179)

9:00AM (390) *Investigating the Consequences of a Chemotactic Mass-Attack Model.*
James A Powell, Utah State University (962-92-1075)

9:30AM (391) *An Existence Result for a Population Model with Constant Effort Harvesting.*
Ratnasingham Shivaji, Mississippi State University (962-35-860)

10:00AM ▶ (392) *Diffusive logistic equations with predation terms.*
Junping Shi, College of William and Mary (962-35-1407)

10:30AM (393) *Conditional persistence in logistic models via nonlinear diffusion.*
Robert S Cantrell* and **George C Cosner**, University of Miami (962-92-570)

11:00AM (394) *Brucellosis, Botflies, and Brainworms: The Impact of Edge Habitats on Pathogen Transmission and Species Extinction.*
Robert S Cantrell, **Chris Cosner***, University of Miami, and **William F Fagan**, Arizona State University (962-92-547)

11:30AM (395) *Linear conjecture for spread in cooperative models.*
Bingtuan Li*, University of Utah, **Hans F Weinberger**, University of Minnesota, and **Mark A Lewis**, University of Utah (962-92-980)

AMS Special Session on Nonlinear Evolution Equations and Applications, II

8:00 AM – 10:50 AM

Organizers: **Ralph A. Saxton**, University of New Orleans
David H. Wagner, University of Houston
Katarzyna Saxton, Loyola University

8:00AM ▶ (396) *Weak Shock Reflection by a Wedge and the Related Free Boundary Problems.*
Suncica Canic*, University of Houston, **Barbara L Keyfitz**, University of Houston, and **Eun-Heui Kim**, University of Houston (962-35-850)

8:30AM (397) *A free boundary problem for a quasilinear degenerate elliptic equation: Weak shock reflection in the UTSD equation.*
Sunčica Čanić, **Barbara L Keyfitz** and **Eun Heui Kim***, University of Houston (962-35-845)

9:00AM (398) *Decay of Almost Periodic Solutions of Conservation Laws.*
Hermano Frid, Institute of Pure and Applied Mathematics-IMPA (962-35-718)

9:30AM (399) *A Strictly Hyperbolic, Genuinely Nonlinear 2x2 System of Conservation Laws which is L^1-unstable.*
Herbert C Kranzer, Adelphi University (962-35-99)

10:00AM (400) *Solitary wave interactions of the Euler-Poisson equations.* Preliminary report.
David H Sattinger*, Utah State University, **Mariana Haragus**, University of Bordeaux, and **David P Nicholls**, University of Minnesota (962-35-339)

10:30AM (401) *Global Attractors for a Degenerate Equation from Viscoelasticity.*
John P Wilber*, Texas A&M University, and **Stuart S Antman**, University of Maryland (962-37-61)

MAA Minicourse #4: Part A

8:00 AM – 10:00 AM

The Global Classroom: Using the Web as an interactive learning environment.

Organizers: **Marcelle Bessman**, Jacksonville University
Douglas A. Quinney, Keele University

MAA Minicourse #7: Part B

8:00 AM – 10:00 AM

Cwatsets: A research experience for undergraduates.

Organizer: **Gary J. Sherman**, Rose-Hulman Institute of Technology

MAA Minicourse #9: Part A

8:00 AM – 10:00 AM

Making liberal arts mathematics the most important course students take to learn effective thinking.

Organizers: **Edward B. Burger**, Williams College
Michael Starbird, University of Texas at Austin

AMS Session on Complex Variables and Potential Theory

8:00 AM – 10:25 AM

8:00AM ▶ (402) *Counting Functional Roots.* Preliminary report.
Lawrence J Crone, American University (962-30-399)

8:15AM (403) *Uniqueness of Solutions to a Free Boundary Problem.*
Jonathan E Huntley, Baruch College,CUNY, **Nam J Moh**, Queensborough Community College, and **David E Tepper***, Baruch College,CUNY (962-30-104)

8:30AM (404) *Numerical computation of the Ahlfors map in multiply connected domains.* Preliminary report.
Thomas J Tegtmeyer, Truman State University (962-30-1099)

8:45AM (405) *Schwarz-Christoffel mapping of the annulus.*
John A Pfaltzgraff*, University of North Carolina, **Thomas K DeLillo** and **Alan R Elcrat**, Wichita State University (962-30-1163)

9:00AM (406) *Density of a Class of Polynomials in the Class S_H^0 of Sense-Preserving Harmonic Functions, Preliminary Report.* Preliminary report.
Christopher J Morgan, University of Kentucky (962-30-438)

9:15AM ▶ (407) *Boxlike domains in the complex plane.*
John Feroe, **Benjamin A Lotto*** and **Charles I Steinhorn**, Vassar College (962-30-662)

9:30AM (408) *On harmonic univalent maps.* Preliminary report.
Yusuf I Abu Muhanna, American University of Sharjah (962-30-918)

9:45AM (409) *Parametric Versions of the Weighted Caccioppoli-type Inequalities for A-Harmonic Tensors.*
Shusen Ding, Seattle University (962-31-282)

10:00AM (410) *Lower bounds of generalized subharmonic functions.*
Alexander I Kheyfits, Bronx Community College/CUNY (962-31-990)

10:15AM (411) *Unbounded Convex Mappings of the Ball in $\mathbb{C}^n$.*
Jerry R Muir, Jr.*, Rose-Hulman Institute of Technology, and **Ted J Suffridge**, University of Kentucky (962-32-714)

AMS Session on Partial Differential Equations

8:00 AM – 11:55 AM

8:00AM (412) *L^p Estimates for Maxwell's Equations in Stratified Media.*
Aurelia Minut, Michigan State University (962-35-1154)

8:15AM (413) *Numerical solution of inverse scattering problem for acoustic waves in inhomogeneous medium.*
Andrzej W Kedzierawski, SUNY Geneseo (962-35-1161)

8:30AM (414) *The Lie Symmetries of the Vaidya Equations.*
Russell L Herman, UNC Wilmington (962-35-1249)

8:45AM (415) *Generalized Quasilinearization Method For Semilinear Hyperbolic Problems.* Preliminary report.
V. Lakshmikantham, **Semen Koksal***, Florida Tech, and **Tenali Gnana Bhaskar**, Indian Institute of Technology (962-35-1309)

9:00AM (416) *A Dynamic Thermoviscoelastic Model for Grinding.* Preliminary report.
Kevin T Andrews*, **M. Shillor** and **S. Wright**, Oakland University (962-35-1358)

9:15AM (417) *Torsional Oscillations in Suspension Bridges: Bifurcation and Stability Results for Nonlinearly Coupled Beam and Wave Equations.* Preliminary report.
Kristen S Moore*, University of Michigan, and **P. J. McKenna**, University of Connecticut (962-35-1373)

9:30AM (418) *Dimensional Reduction Algorithm for A Thin Domain.* Preliminary report.
Robert E DeVille, Boston University (962-35-1384)

9:45AM (419) *An asymptotic expansion for a solution of convection-diffusion problem.* Preliminary report.
Bruce R Kellogg, University of Maryland, and **Igor V Shimansky***, University of Maryland and Enig Associates, Inc (962-35-1417)

10:00AM (420) *On the determining equations for the nonclassical reductions of the heat and Burgers' equation.*
Danny Arrigo* and **Fred Hickling**, University of Central Arkansas (962-35-585)

10:15AM (421) *The nth order Darboux transformation for the heat equation factors.*
Danny Arrigo and **Fred Hickling***, Univ. Central Arkansas (962-35-623)

10:30AM (422) *Global Existence Theorems for the n-Dimensional Vector Burgers Equation.*
Guy Bernard, University of Central Arkansas (962-35-639)

10:45AM (423) *Complete blow-up of solutions for quasilinear parabolic problems.*
C. Y. Chan and **Nadejda E Dyakevich***, University of Louisiana at Lafayette (962-35-701)

11:00AM (424) *Blow-up of solutions for degenerate parabolic problems due to local and nonlocal nonlinear sources.*
C. Y. Chan and **Haiyan Tian***, University of Louisiana at Lafayette (962-35-721)

11:15AM (425) *A Multiplicity Result for Classes of p-Laplacian Equations.*
Shobha Oruganti, Mississippi State University (962-35-861)

11:30AM (426) *Recovery of a boundary flux using far boundary data.* Preliminary report.
Seth F. Oppenheimer* and **Mark S Riggs**, Mississippi State University (962-35-939)

11:45AM (427) *Regularity Properties of a Class of Solutions to the Monge-Ampere Equation.* Preliminary report.
David A Hartenstine, Temple University (962-35-965)

AMS Session on Number Theory, II

8:00 AM – 11:55 AM

8:00AM (428) *The Distribution of Primes in Function Fields.* Preliminary report.
Joseph J Palen, Alma College (962-11-1020)

8:15AM (429) *Generalized Stieltjes constants γ_k for non-integral k.* Preliminary report.
Rick Kreminski, Texas A&M University - Commerce (962-11-1064)

8:30AM (430) *Nontrivial Tame Extensions Over Hopf Orders.*
Daniel R Replogle, College of Saint Elizabeth, and **Robert G Underwood***, Auburn University Montgomery (962-11-107)

8:45AM (431) *The First Moment of the Number of 1's Function in the Zeckendorf Number System and in Base β.*
Curtis N Cooper* and **Robert E Kennedy**, Central Missouri State University (962-11-1103)

9:00AM ▶ (432) *n-Pattern Sequences and Stirling Numbers of the Second Kind.*
Robert E Kennedy* and **Curtis N Cooper**, Central Missouri State University (962-11-1105)

9:15AM ▶ (433) *A connection between the final digits of Fibonacci numbers and Chinese zodiac.* Preliminary report.
Seok Sagong, Middlesex Community College (962-11-1191)

9:30AM (434) *The distribution of prime ideals of imaginary quadratic fields.* Preliminary report.
Glyn Harman, University of London, **Angel V Kumchev***, University of South Carolina, and **Philip Lewis**, Cardiff University (962-11-1234)

9:45AM ▶ (435) *A digit-product function with interesting properties.* Preliminary report.
Paul A Loomis, Bloomsburg University (962-11-1318)

10:00AM (436) *Fundamental system of units of certain composita of two pure cubic fields.* Preliminary report.
Claude Levesque, Université Laval (962-11-1356)

10:15AM (437) *Annihilating Polynomials in the Witt Ring.* Preliminary report.
Thomas C Palfrey, Xavier University of Louisiana (962-11-283)

10:30AM ▶ (438) *The 3x+1 Problem and Directed Graphs.*
Paul J Andaloro, Kent State University, Stark Campus (962-11-409)

10:45AM ▶ (439) *Pure Multigrades.*
A. W. Goodman, University of South Florida (962-11-518)

11:00AM ▶ (440) *On disproving the Fermat-Catalan Conjecture.*
Susil K Jena, Bhubaneswar, Orissa,India (962-11-619)

11:15AM *Extension of Universal Kummer Congruences.*
▶ (441) **Arnold M Adelberg**, Grinnell College (962-11-644)

11:30AM *Primitive Roots in Cubic and Higher Extensions of a*
(442) *Finite Field.*
Donald Mills*, United States Military Academy, and **Gavin McNay**, London, UK (962-11-735)

11:45AM *Fractal Dimension of Generalized Multinomial*
▶ (443) *Coefficients Modulo a Prime.* Preliminary report.
John M Holte, Gustavus Adolphus College (962-11-890)

AMS Session on Field Theory and Commutative Rings

8:00 AM – 11:55 AM

8:00AM *Division Algebras with PSL*$(2, q)$*-Galois Maximal*
(444) *Subfields.*
Elizabeth S Allman*, University of Southern Maine, and **Murrray M Schacher**, UCLA (962-12-1208)

8:15AM *Isomorphism Classes of Elliptic Function Fields Over*
(445) *a Finite Field.* Preliminary report.
Mark J Motley, University of Kentucky (962-12-1322)

8:30AM *On pseudo-valuation domains whose overrings are*
(446) *going-down domains.*
R. Douglas Chatham*, Wake Forest University, and **David E Dobbs**, University of Tennessee, Knoxville (962-13-1029)

8:45AM *Iteration of Quadratic Functions in* $\mathbb{Z}_n$*.* Preliminary
▶ (447) report.
Carrie E Finch*, **Lenny K Jones** and **Michael D Seyfried**, Shippensburg University (962-13-1108)

9:00AM *Monoids and Direct Sum Decompositions of*
(448) *Modules.* Preliminary report.
Karl Kattchee, University of Nebraska, Lincoln (962-13-1176)

9:15AM *Gröbner Bases and the Design and Implementation*
(449) *of Multi-Dimensional Filter Banks.* Preliminary report.
Mikhail K Tchobanou, Moscow Power Engineering Institute (Technical University), and **Cynthia J Woodburn***, Pittsburg State University (962-13-1183)

9:30AM *Two star-operations and their induced lattices.*
(450) Preliminary report.
Daniel D Anderson, The University of Iowa, and **Sylvia J Forman***, St. Joseph's University (962-13-1200)

9:45AM *Normal Monomial Ideals.* Preliminary report.
(451) **Les Reid**, Southwest Missouri State University, **Leslie G. Roberts**, Queen's University, and **Marie A. Vitulli***, University of Oregon (962-13-1276)

10:00AM *Koszul Homology and Frobenius Powers of Quotient*
(452) *Ideals.* Preliminary report.
Carolyn A Yackel, Indiana University (962-13-255)

10:15AM *Eminent Domains and Algebraically-Defined*
▶ (453) *Integers.*
Michael J Khoury, Denison University (962-13-292)

10:30AM *Some Remarks on U-factorizations.*
(454) **Michael C Axtell**, Wabash College (962-13-30)

10:45AM *Tensor Products and Quotient Rings which are*
▶ (455) *Finite Commutative Principal Ideal Rings.*
Jilyana Cazaran, Louisiana State University (962-13-335)

11:00AM *Dense Ideals of Incidence Algebras.* Preliminary
(456) report.
Muge Kanuni, University of Connecticut (962-13-739)

11:15AM *Implications of the maximal growth of a Hilbert*
(457) *function on the Betti numbers of a lex-segment ideal.*
Kimberly J Presser, Shippensburg University (962-13-823)

11:30AM *A* p*-Bases Algorithm for Indecomposable*
(458) $\mathbf{Z}_{p^n}C_p$*-Modules.*
Maria A. Avino-Diaz*, ITESM, Ciudad de México, and **Luis D Garcia**, New Mexico State University (962-13-971)

11:45AM *Slender rings.*
(459) **Radoslav M. Dimitric**, Berkeley City College (962-13-220)

MAA Session on Great Theorems of Mathematics, II

8:00 AM – 11:55 AM

Organizers: **Cheryl L. Olsen**, Shippensburg University
Douglas E. Ensley, Shippensburg University

8:00AM *Derivative Relationships Between Volume and*
▶ (460) *Surface Area.* Preliminary report.
Leon Hall*, University of Missouri-Rolla, and **Michael Dorff**, Brigham Young University (962-A1-184)

8:20AM *Proofs of the infinity of prime numbers.*
▶ (461) **Zengxiang Tong**, Otterbein College (962-A1-11)

8:40AM *Bolyai's Geometric Constructions.*
▶ (462) **J. Charles Jascobson**, Elmira College (962-A1-378)

9:00AM *The Cantor-Schröder-Bernstein Theorem, Yente the*
▶ (463) *Matchmaker's Marriage Theorem, and Why ONE Point Determines a Straight Line.*
Ira Rosenholtz, Eastern Illinois University (962-A1-250)

9:20AM *A Glimpse at the Weyl Unitary Trick.*
▶ (464) **Maria G. Fung**, University of Wisconsin-Stout (962-A1-311)

9:40AM *Godel's Theorem Via Kolmogorov Complexity.*
(465) **Homer S White**, Georgetown College (962-A1-148)

10:00AM *Arrow's Theorem.* Preliminary report.
▶ (466) **Thomas L Bartlow**, Villanova University (962-A1-106)

10:20AM *The Sprague-Grundy Theorem: Nim Games in*
▶ (467) *Disguise.*
Jodie D Novak, University of Northern Colorado (962-A1-461)

10:40AM *Alfred Kempe's "Proof" of the Four Color Theorem.*
▶ (468) **Timothy A Sipka**, Alma College (962-A1-636)

11:00AM *The Erdos-Ramsey Connection.*
▶ (469) **Elaine A Terry**, St. Joseph's University (962-A1-510)

11:20AM *Graphical Sequences and the Havel-Hakimi*
▶ (470) *Theorem.*
Linda E McGuire, Muhlenberg College (962-A1-180)

11:40AM *Cauchy's Integral Theorem.* Preliminary report.
▶ (471) **Louise Amick**, Washington College (962-A1-431)

MAA Session on Courses and Programs That Illustrate Recommendations of the Mathematical Education of Teachers Document, II

8:00 AM – 11:50 AM

Organizer: **Judith L. Covington**, LSU-Shreveport

8:00AM *Providing the Historical Perspective.*
▶ (472) **Dick Jardine**, Keene State College (962-F1-413)

8:30AM (473) *The Vision, the Challenge, and the Reality: An examination of efforts to develop preservice teachers' mathematical habits of mind in the mathematics content courses.*
Mercedes A McGowen, William Rainey Harper College (962-F1-616)

9:00AM ▶ (474) *Improving Middle Grades Mathematics Instruction Through Certification of Mathematics Specialists.*
Judy S O'Neal, North Georgia College & State University (962-F1-24)

9:30AM ▶ (475) *An Example of a Capstone Course for Mathematics Education Majors.*
Curtis D Bennett* and **David E Meel**, Bowling Green State University (962-F1-289)

10:00AM ▶ (476) *Project T.E.A.M.: A Professional Development Opportunity for Mathematics Teachers, Mathematicians, and Mathematics Educators.* Preliminary report.
Katherine G McGivney, Shippensburg University (962-F1-460)

10:30AM (477) *Three Math Courses to Support the Teaching of Algebra in the Middle Grades.*
Dale Oliver, Humboldt State University (962-F1-414)

11:00AM (478) *Capstone Courses For Secondary Mathematics Teachers.* Preliminary report.
Barbara J Pence, San Jose State University (962-F1-266)

11:30AM (479) *I saw two paths: Parallels Between the MET Document and the MST Major at SJFC.*
Kris H Green, St. John Fisher College (962-F1-402)

MAA Session on Mathematics in the Age of Euler, I

8:00 AM – 11:15 AM

Organizers: **V. Frederick Rickey**, United States Military Academy
William W. Dunham, Muhlenberg College

8:00AM ▶ (480) *Euler's proof for the value of the zeta function in a classroom.*
Mysore S. Jagadish, Barry University, Miami Shores (962-Q1-457)

8:20AM ▶ (481) *Euler and some "paradoxes" of integral calculus.*
Michael K Kinyon, Indiana University South Bend (962-Q1-439)

8:40AM ▶ (482) *Euler, the Calculus of Variations, and Some Applications.* Preliminary report.
Lisa O Coulter, Stetson University (962-Q1-159)

9:00AM ▶ (483) *Chains, Names, and Imaginary Spheres: A History of the Hyperbolic Functions in the 18th Century.*
Janet H Barnett, University of Southern Colorado (962-Q1-502)

9:20AM ▶ (484) *Leonhard Euler as a Map Maker.* Preliminary report.
George W Heine, BLM (962-Q1-443)

9:40AM ▶ (485) *Researches on the Curvature of Surfaces.*
Jerry M Lodder, New Mexico State University (962-Q1-465)

10:00AM ▶ (486) *Euler's Fourteen Problems.*
Edward Sandifer, Western Connecticut State U (962-Q1-97)

10:20AM ▶ (487) *A Letter from Euler to Goldbach: Comments on the Factorization of a Polynomial.* Preliminary report.
Luise-Charlotte Kappe and **Friedrich L Kluempen***, SUNY at Binghamton (962-Q1-291)

10:40AM ▶ (488) *A History of Euler's Theorem that* $(m,n)=1 \Rightarrow m^{\varphi(n)}=1$ *(mod n) with Applications.* Preliminary report.
Craig P Bauer, Northwestern State University of Louisiana (962-Q1-390)

11:00AM ▶ (489) *Gauss, recurrence relations, and the agM.*
Stacy G Langton, University of San Diego (962-Q1-271)

MAA Session on ARUME, II

8:00 AM – 11:35 AM

Organizers: **Julie M. Clark**, Emory & Henry College
Chris Rasmussen, Purdue University Calumet
Rina Zazkis, Simon Fraser University

8:00AM ▶ (490) *Development of a Calculus Concept Inventory (CCI).* Preliminary report.
Jerome S Epstein, Polytechnic University (962-S1-455)

8:20AM (491) *Why formal set theory should be excluded from prospective elementary teachers' mathematics preparation.* Preliminary report.
Sybilla K Beckmann, University of Georgia (962-S1-372)

8:40AM ▶ (492) *Collaborative Learning and the Use of Technology:Experiences Gained from a Statistics Course.*
Maria M Meletiou*, Pedagogical Institute of Cyprus, and **William O Martin**, North Dakota State University (962-S1-1359)

9:00AM ▶ (493) *Introducing indivisibles into calculus instruction - preliminary results.* Preliminary report.
Bronislaw Czarnocha*, Hostos Community College, City University of New York, **Vrunda Prabhu**, William Woods University, and **Marlene Aquilar**, Tecnico de Monterey (962-S1-1352)

9:20AM ▶ (494) *Mixed Metaphors: Undergraduate Language and Understanding in Calculus.* Preliminary report.
Eric Hsu* and **Michael Oehrtman**, University of Texas at Austin (962-S1-1301)

9:40AM ▶ (495) *Motivation of the Limit Concept.* Preliminary report.
Aaron G Montgomery*, Central Washington University, and **Keith E Schwingendorf**, Purdue University North Central (962-S1-244)

10:00AM ▶ (496) *Pre-service Teachers Learning Mathematics with Calculators: A Failure to Connect Between Current and Future Practice.*
Sharon B Walen, Boise State University, **Steven R Williams**, Brigham Young University, and **Bradley E Garner***, Boise State University (962-S1-446)

10:20AM (497) *Tool or Topic: Student Perceptions of Matrices in Linear Algebra.*
Jim Cottrill*, Illinois State University, and **Aaron Montgomery**, Central Washington University (962-S1-1168)

10:40AM ▶ (498) *An Investigation of the Major Conceptual Strands of First Semester Calculus.*
Marilyn P Carlson, Arizona State University (962-S1-1246)

11:00AM (499) *On Understanding of Transformations, Domain, and Range of Functions.* Preliminary report.
Bernadette Baker, Drake University, **Clare Hemenway***, University of Wisconsin Marathon County, and **Maria Trigueros**, Instituto Tecnologico Autonomo de Mexico (962-S1-1341)

11:20AM (500) *Conceptions of Indexing.* Preliminary report.
Anne Brown*, Indiana University South Bend, **Michael McDonald**, Occidental College, and **Kirk Weller**, Bethel College (962-S1-1007)

AWM Emmy Noether Lecture

9:00 AM – 9:50 AM

(501) *Nonlinear equations in conformal geometry.*
Sun-Yung Alice Chang, Princeton University and University of California Los Angeles

MAA Session on Chaotic Systems and Fractal Geometry, II

9:00 AM – 11:55 AM

Organizers: **Denny Gulick**, University of Maryland, College Park
Jon W. Scott, Montgomery College

9:00AM ▶ (502) *Fractal Tilings with Radial Symmetry.* Preliminary report.
Thomas E Price* and **Adam E Roberts**, The University of Akron (962-B1-773)

9:20AM ▶ (503) *Visualizing point sets, fractals and quasicrystals with raster tilings.*
Ned W Allis, **Jeffrey P Dumont** and **Clifford A Reiter***, Lafayette College (962-B1-519)

9:40AM ▶ (504) *Does Devaney's definition of SDIC imply a positive Lyapunov constant?* Preliminary report.
Timothy J Pennings, Hope College (962-B1-400)

10:00AM ▶ (505) *Irregular Sierpinski Triangles.* Preliminary report.
Judith A Palagallo* and **Matthew C Palmer**, University of Akron (962-B1-775)

10:20AM ▶ (506) *Fractal Geometry as Curriculum Enhancement.* Preliminary report.
David A Brown*, Cornell University, and **Osman Yurekli**, Ithaca College (962-B1-260)

10:40AM ▶ (507) *Fractals in the Liberal Arts Classroom.*
Holly Hirst, Appalachian State University (962-B1-592)

11:00AM ▶ (508) *The Fractal Dimension of the Blues.*
David Fowler, University of Nebraska-Lincoln (962-B1-162)

11:20AM ▶ (509) *Persistent Properties of Chaos.*
Pat Touhey, College Misericordia (962-B1-18)

11:40AM ▶ (510) *Mfurcations, M=3,4,5,... or Parabolic Bifurcations in the Mandelbrot Set.* Preliminary report.
Anne M Burns, Long Island University/C.W.Post Campus (962-B1-239)

MAA Committees Panel Discussion

9:00 AM – 10:30 AM

Faculty isolated by discipline.
Organizer: **John D. Fulton**, Virginia Polytechnic Institute and State University
Panelists: **Donald L. Bentley**, Pomona College
John B. Fink, Kalamazoo College
Annie Selden, Tennessee Technilogical University
Henry M. Walker, Grinnell College
Bernard L. Madison, University of Arkansas

MAA Subcommittee on Quantitative Literacy Poster Session

9:00 AM – 11:00 AM

College and university quantitative literacy programs across the nation.
Organizer: **John G. Harvey**, University of Wisconsin

MAA Panel Discussion

9:00 AM – 10:30 AM

Doctoral programs in mathematics education.
Organizer: **Robert E. Reys**, University of Missouri, Columbia
Panelists: **Joan Ferrini-Mundy**, Michigan State University
James T. Fey, University of Maryland, College Park
Robert Glasgow, Southwest Baptist University
Jeremy Kilpatrick, University of Georgia

MAA Project NExT Panel Discussion

9:00 AM – 10:30 AM

How to attract more students into advanced mathematics classes.
Organizers: **T. Christine Stevens**, St. Louis University
Joseph A. Gallian, University of Minnesota, Duluth
Aparna W. Higgins, University of Dayton
Panelists: **Mary D. Shepherd**, SUNY-College at Potsdam
Paul Zorn, St. Olaf College
Kirby A. Baker, University of California Los Angeles

Book Sales and Exhibits

9:30 AM – 5:30 PM

MAA Invited Address

10:05 AM – 10:55 AM

(511) *Some topics in applied mathematics.*
Peter D. Lax, Courant Institute, New York University (962-A0-37)

MAA Minicourse #3: Part A

10:15 AM – 12:15 PM

Teaching contemporary statistics with active learning.
Organizers: **Allan J. Rossman**, Dickinson College
Beth L. Chance, California Polytechnic State University
Robin H. Lock, St. Lawrence University
Mary R. Parker, Austin Community College

AMS Session on Integral Equations and Transforms

10:45 AM – 11:40 AM

10:45AM (512) *Multidimensional Laplace transforms involving heat equation and Green's function.*
R.S. Dahiya, Iowa State University (962-44-687)

11:00AM (513) *A Quenching Problem for the Heat Equation.*
Colleen M Kirk*, Montclair State University, and **Catherine A Roberts**, Northern Arizona University (962-45-1378)

11:15AM (514) *A Comparison Study on Quadrature Based Method and Hybrid Sampling Series For an Abel - Type Equation.* Preliminary report.
Xiaoping Shen, Eastern Connecticut State University (962-45-778)

11:30AM (515) *On a certain integral equation.*
Murali Rao* and **Li-chien Shen**, University of Florida (962-45-882)

MAA Committee on the Teaching of Undergraduate Mathematics Panel Discussion

10:45 AM – 12:15 PM

Growing an oak tree from an acorn: Extending a new program from a few innovators to the whole department.

Organizers: **Bonnie Gold**, Monmouth University
Richard Jardin, Keene State College

Panelists: **Morton Brown**, University of Michigan, Ann Arbor
Jim Lewis, University of Nebraska
Bernard L. Madison, University of Arkansas
David C. Arney, U.S. Military Academy

MAA Panel Discussion

10:45 AM – 12:15 PM

Beyond the writing of principles and standards for school mathematics.

Organizer: **Gary Martin**, NCTM

Panelists: **Lee V. Stiff**, North Carolina State University
Glenda Lappan, Michigan State University
Mary Lindquist, Columbus State University
Gary Martin
John A. Thorpe, NCTM

MAA Panel Discussion

10:45 AM – 12:15 PM

Funding opportunities in the NSF Division of Undergraduate Education.

Organizers: **James H. Lightbourne**, NSF
Harriet G. Taylor, NSF
Elizabeth J. Teles, NSF
Lee L. Zia, NSF

AMS Colloquium Lectures: Lecture II

1:00 PM – 2:00 PM

(516) *Large rationally connected varieties, II.*
János Kollár, Princeton University

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

1:00 PM – 3:15 PM

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

1:00PM ▶ (517) *Improving Secondary School Mathematics with NSF-funded Curricula: What Are They Trying to Accomplish?*
James Fey*, University of Maryland, College Park, and **Eric Robinson**, Ithaca College (962-97-791)

1:30PM ▶ (518) *The Interactive Mathematics Program.*
Sherry Fraser*, Interactive Mathematics Program, and **Edward F Wolff**, Beaver College (962-97-1149)

2:00PM ▶ (519) *"Mathematics: Modeling Our World" – Reforming High School Curricula Via a Modeling Immersion Approach.*
Solomon Garfunkel*, COMAP, Inc., and **Jerry Lege**, Jersey City, NJ (962-97-1074)

2:30PM (520) *Implementation Issues Surrounding New Directions in High School Mathematics.*
Eric Robinson*, Ithaca College, **Midge Cozzens**, Univ. of Colorado, Denver, **Edward Wolff**, Beaver College, and **Paul Zorn**, St. Olaf College (962-97-810)

AMS Special Session on Geometric Group Theory, IV

1:00 PM – 3:50 PM

Organizers: **Stephen G. Brick**, University of South Alabama
Igor Mineyev, University of South Alabama
Jon M. Corson, University of Alabama

1:00PM (521) *A Class of Rigid Coxeter Groups.*
Anton Kaul, University of South Florida (962-20-647)

1:30PM (522) *Visual JSJ Decompositions of Coxeter Groups.*
Michael L Mihalik* and **Steven T Tschantz**, Vanderbilt University (962-20-133)

2:00PM (523) *Commensurability classes of hyperbolic Coxeter simplex reflection groups.*
Norman W Johnson, Wheaton College, **Ruth Kellerhals**, University of Fribourg, **John G Ratcliffe*** and **Steven T Tschantz**, Vanderbilt University (962-20-696)

2:30PM (524) *Homological finiteness conditions and finite derivation type.*
Juan M Alonso, Industrilogik, and **Susan M Hermiller***, University of Nebraska (962-20-885)

3:00PM (525) *Test elements on the boundary of a group.* Preliminary report.
Edward C Turner, SUNY Albany (962-20-895)

3:30PM (526) *The canonical JSJ decomposition for fully residually free groups and Krull dimension of F^n.*
Olga G. Kharlampovich, McGill University (962-20-1434)

AMS Special Session on Representation Theory of Finite and Algebraic Groups, III

1:00 PM – 3:50 PM

Organizers: **Zongzhu Lin**, Kansas State University
Daniel K. Nakano, Utah State University
Cornelius Pillen, University of South Alabama

1:00PM (527) *Variations on a theme of Steinberg.* Preliminary report.
Gary M Seitz*, Univerity of Oregon, and **Martin W Liebeck**, Imperial College, London (962-20-238)

1:30PM (528) *Abstract homomorphisms of algebraic groups with non-reductive image.* Preliminary report.
Lucy Lifschitz*, Tufts University, and **Andrei S Rapinchuk**, University of Virginia (962-20-1193)

2:00PM (529) *Admissible Nilpotent Coadjoint Orbits of Exceptional Real and p-adic Lie Groups.* Preliminary report.
Monica A Nevins, University of Ottawa (962-22-359)

2:30PM (530) *Nilpotent blocks of reduced enveloping algebras: Problems and conjectures.* Preliminary report.
James E Humphreys, U. Massachusetts, Amherst (962-17-762)

3:00PM (531) *On the restricted nullcone of an algebraic group.* Preliminary report.
Brian J Parshall*, University of Virginia, and **Daniel K Nakano**, Utah State University (962-20-892)

3:30PM (532) *Representations of affine and classical Lie algebras in positive characteristic.* Preliminary report.
Leonard L Scott, The University of Virginia (962-20-999)

AMS Special Session on Commutative Rings and Monoids, III

1:00 PM – 3:50 PM

Organizers: **Scott T. Chapman**, Trinity University
Evan G. Houston, University of North Carolina at Charlotte

1:00PM (533) *The strong two-generator property in rings of integer-valued polynomials.* Preliminary report.
Paul-Jean Cahen, Université Aix-Marseille 3 (962-13-789)

1:30PM (534) *Prime ideals in power series rings.* Preliminary report.
Evan Houston, University of North Carolina - Charlotte, **Alan Loper***, Ohio State University - Newark, and **Thomas G Lucas**, University of North Carolina - Charlotte (962-13-915)

2:00PM ▶ (535) *Generalized Factorial Ideals.*
Jean-Luc Chabert, Université de Picardie, Amiens, France (962-13-424)

2:30PM (536) *Realizing monoids as isomorphism classes of modules.*
Roger A Wiegand, University of Nebraska (962-13-774)

3:00PM (537) *Divisibility properties and total quotient rings.* Preliminary report.
David F Anderson*, University of Tennessee, and **Ayman Badawi**, Birzeit University (962-13-960)

3:30PM (538) *One-dimensional rings of bounded representation type.* Preliminary report.
Meral Arnavut, SUNY Fredonia and University of Nebraska, **Roger A Wiegand** and **Sylvia M Wiegand***, University of Nebraska (962-13-1053)

AMS Special Session on Function Theory, Differential Equations and Functional Equations, III

1:00 PM – 3:50 PM

Organizers: **Gary G. Gundersen**, University of New Orleans
Ilpo Laine, University of Joensuu
Enid M. Steinbart, University of New Orleans

1:00PM (539) *Functions of slow growth in the disc and differential equations.* Preliminary report.
Linda R. Sons, Northern Illinois University (962-30-1190)

1:30PM ▶ (540) *On the quotients and products of two linearly independent solutions of $f'' + A(z)f = 0$ in the unit disc.* Preliminary report.
Janne M. Heittokangas, University of Joensuu (962-34-693)

2:00PM (541) *Sharp Inequalities for Integral Means of Conjugate Functions.*
Daniel F. Shea*, University of Wisconsin–Madison, **Matts R. Essen**, University of Uppsala, and **Charles S. Stanton**, California State University (962-30-896)

2:30PM (542) *Oscillation of harmonic and quasiregular mappings.*
J.M. Anderson, University College London, and **Aimo Hinkkanen***, University of Illinois (962-30-812)

3:00PM (543) *Value distribution of meromorphic solutions to the functional equation $f^n + g^n + h^n \equiv 1$ when $n \leq 6$.*
Kazuya Tohge, Kanazawa University (962-30-749)

3:30PM ▶ (544) *Some remarks on complex difference equations.* Preliminary report.
Ilpo E. Laine, University of Joensuu (962-39-1066)

AMS Special Session on Braid Groups and Configuration Spaces, III

1:00 PM – 3:50 PM

Organizers: **Daniel C. Cohen**, Louisiana State University
Neal W. Stoltzfus, Louisiana State University

1:00PM ▶ (545) *Growth Functions of the Positive Braid Monoid.* Preliminary report.
Aaron R Bronfman, Harvard University (962-20-1192)

1:30PM (546) *Right-orderability and bi-orderability of braid groups and their generalisations.*
Bert Wiest, UBC (Vancouver) (962-20-1267)

2:00PM (547) *Braid constraints on Vassiliev knot invariants.* Preliminary report.
Oliver Dasbach and **Xiao-Song Lin***, University of California, Riverside (962-57-1385)

2:30PM (548) *On the cohomology of braid groups with symplectic coefficients.* Preliminary report.
Daniel C. Cohen*, Louisiana State University, and **Frederick R. Cohen**, University of Rochester (962-20-1338)

3:00PM (549) *Properties of generalizations of braid groups.*
Oliver T Dasbach, University of California, Riverside (962-20-1294)

3:30PM (550) *Analytic invariants of boundary links.* Preliminary report.
Jerome P Levine*, Brandeis University, and **Stavros Garoufalidis**, Georgia Institute of Technology (962-57-913)

AMS Special Session on PDE Models in Population Biology and Epidemiology, III

1:00 PM – 4:20 PM

Organizers: **J. M. Cushing**, University of Arizona
Eric T. Funasaki, Georgia Southern University
Shandelle M. Henson, College of William and Mary
Anna Maria Spagnuolo, Oakland University

1:00PM ▶ (551) *Microbial growth and competition for wall sites in tubular flow reactors.*
Hal L Smith, Arizona State University (962-35-307)

1:30PM (552) *A coupled system of nonlinear size-structured populations.*
Azmy S. Ackleh*, University of Louisiana at Lafayette, **H. T. Banks**, North Carolina State University, and **Keng Deng**, University of Louisiana at Lafayette (962-92-766)

2:00PM (553) *A size-structured model with variable sizes at birth.* Preliminary report.
Tanya V Kostova, Bulgarian Academy of Sciences (962-92-1101)

2:30PM (554) *Asymptotic Dynamics of the Density of Hierarchical Size-Structured Population.*
Kbenesh W Blayneh, Florida A&M University (962-35-804)

3:00PM ▶ (555) *A note on the Mac Kendrick von Forster type model in a population with genotype structure.* Preliminary report.
Jean Michel Tchuenche, University of Ibadan (962-92-214)

3:30PM ▶ (556) *A Control Problem in Tuberculosis.* Preliminary report.
Zhilan Feng, Purdue University, **Mimmo Iannelli**, University of Trento, Italy, and **Fabio A Milner***, Purdue University (962-92-1415)

4:00PM Discussion.

AMS Special Session on Graduate and Postdoctoral Education in Arithmetical Algebraic Geometry: The Arizona Winter School, II

1:00 PM – 3:50 PM

Organizers: **Douglas L. Ulmer**, University of Arizona
William G. McCallum, University of Arizona

1:00PM (557) *On the degree of modular parametrization over function fields.*
Mihran Papikian, University of Michigan (962-11-906)

1:30PM (558) *Elliptic curves over function fields with large Mordell-Weil group.*
Douglas Ulmer, University of Arizona (962-11-1295)

2:00PM (559) *Method to compute the ξ function for a prime p, in order to verify a special case of the the Birch-Swinnerton-Dyer conjecture for p-adics.*
Francisco X Portillo, University of Texas at Austin (962-11-1286)

2:30PM (560) *The Brauer-Manin Obstruction for 0-cycles.*
Victor Scharaschkin, University of Southern California (962-11-1372)

3:00PM (561) *Finite representations and Fermat curves.* Preliminary report.
Susan Hammond Marshall, University of Arizona (962-11-1211)

3:30PM (562) *A relationship between two conjectures of the structure of Galois groups of number fields.* Preliminary report.
Romyar T Sharifi, University of Arizona (962-11-1392)

AMS Special Session on Nonlinear Evolution Equations and Applications, III

1:00 PM – 3:20 PM

Organizers: **Ralph A. Saxton**, University of New Orleans
David H. Wagner, University of Houston
Katarzyna Saxton, Loyola University

1:00PM (563) *Wave Interactions in Nonlinear Elastic Strings.*
Robin C Young, Univ of Mass (962-35-667)

1:30PM (564) *Vacuum and Stability of Global Weak Solutions for Compressible Flow.* Preliminary report.
Gui-Qiang G. Chen, Northwestern University (962-35-1245)

2:00PM ▶ (565) *No Local L^1 Solution for a Nonlinear Heat Equation.* Preliminary report.
Canan Celik, Michigan State University (962-35-1037)

2:30PM (566) *Capillary Gravity Surface Waves of a Fluid over an Obstruction.*
Daniel Ahn*, **Chaeho Lim** and **Jeongwhan Choi**, Korea University (962-76-1063)

3:00PM (567) *Penalty Approximations to Incompressible Power-Law Flows.* Preliminary report.
Dongming Wei, University of New Orleans (962-76-1143)

MAA Minicourse #11: Part A

1:00 PM – 3:00 PM

The mathematics of decision making.

Organizers: **Deborah Hughes Hallett**, University of Arizona
William G. McCallum, University of Arizona
Richard B. Thompson, University of Arizona

MAA Minicourse #14: Part A

1:00 PM – 3:00 PM

Discrete dynamical systems, mathematics, methods, and models.

Organizers: **David C. Arney**, U.S. Military Academy
Frank R. Giordano, Marina, CA
John S. Robertson, Georgia College & State University
Maurice D. Weir, Naval Postgraduate School

MAA Minicourse #5: Part A

1:00 PM – 3:00 PM

Creating and exporting computer animations to the Web.

Organizers: **William D. Emerson**, Metropolitan State College of Denver
Louis A. Talman, Metropolitan State College of Denver
Bradford Kline, Metropolitan State College of Denver

AMS Session on General Mathematics, History and Logic

1:00 PM – 4:10 PM

1:00PM ▶ (568) *Color By Numbers: Anti-Ramsey Problems on Labeled Graphs.*
Anna Engelsone, Goshen College (962-00-1420)

1:15PM (569) *Acceleration on a Metric Space.* Preliminary report.
Craig J Calcaterra, Metropolitan State University (962-00-624)

1:30PM ▶ (570) *Liu Hui: A Great Ancient Chinese Mathematician.* Preliminary report.
Zengxiang Tong* and **Zhen Huang**, Otterbein College (962-01-08)

1:45PM ▶ (571) *Who authored the first algebra book in the world.*
Mohammad Moazzam, Salisbury State University (962-01-1079)

2:00PM ▶ (572) *Pavel Florensky: The geometry of imaginary values and the geometry of the universe.*
Dimitri A Bayuk, Institute for History of Sciences & Technology (962-01-118)

2:15PM ▶ (573) *Surface Area.* Preliminary report.
Harriet M Lord, Cal Poly Pomona (962-01-147)

2:30PM ▶ (574) *Historical Works in Contemporary Classrooms.*
Bronislaw Czarnocha*, CUNY, and **Vrunda P Prabhu**, William Woods University (962-01-504)

2:45PM ▶ (575) *On Some Contributions of Nasireddin Tusi to Geometry, Trigonometry, and Astronomy.* Preliminary report.
Ilhan M Izmirli, Strayer University (962-01-82)

3:00PM ▶ (576) *Temperament of Mind: Hector Berlioz and Evariste Galois.* Preliminary report.
Jeff Johannes, University of Nevada, Las Vegas (962-01-90)

3:15PM ▶ (577) *The Fundamental Theorem of Arithmetic without the Axiom of Infinity (Preliminary Report).* Preliminary report.
Robert S Wilson, Sonoma State University (962-03-1125)

3:30PM (578) *A New Proof of the Strong Partition Relation on ω_1.* Preliminary report.
Russell J. May* and **Steve C. Jackson**, University of North Texas (962-03-1361)

3:45PM ▶ (579) *Prescribed Degree Lattice Embedding into $\mathcal{L}^*(V_\infty)$.*
Rumen D. Dimitrov, The George Washington University (962-03-967)

4:00PM (580) *Generalized Shifts and Backward shifts on Banach Spces.* Preliminary report.
Rajagopalan Minakshisundaram, Tennessee State University, and **Sundaresan Kondagunta***, Cleveland State University (962-46-319)

AMS Session on Lie Groups, Real Functions and Measure Theory

1:00 PM – 4:10 PM

1:00PM ▶ (581) *Notions of Size in Partial Semigroups.* Preliminary report.
Jillian E McLeod, Howard University (962-22-1043)

1:15PM (582) *Weakened group topologies and locally isometric completions.* Preliminary report.
Jon W Short, Indiana University (962-22-1227)

1:30PM (583) *Extremal Phenomena in Pseudocompact Topological Groups.*
W. W. Comfort*, Wesleyan University, and **Jorge Galindo**, Universitat Jaume I (962-22-928)

1:45PM (584) *Path-connectedness in the plane as a topological group.* Preliminary report.
Laurie A Edler, Jacksonville State University (962-22-948)

2:00PM (585) *On Extreme Path and Extreme First Return Path Derivatives.* Preliminary report.
Ali A. Alikhani-koopaei, University of Wisconsin Marathon County (962-26-1405)

2:15PM (586) *Fractional Opial type inequalities and fractional differential equations.*
George A. Anastassiou* and **Jerome A. Goldstein**, University of Memphis (962-26-627)

2:30PM (587) *A Generalization of the Mean Value Theorem.* Preliminary report.
Nasser Dastrange, Buena Vista University (962-26-770)

2:45PM ▶ (588) *Polynomials with a positive power.* Preliminary report.
Valerio De Angelis, Xavier University of Louisiana (962-26-972)

3:00PM ▶ (589) *On the second quantum derivative.* Preliminary report.
J. Marshall Ash* and **Stefan Catoiu**, DePaul University (962-26-978)

3:15PM ▶ (590) *Finitely determined quasi-measures.*
Svetlana V Butler, Northern Illinois University (962-28-1237)

3:30PM (591) *An Application of Ultrafilters to the Haar Measure.*
Amir A Maleki, Khan, Howard University (962-28-200)

3:45PM (592) *$A_r(\lambda)$-weighted Caccioppoli-type and Poincaré type inequalities for A-harmonic tensors.* Preliminary report.
Bing Liu, Saginaw Valley State University (962-28-931)

4:00PM (593) *Integral transforms of functionals in $L_2(C_0[0,T])$.*
Byoung Soo Kim, Yonsei University, and **David L Skoug***, University of Nebraska-Lincoln (962-28-961)

AMS Session on Probability Theory

1:00 PM – 4:10 PM

1:00PM (594) *Partially Monitored Reliability Models With Imperfect Maintenance.*
Ranko R Nedeljkovic, University of Belgrade (962-60-1123)

1:15PM (595) *Renewal type processes on partially ordered sets.* Preliminary report.
Kyle T Siegrist, University of Alabama in Huntsville (962-60-1130)

1:30PM (596) *Metrics for multivariate stable distributions.* Preliminary report.
John P Nolan, American University (962-60-1160)

1:45PM (597) *Infinite products of independent random variables.*
Italo Simonelli, Texas A&M University-Commerce (962-60-1164)

2:00PM (598) *Poisson Approximations in DNA Sequence Analysis.* Preliminary report.
Ming-Ying Leung, University of Texas at San Antonio (962-60-1167)

2:15PM (599) *An example of an orthogonal i-martingale.*
Michael L Green, Baylor University (962-60-1181)

2:30PM ▶ (600) *Optimal stopping rules for directionally reinforced processes.* Preliminary report.
Michael G Monticino* and **Pieter Allaart**, University of North Texas (962-60-1292)

2:45PM (601) *Copulas with fractal supports.* Preliminary report.
Gregory A. Fredricks*, **Roger B. Nelsen**, Lewis & Clark College, and **José Antonio Rodríguez-Lallena**, Universidad de Almería (962-60-1353)

3:00PM (602) *Numerical Solutions for a Maintenance and Replacement Model.*
Nabil M Moussa, Amer. Univ. in Cairo, Egypt (962-60-233)

3:15PM (603) *Completeness of the Spectral Domain of some classes of Nonstationary Processes.* Preliminary report.
Randall J Swift, Western Kentucky University (962-60-305)

3:30PM (604) *A unified method for proving the modulus of continuity and the law of the iterated logarithm for Brownian motion with applications to mathematical finance.* Preliminary report.
Lisa E Marano, Lehigh University (962-60-754)

3:45PM ▶ (605) *Making a Retirement Fund Last Forever Under Stochastic Volatility.* Preliminary report.
John A Quintanilla* and **Michael Monticino**, University of North Texas (962-60-757)

4:00PM (606) *Decomposing potential densities of Markov chains with raw time changes.* Preliminary report.
Joseph Glover, University of Florida (962-60-867)

MAA Session on Innovative Uses of the World Wide Web in Teaching Mathematics, II

1:00 PM – 4:15 PM

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

1:00PM ▶ (607) *Visual Calculus - a Report.*
Lawrence S Husch, University of Tennessee (962-C1-234)

1:20PM ▶ (608) *LiveMath: Dynamic and Interactive Mathematics for All Your Classes...Traditional and Online.*
Joan S. Bookbinder, Theorist Interactive, LLC (962-C1-1441)

1:40PM ▶ (609) *Statistical Data on the Internet: Seek and Find!*
Brian E Smith, McGill University (962-C1-273)

2:00PM ▶ (610) *Learning Trigonometry through a Virtual Mathematics Learning System—Informath.* Preliminary report.
Yuan Yuan* and **Ming-Jang Chen**, Hsinchu, Taiwan (962-C1-377)

2:20PM ▶ (611) *The World Wide Web as a Resource in a Course for Non-Majors.*
Kay B Somers* and **Alicia Sevilla**, Moravian College (962-C1-483)

2:40PM ▶ (612) *A Hyper-Chapter for Discrete Mathematics.* Preliminary report.
William E Fenton, Bellarmine University (962-C1-539)

3:00PM ▶ (613) *Modeling and Census Data from the WWW: Introducing the Derivative.*
Thomas B Fox, University of Houston-Clear Lake (962-C1-327)

3:20PM ▶ (614) *Using Java, Animated GIFs, and Shockwave Movies in Introductory Classes.*
William Hammack, Nova Southeastern University (962-C1-235)

3:40PM ▶ (615) *Online Mathematics Tutoring - An Alternative to Face-to-Face Tutoring?* Preliminary report.
Conrad D Lotze, American University (962-C1-527)

4:00PM ▶ (616) *Animation of Areas and Tangent Lines using Java Applets.*
Teri J. Murphy, University of Oklahoma, **Darren A. Narayan***, Rochester Institute of Technology, and **David Streid**, Maharishi University of Management (962-C1-521)

MAA Session on Serving the Needs of Developmental Students: Who Are They, Where Do They Come From, Where Do They Go?

1:00 PM – 3:35 PM

Organizers: **Suzanne Dorée**, Augsburg College
Bonnie Gold, Monmouth University

1:00PM ▶ (617) *Mathematics Curricula for Students with Differentiated Learning Needs.* Preliminary report.
Michael J. Bosse', Delaware State University (962-H1-454)

1:20PM (618) *Using a Web-Based Testing System to Support PSI in Remedial Mathematics.*
Richard Kuntz, Monmouth University (962-H1-731)

1:40PM ▶ (619) *Back to the Fundamentals of Algebra With Varied Approaches.*
Joel Baumeyer* and **Cathy W Carter**, Christian Brothers University (962-H1-602)

2:00PM ▶ (620) *Extra Credit Sessions Mingling Students from Two Different Courses, a Developmental Algebra Review Course and a Pre-calculus Course.* Preliminary report.
Sindhu Unnithan and **Paul R McCreary***, Xavier University of Louisiana (962-H1-1316)

2:20PM ▶ (621) *The City University of New York (CUNY) Immersion Program: An Innovative Model For Developmental Mathematics Instruction.*
Fred Peskoff, Borough of Manhattan Community College/CUNY (962-H1-671)

2:40PM ▶ (622) *Developmental Students, Who Are They Now?* Preliminary report.
Gabriella C Wepner, Ramapo College of New Jersey (962-H1-561)

3:00PM ▶ (623) *Integrated Mathematics & Science - A Tested Program for Cognitive Development.*
Jerome S Epstein, Polytechnic University (962-H1-459)

3:20PM (624) *Developmental Students: A homogeneous group with similar backgrounds, needs and expectations or a diverse population with varied backgrounds, widely divergent needs and expectations?* Preliminary report.
Mercedes A McGowen, William Rainey Harper College (962-H1-615)

MAA Session on Computer Algebra Systems in Upper-Division Mathematics Courses, I

1:00 PM – 4:10 PM

Organizers: **Kent M. Neuerburg**, Southeastern Louisiana University
Andrew Stuart Lang, Oral Roberts University

1:00PM ▶ (625) *MAPLE and Modeling with Ordinary Differential Equations.*
William P Fox, Francis Marion University (962-J1-801)

1:15PM ▶ (626) *Forced Investigation: A Student Project Using Derive in Differential Equations.*
Susan L Callahan, Cottey College (962-J1-479)

1:30PM ▶ (627) *A Computer Algebra System and a Terrain Walk in an Undergraduate Nonlinear Programming Course.*
Gerald C Kobylski*, **Donovon Phillips** and **Patrick J Driscoll**, United States Military Academy (962-J1-473)

1:45PM (628) *Putting Mathematica in Motion: Using Animations in ODE and PDE Courses.*
John M Davis, Baylor University (962-J1-468)

2:00PM ▶ (629) *Constructing Airfoils on the Fly.*
Elton Graves, Rose-Hulman Institute of Technology (962-J1-379)

2:15PM ▶ (630) *Effective Uses of a Computer Algebra System in a Differential Equations Course.* Preliminary report.
Dean E Allison, University of Northern Colorado (962-J1-221)

2:30PM ▶ (631) *Dynamica-A computer package for the study of Difference Equations and Discrete Dynamical Systems.*
M. R.S. Kulenovic* and **Orlando Merino**, University of Rhode Island (962-J1-76)

2:45PM ▶ (632) *Ideal Membership and "Automated" Theorem-Proving in Abstract Algebra.*
J Lyn Miller, Western Kentucky University (962-J1-559)

3:00PM ▶ (633) *Using computer algebra systems to develop students' theoretical understanding of abstract algebra.* Preliminary report.
Mike May*, **Russell Blyth**, **Julianne Rainbolt** and **T. Christine Stevens**, Saint Louis University (962-J1-528)

3:15PM ▶ (634) *A Constructivist Approach to Abstract Algebra Using Mathematica.*
William R Harris, Georgetown College (962-J1-464)

3:30PM ▶ (635) *Increasing Accessibility of Examples in Abstract Algebra Using GAP.*
Peter Blanchard*, Denison University, and **Judy A Holdener**, Kenyon College (962-J1-401)

3:45PM ▶ (636) *Galois Theory by Calculator.* Preliminary report.
Thomas W Mattman, CSU, Chico (962-J1-317)

4:00PM ▶ (637) *Using Mathematica labs to encourage students to explore the underlying concepts.* Preliminary report.
Stacey A Rodman, Augustana College (962-J1-637)

MAA Session on Mathematics in the Age of Euler

1:00 PM – 3:55 PM

Organizers: **V. Frederick Rickey**, United States Military Academy
William W. Dunham, Muhlenberg College

1:00PM ▶ (638) *Euler and the Genoese Lottery.*
Robert E Bradley, Adelphi University (962-Q1-136)

1:20PM ▶ (639) *Euler's Observations on a Classic of Recreational Mathematics.*
Douglas E. Ensley, Shippensburg University (962-Q1-494)

1:40PM ▶ (640) *Euler's Königsberg letters.* Preliminary report.
Robin J Wilson, Open University (962-Q1-1185)

2:00PM ▶ (641) *Euler's Geometry of Position: Graph Theory.*
Brian P Hopkins, Seattle University (962-Q1-393)

2:20PM ▶ (642) *Why did Euler promote Edward Waring?*
June E Barrow-Green, The Open University, UK (962-Q1-423)

2:40PM ▶ (643) *Dances between continuous and discrete: Euler's summation formula.*
David J. Pengelley, New Mexico State University (962-Q1-322)

3:00PM ▶ (644) *Formalist Derivations of Exponential and Logarithmic Power Series.*
Mark McKinzie, Monroe Community College (962-Q1-526)

3:20PM ▶ (645) *Euler and the Concept of Convergence.*
Lawrence A D'Antonio, Ramapo College of New Jersey (962-Q1-356)

3:40PM ▶ (646) *Anastácio da Cunha and the search for rigor.*
Jaime Carvalho e Silva, Universidade de Coimbra, Portugal (962-Q1-111)

MAA Session on General Contributed Papers, II

1:00 PM – 4:10 PM

Organizers: **Howard L. Penn**, United States Naval Academy
Elizabeth M. Mayfield, Hood College
Jay A. Malmstrom, Oklahoma City Community College
William P. Wardlaw, United States Naval Academy

1:00PM (647) *Outside Academia: A Sabbatical in Industry.*
Donna L Beers, Simmons College (962-T1-73)

1:15PM (648) *Outside Academia : A Sabbatical in Government.*
Sonja Sandberg, Framingham State College (962-T1-83)

1:30PM ▶ (649) *Concept questions in a calculus class.*
David O. Lomen* and **Maria K. Robinson**, University of Arizona (962-T1-557)

1:45PM ▶ (650) *An Alternative Approach to Graphing the Inverse of a Function.* Preliminary report.
Thomas J Pfaff, University of Wisconsin-Superior (962-T1-384)

2:00PM ▶ (651) *A Generalized Divisibility Check.* Preliminary report.
Jay A Malmstrom, Oklahoma City Community College (962-T1-267)

2:15PM ▶ (652) *Complex numbers. Simple geometry.* Preliminary report.
Masato Kimura, Hood College (962-T1-544)

2:30PM ▶ (653) *Strolls through the French Quarter with my pal Pascal.*
Dennis P Walsh, Middle Tennessee State University (962-T1-656)

2:45PM ▶ (654) *Video poker in South Carolina.*
Todd D Mateer, Clemson University (962-T1-545)

3:00PM ▶ (655) *Rings, Strings, Blocks and Beads: Using Puzzles in Math Liberal Arts.*
Stephanie A Fitchett, Florida Atlantic University (962-T1-532)

3:15PM ▶ (656) *Watches, laser scanners, and why they have anything to do with angle trisection.*
Brendan J Foreman, Case Western Reserve University (962-T1-349)

3:30PM ▶ (657) *Elementary Geometry: Fagnano and Erdos.* Preliminary report.
Dragan S. Jankovic, Cameron University (962-T1-593)

3:45PM ▶ (658) *What is the Rank of a Matrix over a Commutative Ring?* Preliminary report.
William P Wardlaw, U. S. Naval Academy (962-T1-462)

4:00PM ▶ (659) *Tic-Tac-Toe on a Finite Plane.* Preliminary report.
Maureen T Carroll* and **Steven T Dougherty**, University of Scranton (962-T1-201)

MAA Panel Discussion

1:00 PM – 2:30 PM

Curriculum Foundations Project I: Reports from the client discipline workshops.

Organizers: **William H. Barker**, Bowdoin College
Jack Bookman, Duke University
Susanna S. Epp, DePaul University

MAA Committee on Industrial and Government Mathematicians Panel Discussion

1:00 PM – 2:30 PM

Mathematics in industry.

Moderator: **Michael G. Monticino**, University of North Texas

Organizer: **Philip E. Gustafson**, Mesa State College

Panelists: **Tony Cabal**, Eastman Kodak Company
Tami Carpenter, Telcordia Technologies
James C. Cavendish, General Motors Corporation
Alan Lewis, Envision Financial Systems
Laura Mather, La Jolla Research Laboratories
Michael E. Moody, Harvey Mudd College

MAA Panel Discussion

1:00 PM – 2:30 PM

How to facilitate change?
Moderator: **Kathleen Snook**, U.S. Military Academy
Organizer: **Donald B. Small**, U.S. Military Academy
Panelists: **David C. Arney**, U.S. Military Academy
Jim Lewis, University of Nebraska
Scott Hunt, Champion Paper Company
Scott Snook, Harvard Business School and U.S. Military Academy

AMS Special Session on Model Theory, II

2:00 PM – 3:50 PM

Organizers: **Steven A. Buechler**, University of Notre Dame
Sergei Starchenko, University of Notre Dame

2:00PM (660) *Decidable Prime Models.* Preliminary report.
Jessica M Young, M.I.T. (962-03-922)

2:30PM (661) *Strongly minimal sets in differentially closed fields.* Preliminary report.
David E Marker, University of Illinois at Chicago (962-03-227)

3:00PM (662) *Finding groups in models of stable, unsuperstable theories.* Preliminary report.
Michael C Laskowski, University of Maryland (962-03-864)

3:30PM (663) *Almost algebraically compact modules.* Preliminary report.
Ivo Herzog, The Ohio State University at Lima (962-13-959)

Project NExT-Young Mathematicians Network Poster Session

2:00 PM – 4:00 PM

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

Summer Program for Women in Mathematics (SPWM) Reunion

2:00 PM – 4:00 PM

Organizers: **Murli M. Gupta**, George Washington University
E. Arthur Robinson Jr., George Washington University

AMS Invited Address

2:15 PM – 3:05 PM

(664) *From Platonic solids to affine Lie algebras and beyond.*
Igor B. Frenkel, Yale University (962-17-13)

AMS-MAA Joint Panel Discussion

2:45 PM – 4:15 PM

The NSF national science, mathematics, engineering, and technology education library program: A report on current activities and projects.
Organizers: **Lee L. Zia**, National Science Foundation
James H. Lightbourne, National Science Foundation
Panelists: **Lang Moore**, Duke University
Gene Klotz, Swarthmore College
Robby Robson, Oregon State University

MAA Panel Discussion

2:45 PM – 4:15 PM

Statistics and mathematical modeling: Lively applications for the classroom.
Organizers: **G. Elton Graves**, Rose-Hulman Institute of Technology
Francis E. Su, Harvey Mudd College
Catherine M. Murphy, Purdue University-Calumet
Panelists: **Ami Radunskaya**, Pomona College
Allan J. Rossman, Dickinson College

MAA Panel Discussion

2:45 PM – 4:15 PM

New directions in Moore method teaching.
Organizers: **James P. Ochoa**, Hardin-Simmons University
W. Ted Mahavier, Nicholls State University
Panelists: **Carol Jean Browning**, Drury University
Charles A. Coppin, University of Dallas
Dale Daniel, Lamar University
Joseph W. Eyles, University of the Incarnate Word
Carol S. Schumacher, Kenyon College.

AMS Invited Address

3:20 PM – 4:10 PM

(665) *New perspectives on algebraic cycles.*
Mark L. Green, University of California Los Angeles (962-14-07)

Joint Prize Session and Reception

4:25 PM – 7:00 PM

Illinois State University Department of Mathematics Reception

5:45 PM – 7:45 PM

MAA Committee on Industrial and Government Mathematicians Welcome Reception

5:45 PM – 6:45 PM

MAA Two-Year College Reception

5:45 PM – 7:00 PM

MER Banquet

6:00 PM – 9:30 PM

MAA Special Presentation

7:00 PM – 8:15 PM

The mathematics of Lewis Carroll
Organizer: **Robin J. Wilson**, British Open University

Reception for Friends and Alumni of Teachers College, Columbia University

7:00 PM – 9:00 PM

Friday, January 12

Joint Pi Mu Epsilon and MAA Student Chapter Advisors' Breakfast

7:00 AM – 8:00 AM

MAA Session on Computer Algebra Systems in Upper-Division Mathematics Courses, II

7:15 AM – 10:55 AM

Organizers: **Kent M. Neuerburg**, Southeastern Louisiana University
Andrew Stuart Lang, Oral Roberts University

7:15AM ▶ (666) *A Hand-held Computer Algebra System in ODE.* **Mary Ann Connors*** and **Kathleen Snook**, United States Military Academy at West Point (962-J1-306)

7:30AM ▶ (667) *A Course on Computational Algebra and Algebraic Geometry.* **Susan J Colley**, Oberlin College (962-J1-287)

7:45AM ▶ (668) *Introducing Upper-Division Mathematics Students to Mathematica.* **Danny W Turner**, Winthrop University (962-J1-207)

8:00AM ▶ (669) *Binary Operations: Enumeration and Algebraic Structures.* **Ralph P. Grimaldi**, Rose-Hulman Institute of Technology (962-J1-315)

8:15AM ▶ (670) *A Computational Approach to Elementary Galois Theory with Mathematica.* **John R Swallow**, Davidson College (962-J1-294)

8:30AM ▶ (671) *Number Theory and Mathematica.* **Patrick S Mitchell**, Midwestern State University (962-J1-344)

8:45AM (672) *Improved Algorithms of Recursive Triangular Factorization for Cauchy-like Matrices.* **Zhao Chen**, New York City Technical College, CUNY. (962-J1-633)

9:00AM ▶ (673) *Using Mathematica to Illustrate Theorems from Advanced Linear Algebra.* **Herbert A Medina**, Loyola Marymount University (962-J1-66)

9:15AM ▶ (674) *An Investigation of Stochastic Population Models.* **Martha L Abell***, **John A Rafter** and **James P Braselton**, Georgia Southern University (962-J1-208)

9:30AM (675) *Conjectures and Counterexamples in Discrete Mathematics.* **Nancy L Hagelgans**, Ursinus College (962-J1-408)

9:45AM ▶ (676) *A Math Course to Teach Computer Programming using Maple.* Preliminary report. **David E Betounes*** and **Mylan E Redfern**, Univ. of Southern Mississippi (962-J1-240)

10:00AM ▶ (677) *Using Mathematica in the Real Analysis Classroom.* **Ellen M Parker**, DePauw University (962-J1-412)

10:15AM ▶ (678) *Computing Probability Generating Functions Using Mathematica.* Preliminary report. **Bruce W. Atkinson**, Samford University (962-J1-332)

10:30AM ▶ (679) *Advanced Engineering Math - A New Apprenticeship.* **Robert J Lopez**, Rose-Hulman Institute of Technology (962-J1-280)

10:45AM ▶ (680) *Introduction to Complex Analysis with Maple 6.* Preliminary report. **William C Bauldry**, Appalachian State University (962-J1-14)

Joint Meetings Registration

7:30 AM – 4:00 PM

MAA Session on Outreach Programs for Women and Girls

7:30 AM – 10:50 AM

Organizers: **Kathleen A. Sullivan**, Seattle University
Elizabeth G. Yanik, Emporia State University

7:30AM ▶ (681) *MESSAGE: A Math, Engineering, Science Summer All Girls' Experience.* Preliminary report. **M. Hope McIlwain**, Mercer University (962-R1-1306)

7:45AM ▶ (682) *A Secondary School Program in Science, Mathematics, and Engineering Enrichment fo Future Women Scientists.* **Rahim G Karimpour**, Southern Illinois University Edwardsville (962-R1-1199)

8:00AM ▶ (683) *Hypatia Day: An Enrichment Program for Seventh Grade Girls.* **Colleen M Hoover**, Saint Mary's College, Notre Dame, IN (962-R1-276)

8:15AM ▶ (684) *Summer Math Academy Growing Pains.* **Deborah Lynn Gochenaur**, Messiah College (962-R1-389)

8:30AM ▶ (685) *Women in Mathematics and Science Conference at Millersville University.* **Dorothee J Blum** and **Ximena Catepillan Hearn***, Millersville University of Pennsylvania (962-R1-589)

8:45AM ▶ (686) *Mathematical Association of America/Tensor Foundation/Mississippi University for Women Math Camp 2000.* **Bonnie L Oppenheimer**, Mississippi University for Women (962-R1-251)

9:00AM ▶ (687) *USC Math Camp for Young Women: 1999 & 2000.* **Hortensia Soto-Johnson*** and **Paul R Chacon**, University of Southern Colorado (962-R1-202)

9:15AM ▶ (688) *The MENI Mathematics Minicamp for Women at Valparaiso University.* Preliminary report. **Mary T Treanor**, Valparaiso University (962-R1-591)

9:30AM ▶ (689) *Mentoring Experiences and Practices of Professional Mathematicians and Scientists.* Preliminary report. **Jayanthi Ganapathy*** and **Jennifer E Szydlik**, University of Wisconsin Oshkosh (962-R1-226)

9:45AM ▶ (690) *MentorNet: Tapping the Power of the Internet to Support Women Engineering, Science, and Math Students.* **Peg Boyle Single*** and **Carol B Muller**, MentorNet (962-R1-361)

10:00AM ▶ (691) *Pure and Applied Research for Two Year College Women.* **Patricia R Wilkinson*** and **Lawrence A Sher**, Manhattan CC (962-R1-316)

10:15AM ▶ (692) *Women & Mathematics Network of the MAA.* **Virginia Gielincki Kasten***, General Motors, **Kathleen A. Sullivan**, Seattle University, and **Elizabeth G. Yanik**, Emporia State University (962-R1-543)

10:30AM (693) *Funding Sources for Outreach Programs.*
Elizabeth G. Yanik, Emporia State University (962-R1-828)

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 (694) *On the locus of real Riemann surfaces.*
Milagros Izquierdo*, Mälardalen University, and **Antonio Costa**, UNED (962-14-1070)

8:30AM (695) *Short homology bases of compact Riemann surfaces.* Preliminary report.
Peter J Buser*, Swiss Federal Institue of Technology Lausanne, and **Mika Seppala**, Florida State University (962-30-747)

9:00AM (696) *An algorithm for symplectic matrices of finite order surface mapping-classes.* Preliminary report.
Moira Chas, CUNY, and **Jane Gilman***, Rutgers-Newark (962-20-988)

9:30AM (697) *Hyperbolic Lego and Algebraic Curves.*
Robert J Silhol, Université Montpellier II (962-14-919)

10:00AM (698) *Numerical Uniformization of hyperelliptic Curves.*
Matthias J Wagner, Swiss Federal Institute of Technology (962-30-930)

10:30AM (699) *Deformation of Packable Surfaces.*
Roger W Barnard and **G. Brock Williams***, Texas Tech University (962-30-103)

AMS Special Session on Group Cohomology and Applications to Homotopy Theory and Representation Theory, I

8:00 AM – 10:50 AM

Organizers: **Alejandro Adem**, University of Wisconsin, Madison
Jon F. Carlson, University of Georgia

8:30AM (700) *An obstruction theory for constructing spherical fibrations with a give Euler class.* Preliminary report.
Jeffrey H Smith, Purdue University (962-55-1362)

9:00AM (701) *Homotopy representation theory.*
Jesper Grodal, Institute for Advanced Study (962-20-1370)

9:30AM (702) *Finding Effective Euler Classes of Finite Groups.* Preliminary report.
Michael A. Jackson, Purdue University (962-55-351)

10:00AM ▶ (703) *On Commuting and Noncommuting Complexes.*
Jonathan N Pakianathan*, University of Rochester, and **Ergun Yalcin**, Bilkent University, Turkey (962-55-1277)

10:30AM (704) *Group Cohomology and (Twisted) K-theory of Orbifolds.* Preliminary report.
Alejandro Adem* and **Yongbin Ruan**, University of Wisconsin (962-55-691)

AMS Special Session on Geometry and Topology of Low Dimensional Manifolds, I

8:00 AM – 10:50 AM

Organizers: **Slawomir Kwasik**, Tulane University
Terry Lawson, Tulane University

8:00AM (705) *Lie superalgebra bundles over Riemannian manifolds.*
David A Richter, Southeast Missouri State University (962-53-265)

8:30AM ▶ (706) *Which cones have minimal surface foliations?* Preliminary report.
Simon P Morgan, Rice University (962-51-943)

9:00AM ▶ (707) *Length distortion and the Hausdorff dimension of limit sets.*
Martin J Bridgeman*, Boston College, and **Edward Taylor**, University of Connecticut (962-51-237)

9:30AM (708) *Maximal holonomy of almost Bieberbach groups for* $Heis_5$.
Kyung Bai Lee*, University of Oklahoma, U.S.A., and **Andrzej Szczepański**, University of Gdańsk (962-57-869)

10:00AM (709) *On surgery in dimension 3.*
Bjorn Jahren, University of Oslo (962-57-1269)

10:30AM (710) *Exotic spheres with no smooth* T^3 *actions.* Preliminary report.
Reinhard Schultz, UC Riverside (962-57-1156)

AMS Special Session on Analysis on Infinite Dimensional Spaces (in Honor of Leonard Gross), I

8:00 AM – 10:50 AM

Organizers: **Hui-Hsiung Kuo**, Louisiana State University
Ambar N. Sengupta, Louisiana State University

8:00AM (711) *Dirichlet forms in holomorphic function spaces.*
Leonard Gross, Cornell University (962-46-263)

9:00AM (712) *Logarithmic Sobolev inequalities, hypercontractivity and the Poisson-Szëgo semigroup.* Preliminary report.
William Beckner, University of Texas at Austin (962-58-178)

9:30AM (713) *Convex Functions and Geodesics for Several Operator Metrics.*
Eric A Carlen, Georgia Tech (962-52-1048)

10:00AM (714) *Equivalence of heat kernel measure and pinned Wiener measure on loop groups.*
Driver K Bruce*, University of CA, San Diego, **Shigeki Aida**, Osaka University, and **Vikram K Srimurthy**, Cambridge, MA (962-60-274)

10:30AM (715) *Heat kernel analysis on complex infinite dimensional groups.*
Maria Gordina, University of California at San Diego (962-60-936)

AMS Special Session on Stochastic Analysis and Applications, I

8:00 AM – 10:50 AM

Organizers: **Padmanabhan Sundar**, Louisiana State University
Guillermo S. Ferreyra, Louisiana State University

8:00AM (716) *Mass Transport by Stochastic Flows.* Preliminary report.
Erhan Cinlar, Princeton University (962-60-1124)

9:00AM (717) *Linear Programming Formulation for Optimal Stopping Problems.*
Moon Jung Cho, University of Kentucky, and **Richard H Stockbridge***, University of Wisconsin - Milwaukee (962-60-456)

9:30AM (718) *A cyclically catalytic super-Brownian motion.*
Jie Xiong, University of Tennessee (962-60-628)

10:00AM (719) *Universality, Conformal Invariance, and the Dimension of the Brownian Frontier.*
Gregory F Lawler, Duke University (962-60-1271)

10:30AM (720) *Stochastic Difference Equations.*
D. Kannan, University of Georgia (962-60-1310)

AMS Special Session on Integral Transforms, I

8:00 AM – 10:50 AM

Organizers: **Gestur Olafsson**, Louisiana State University
Gunter Lumer, University of Mons-Hainaut
Frank Neubrander, Louisiana State University
A. Ludu, Louisiana State University

8:00AM (721) *Radon Transform and Wavelets.*
Carlos A Berenstein, University of Maryland (962-44-1131)

8:30AM (722) *On attenuated Radon transforms.* Preliminary report.
Peter Kuchment, Wichita State University (962-44-1008)

9:00AM (723) *Uniqueness and Support Theorems for spherical Radon transforms.*
Eric Todd Quinto*, Tufts University, and **Yiying Zhou**, Kendle International, Inc. (962-44-851)

9:30AM (724) *Limitations of the Radon Transform in Emission Tomography.*
Bernard A Mair, University of Florida (962-45-935)

10:00AM (725) *Analysis of a filtered back projection algorithm for truncated spiral cone beam data.*
Alexander Katsevich, University of Central Florida (962-44-1076)

10:30AM (726) *Incomplete data problems in tomography.*
Alfred Louis, University of Saarbruecken, Germany (962-44-1288)

AMS Special Session on Interaction of Inverse Problems and Image Analysis, I

8:00 AM – 10:50 AM

Organizers: **M. Zuhair Nashed**, University of Delaware
Otmar Scherzer, Ludwig-Maximilians-Universität München

8:00AM (727) *Mathematical issues, problems, and challenges in echocardiographic image analysis.*
David C Wilson, University of Florida (962-92-929)

8:30AM (728) *Curve recognition modulo Lie group action.*
Mireille Boutin, University of Minnesota (962-22-881)

9:00AM (729) *Anisotropic Geometric Diffusion in Surface Processing.* Preliminary report.
Martin Rumpf, Institute for Applied Mathematics, Bonn University (962-35-1065)

9:30AM (730) *Reconstruction of Diffusion Tensor Magnetic Resonance Images.*
Akram Aldroubi*, Vanderbilt University, **Peter Basser** and **Sinisa Pajevic**, NIH (962-42-830)

10:00AM (731) *On fast non-rigid matching.*
Bernd Fischer, Institute of Mathematics, Medical University of Luebeck (962-65-822)

10:30AM (732) *Reconstruction from Radiographic Projections using Dynamics: Non-Stochastic Case.*
Kevin R Vixie* and **Gary Sandine**, Los Alamos National Laboratory (962-37-144)

MAA Minicourse #10: Part A

8:00 AM – 10:00 AM

Developing your department's assessment plan.
Organizers: **William A. Marion**, Valparaiso University
Bonnie Gold, Monmouth University

MAA Minicourse #12: Part B

8:00 AM – 10:00 AM

Contemporary college algebra: A reform program.
Organizers: **Donald B. Small**, U.S. Military Academy
Dorothy Hunter, Huston-Tillotson College

MAA Minicourse #1: Part B

8:00 AM – 10:00 AM

Creating materials using 'real-world' data.
Organizers: **Janet L. Andersen**, Hope College
Todd M. Swanson, Hope College
Elliot A. Tanis, Hope College

AMS Session on Combinatorics, I

8:00 AM – 10:55 AM

8:00AM ▶ (733) *A Complete Classification of Tournaments Having a Disjoint Union of Directed Paths as a Minimum Feedback Arc Set.*
Garth Isaak, Lehigh University, and **Darren A. Narayan***, Rochester Institute of Technology (962-05-1002)

8:15AM ▶ (734) *Isometry Dimension of Finite Groups.* Preliminary report.
Manish M Patnaik, Massachusetts Institute of Technology (962-05-1016)

8:30AM ▶ (735) *Surprises in the mathematics research collaboration graphs.*
Jerrold W Grossman, Oakland University (962-05-1031)

8:45AM ▶ (736) *A General Notion of Visibility Graphs.*
Michael L Develin*, University of California, Berkeley, **Stephen G Hartke**, Rutgers, and **David P Moulton**, Center for Communications Research (962-05-1041)

9:00AM (737) *Counting trees by inversions and descents.* Preliminary report.
Louis H. Kalikow, College of the Holy Cross (962-05-1051)

9:15AM (738) *Dot-Critical Graphs.* Preliminary report.
Tamara A Burton* and **David P Sumner**, University of South Carolina (962-05-1147)

9:30AM ▶ (739) *Minimum Independence Number of Graphs with Specified Degree Sequence.* Preliminary report.
Patricia Nelson, University of Nebraska-Lincoln (962-05-1195)

9:45AM (740) *Pitch Tournament Designs and Other BIBD's - Existence Results for the Case v=8n.*
R. Julian R Abel, University of New South Wales, **Norman J Finizio**, University of Rhode Island, **Malcolm Greig**, Greig Consulting, and **Scott J Lewis***, Murray State University (962-05-1201)

10:00AM (741) *k-Pseudosnakes in Large Grids.*
Martin Matamala, Universidad de Chile, **Erich Prisner***, University of Louisville, and **Ivan Rapaport**, Universidad de Chile (962-05-1207)

10:15AM (742) *Radio labelings of graphs.*
Gary Chartrand, **David J Erwin***, Western Michigan University, **Frank Harary**, New Mexico State University, and **Ping Zhang**, Western Michigan University (962-05-1210)

10:30AM ▶ (743) *Rado Numbers for* $c(x1 + x2 + \ldots + xm - 1) = xm$. Preliminary report.
Erin M Flickinger*, University of South Carolina Honor's College, and **Daniel J Schaal**, South Dakota State University (962-05-1226)

10:45AM ▶ (744) *Minimum Degree Growth of the Iterated Line Graph.* Preliminary report.
Stephen G Hartke*, Rutgers University, and **Aparna W Higgins**, University of Dayton (962-05-1243)

AMS Session on Geometry

8:00 AM – 9:55 AM

8:00AM ▶ (745) *Assigning distributional curvature to 1 complexes via their isometric embedding in polyhedra.* Preliminary report.
Simon P Morgan, Rice University (962-51-1097)

8:15AM ▶ (746) *Statistical Geometry.* Preliminary report.
Reza R Ahangar, University of Central Arkansas (962-51-1231)

8:30AM (747) *Coxeter-Petrie Complexes.* Preliminary report.
Kevin Lee Anderson, Kansas State University (962-51-1432)

8:45AM (748) *Groups in the category of para-φ-manifolds.*
Andrew J Bucki, Oklahoma School of Science and Mathematics (962-53-1224)

9:00AM (749) *Cut and conjugate points on two-step nilpotent metric Lie groups.* Preliminary report.
Ruth Gornet, Texas Tech University, and **Maura B Mast***, University of Massachusetts Boston (962-53-1381)

9:15AM (750) *Space-like surfaces of constant mean curvature one in the 3 dimensional de Sitter space* $\mathbb{S}^3_1$. Preliminary report.
Sungwook Lee, The University of Connecticut (962-53-712)

9:30AM ▶ (751) *Refined Arithmetic, Geometric & Harmonic Mean Inequalities.* Preliminary report.
Peter R Mercer, S.U.N.Y. College at Buffalo (962-26-1068)

9:45AM (752) *A Homological Approach to Graded Principal Ideal Domains.* Preliminary report.
William T Ashby, Charleston Southern University (962-18-245)

AMS Session on Numerical Analysis

8:00 AM – 10:10 AM

8:00AM (753) *Wavelet Techniques Applied to Multigrid Methods.*
Doreen De Leon, University of California, Los Angeles (962-65-1121)

8:15AM (754) *Wavelet Schemes for Advection-Reaction Equations.*
Jiangguo Liu, University of South Carolina (962-65-1145)

8:30AM (755) *An efficient algorithm for smoothing by spline function.*
Robert P Bennell, Virginia Military Institute (962-65-1162)

8:45AM ▶ (756) *Finding a few interior eigenvalues of a large symmetric matrix without factorization.* Preliminary report.
James Baglama*, Ball State University, **Daniela Calvetti**, Case Western Reserve University, and **Lothar Reichel**, Kent State University (962-65-1182)

9:00AM ▶ (757) *On the Quadratic Convergence of Heron's Recursion for Roots.* Preliminary report.
Constantine Georgakis, DePaul University (962-65-1242)

9:15AM ▶ (758) *Molecular Dynamics Simulation of Cracks and Fractures in a Solid.* Preliminary report.
Mark S Korlie, Montclair State University (962-65-1313)

9:30AM (759) *New effective method for numerical solution of Mathematical Physics Problems.* Preliminary report.
Isom N Djuraev, Samarkand State University (962-65-348)

9:45AM (760) *A Fourth Order Finite Difference Method for Solving Navier Stokes Equations.*
Nihal J Siriwardana, Lincoln University (962-65-874)

10:00AM ▶ (761) *Transient Anomalous Diffusion in Poiseuille Flow.*
Marco Latini* and **Andrew J Bernoff**, Harvey Mudd College, Claremont CA (962-76-917)

MAA Session on Innovative Practices in Statistics Education, I

8:00 AM – 10:55 AM

Organizers: **Mary M. Sullivan**, Rhode Island College
Carolyn K. Cuff, Westminster College
Mary R. Parker, Austin Community College

8:00AM ▶ (762) *Using the Graphing Calculator to Enhance Conceptual Development in Linear Regression.*
Murray H Siegel, Sam Houston State University (962-E1-17)

8:15AM (763) *Introductory statistics laboratory projects using the TI-83.*
John A Rafter and **Patricia B Humphrey***, Georgia Southern University (962-E1-187)

8:30AM ▶ (764) *Using Technology to Develop Understanding of Statistical Concepts.*
Roxy L Peck, Cal Poly, San Luis Obispo (962-E1-575)

8:45AM ▶ (765) *Statistics and Data: a Web-based Approach.*
Brian E Smith, McGill University (962-E1-275)

9:00AM ▶ (766) *An alternative method of teaching: Reverse-Traditional/Hands-On: A success story.*
Aliakbar Montazer-Haghighi, Benedict College (962-E1-345)

9:15AM ▶ (767) *A Fishy Introductory Statistics Course.*
Dick Jardine*, Keene State College, and **Kenneth Sprankle**, New Hampshire Fish and Game (962-E1-299)

9:30AM ▶ (768) *Service-Learning in Applied Statistics.*
Robert G Root*, Lafayette College, and **Trisha Thorme**, Princeton University (962-E1-350)

9:45AM ▶ (769) *Introductory Statistics with an International Travel Lab Component in Nicaragua, Central America.*
Robert A Leslie, Agnes Scott College (962-E1-228)

10:00AM ▶ (770) *Can Real Data and Real Mathematics Coexist in a Sophomore Level Course?*
George W. Cobb, Mount Holyoke College (962-E1-324)

10:15AM ▶ (771) *The Source of Significance: Using Cost To Illuminate Statistical Decision-Making.*
Hunter D Ellinger*, University of Texas at Austin, and **Mary R Parker**, Austin Community College (962-E1-507)

10:30AM ▶ (772) *Students Conduct a University Needs Assessment Survey.*
Barbara A Wainwright, Salisbury State University (962-E1-383)

10:45AM Discussion.

MAA Session on Integrating Mathematics and Other Disciplines, I

8:00 AM – 10:55 AM

Organizers: **William G. McCallum**, University of Arizona
Deborah Hughes Hallett, University of Arizona
Yajun Yang, SUNY at Farmingdale

8:00AM ▶ (773) *Using Mathematics in a Business Simulation: Broadening the Options.* Preliminary report. **William F. Straley***, Oglethorpe University, and **Margaret E. Cole**, University of Tennessee at Chattanooga (962-G1-516)

8:15AM ▶ (774) *Integrating Business, Education, and Social Sciences In a First Year Finite Math Course.* **Morteza Shafii-Mousavi*** and **Paul S Kochanowski**, Indiana University South Bend (962-G1-230)

8:30AM ▶ (775) *Economics Applications in Multivariable Calculus.* **Darryl K Ahner*** and **Gerald Kobylski**, United States Military Academy, West Point, NY (962-G1-440)

8:45AM ▶ (776) *Dynamic Visualization Tools in Calculus as a Bridge to Economics and Finance.* Preliminary report. **Agnes Rash***, St. Joseph's University, Philadelphia, PA, and **Jean Marie McDill**, California Polytechnic State University, San Luis Obispo (962-G1-486)

9:00AM ▶ (777) *Incorporating Projects from Industry into Classroom Instruction.* Preliminary report. **Yajun Yang**, SUNY-Farmingdale (962-G1-541)

9:15AM (778) *Algebraic Concepts Illustrated through Musical Analysis: Interdisciplinary Applications in Mathematics and Music Courses.* **Robert W Peck**, Louisiana State University (962-G1-86)

9:30AM ▶ (779) *A Celestial Cubic.* **Charles W Groetsch**, University of Cincinnati (962-G1-933)

9:45AM ▶ (780) *Integrating Mathematics and Astronomy.* **Frank Zizza**, University of Arizona South (962-G1-1351)

10:00AM ▶ (781) *Cryptography and society: Report on a new course.* **Joshua R Holden**, Duke University (962-G1-555)

10:15AM ▶ (782) *Cryptology: the Mathematics of Secret Writing.* **Thomas H Barr**, Rhodes College (962-G1-563)

10:30AM ▶ (783) *Understanding the Graphic Output From Respirometers and EKG's.* **Leonard Simons*** and **Jerry Przybylski**, Elmira College (962-G1-594)

10:45AM ▶ (784) *Shapes of Nature: E-Coursebook.* **Jack R Stewart***, **Annalisa Crannell** and **Roger Thomas**, Franklin & Marshall (962-G1-101)

MAA Session on Classroom Demonstrations and Course Projects That Make a Difference, I

8:00 AM – 10:55 AM

Organizers: **David R. Hill**, Temple University
Sarah L. Mabrouk, Boston University
Lila F. Roberts, Georgia Southern University

8:00AM ▶ (785) *A Spring-Mass System Demonstration Enhanced by the TI-89 Hand Held Computer Algebra System.* Preliminary report. **Kathleen G. Snook*** and **Mary Ann Connors**, U.S. Military Academy (962-L1-309)

8:15AM ▶ (786) *Changing Basis With Hockey Pucks.* Preliminary report. **Carl V Lutzer**, Rochester Institute of Technology (962-L1-588)

8:30AM ▶ (787) *Buying Your Dream Home: A Project in Financial Mathematics.* **George L Ashline**, St. Michael's College (962-L1-489)

8:45AM ▶ (788) *The Mystery of the Francois Vase: A Calculus Project.* **John H Wilson**, Centre College (962-L1-437)

9:00AM ▶ (789) *A manipulative for demonstrating graphs dynamically and statically.* **Mike Pinter**, Belmont University (962-L1-472)

9:15AM ▶ (790) *Monte Carlo Area Simulations.* **Anthony D Berard, Jr.**, King's College (962-L1-195)

9:30AM ▶ (791) *Shape Memory Alloys Calculus Project.* Preliminary report. **Tanya L Leise**, Rose-Hulman Institute of Technology (962-L1-254)

9:45AM ▶ (792) *Mirrors and Chances: Examples of Individualized Mathematica Projects for Calculus.* **Eve A. Torrence**, Randolph-Macon College (962-L1-225)

10:00AM ▶ (793) *Spreadsheet-Based Demonstrations for College Mathematics Courses.* **Louise M Berard**, Wilkes University (962-L1-188)

10:15AM ▶ (794) *A Website that Illustrates Using Taylor Polynomials to Approximate Other Functions.* Preliminary report. **Cathy M Frey**, Norwich University (962-L1-63)

10:30AM ▶ (795) *Using the Digital Camera to Make a Difference in Geometry.* **Tena L Golding*** and **Elizabeth D Gray**, Southeastern Louisiana University (962-L1-52)

10:45AM ▶ (796) *Airplanes, Hurricanes and the Simplex Method in Finite Mathematics.* **Pam Crawford**, Jacksonville University (962-L1-630)

Employment Center

8:00 AM – 7:30 PM

Scheduled interviews and interview center (see article October 2000 issue, page 1218).

PME Council

8:00 AM – 11:00 AM

AMS-MAA Special Session on History of Mathematics, I

8:30 AM – 10:50 AM

Organizers: **Karen H. Parshall**, University of Virginia
David E. Zitarelli, Temple University

8:30AM ▶ (797) *The history of almost-periodic functions.* Preliminary report. **Roger L Cooke**, University of Vermont (962-01-50)

9:00AM ▶ (798) *An Historical Lecture about Ramanujan Arranged in 3 Acts, an Interact, and an Exodion: Act 1: S. Janaki Ammal (Mrs. Ramanujan), Act 2: Books Studied by Ramanujan, Act 3: A Family History.* **Bruce C. Berndt**, University of Illinois at Urbana-Champaign (962-11-45)

9:30AM ▶ (799) *Figures on the threshold - The kolam tradition of Tamil Nadu (southern India).* **Marcia Ascher**, Ithaca College (962-01-398)

10:00AM (800) *Getting an Angle on the Stars in Ancient Babylon.* **John A Fossa**, UFRN - Natal, Brazil (962-01-284)

10:30AM ▶ (801) *Concrete geometry in the medieval Islamic world: An instrument for finding the distance and direction of Mecca.*
Jan P Hogendijk, University of Utrecht, Netherlands (962-01-22)

AMS Special Session on Applications of Mathematics to Human Physiology and Medicine, I

8:30 AM – 10:50 AM

Organizers: **James Cassatt**, National Institutes of Health
Michael C. Reed, Duke University

8:30AM (802) *Oscillations Mediated by Tubuloglomerular Feedback (TGF): Physiological Role and Pathophysiology.*
Harold Layton, Duke University (962-92-1225)

9:20AM (803) *Quasi-conformal Flat Maps of the Human Brain from Circle Packings.*
Monica Hurdal*, Florida State University, **Ken Stephenson**, University of Tennesee, Knoxville, **Phil Bowers**, Florida State University, and **De Witt Sumners**, Florida State university (962-92-1221)

10:10AM (804) *Dynamics of Reentrant Tachycardia.*
Leon Glass, Dept. of Physiology, McGill University (962-92-1218)

AMS Invited Address

9:00 AM – 9:50 AM

(805) *Mathematical challenges in protein motif recognition.*
Bonnie Berger, Massachusetts Institute of Technology (962-92-06)

ASL Invited Address

9:00 AM – 9:50 AM

(806) *Logical aspects of the classification problem for torsion-free abelian groups of finite rank.*
Alexander A. Kechris, California Institute of Technology

AMS Special Session on Analytic Number Theory, I

9:00 AM – 10:50 AM

Organizer: **Dorian Goldfeld**, Columbia University

9:00AM *Panel discussion with H. Iwaniec, B. Conrey, B. Mazur, S. Zhang, J. Hoffstein, D. Goldfeld.*

10:05AM (807) *Multiple Dirichlet series and moments of quadratic L-series, I.* Preliminary report.
Adrian Diaconu, Columbia University, and **Jeffrey Hoffstein***, Brown University (962-11-1044)

10:30AM (808) *Multiple Dirichlet series and moments of quadratic L-series, II.*
Adrian Diaconu*, Columbia University, and **Jeffrey Hoffstein**, Brown University (962-11-1222)

AMS-MAA Joint Panel Discussion

9:00 AM – 10:30 AM

Teaching math and the World Wide Web.
Moderator: **Judith Lee Baxter**
Organizers: **Andrew G. Bennett**, Kansas State University
Judith Lee Baxter, University of Illinois, Chicago
Panelists: **Andrew G. Bennett**
Thomas F. Banchoff, Brown University
Susan Holmes, Stanford University
Gene Klotz, Swarthmore College

MAA Panel Discussion

9:00 AM – 10:30 AM

Curriculum Foundations Project II: Implications for the mathematics community.
Organizers: **William H. Barker**, Bowdoin College
Jack Bookman, Duke University
Susanna S. Epp, DePaul University

MAA Special Workshop

9:00 AM – 10:30 AM

Proposal writing for NSF projects in the Division of Undergraduate Education.
Organizer: **James H. Lightbourne**, NSF
Presenters: **James H. Lightbourne**
Harriet G. Taylor, NSF
Elizabeth J. Teles, NSF
Lee L. Zia, NSF

MAA Poster Session

9:00 AM – 11:00 AM

College algebra reform.
Organizers: **Donald B. Small**, U.S. Military Academy
Dorothy Hunter Huston, Tillotson College
Kamalvand Huston, Tillotson College

Book Sales and Exhibits

9:30 AM – 5:30 PM

ASL Invited Address

10:00 AM – 10:50 AM

(809) *Computability, complexity, and Riemannian variational problems.*
Shmuel A. Weinberger, University of Chicago

AMS Invited Address

10:05 AM – 10:55 AM

(810) *Finitely presented groups: Their curvature, grammar, and isoperimetric inequalities.*
Martin R. Bridson, Mathematical Institute, Oxford, England (962-20-78)

AMS-MAA Invited Address

11:10 AM – NOON

(811) *Deformations, perturbations and near-misses in geometry, physics, and number theory.*
Barry Mazur, Harvard University (962-11-12)

AMS Colloquium Lectures: Lecture III

1:00 PM – 2:00 PM

(812) *Large rationally connected varieties, III.*
János Kollár, Princeton University

ASL Invited Address

1:00 PM – 1:50 PM

(813) *The first two uncountable cardinals.*
Paul Larson, Mittag-Lefler Institute/University of Chicago

AMS-MAA Special Session on History of Mathematics, II

1:00 PM – 4:20 PM

Organizers: **Karen H. Parshall**, University of Virginia
David E. Zitarelli, Temple University

1:00PM ▶ (814) *Patronage and the history of American mathematics from 1950 to 2000.* Preliminary report.
Florence D Fasanelli, The College Board (962-01-1104)

1:30PM ▶ (815) *Exploring the Role of the Carnegie Institution in the Development of American Mathematics.* Preliminary report.
Della D. Fenster, University of Richmond (962-01-1406)

2:00PM ▶ (816) *Funding of Research in the Mid-Twentieth Century: The Influence of Mina Rees.* Preliminary report.
Amy E Shell, West Point (962-01-41)

2:30PM ▶ (817) *Grace Murray Hopper, B.C.*
Agnes M Kalemaris, SUNY at Farmingdale (962-01-769)

3:00PM ▶ (818) *"Characteristic Classes": From lectures to book and beyond.*
Jim Stasheff, UNC-Chapel Hill (962-01-678)

3:30PM ▶ (819) *Hermann Grassmann's algebra of 1844 and his version of student-centered learning.*
Albert C. Lewis, Indiana University - Purdue University, Indianapolis (962-01-69)

4:00PM ▶ (820) *Hermite and Jacobi.* Preliminary report.
Thomas W Archibald, Acadia University (962-01-686)

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

1:00 PM – 5:50 PM

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

1:00PM ▶ (821) *Visualization of Riemann Surfaces.*
Michael Trott, Wolfram Research, Inc. (962-97-1067)

1:30PM (822) *Computing Teichmuller Distance Between Elliptic Curves.* Preliminary report.
Eric P Klassen*, **Craig Nolder**, **Mika Seppala** and **Tyler Sutton**, Florida State University (962-51-1275)

2:00PM (823) *Computation of monodromies and Bers embedded Teichmüller spaces for once punctured tori.*
Yohei Komori, Osaka City University, **Toshiyuki Sugawa***, Kyoto University, **Masaaki Wada** and **Yasushi Yamashita**, Nara Women's University (962-30-748)

2:30PM (824) *Macaulay Resultant of Composed Polynomials.*
Manfred Minimair, North Carolina State University (962-14-659)

3:00PM ▶ (825) *Computing the period matrix of an algebraic curve.*
Mark van Hoeij, Florida State University (962-14-1009)

3:30PM (826) *Riemann Surface Calculation of Nonlinear Electrical Filters.* Preliminary report.
Martin Hassner*, IBM Almaden Research Center, and **Barry M Trager**, IBM Watson Research Center (962-14-1399)

4:00PM ▶ (827) *Hyperspheres and hyperplanes fitted seamlessly by algebraic constrained total least-squares.* Preliminary report.
Yves Nievergelt, Eastern Washington University (962-65-120)

4:30PM (828) *Computations with Tori II.* Preliminary report.
Craig A Nolder*, **Eric Klassen**, **Mika K Seppala** and **Tyler Sutton**, Florida State University (962-14-1340)

5:00PM (829) *An algorithm deciding the discreteness of a given Mobius group generated by two loxodromic elements with parabolic commutator.*
Yohei Komori, Osaka City University, **Toshiyuki Sugawa**, Kyoto University, **Masaaki Wada** and **Yasushi Yamashita***, Nara Women's University (962-30-1012)

5:30PM ▶ (830) *Computing conformal mappings of curved surfaces.* Preliminary report.
Philip L Bowers, Florida State University (962-30-979)

AMS Special Session on Applications of Mathematics to Human Physiology and Medicine, II

1:00 PM – 5:00 PM

Organizers: **James Cassatt**, National Institutes of Health
Michael C. Reed, Duke University

1:00PM (831) *Global Optimization of Potential Energy in the Protein Folding Problem.*
Harold A Scheraga, Baker Laboratory of Chemistry and Chemical Biology, Cornell University (962-92-1400)

1:50PM (832) *Three-dimensional Cryo-electron Microscopy of Biological Macromolecules: The Challenge Posed by Structural Heterogeneity.*
Joachim Frank, Howard Hughes Medical Institute, Albany, NY (962-92-1229)

2:40PM (833) *Relating Genotype to Phenotype Through Analysis of Gene Circuitry.*
Michael A. Savageau, Dept. of Microbiology and Immunology, University of Michigan (962-92-1394)

3:30PM ▶ (834) *Biology and Mathematics in the New Era.*
James Cassatt, National Institute of General Medical Sciences, National Institutes of Health (962-92-1396)

4:20PM Discussion.

AMS Special Session on Group Cohomology and Applications to Homotopy Theory and Representation Theory, II

1:00 PM – 4:50 PM

Organizers: **Alejandro Adem**, University of Wisconsin, Madison
Jon F. Carlson, University of Georgia

1:00PM (835) *Mod-n K-theory and mod-n cohomology.*
Eric M Friedlander*, Northwestern University, and **Mark E Walker**, University of Nebraska-Linclon (962-19-1289)

1:30PM (836) *Group Homology, the Novikov Conjecture, and Representation Theory.*
Paul Frank Baum, Penn State (962-20-660)

2:00PM (837) *On the cohomology of the hyperelliptic mapping class group.*
Daniel J Gries, Ohio State University (962-55-973)

2:30PM (838) *Homology of holomorphs of free groups.* **Craig A Jensen**, Ohio State University (962-20-697)

3:00PM (839) *On modular forms, and the real cohomology of mapping class groups for a punctured torus.* **Frederick R. Cohen**, University of Rochester (962-55-1006)

3:30PM (840) *Support varieties for algebraic groups.* **Daniel K Nakano***, Utah St. University, **Brian J Parshall**, University of Virginia, and **David C Vella**, Skidmore College (962-20-658)

4:00PM (841) *Hochschild cohomology and Linckelmann cohomology for blocks of finite groups.* Preliminary report. **Jonathan Pakianathan**, University of Rochester, and **Sarah Witherspoon***, University of Massachusetts (962-20-963)

4:30PM (842) *The classifying space of a block of a finite group.* Preliminary report. **Markus Linckelmann**, Paris 7, and **Peter J Webb***, University of Minnesota (962-20-395)

AMS Special Session on Geometry and Topology of Low Dimensional Manifolds, II

1:00 PM – 5:20 PM

Organizers: **Slawomir Kwasik**, Tulane University
Terry Lawson, Tulane University

1:00PM (843) *A perturbative SU(3) Casson invariant.* Preliminary report. **Ronnie Lee**, Yale University (962-57-622)

1:30PM (844) *An integer valued SU(3) Casson invariant via gauge theory.* **Hans U Boden***, McMaster University, and **Christopher M Herald**, University of Nevada, Reno (962-57-938)

2:00PM (845) *Homology cobordisms of graph homology 3-spheres.* **Nikolai Saveliev**, Tulane University (962-57-825)

2:30PM (846) *Rational Homology 3-Spheres in Positive Definite 4-Manifolds.* Preliminary report. **Allan L Edmonds**, Indiana University (962-57-865)

3:00PM (847) *Cappell-Shaneson's 4-dimensional s-cobordism.* Preliminary report. **Selman Akbulut**, Michigan State University (962-57-1238)

3:30PM (848) *Minimal genus embeddings in symplectic four manifolds.* **Bang-He Li**, Institute of Mathematics, Chinese Academy of Sicence, and **Tian-Jun Li***, Princeton University (962-57-1000)

4:00PM (849) *On 4-manifolds with even intersection forms.* **Jin-Hong Kim**, Oklahoma State University (962-57-798)

4:30PM (850) *Applications of RO($\mathbf{Z}_2$)-graded cohomology to gauge theory.* Preliminary report. **Shuguang Wang**, University of Missouri (962-58-1278)

5:00PM (851) *Splitting the Atiyah-Patodi-Singer rho invariant.* Preliminary report. **Paul A Kirk***, Indiana University, and **Matthias Iesch**, University of Arizona (962-53-1255)

AMS Special Session on Analytic Number Theory, II

1:00 PM – 5:30 PM

Organizer: **Dorian Goldfeld**, Columbia University

1:00PM (852) *Central vanishing of quadratic twists of modular L-functions.* Preliminary report. **Brian J Conrey***, American Institute of Mathematics, **Jonathan P Keating**, BRIMS, Hewlett Packard Laboratories, **Michael Rubinstein**, University of Texas, and **Nina C Snaith**, University of Bristol (962-11-852)

1:40PM (853) *L-functions of Quadratic Fields.* **William Duke**, Calif. St. Univ., Los Angeles, **John Friedlander**, Toronto University, and **Henryk Iwaniec***, Rutgers University (962-11-1377)

2:20PM (854) *Some hidden functional equations.* **Daniel W Bump***, Stanford University, and **Jennifer Beineke**, Trinity College (962-11-976)

3:00PM (855) *Analytic aspects of Eisenstein series formed with powers of modular symbols.* **Cormac O'Sullivan**, Bronx Community College (962-11-1018)

3:40PM (856) *Average order of the Selmer groups of certain families of elliptic curves.* Preliminary report. **Gang Yu**, University of Michigan (962-11-1005)

4:20PM (857) *Sums of twisted L-functions over function fields.* Preliminary report. **Solomon Friedberg*** and **Benji Fisher**, Boston College (962-11-761)

5:00PM (858) *Multiplier systems.* **Paul C Pasles**, Villanova University (962-11-114)

AMS Special Session on Partial Differential Equations and Geometric Implications, I

1:00 PM – 5:50 PM

Organizer: **Vladimir E. Shklover**, Northeastern University of Illinois

1:00PM ▶ (859) *What's new about the Pompeiu problem?* Preliminary report. **Carlos A Berenstein**, University of Maryland (962-35-1128)

1:30PM ▶ (860) *Applications of Partial Differential Equations to Approximation by Harmonic and Analytic Functions in the Mean.* Preliminary report. **Dmitry Khavinson**, University of Arkansas and NSF (962-31-70)

2:00PM (861) *Qualitative properties of entire solutions of non-linear equations arising in geometry and in phase transitions.* Preliminary report. **Nicola Garofalo***, Purdue University, and **Donatella Danielli**, Johns Hopkins University (962-35-796)

2:30PM (862) *Recent Progress in the Theory of Automorphism Groups of Domains.* **Steven G Krantz**, Washington University in St. Louis (962-32-679)

3:00PM (863) *How the geometry of the boundary impacts regularity of functions holomorphic in a domain.* Preliminary report. **David Tartakoff**, University of Illinois in Chicago (962-32-1355)

3:30PM Break.

4:00PM (864) *Universal Eigenvalue Inequalities for Domains in Spaces of Constant Curvature.* Preliminary report. **Mark S. Ashbaugh**, University of Missouri–Columbia (962-58-1223)

4:30PM (865) *Generalized Schwarzians.* **Robert E Molzon***, University of Kentucky, and **Hirotaka H Tamanoi**, University of California, Santa Cruz (962-32-1098)

5:00PM (866) *The Complex Geometry of Weak Piecewise Smooth Solutions of Integrable Nonlinear PDE's.* **Mark S Alber**, University of Notre Dame (962-35-631)

5:30PM (867) *Geometric Transplantation in Harmonic Analysis and its Application.*
William O Bray, University of Maine (962-42-941)

AMS Special Session on Stochastic Analysis and Applications, II

1:00 PM – 4:50 PM

Organizers: **Padmanabhan Sundar**, Louisiana State University
Guillermo S. Ferreyra, Louisiana State University

1:00PM (868) *Some Problems in Stochastic Fluid Dynamics.* Preliminary report.
Gopinath Kallianpur* and **Anna Amirdjanova**, University of North Carolina at Chapel Hill (962-60-1311)

2:00PM (869) *Some Fine Properties of Solutions to Backward Stochastic Differential Equations.*
Jin Ma, Purdue University (962-60-905)

2:30PM (870) *Some Applications of Fractional Brownian Motion.* Preliminary report.
Tyrone E Duncan, University of Kansas (962-60-926)

3:00PM (871) *Decomposition of stochastic flows.*
Ming Liao, Auburn University (962-60-742)

3:30PM (872) *A Scaling Limit Process for the Age-dependent Structure in a Markov Population.*
Amit Bose*, Carleton University, and **Ingemar Kaj**, Uppsala University (962-60-1010)

4:00PM (873) *Stochastic series representations of exponentially tilted stable processes.* Preliminary report.
Jan Rosinski, University of Tennessee, Knoxville (962-60-1017)

4:30PM (874) *Parameter Estimation in Polynomial Stochastic Models.*
Ian H Dinwoodie, Tulane University (962-62-844)

AMS Special Session on Integral Transforms, II

1:00 PM – 5:50 PM

Organizers: **Gestur Olafsson**, Louisiana State University
Gunter Lumer, University of Mons-Hainaut
Frank Neubrander, Louisiana State University
A. Ludu, Louisiana State University

1:00PM (875) *Complex Radon type transforms in real problems of integral geometry.*
Simon Gindikin, Rutgers University (962-42-1032)

1:30PM (876) *Local Pompeiu Problems and Sampling.* Preliminary report.
David F Walnut, George Mason University (962-42-1293)

2:00PM (877) *Multitemporal Wave Equations on Compact Symmetric Spaces.* Preliminary report.
Fulton B Gonzalez, Tufts University (962-43-841)

2:30PM (878) *Radon transform of tensor fields.*
Andrea D'Agnolo, Paris 6 (962-58-920)

3:00PM Break.

4:00PM ▶ (879) *Multiresolution wavelet filters as quantum gates.*
Palle E. T. Jorgensen, The University of Iowa (962-42-109)

4:30PM (880) *Solution of cartesian and curvilinear quantum equations via multiwavelets on the interval.* Preliminary report.
Bruce R Johnson*, **Jeffrey L Mackey** and **James L Kinsey**, Rice University (962-43-1169)

5:00PM (881) *A Generalization of the Fractional Fourier Transform.* Preliminary report.
Ahmed I Zayed, University of Central Florida (962-42-694)

5:30PM ▶ (882) *A Convolution Property of Some Measures With Self-Similar Fractal Support.*
Denise A Szecsei, Stetson University (962-28-529)

AMS Special Session on Discrete Geometry, I

1:00 PM – 5:50 PM

Organizer: **Andras Bezdek**, Auburn University

1:00PM ▶ (883) *Beyond the Descartes Circle Theorem.*
Jeffrey C Lagarias*, **Colin L Mallows** and **Allan R Wilks**, AT&T Labs (962-52-741)

1:30PM (884) *Integer points in rotated convex bodies.*
Imre Bárány*, University College London, and **Jiri Matousek**, Charles University (962-52-1247)

2:00PM ▶ (885) *The total curvature of a shortest path.*
Imre Barany, Hungarian Academy of Sciences, **Krystyna M Kuperberg***, Auburn University, and **Tudor Zamfirescu**, Universitat Dortmund (962-52-646)

2:30PM (886) *Helly-type theorems for higher-dimensional transversals to large collections.*
Jacob E. Goodman, City College, CUNY (962-52-514)

3:00PM ▶ (887) *Lattice points in flow polytopes.* Preliminary report.
Jesus A De Loera*, Univ. of California, Davis, and **Bernd Sturmfels**, Univ. of California, Berkeley (962-52-680)

3:30PM (888) *Locally Unitary Groups and Regular Polytopes.* Preliminary report.
Egon Schulte, Northeastern University (962-51-1109)

4:00PM ▶ (889) *Separation in neighbourly 4-polytopes.*
Ted Bisztriczky, University of Calgary (962-52-664)

4:30PM ▶ (890) *Minkowski sums of Voronoi Polytopes and Commensurate Delaunay Tilings.* Preliminary report.
Robert M Erdahl, Queen's University (962-52-1371)

5:00PM ▶ (891) *An example for a convex body whose translative kissing number is odd.*
Istvan Talata, University of Michigan (962-52-910)

5:30PM ▶ (892) *On a question of Erdős.*
Dan P Ismailescu, Courant Institute of Mathematical Sciences, NYU (962-52-1391)

AMS Special Session on Interaction of Inverse Problems and Image Analysis, II

1:00 PM – 5:50 PM

Organizers: **M. Zuhair Nashed**, University of Delaware
Otmar Scherzer, Ludwig-Maximilians-Universitat Munchen

1:00PM ▶ (893) *Direct blind deconvolution.*
Alfred S. Carasso, NIST, Gaithersburg, MD (962-45-33)

1:30PM (894) *Wavelet-based inversion algorithms for resolution enhancement.* Preliminary report.
Christine De Mol, Univ. Libre de Bruxelles (962-45-989)

2:00PM ▶ (895) *Level Set Based Methods for Inverse Problems.* Preliminary report.
Stanley J Osher, UCLA (962-65-765)

2:30PM (896) *Tree Approximation and Images.*
Ingrid Daubechies, Princeton University (962-46-968)

3:00PM (897) *A fractal set constructed from the class of wavelet sets.* Preliminary report.
John J Benedetto* and **Songkiat Sumetkijakan**, University of Maryland at College Park (962-42-397)

3:30PM (898) *New Integral Equations for Inversion and Indefinite Convolution.* Preliminary report.
Frank Stenger, University of Utah (962-35-1259)

4:00PM (899) *Sampling Expansions in Unitarily Translation Invariant Reproducing Kernel and Sobolev Spaces.*
M. Zuhair Nashed, University of Delaware (962-42-1158)

4:30PM ▶ (900) *Analysis of some variational aliasing removal.*
Francois Malgouyres, UCLA (962-49-839)

5:00PM (901) *Applications of Measure Theory to Imaging.*
Bernard A Mair*, **Murali Rao** and **John M Anderson**, University of Florida (962-45-932)

5:30PM (902) *A new model fitting algorithm for shape recovery from 3D and 2D image data sets.*
Ravi Malladi, Lawrence Berkeley Radiation National Laboratory (962-65-1414)

MAA Minicourse #13: Part B

1:00 PM – 3:00 PM

Getting students involved in undergraduate research.

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

MAA Minicourse #2: Part B

1:00 PM – 3:00 PM

WeBWorK, an Internet-based system for generating and delivering homework problems to students.

Organizers: **Arnold K. Pizer**, University of Rochester
Michael E. Gage, University of Rochester
Vicki Roth, University of Rochester

MAA Minicourse #8: Part B

1:00 PM – 3:00 PM

Teaching graduate students how to teach using case studies.

Organizers: **Solomon Friedberg**, Boston College
Deborah Hughes Hallett, University of Arizona
William G. McCallum, University of Arizona

AMS Session on Functional Analysis

1:00 PM – 5:10 PM

1:00PM (903) *Controllability of abstract evolution systems with nonlocal initial data.* Preliminary report.
Mark A McKibben, Goucher College (962-39-81)

1:15PM (904) *Asymptotically isometric copies of ℓ^∞ in Banach spaces.*
Patrick N Dowling, Miami University (962-46-1118)

1:30PM (905) *Convexity, concavity, type and cotype of Lorentz spaces.*
Anna H Kamińska, The University of Memphis (962-46-1127)

1:45PM (906) *Weighted inequalities of exponential type.* Preliminary report.
David E Edmunds, University of Sussex, and **Ritva M Hurri-Syrjanen***, University of Kentucky (962-46-1175)

2:00PM (907) *An extension property for Banach spaces.* Preliminary report.
Walden Freedman, Koc University, Turkey (962-46-119)

2:15PM (908) *Simplicial cones and the existence of shape-preserving operators.*
Michael P Prophet*, University of Northern Iowa, and **Bruce L Chalmers**, University of California, Riverside (962-46-1283)

2:30PM (909) *On a space of BV functions on an abstract Wiener space.*
Masatoshi Fukushima, Japan, and **Masanori Hino***, Cornell Univ. and Kyoto Univ. (962-46-1343)

2:45PM (910) *Vector Measures, c_o and (sb) Operators.* Preliminary report.
Elizabeth M Bator*, **Paul R Lewis**, University of North Texas, and **Dawn R Slavens**, Midwestern State Uiversity (962-46-1350)

3:00PM (911) *Modules over commutative C^*-algebras and the BSE condition.*
D. A. Robbins, Trinity College (962-46-137)

3:15PM (912) *The Extension of Relative Tensor Products to Noncommutative L^p Modules - A Preliminary Report.* Preliminary report.
David E Sherman, UCLA (962-46-1403)

3:30PM (913) *On the standard unit vector basis of l_1.*
David S. Mitra, Mercer University (962-46-167)

3:45PM (914) *Analytical and Numerical Solutions of Nonlinear Differential Equations Arising in Non-Newtonian Fluid Flows.*
Kuppalapalle Vajravelu*, **John R Cannon** and **David Rollins**, University of Central Florida (962-34-1426)

4:00PM ▶ (915) *On the Origin of Basic Sequences.*
John J Saccoman, Seton Hall University (962-46-68)

4:15PM (916) *The Banach-Stone Theorem for Nice Operators.* Preliminary report.
Hasan Al Halees*, Saginaw Valley State University, and **Richard J Fleming**, Central Michigan University (962-46-842)

4:30PM (917) *Nice operators on subspaces of $C_0(Q, X)$.* Preliminary report.
Hasan Al Halees, Saginaw Valley State University, and **Richard J Fleming***, Central Michigan University (962-46-847)

4:45PM (918) *The Pettis Integral and Operator Theory.* Preliminary report.
Elizabeth M Bator and **Rhonda K Huettenmueller***, University of North Texas (962-46-903)

5:00PM (919) *A "Change of Variables" Theorem for Feynman's Operational Calculus - Preliminary Report.* Preliminary report.
Lance W Nielsen, Creighton University (962-46-940)

AMS Session on Operator Theory

1:00 PM – 4:10 PM

1:00PM (920) *Families of compostion operators on Frechet spaces of holomorphic functions.* Preliminary report.
William E Hornor, University of Southern Mississippi (962-47-1144)

1:15PM (921) *On the equation $a\mathcal{H}(b) \cap b\mathcal{H}(a) = 0$.* Preliminary report.
Troy J Siemers, Virginia Military Institute (962-47-1155)

1:30PM (922) *Isometric Equivalence of Operators on Banach Spaces.* Preliminary report.
James E. Jamison, University of Memphis (962-47-1172)

1:45PM (923) *On the Hypercyclicity Criterion.* Preliminary report.
L. Bernal-González, Universidad de Sevilla, Sevilla, Spain, and **K. G. Grosse-Erdmann***, Fernuniversitaet Hagen, Hagen, Germany (962-47-1196)

2:00PM (924) *A Bolzano's Theorem in the New Millennium.*
Claudio H Morales, University of Alabama in Huntsville (962-47-1290)

2:15PM (925) *A Class of Essentially Normal Composition Operators on the Hardy Space.*
David Levi and **Sivaram K Narayan***, Central Michigan University (962-47-57)

2:30PM (926) *Lomonosov's Invariant Subspace Theorem for Multivalued Linear Operators.*
Peter Saveliev, Allegheny College (962-47-733)

2:45PM (927) *The Littlewood-Orlicz Operator Ideal.*
Qingying Bu* and **Joseph Diestel**, Kent State University (962-47-746)

3:00PM (928) *Trace-class commutators with trace zero.*
Vasile Lauric*, Wheeling Jesuit Univ., and **Carl M Pearcy**, Texas A&M Univ. (962-47-752)

3:15PM (929) *On a Fredholm alternative with operators of type (S_+).* Preliminary report.
Dan D Pascali, Courant Institute, New York University (962-47-799)

3:30PM (930) *A simple approach to generalized eigenfunction expansions.*
Robert M Kauffman and **Mayumi Sakata***, University of Alabama at Birmingham (962-47-900)

3:45PM (931) *A Representation Theorem for Near-isometries of C(K)-spaces.*
G. Beate Zimmer, Mississippi University for Women (962-47-93)

4:00PM (932) *A class of L^1 operators associated with nonsingular mappings and a problem of E. Hille.*
Isaac Kornfeld, North Dakota State University (962-47-996)

AMS Session on Combinatorics, II

1:00 PM – 6:10 PM

1:00PM ▶ (933) *Turán's Triangle Theorem and Real-Weighted Graphs.* Preliminary report.
John A Kuchenbrod, Emory & Henry College (962-05-1250)

1:15PM ▶ (934) *Bilinski Maps and Geodesics in One-Ended Planar Maps (Preliminary report).* Preliminary report.
Jennifer A Bruce, Maryville College (962-05-1251)

1:30PM (935) *Cycle spectra in graphs.*
Tristan M Denley, University of Mississippi (962-05-1279)

1:45PM ▶ (936) *The Enumeration of Unlabeled Euler Multigraphs.* Preliminary report.
Huaien Li* and **David C. Torney**, Los Alamos Laboratory (962-05-1304)

2:00PM (937) *Reiner-Stanton Lattices Are Rank Symmetric, Rank Unimodal, and Strongly Sperner.*
Robert G. Donnelly*, **Scott J. Lewis** and **Robert Pervine**, Murray State University (962-05-1307)

2:15PM ▶ (938) *A Plethora of Perplexingly Presistent Paradoxes.* Preliminary report.
Allen J Schwenk, Western Michigan University (962-05-1314)

2:30PM ▶ (939) *On 4-color Rado Numbers and Stubborn Colorings.* Preliminary report.
Robert Malo and **Daniel Schaal***, South Dakota State University (962-05-1320)

2:45PM (940) *On 3-connected binary matroids.*
Talmage J. Reid and **Haidong Wu***, The University of Mississippi (962-05-1327)

3:00PM (941) *Cycle Exponents of Maximal Planar Graphs.*
Hang Chen*, Central Missouri State University, and **Allen J Schwenk**, Western Michigan University (962-05-1336)

3:15PM ▶ (942) *On the number of edges meeting vertices of degree k in minimally k-connected graphs.*
Talmage J Reid* and **Haidong Wu**, The University of Mississippi (962-05-1360)

3:30PM ▶ (943) *On Zero-Sums and a Problem of Erdős, Preliminary report.* Preliminary report.
David J Grynkiewicz, Bates College (962-05-1380)

3:45PM (944) *Generalized stress spaces on nonsimplicial polytopes.*
Susan L Foege, Eastern Kentucky University (962-05-1388)

4:00PM (945) *Exact and Asymptotic Results for Tilings of Rectangles with Squares.*
Silvia P Heubach*, California State University Los Angeles, and **Phyllis Z Chinn**, Humboldt State University (962-05-1398)

4:15PM (946) *On the Number of Arcs in Primitive Digraphs with Large Exponents.*
Jian Shen, Queen's University, and **Cynthia J Wyels***, California Lutheran Univ. (962-05-1401)

4:30PM ▶ (947) *Convex Drawing of Nonplanar Graphs.*
Nathaniel Dean, Rice University (962-05-1411)

4:45PM (948) *Dependent Edges in Acyclic Orientations of Graphs.* Preliminary report.
Karen L Collins and **Kimberly Tysdal***, Wesleyan University (962-05-158)

5:00PM (949) *Chromatic Capacities of Graphs and Hypergraphs.*
Joshua E Greene, Harvey Mudd College (962-05-212)

5:15PM ▶ (950) *The Edge-Isoperimetric Problem for Discrete Tori.*
Thomas A Carlson, University of Washington (962-05-366)

5:30PM ▶ (951) *Bipartite Distance-Regular Graphs, Three-Term Recurrent Eigenvalues, and Representation Diagrams.*
Michael S Lang, University of Wisconsin-Madison (962-05-475)

5:45PM ▶ (952) *A Classification of Types of Trees.*
Lon H Mitchell*, University of Kansas, and **Sivaram K Narayan**, Central Michigan University (962-05-56)

6:00PM ▶ (953) *Partitioning the Noncrossing Partition Lattice into Boolean Subposets.*
David S. Hough, The George Washington University (962-05-912)

AMS Session on Information and Mathematics Education

1:00 PM – 4:10 PM

1:00PM ▶ (954) *Rearrangeability Numbers: Bounds on Tournaments and Meshes.* Preliminary report.
Sarah E Moss, Harvard University (962-94-1268)

1:15PM ▶ (955) *Calculus Math Expert Agent - A Computer Algebra System for TEACHING mathematics.* Preliminary report.
Douglas A Quinney, Keele University (962-97-02)

1:30PM ▶ (956) *A capstone course for mathematics education majors.*
Jeffery T McLean, University of St. Thomas (962-97-10)

1:45PM ▶ (957) *Introduction to Modeling via the MCM.* Preliminary report.
Steven M Hetzler, Salisbury State University (962-97-1146)

2:00PM ▶ (958) *Web enhanced calculus instruction.* Preliminary report.
William H Heller*, **John E Bernard**, **Roger Knobel**, **Wendy A Lawrence-Fowler**, **Olga Ramirez** and **Monty B Taylor**, University of Texas-Pan American (962-97-1257)

2:15PM ▶ (959) *Incorporating Technology into Students' Projects.*
Vesna Kilibarda, Indiana University Northwest (962-97-1421)

2:30PM ▶ (960) *The CBBL Standards 2000.*
Clayton Brooks*, Marshall University, and **Bonita Lawrence**, University of South Carolina - Beaufort (962-97-499)

2:45PM ▶ (961) *Visualization Tools for Three Dimensions.*
Daniel L McGee*, **Rafael Martinez-Planell** and **Miguel Torres**, University of Puerto Rico - Mayaguez (962-97-54)

3:00PM ▶ (962) *Recurring Concepts in the (Engineering) Mathematics Sequence: Error Estimates.* Preliminary report.
Bernd S.W. Schroeder, Louisiana Tech University (962-97-67)

3:15PM ▶ (963) *How to prove trig identities.* Preliminary report.
Bao Qi Feng, Kent State University (962-97-727)

3:30PM ▶ (964) *The Geometric Series in Problems of Differentiation and Integration.* Preliminary report.
Bella Wiener and **Joseph Wiener***, University of Texas-Pan American (962-97-776)

3:45PM (965) *Mathematics Pedagogy Course: A Collaborative Effort to Improve the Teaching Performance of Teaching Assistants.*
Thomas C DeFranco* and **Jean M McGivney-Burelle**, University of Connecticut (962-97-794)

4:00PM (966) *An Integrated Mathematics/Science Teacher Training Program for Middle School Teachers.*
Jean J McGehee, University of Central Arkansas (962-97-813)

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

1:00 PM – 2:30 PM

Assimilation of adjunct faculty.
Moderator: **Bettye Anne Case**
Organizers: **Bettye Anne Case**, Florida State University
Kevin E. Charlwood, Washburn University
Stephen B. Rodi, Austin Community College
Panelists: **Kevin E. Charlwood**
Stephen B. Rodi
Scott Herriott, Maharishi University of Management

MAA Special Presentation

1:00 PM – 2:30 PM

LiveMath Maker—The future of mathematics on the Internet.
Organizer: **Joan Bookbinder**, Theorist Interactive

MAA Panel Discussion

1:00 PM – 2:30 PM

Research in Undergraduate Mathematics Education (RUME): From Many Views.
Organizer: **Joan Ferrini-Mundy**, Michigan State University
Panelists: **Ed Dubinsky**, Georgia State University
Herbert S. Wilf, University of Pennsylvania
Barbara E. Edwards, Oregon State University

MAA Poster Session

1:00 PM – 3:00 PM

NSF Division of Undergraduate Education Projects in the Course (curriculum and laboratory improvement program).
Organizer: **Jon W. Scott**, Montgomery College

MAA Special Presentation

1:00 PM – 3:20 PM

Mathematical experiences for students outside the classroom.
Organizers: **Richard L. Poss**, St. Norbert College
Thomas E. Kelley, Metropolitan State College of Denver

MAA Panel Discussion

1:00 PM – 2:30 PM

Evolving interdisciplinary core curriculum.
Moderator: **Gary W. Krahn**, U.S. Military Academy
Organizer: **Donald B. Small**, U.S. Military Academy
Panelists: **Michael E. Moody**, Harvey Mudd College
Joseph D. Myers, U.S. Military Academy
Richard Plumb, SUNY at Binghamton
John L. Scharf, Carroll College

SUMMA Panel Discussion

1:00 PM – 2:30 PM

Organizer: **William A. Hawkins, Jr.**, SUMMA
Panelists: **John H. Harris**, Lemoyne-Owen College
Carlos G. Spaht, Louisiana State University, Shreveport
Viji K. Sundar, California State University, Stanislaus

MAA Panel Discussion

1:00 PM – 2:30 PM

A report on the ASA Undergraduate Statistics Education Initiative (USEI) and curriculum guidelines.
Organizers: **Dexter C. Whittinghill**, Rowan University
John P. Holcomb, Youngstown State University
Panelists: **G. Rex Bryce**, Brigham Young University
Robert V. Hogg, University of Iowa, Iowa City

Richard L. Schaeffer, University of Florida

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

1:00 PM – 5:00 PM

Moderator: **William A. Massey**, Lucent Technologies

Presenters: **Serge A. Bernard**, University of Maryland
Shea Burns, North Carolina A&T State University
Gelonia Dent, IBM T. J. Watson Research Center, Yorktown
Illya Hicks, Texas A&M University
Tasha Inniss, Trinity College
Andrew Jones, Florida A&M University
Sherry Scott, George Washington University
Kimberly Weems, National Security Agency

ASL Invited Address

2:00 PM – 2:50 PM

(967) *Kronecker's Problem.*
Lou P. van den Dries, University of Illinois at Urbana-Champaign

MAA Invited Address

2:15 PM – 3:05 PM

▶ (968) *Financial derivatives and PDEs.*
Robert F. Almgren, University of Toronto (962-A0-35)

RMMC Board of Directors

2:15 PM – 4:10 PM

MAA Session on Integrating Mathematics and Other Disciplines, II

2:45 PM – 3:55 PM

Organizers: **William G. McCallum**, University of Arizona
Deborah Hughes Hallett, University of Arizona
Yajun Yang, SUNY at Farmingdale

2:45PM (969) *Integrating Mathematics and Composition Instruction.* Preliminary report.
Joseph Kirtland* and **Pau-San Hoh**, Marist College (962-G1-259)

3:00PM (970) *Making the Connections for Creative Learning in "Math for Liberal Arts" Classes.*
Ruth L O'Keefe, Kendall College of Art and Design (962-G1-300)

3:15PM ▶ (971) *An Interdisciplinary Course Linking Mathematics, Philosophy, and Literature in the Works of Jorge Luis Borges.*
Mary L Garner*, **Judy Holzman**, **Dewi Wilson**, Kennesaw State University, and **Tina Straley**, MAA (962-G1-441)

3:30PM (972) *M110 - Mathematics and Politics.*
Iztok Hozo, Indiana University Northwest (962-G1-95)

3:45PM ▶ (973) *Thinking critically about issues in science: Using statistics to reinforce skepticism.*
Judith F Moran* and **Barbara Walden**, Trinity College (962-G1-854)

ASL Invited Address

3:00 PM – 3:50 PM

(974) *The structure of the Solovay degrees of computably enumerable reals.*
Denis R. Hirschfeldt, University of Chicago

MAA Minicourse #6: Part B

3:15 PM – 5:15 PM

Computation and discovery in the number theory classroom.
Organizer: **Clifford A. Reiter**, Lafayette College

Blumenthal Session

3:30 PM – 4:35 PM

3:30PM (975) *Representations of Braid Groups.*
Stephen J. Bigelow, University of Melbourne (962-54-1464)

4:05PM (976) *Mean Dimension and Some Applications.*
Elon B Lindenstrauss, IAS, Princeton (962-37-998)

MAA Presentations by Teaching Award Recipients

3:30 PM – 5:00 PM

(977) *Reflections on teaching and learning.*
Evelyn Silvia, University of California Davis

(978) *Teaching through problems and the Putnam Competition.*
Leonard Klosinski, Santa Clara University

(979) *Creating a meaningful piece of the human mosaic.*
Edward Burger, Williams College

ASL Contributed Paper Session

4:00 PM – 6:00 PM

ASL Contributed Paper Session

4:00 PM – 6:00 PM

AMS Committee on Science Policy-MAA Science Policy Committee Government Speaker

4:20 PM – 5:10 PM

Presenter: **To be announced.**

MAA Session on Association for Research on Undergraduate Mathematics Education SIGMAA, Business Meeting and Reception

5:00 PM – 7:30 PM

Organizer: **Julie M. Clark**, Emory and Henry College

5:00PM (980) *The Case for Situated Knowledge: The Concept of Function as Socially Embedded Practices.*
Stephen Monk, University of Washington (962-S1-1422)

MAA Informal Session on Actuarial Education

5:00 PM – 7:00 PM

Organizer: **James W. Daniel**, University of Texas

MAA-Young Mathematicians Network Panel Discussion

5:00 PM – 7:00 PM

Balancing career and family.
Organizers: **Heather Ames**, Nazareth College
John A. Kuchenbrod, Emory and Henry College
Panelists: **Cheri L. Boyd**, Nazareth College
Stephanie Edwards, Bemidji State University
Patti Frazer Lock, St. Lawrence University
Michael P. Prophet, University of Northern Iowa

MAA Undergraduate Student Poster Session

5:00 PM – 7:30 PM

Organizer: **Mario U. Martelli**, Claremont McKenna College

University of Illinois Reception

5:00 PM – 7:00 PM

Annual Reunion of University of Wisconsin-Madison Alumni and Friends

5:00 PM – 7:00 PM

Purdue University Department of Mathematics Reception

5:30 PM – 7:00 PM

NAM Reception, Banquet and Cox-Talbot Address

6:00 PM – 9:00 PM

(981) *55 Years of Mathematics.*
Eleanor G. Jones, Norfolk State University

SIGMAA on Statistics Education Reception and Business Meeting

6:00 PM – 8:00 PM

Organizer: **Dexter C. Whittinghill**, Rowan University

Mathematical Reviews Reception

6:00 PM – 7:00 PM

MAA Dramatic Presentations

6:30 PM – 8:00 PM

Environmental mathematics.
Organizers: **Ben A. Fusaro**, Florida State University
Lothar A. Dohse, University of North Carolina at Asheville

MAA Student Lecture

7:30 PM – 8:20 PM

▶ (982) *Building and using mathematical models to guide decision making.*
Ralph L. Keeney, University of Southern California (962-A0-64)

Saturday, January 13

Joint Meetings Registration

7:30 AM – 2:00 PM

MAA Session on Implementation of National Projects on Local Campuses

7:30 AM – 10:55 AM

Organizers: **Stuart F. Boersma**, Alfred University
Constant J. Goutziers, SUNY at Oneonta

7:30AM ▶ (983) *The Saturday Mathematics Workshop Series at the University of Arizona: An Outreach Project Connecting Undergraduate and Graduate Students to High School Students and Teachers.*
Jennifer C Smith, University of Arizona (962-K1-601)

7:45AM (984) *Computer Enhanced Instruction in Differential Equations.*
Stuart Boersma, Central Washington University, **Addison E Frey*** and **Robert C Williams**, Alfred University (962-K1-536)

8:00AM ▶ (985) *ATLAST Project in Linear Algebra.* Preliminary report.
David E Manes, State University of New York, College at Oneonta (962-K1-551)

8:15AM ▶ (986) *Writing Interdisciplinary Lively Application Projects.*
Stuart F Boersma, Central Washington University (962-K1-535)

8:30AM (987) *Experiencing geometry in diverse ways in one semester.*
Margaret L Morrow, Plattsburgh SUNY (962-K1-534)

8:45AM (988) *Local implementation of the Boston University ODE project and the ATLAST initiative in Linear Algebra.*
Constant J Goutziers, SUNY, College at Oneonta (962-K1-488)

9:00AM ▶ (989) *A Calculus Lab Component Adapted from the MAA "Resources for Calculus" Collection.* Preliminary report.
Cameron C Sawyer, Southwestern University (962-K1-484)

9:15AM ▶ (990) *A Discussion: How Standards and Assessment Might Improve Undergraduate Mathematics Education.* Preliminary report.
Steven M Hetzler* and **Robert M Tardiff**, Salisbury State University (962-K1-444)

9:30AM (991) *Mathematics, Science and Technology Integration for Education.*
Kris H Green and **Carol Freeman***, St. John Fisher College (962-K1-403)

9:45AM ▶ (992) *Engaging Students with Hands-On Algebra Activities.*
Cathy W Carter, Christian Brothers University (962-K1-385)

10:00AM (993) *Course, Curriculum, and Faculty Development Through a Consortium of Schools.*
Jack Y Narayan*, SUNY Oswego, and **John A Winn**, SUNY Farmingdale (962-K1-358)

10:15AM ▶ (994) *Mathematics In Action: Social and Industrial Problems.*
Morteza Shafii-Mousavi*, **Paul Kochanowski**, Indiana University South Bend, and **Jesse H Warren**, South Bend Community School Corporation (962-K1-248)

10:30AM ▶ (995) *Mathematics Reform Across the Curriculum.*
Jack A Winn, SUNY Farmingdale (962-K1-241)

10:45AM Closing Remarks.

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 (996) *Ruled surfaces contained in quadric cones in five dimensional complex projective space.* Preliminary report.
Gian Mario Besana*, Indiana University Northwest, **Alberto Alzati** and **Marina Bertolini**, Universita' degli Studi di Milano (962-14-134)

8:30AM (997) *Specializing A_n Covers of Elliptic Curves with j-invariant 1728.* Preliminary report.
Mark F Evans, Vassar College (962-11-657)

9:00AM (998) *The use of computer algebra programs for the classification and for explicit constructions in the theory of algebraic surfaces.* Preliminary report.
Fabrizio M Catanese, Universitaet Goettingen (962-14-724)

9:30AM (999) *Resultants and Chow forms via exterior algebra.* Preliminary report.
David Eisenbud, MSRI (962-14-779)

10:00AM ▶ (1000) *Maximally Inflected Curves.* Preliminary report.
Viatcheslav Kharlamov, IRMA Strasbourg, and **Frank J Sottile***, University of Massachusetts (962-14-96)

10:30AM (1001) *Reduction of wildly ramified covers of curves.* Preliminary report.
Claus G Lehr, University of Pennsylvania (962-14-815)

AMS Special Session on Group Cohomology and Applications to Homotopy Theory and Representation Theory, III

8:00 AM – 10:50 AM

Organizers: **Alejandro Adem**, University of Wisconsin, Madison
Jon F. Carlson, University of Georgia

8:30AM (1002) *Constructing group actions.*
William Browder, Princeton University (962-55-709)

9:00AM (1003) *Celluar vs Acyclic.*
Wojciech Chacholski*, Yale University, **Paul-Eugene Parent**, Universite Catholique de Louvain, and **Don Stanley**, University of Alberta (962-55-1026)

9:30AM (1004) *Some groups of type VF.*
Ian J Leary*, University of Southampton, and **Brita E A Nucinkis**, Eidgenoessische Technische Hochschule, Zuerich (962-20-827)

10:00AM (1005) *Relating the cohomological varieties for finite groups and Lie algebras.* Preliminary report.
Zongzhu Lin, Kansas State University (962-20-993)

10:30AM (1006) *Minami-Webb Type Decompositions For Compact Lie Groups.*
John R Martino, Western Michigan University, and **Stewart B Priddy***, Northwestern University (962-55-833)

AMS Special Session on Geometry and Topology of Low Dimensional Manifolds, III

8:00 AM – 10:50 AM

Organizers: **Slawomir Kwasik**, Tulane University
Terry Lawson, Tulane University

8:00AM ▶ (1007) *A sufficient condition for a graph to be intrinsically knotted.* Preliminary report.
Joel S Foisy, SUNY Potsdam (962-57-77)

8:30AM (1008) *Colored Unlinking.* Preliminary report.
Jeff Johannes, University of Nevada, Las Vegas (962-57-982)

9:00AM (1009) *Trace Fields of Twist Knots.*
Jim Hoste, Pitzer College, and **Patrick D Shanahan***, Loyola Marymount Univ. (962-57-94)

9:30AM ▶ (1010) *On the existence of finite type link homotopy invariants.*
Blake Mellor*, Honors College, Florida Atlantic University, and **Dylan Thurston**, Harvard University (962-57-127)

10:00AM (1011) *Hochschild homology of skein algebras.* Preliminary report.
Michael S McLendon, University of Iowa (962-57-186)

10:30AM (1012) *Integrality for morphisms induced by cobordisms in TQFTs.* Preliminary report.
Patrick M Gilmer, Louisiana State University (962-57-688)

AMS Special Session on Analysis on Infinite Dimensional Spaces (in honor of Leonard Gross), II

8:00 AM – 10:50 AM

Organizers: **Hui-Hsiung Kuo**, Louisiana State University
Ambar N. Sengupta, Louisiana State University

8:00AM (1013) *A conjectural analog of the Stone-von Neumann theorem in the setting of Gross's generalized Fock space.* Preliminary report.
Brian C Hall, University of Notre Dame (962-81-819)

8:30AM (1014) *Asymptotic Behavior of Special Functions in Heat Kernel Analysis.*
Jeffrey J Mitchell, Baylor University (962-58-808)

9:00AM (1015) *Sharp bounds for the heat kernel on certain symmetric spaces of the non-compact type.* Preliminary report.
Matthew B Stenzel, Ohio State University, Newark Campus (962-58-877)

9:30AM (1016) *Recent results in Segal-Bargmann Analysis.*
Stephen B Sontz, UAM-Iztapalapa (962-81-777)

10:00AM ▶ (1017) *A new Heisenberg inequality for White Noise Analysis.* Preliminary report.
Aurel I Stan, Northwestern University (962-60-699)

10:30AM (1018) *Complex white noise.*
Mylan Redfern, University of Southern Mississippi (962-60-391)

AMS Special Session on Partial Differential Equations and Geometric Implications, II

8:00 AM – 10:50 AM

Organizer: **Vladimir E. Shklover**, Northeastern University of Illinois

8:00AM (1019) *Spherical Line Congruences and the Sinh-Gordon Equation.* Preliminary report.
Mary D Shepherd, SUNY-College at Potsdam (962-53-84)

8:30AM (1020) *Pompeiu Sets in Compact Heisenberg Manifolds.*
Robert Park*, Raytheon, and **Leonard Richardson**, Louisiana State University (962-44-921)

9:00AM (1021) *Heat Equation and Schiffer Problem.* Preliminary report.
Vladimir E Shklover, Northeastern Illinois University (962-35-1003)

9:30AM (1022) *The conformal Laplacian and Dirac operators on the sphere and hyperbola.* Preliminary report.
John Ryan*, University of Arkansas, and **Hong Liu**, Embry Riddle Aeronautical University (962-30-1039)

10:00AM (1023) *Crystals that rotate as they shrink.* Preliminary report.
Jean E Taylor, Rutgers University (962-35-1025)

10:30AM (1024) *On inverse scattering solutions to the Hunter-Saxton equation.*
David H Sattinger*, Utah State University, **Richard W Beals**, Yale University, and **Jacek Szmigielski**, University of Saskatchewan (962-35-242)

AMS Special Session on Integral Transforms, III

8:00 AM – 10:50 AM

Organizers: **Gestur Olafsson**, Louisiana State University
Gunter Lumer, University of Mons-Hainaut
Frank Neubrander, Louisiana State University
A. Ludu, Louisiana State University

8:00AM (1025) *Wavelet methods for edge detection problems.*
Sitharama S Iyengar, Louisiana State University (962-43-1296)

8:30AM (1026) *Time Operator, Wavelets and Shift Representation of Chaotic Systems.* Preliminary report.
Ioannis Antoniou, Solvay Institutes for Physics and Chemistry, Belgium (962-37-726)

9:00AM (1027) *New materials-simulation techniques and algorithms based on wavelets and multiresolution approaches.*
Priya Vashishta* and **Rajiv K Kalia**, Louisiana State University (962-43-1303)

9:30AM (1028) *Localized eigenvectors from widely spaced matrix modifications.* Preliminary report.
Gilbert Strang*, **Xiangwei Liu** and **Susan Ott**, M.I.T. (962-43-469)

10:00AM (1029) *Sampling and reconstruction in shift invariant spaces in presence of noise.*
Akram Aldroubi, Vanderbilt University (962-44-831)

10:30AM (1030) *M Band Daubechies' Scaling Functions Are Asymmetric.*
Qiyu Sun, National University ofSingapore (962-43-216)

AMS Special Session on Discrete Geometry, II

8:00 AM – 10:50 AM

Organizer: **Andras Bezdek**, Auburn University

8:00AM ▶ (1031) *Packing congruent balls in the d-dimensional cube.* Preliminary report.
Wlodzimierz Kuperberg, Auburn University (962-52-651)

8:30AM ▶ (1032) *On the Dimension of Dense Sphere Packings.* Preliminary report.
Joerg Wills, University of Siegen (962-52-863)

9:00AM (1033) *Densest packings of the hyperbolic plane by equal circles.*
Charles Radin, University of Texas at Austin (962-52-560)

9:30AM ▶ (1034) *Isoperimetric Networks With Five Regions In the Euclidean Plane.* Preliminary report.
Michael N Bleicher*, Clark Atlanta University, and **J. Marshall Osborn**, University of Wisconsin – Madison (962-52-1013)

10:00AM (1035) *On Malfatti's Problem.*
Ferenc Fodor, Tennessee Technological University (962-52-1019)

10:30AM (1036) *Big holes in lattices.* Preliminary report.
Bob Erdahl, Queen's University, and **Konstantin Rybnikov***, Cornell University (962-52-1220)

MAA Minicourse #10: Part B

8:00 AM – 10:00 AM

Developing your department's assessment plan.

Organizers: **William A. Marion**, Valparaiso University
Bonnie Gold, Monmouth University

MAA Minicourse #4: Part B

8:00 AM – 10:00 AM

The global classroom: Using the Web as an interactive learning environment.

Organizers: **Marcelle Bessman**, Jacksonville University
Douglas A. Quinney, Keele University

MAA Minicourse #9: Part B

8:00 AM – 10:00 AM

Making liberal arts mathematics the most important course students take to learn effective thinking.

Organizers: **Edward B. Burger**, Williams College
Michael Starbird, University of Texas at Austin

AMS Session on Rings

8:00 AM – 10:25 AM

8:00AM (1037) *Primitive and Poisson Spectra of Twists of Polynomial Algebras.* Preliminary report.
Mary-Katherine E Brandl, University of Oregon (962-16-1033)

8:15AM (1038) *Binomial Algebras and Rings.* Preliminary report.
Jessica K Sklar, University of Oregon (962-16-1046)

8:30AM (1039) *Blowings-up of noncommutative weighted projective planes.*
Colin Ingalls, Research Institute for Mathematical Sciences, and **David Patrick***, University of Washington (962-16-1122)

8:45AM (1040) *Quadratic Artin-Schelter Regular Algebras.* Preliminary report.
Craig C Tingey, University of Oregon (962-16-1129)

9:00AM (1041) *Descent Theory for Duals of Inseparable Field Extensions.* Preliminary report.
Darren B Parker, Bemidji State University (962-16-135)

9:15AM (1042) *Representation Theory of the quantum function algebra of a Kac Moody Lie algebra.*
Bharath R Narayanan, Kansas State University (962-16-140)

9:30AM ▶ (1043) *The Zero-Divisor Graph of a Noncommutative Ring.* Preliminary report.
Shane P Redmond, University of Tennessee-Knoxville (962-16-898)

9:45AM (1044) *An operational calculus for operator-valued equations.*
Jason P Huffman*, Jacksonville State University, and **Henry E Heatherly**, University of Louisiana, Lafayette (962-16-947)

10:00AM (1045) *Difference equations compatible with the KZ differential equations. Some results on integral solutions.* Preliminary report.
Yavor G. Markov, Univ. of North Carolina - Chapel Hill (962-17-126)

10:15AM (1046) *Locally Artinian Serial Rings.*
Jennifer A Firkins, Linfield College (962-16-953)

AMS Session on Statistics

8:00 AM – 10:25 AM

8:00AM (1047) *Confidence Intervals for the Common Variance of Correlated Normal Random Variables.*
Daniel J Ghezzi, SUNY at Binghamton (962-62-1078)

8:15AM (1048) *Efficient Estimation of a Linear Functional of a Bivariate Distribution with Identical Marginal Distributions.*
Hanxiang Peng, Binghamton University (962-62-1335)

8:30AM (1049) *Analysis of the One- and Two-Sample Kolmogorov-Smirnov Test for Quality Control.*
Raymond N Greenwell*, Hofstra University, and **Stephen J Finch**, State University of New York at Stony Brook (962-62-249)

8:45AM Break.

9:00AM (1050) *Learning and Teaching Statistics Through the Language Roots of the Basic Statistics Terms.*
Annie Y Han, BMCC/CUNY (962-62-416)

9:15AM (1051) *Multigroup Detection and Analysis of Seasonality.*
Osvaldo Marrero, Villanova University (962-62-606)

9:30AM ▶ (1052) *Fairly Ranked NFL Statistics*. Preliminary report.
Chris T Edwards, University of Wisconsin Oshkosh (962-62-715)

9:45AM ▶ (1053) *Semi-parametric Modeling Techniques and Applications.*
William J Hooper, Binghamton University and SUNY Oneonta (962-62-835)

10:00AM ▶ (1054) *On the Robustness of the Synthetic Control Chart.*
Maria E Calzada* and **Stephen Scariano**, Loyola University New Orleans (962-62-868)

10:15AM (1055) *Estimation and relative efficiency of a periodic inspection plan: The case of loglogistic distribution.*
Haimeng Zhang*, Concordia College, **M. B Rao**, North Dakota State University, and **Ahmad Abu-Taleb**, Jordan University of Science and Technology (962-62-914)

AMS Session on Game Theory, Economics and Natural Sciences

8:00 AM – 9:10 AM

8:00AM (1056) *Laplace Transform Formulation for an American Put Option.*
Roland Mallier* and **Ghada Alobaidi**, University of Western Ontario (962-91-1215)

8:15AM (1057) *Stochastic model of caries progression.* Preliminary report.
Dorota T Kopycka-Kedzierawski*, University of Rochester, **Mark E Moss**, University of Rochester, and **Andrzej W Kedzierawski**, SUNY Geneseo (962-92-1166)

8:30AM (1058) *Biotopology and Chirality in Proteins.* Preliminary report.
Okan Gurel*, IBM, and **Demet Gurel**, Touro College (962-92-1239)

8:45AM ▶ (1059) *Grand Canyon River Trip Simulator Project.*
Joanna A Bieri* and **Catherine A Roberts**, Northern Arizona University (962-92-1194)

9:00AM (1060) *Exercise, Fitness, and Case Examples for Recent Application.*
C.S. Felicitas* and **M.W. Auslander**, CFCTE and Gottlieb Library (962-92-782)

MAA Session on Innovative Practices in Statistics Education, II

8:00 AM – 10:25 AM

Organizers: **Mary M. Sullivan**, Rhode Island College
Carolyn K. Cuff, Westminster College
Mary R. Parker, Austin Community College

8:00AM ▶ (1061) *Making Connections: Turning Students onto Learning Statistics.* Preliminary report.
Cathleen M Zucco-Teveloff, Trinity College (962-E1-163)

8:15AM Discussion.

8:30AM (1062) *When Must It Fit? Classroom Activities with Modeling and Sampling.*
Cathy W Carter* and **Pascal Bedrossian**, Christian Brothers University (962-E1-596)

8:45AM ▶ (1063) *Don't neglect descriptive statistics in a first business statistics class.*
Barry Schiller, Rhode Island College (962-E1-587)

9:00AM ▶ (1064) *Statistics Activities for Psychology Majors.* Preliminary report.
Ginger Holmes Rowell, Middle Tennessee State University (962-E1-362)

9:15AM ▶ (1065) *Statistical Experiments in the Natural Sciences.* Preliminary report.
Colleen G. Livingston, Bemidji State University (962-E1-338)

9:30AM (1066) *When Statistics Is Not A Full-Semester Course...* Preliminary report.
Mary M Sullivan, Rhode Island College (962-E1-374)

9:45AM ▶ (1067) *Innovation in the teaching of introductory statistics: Results of a survey.*
Joan B Garfield, University of Minnesota (962-E1-329)

10:00AM ▶ (1068) *The American Statistical Association's Undergraduate Statistics Education Initiative (USEI).*
Mary R Parker, Austin Community College (962-E1-614)

10:15AM (1069) *Ways to Incorporate Innovative Practices in an Applied Regression Analysis Course.*
Katherine T Halvorsen, Smith College, **John D McKenzie, Jr.***, Babson College, and **Mary M Sullivan**, Rhode Island College (962-E1-567)

MAA Session on Integrating Mathematics and Other Disciplines, III

8:00 AM – 10:55 AM

Organizers: **William G. McCallum**, University of Arizona
Deborah Hughes Hallett, University of Arizona
Yajun Yang, SUNY at Farmingdale

8:00AM ▶ (1070) *Integrated Mathematics and Physical Science—The Best pre-Calculus.*
Jerome S Epstein, Polytechnic University (962-G1-411)

8:15AM (1071) *Integrating Mathematics with the Undergraduate Engineering Curriculum: Using Just-in-Time Delivery.*
Jenna P Carpenter* and **Bernd Schroeder**, Louisiana Tech University (962-G1-579)

8:30AM (1072) *Multi-Disciplinary Multivariate Calculus.*
Andrew J Weate*, **Joseph Myers** and **Gerald C Kobylski**, United States Military Academy (962-G1-586)

8:45AM (1073) *Service in Ordinary Differential Equations.*
William P Fox, Francis Marion University (962-G1-1014)

9:00AM ▶ (1074) *The outcomes of direct problem solving instruction in an integrated calculus and physics program.* Preliminary report.
Karen A Marrongelle*, **Kelly Black** and **Dawn Meredith**, University of New Hampshire (962-G1-410)

9:15AM ▶ (1075) *EcoMath: A Computer-Based Teaching Initiative in Integrated Ecology and Mathematics.*
Betty Mayfield, Hood College (962-G1-183)

9:30AM ▶ (1076) *The Use of Elementary Mathematics to Solve Important Optimization Problems in Forestry.*
Hari Pulapaka*, Stetson University, and **David R Gibson**, Valdosta State University (962-G1-471)

9:45AM ▶ (1077) *"Directed Consulting": A Course in Which Students Solve Real, Not Just Realistic, Problems.*
Everette L May, Salisbury State University (962-G1-386)

10:00AM (1078) *Chemical Reactions in Many Levels of Math.*
Richard D West, Francis Marion University (962-G1-466)

10:15AM ▶ (1079) *The Computational Science Paradigm: Connecting Mathematics, Computing and Science.* Preliminary report.
Ignatios E Vakalis, Capital University (962-G1-373)

10:30AM ▶ (1080) *A special course for students with advanced placement calculus credit.*
David O Lomen, University of Arizona (962-G1-500)

10:45AM (1081) *An Integrated Course in Advanced Engineering Mathematics: A Multimedia Approach.*
Donald G Hartig* and **Russell M Cummings**, California Polytechnic State University (962-G1-954)

MAA Session on Putting the "Service" Back into Service Courses

8:00 AM – 10:50 AM

Organizers: **Thomas L. Moore**, Grinnell College
Ahmed I. Zayed, University of Central Florida

8:00AM ▶ (1082) *College Algebra: A coordinated approach.*
JoAnn B. Royster, University of Central Arkansas (962-M1-430)

8:30AM ▶ (1083) *Designing College Algebra To Serve Its Clientele Effectively.*
Scott R Herriott, Maharishi University of Management (962-M1-421)

9:00AM Discussion.

9:30AM ▶ (1084) *"The Private History of a Reform that Failed:" College Algebra and Student Readiness.*
Thomas W Polaski* and **Ron C Goolsby**, Winthrop University (962-M1-337)

10:00AM (1085) *Service Courses for Humanities and for Business.*
Kay M. Gura, Ramapo College of New Jersey (962-M1-463)

10:30AM ▶ (1086) *A Freshman Study Skills Seminar for Underprepared Students.*
Barbara A Ashton, Wittenberg University (962-M1-278)

MAA Session on College Mathematics in Depth with Dynamic Mathematics Software, I

8:00 AM – 10:50 AM

Organizers: **E. Paul Goldenberg**, Education Development Center
Jean-Marie Laborde, Laboratoire Leibnitz
Barbara J. Pence, San Jose State University

8:00AM ▶ (1087) *Sketchpad Explorations that Help Students Read, Discover, and Understand Euclidean Theorems and Proofs.*
Teresa D Magnus, Rivier College (962-N1-546)

8:15AM ▶ (1088) *Creating Your Own Dynamic Software with TCL/TK.*
Robert J Decker, University of Hartford (962-N1-417)

8:30AM (1089) *Mathematica Packages for the Visualization of Mathematical Ideas.*
Bruce F Torrence, Randolph-Macon College (962-N1-304)

8:45AM ▶ (1090) *Visualization in Precalculus with Mathematica.*
Barry Cherkas, Hunter College (CUNY) (962-N1-270)

9:00AM ▶ (1091) *Dynamic Interactive Explorations Using Mathwright and LAVA.*
James E White*, President, Bluejay Lispware and Director, Project WELCOME, and **Dan Kalman**, American University (962-N1-432)

9:30AM ▶ (1092) *Regression lines through quadratic forms.* Preliminary report.
Al Cuoco, Center for Mathematics Education, EDC (962-N1-1333)

10:00AM ▶ (1093) *Non-Euclidean Constructions using Geometer's Sketchpad.*
Stephen D Szydlik, University of Wisconsin-Oshkosh (962-N1-451)

10:30AM ▶ (1094) *Dynamic Projective Geometry.*
Alan S McRae, Washington and Lee University (962-N1-433)

AMS Special Session on Analytic Number Theory, III

8:20 AM – 10:50 AM

Organizer: **Dorian Goldfeld**, Columbia University

8:20AM (1095) *Analytic Number Theory and Cryptography.*
Banks William, University of Missouri, **Daniel B Lieman***, University of Georgia, and **Igor Shparlinski**, Macquarie University (962-11-1240)

9:00AM (1096) *On the Normality of Arithmetical Constants.* **Jeffrey C Lagarias**, AT&T Labs (962-11-740)

9:40AM (1097) *Towards an Artin conjecture for composites.* Preliminary report. **Carl Pomerance**, Bell Labs - Lucent Technologies (962-11-814)

10:20AM ▶ (1098) *q-series identities and L-functions.* Preliminary report. **Ken Ono**, University of Wisconsin at Madison (962-11-785)

AWM Workshop

8:20 AM – 4:10 PM

This session consists of several parts listed separately throughout this program. All meeting participants are invited to attend all presentations.

Organizers: **Gail D. L. Ratcliff**, University of Missouri, St. Louis
Sue Geller, Texas A&M University
Jodie D. Novak, University of Northern Colorado

AMS-MAA Special Session on History of Mathematics, III

8:30 AM – 10:50 AM

Organizers: **Karen H. Parshall**, University of Virginia
David E. Zitarelli, Temple University

8:30AM ▶ (1099) *Florian Cajori at Tulane University: How history entered mathematical pedagogy in the United States.* Preliminary report. **John G Fauvel**, Open University (962-01-750)

9:00AM ▶ (1100) *Operations Research Work of Dwight Eisenhower and Omar Bradley.* **David C Arney*** and **Frederick Rickey**, United States Military Academy (962-01-74)

9:30AM (1101) *On Hilbert's 24th Problem: Report on a new source and some remarks.* **Rüdiger Thiele**, University of Leipzig (962-01-285)

10:00AM ▶ (1102) *Agustín Aragón, Mexican scholar and journalist.* Preliminary report. **Alejandro R Garciadiego**, UNAM - CINVESTAV (962-01-984)

10:30AM ▶ (1103) *On the Discovery of Wallis's Formula.* **Harold M. Edwards**, New York University (962-01-281)

AMS Special Session on Applications of Mathematics to Human Physiology and Medicine, III

8:30 AM – 10:50 AM

Organizers: **James Cassatt**, National Institutes of Health
Michael C. Reed, Duke University

8:30AM ▶ (1104) *Half-lives of HIV infected Cells.* **Patrick Nelson**, University of Michigan (962-92-1216)

9:20AM ▶ (1105) *Transmembrane protein structure from NMR, mathematical analysis.* Preliminary report. **J R Quine***, Florida State University and National High Magnetic Field Laboratory, **Jeffrey K Denny**, Mercer University, and **Timothy A Cross**, Florida State University and National High Magnetic Field Laboratory (962-92-1023)

10:10AM (1106) *A spatio-temporal model of the mitotic clock in avascular tumors.* **Trachette Jackson**, University of Michigan (962-92-1102)

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

8:30 AM – 10:20 AM

8:30AM (1107) *Counting Permutations by their Rigid Patterns.* **Amy N. Myers**, University of Pennsylvania

9:00AM (1108) *Computational Complexity of Generalized Pattern Matching.* **Christine E. Heitsch**, University of British Columbia

9:30AM (1109) *The Baues problem and the toric Hilbert scheme.* **Diane Maclagan**, Institute for Advanced Study

10:00AM (1110) *Gap sets and error-correcting codes.* **Gretchen L. Matthews**, University of Tennessee, Knoxville

AMS Committee on Education Panel Discussion

8:30 AM – 10:00 AM

The Mathematics Learning Study and its implications for teacher preparation.

Organizer: **Roger E. Howe**, Yale University

Panelists: **Jeremy Kilpatrick**, University of Georgia
Jane O. Swafford, National Research Council
Deborah L. Ball, University of Michigan
Roger E. Howe

MAA Invited Address

9:00 AM – 9:50 AM

▶ (1111) *Collision and percolation.* **Peter M. Winkler**, Bell Laboratories - Lucent Technologies (962-A0-40)

ASL Invited Address

9:00 AM – 9:50 AM

(1112) *The latest news about the computably enumerable sets.* **Peter A. Cholak**, University of Notre Dame

MAA Panel Discussion

9:00 AM – 10:30 AM

Restructuring the mathematics bachelor degree.

Organizer: **Lisa Townsley Kulich**, Benedictine University

Panelists: **Patricia Rogers**, York University
Richard A. Gillman, Valparaiso University
David C. Arney, U.S. Military Academy
Donald W. Vander Jagt, Grand Valley State University
Thomas R. Berger, Colby College

MAA Special Presentation

9:00 AM – 10:30 AM

The pedagogical potential of computer symbolic algebra in the teaching of precalculus and calculus.

Organizers: **Bernhard Kutzler**, University of Linz

Helmut Heugl, Technical University of Vienna

MAA Panel Discussion

9:00 AM – 10:30 AM

Writing and the mathematics classroom.
Organizers: **John E. Meier**, Lafayette College
Thomas W. Rishel, MAA
Panelists: **Annalissa Crannell**, Franklin and Marshall College
Julian F. Fleron, Westfield State College
Philip R. Hotchkiss, Westfield State College
John E. Meier
Morris Orzech, Queen's University
Thomas W. Rishel

NAM Panel Discussion

9:00 AM – 9:50 AM

Successful graduate diversity programs in the mathematical sciences.
Moderator: **Nathaniel Dean**, Rice University
Panelists: **Carl Cowen**, Purdue University
Duane A. Cooper, University of Maryland, College Park
Eugene W. Madison, University of Iowa
William A. Massey, Lucent Technologies
LaMont Toliver, University of Maryland, Baltimore County

Employment Center

9:00 AM – 1:00 PM

Interview center.

Book Sales and Exhibits

9:00 AM – NOON

ASL Invited Address

10:00 AM – 10:50 AM

(1113) *Model theory of compact complex manifolds.*
Thomas W. Scanlon, University of California Berkeley

NAM Business Meeting

10:00 AM – 10:50 AM

MAA Invited Address

10:05 AM – 10:55 AM

▶ (1114) *A kaleidoscope of mathematics and art.*
Ivars Peterson, *Science News* (962-A0-38)

AWM Workshop: Women Graduate Student Poster Session

10:30 AM – 11:00 AM

10:30AM **Light refreshments will be served.**
(1115) *Weak P_{κ^+} -points in $u(\kappa)$.*
Joni E. Baker, University of Wisconsin, Madison
(1116) *Goodwillie Calculus Towers of Functors of Hopf Algebra Type.*
Kristine Baxter, University of Illinois at Urbana-Champaign
(1117) *Moving Frames and Cartesian Lie Group Actions.*
Mireille Boutin, University of Minnesota
(1118) *The Geometry of DNA and DNA-Protein Interactions.*
Dorothy Buck, University of Texas at Austin
(1119) *Wavelet Homogenization Methods for Partial Differential Equations.*
Kirsten J. Boyd, Stanford University
(1120) *Dynamics of Non-Abelian Toda-like Flows.*
Melinda Evrithiki Koelling, University of Michigan, Ann Arbor
(1121) *L^p Estimates for Maxwell's Equations in Stratified Media.*
Aurelia Minut, Michigan State University
(1122) *Incidence Numbers for Line and Pseudo-line Arrangements.*
Kathryn Nyman, Cornell University
(1123) *Questions On and Uses of Local Cohomology.*
Victoria A. Sapko, University of Nebraska, Lincoln
(1124) *Hyperbolic sets for holomorphic endomorphisms of $\mathbb{P}^k$.*
Małgorzata Stawiska, Northwestern University
(1125) *Analytic Rigidity of K-trivial Contractions in Dimension Three.*
Csilla Tamás, Purdue University
(1126) *Dependent Edges in Acyclic Orientations of Graphs.*
Kimberly Tysdal, Wesleyan University

MAA Business Meeting

11:10 AM – 11:40 AM

AMS Business Meeting

11:45 AM – 12:15 PM

AWM Workshop: Panel Discussion

12:30 PM – 2:00 PM

Launching a Career in Mathematics.
Moderator: **Jodie D. Novak**, University of Northern Colorado
Panelists: **Carolyn S. Gordon**, Dartmouth College
Tasha R. Inniss, Trinity College, D.C.
Tamara G. Kolda, Sandia National Labs
Lisa Mantini, Oklahoma State University

NAM William W.S. Claytor Lecture

1:00 PM – 1:50 PM

(1127) *Numerical grid generation and 3D visualization of special functions.*
Bonita V. Saunders, National Institute of Standards and Technology

AMS-MAA Special Session on History of Mathematics, IV

1:00 PM – 4:20 PM

Organizers: **Karen H. Parshall**, University of Virginia
David E. Zitarelli, Temple University

1:00PM ▶ (1128) *Large Numbers and the Infinite in Ancient Chinese Mathematics: Puzzles of Xu Yue's* Shu Shu Ji Yi *(Memoir on Some Traditions of the Mathematical Art).* Preliminary report.
Joseph W. Dauben, Herbert H. Lehman College and Ph.D. Program in History, The Graduate Center, CUNY (962-01-788)

1:30PM ▶ (1129) *Mathematics in the American Journal of Science and Arts, 1819-1840.* Preliminary report.
Todd Timmons, Westark College/University of Oklahoma (962-01-295)

2:00PM ▶ (1130) *Tragedy and Trigonometry: The Story of Harvard's John Farrar.*
Amy K Ackerberg-Hastings, Rockville, MD (962-01-209)

2:30PM ▶ (1131) *Hilbert's Grundlagen der Geometrie and Its Relation to Euclid's Elements.*
Craig G Fraser, University of Toronto (962-01-161)

3:00PM (1132) *Mathematics around 1900: Transition from one century to the next.*
Erwin O. Kreyszig, Carleton University (962-01-58)

3:30PM ▶ (1133) *The Lost Squares of Dr. Franklin.*
Paul C Pasles, Villanova University (962-01-113)

4:00PM ▶ (1134) *The Laws of Boole's Thought.*
Stanley N Burris, University of Waterloo (962-01-253)

AMS Special Session on Applications of Mathematics to Human Physiology and Medicine, IV

1:00 PM – 4:50 PM

Organizers: **James Cassatt**, National Institutes of Health
Michael C. Reed, Duke University

1:00PM (1135) *Distribution of the number of clonogenic tumor cells surviving fractionated radiation.*
Leonid Hanin, Idaho State university (962-92-1214)

1:40PM ▶ (1136) *Natural Selection of Strategies for the Iterated Prisoner's Dilemma.*
David Kraines, Duke University, and **Vivian Kraines***, Meredith College (962-92-1082)

2:20PM ▶ (1137) *Hypothesis Testing with the Benefit/Risk Model.*
Michael Greenwich*, Purdue University Calumet, **Benjamin Djulbegovic**, Moffitt Cancer Center, **Iztok Hozo** and **Stela Pudar-Hozo**, Indiana University Northwest (962-62-197)

3:00PM (1138) *Mathematical modeling of motile microorganisms.*
Lisa Fauci, Tulane University (962-92-1386)

3:40PM ▶ (1139) *Why is Mathematical Biology so Hard?*
Michael C Reed, Duke University (962-92-1402)

4:20PM Discussion.

AMS Special Session on Analysis on Infinite Dimensional Spaces (in honor of Leonard Gross), III

1:00 PM – 5:50 PM

Organizers: **Hui-Hsiung Kuo**, Louisiana State University
Ambar N. Sengupta, Louisiana State University

1:00PM (1140) *Some roles of the Levy Laplacian.* Preliminary report.
Takeyuki Hida, IIAS, Japan (962-60-956)

1:30PM ▶ (1141) *Stochastic calculus with the renormalized square of white noise.*
Luigi Accardi, Centro Vito Volterra (962-46-1072)

2:00PM (1142) *Invariant measures on (finite and) infinite dimensional manifolds.*
Michael Roeckner, Fakultaet fuer Mathematik, Universitaet Bielefeld (962-60-1416)

2:30PM (1143) *Infinite dimensional stochastic analysis and interest rate models.*
Rene Carmona, Princeton University (962-60-1435)

3:00PM (1144) *Random Field Models of Interest Rates.*
Victor W. Goodman* and **Hassan Allouba**, Indiana University (962-60-974)

3:30PM (1145) *A generalization of the Riesz representation theorem to infinite dimensions.*
Yuh-Jia Lee, National University of Kaohsiung (962-46-326)

4:00PM (1146) *Information capacity of quantum channels.*
Christopher K King*, Northeastern University, and **Beth Ruskai**, University of Massachusetts Lowell (962-81-751)

4:30PM (1147) *Roles of Growth Functions in Infinite Dimensional Analysis.* Preliminary report.
Nobuhiro Asai, International Institute for Advanced Studies (962-46-343)

5:00PM (1148) *Itô formula for generalized Lévy white noise functionals.*
Hsin-Hung Shih, Kung Shan University of Technology (962-60-857)

5:30PM (1149) *New Developments in Infinite-dimensional Processes.*
Sergio Albeverio, University of Bonn (962-60-871)

AMS Special Session on Analytic Number Theory, IV

1:00 PM – 5:10 PM

Organizer: **Dorian Goldfeld**, Columbia University

1:00PM (1150) *Gross-Zagier's formulas with characters.*
Shou-Wu Zhang, Columbia University (962-11-723)

1:40PM (1151) *Geometric construction of modular forms over function fields.* Preliminary report.
Douglas Ulmer, University of Arizona (962-11-837)

2:20PM (1152) *Cocycles associated to values of derivatives of L-functions and their geometry.*
Nikolaos Diamantis, McMaster University (962-11-744)

3:00PM (1153) *Generalized Jacobi's derivative formulas and singular torsion on elliptic curves.* Preliminary report.
David R Grant*, University of Colorado at Boulder, and **John Boxall**, Universite de Caen (962-11-1235)

3:45PM (1154) *Generating Jacobi forms.*
Howard Skogman, University of Southern California (962-11-817)

4:00PM (1155) *On Generalizations of Irreducibility Theorems of I. Schur.* Preliminary report.
Martha A Allen, University of South Carolina (962-11-855)

4:15PM (1156) *The Density of Pseudoprimes with Two Prime Factors.* Preliminary report.
William F Galway, Univ. of Illinois at Urbana-Champaign (962-11-1393)

4:30PM ▶ (1157) *On a conjecture of Mąkowski and Schinzel.* Preliminary report.
Alexander Grytczuk, T. Kotarbinski Pedagogical University, **Florian Luca***, UNAM, and **Marek Wojtowicz**, T. Kotarbinski Pedagogical University (962-11-117)

4:45PM (1158) *Divisibility of Binomial Coefficients and Catalan Numbers.*
Pantelimon Stanica, Auburn University Montgomery (962-11-818)

5:00PM (1159) *Iterative Methods for Systems of Additive Forms.* Preliminary report.
Scott T Parsell, Texas A&M University (962-11-125)

AMS Special Session on Partial Differential Equations and Geometric Implications, III

1:00 PM – 4:50 PM

Organizer: **Vladimir E. Shklover**, Northeastern University of Illinois

1:00PM (1160) *An integral representation of solutions of elliptic periodic PDE.* **Peter Kuchment***, Wichita State University, and **Yehuda Pinchover**, Technion - Israel Institute of Technology (962-35-190)

1:30PM (1161) *Geometry of Stationary Sets for the Wave Equation in R^n. The Case of Finitely Supported Initial Data.* **Mark Agranovsky**, Bar Ilan University, and **Eric Todd Quinto***, Tufts University (962-35-312)

2:00PM (1162) *Integrability criteria for distributions orthogonal to foliations on closed Riemannian manifolds.* Preliminary report. **Richard H Escobales**, Canisius College (962-53-112)

2:30PM (1163) *A Symmetry Result for Overdetermined Degenerate Elliptic Problems.* **Friedemann Brock**, University of Missouri-Columbia (962-35-797)

3:00PM (1164) *The length spectrum and isospectral Riemannian nilmanifolds.* **Ruth Gornet***, Texas Tech University, and **Maura B Mast**, University of Massachusetts Boston (962-53-1312)

3:30PM (1165) *Pompeiu problem and discrepancy theory.* **Tibor O'dor**, Tokyo University (962-35-1284)

4:00PM (1166) *Semilinear Elliptic Problem on Lipschitz domains in Riemannian manifolds.* **Martin Dindos**, University of North Carolina (962-35-100)

4:30PM (1167) *Lorentz Wave Maps.* Preliminary report. **Tadg H Woods**, University of Oregon (962-35-1379)

AMS Special Session on Stochastic Analysis and Applications, III

1:00 PM – 5:20 PM

Organizers: **Padmanabhan Sundar**, Louisiana State University

Guillermo S. Ferreyra, Louisiana State University

1:00PM (1168) *Inversion formulas and ergodic properties of general spacing measures.* **Olav H Kallenberg**, Auburn University (962-60-1178)

2:00PM (1169) *A simple test for Holder continuity of a class of Hilbert space valued processes.* **Douglas J Blount***, Arizona State University, and **Michael A Kouritzin**, University of Alberta (962-60-908)

2:30PM (1170) *Stochastic differential games with multiple modes and a small parameter.* Preliminary report. **Kandethody M Ramachandran**, University of South Florida (962-60-690)

3:00PM (1171) *Regularity conditions and Lyapunov exponents for stochastic partial differential equations with random coefficients.* Preliminary report. **Frederi G Viens***, Purdue University, **Jorge A Leon**, CINVESTAV-IPN, Mexico DF, Mexico, and **Samy Tindel**, Universite Paris XIII, France (962-60-893)

► 3:30PM (1172) *Optimal Fluid Control Problems and Large Deviations of Stationary Reflected Brownian Motion.* **Kavita Ramanan***, Bell Labs, Lucent Technologies, and **Paul Dupuis**, Brown University (962-60-981)

4:00PM (1173) *Growth and Spatial Dispersal Behavior of the Contact Process.* **Irene Hueter**, University of Florida (962-60-1034)

4:30PM (1174) *Integration with respect to fractional Brownian motion.* Preliminary report. **Jerzy Szulga**, Auburn University, AL (962-60-1236)

5:00PM (1175) *A summable process which is not a semimartingale.* Preliminary report. **Nicolae Dinculeanu** and **Oana Mocioalca***, University of Florida (962-60-330)

AMS Special Session on Integral Transforms, IV

1:00 PM – 5:20 PM

Organizers: **Gestur Olafsson**, Louisiana State University

Gunter Lumer, University of Mons-Hainaut

Frank Neubrander, Louisiana State University

A. Ludu, Louisiana State University

1:00PM (1176) *Generalizations of H^r functions and applications.* Preliminary report. **Richard D. Carmichael***, Wake Forest University, and **S. Pilipović**, University of Novi Sad (962-44-654)

1:30PM (1177) *Boehmians on Manifolds.* **Piotr Mikusiński**, University of Central Florida (962-44-925)

2:00PM (1178) *On the inversion of some integral transforms in spaces of ultradistributions.* Preliminary report. **Ioana Cioranescu**, University of Puerto Rico (962-46-1083)

2:30PM (1179) *The distributional and average behavior of generalized functions.* Preliminary report. **Ricardo Estrada**, Universidad de Costa Rica (962-46-937)

3:00PM Break.

3:30PM (1180) *Applications of Generalized Functions in the Theory of Singular Integral Equations.* **Ram P Kanwal**, Pennsylvania State University (962-45-1056)

4:00PM (1181) *Generalized functions and Laplace transform in stabilization by boundary control.* Preliminary report. **Gunter Lumer**, University of Mons-Hainaut and Solvay Institutes for Physics and Chemistry, Belgium (962-44-725)

4:30PM (1182) *Vector-valued generalized functions.* Preliminary report. **Boris Baeumer**, University of Nevada, Reno (962-44-970)

5:00PM (1183) *Local Laplace transform and singular Cauchy problems.* Preliminary report. **Valentin Keyantuo**, University of Puerto Rico (962-47-1069)

AMS Special Session on Discrete Geometry, III

1:00 PM – 5:20 PM

Organizer: **Andras Bezdek**, Auburn University

1:00PM (1184) *Remarks on the Moment Theorem.* Preliminary report. **Gábor Fejes Tóth**, Rényi Institute of Mathematics, Hungarian Academy of Sciences (962-52-1387)

1:30PM (1185) *On a problem in X-ray tomography.* **David G Larman*** and **Jonathan A Barker**, University College London (962-52-1248)

2:00PM (1186) *Modelling the folding of paper into three dimensions.*
Sarah-Marie Belcastro, University of Northern Iowa, and **Thomas C Hull***, Merrimack College (962-52-873)

2:30PM ▶ (1187) *Aperiodicity and Computation in the Hyperbolic Plane.*
Chaim Goodman-Strauss, University of Arkansas (962-52-1080)

3:00PM (1188) *The combinatorics of $n+3$ points in projective n-dimensional space.* Preliminary report.
Javier Bracho, Instituto de Matematicas, UNAM (962-52-1315)

3:30PM ▶ (1189) *Configurations of points and lines in affine and projective space.* Preliminary report.
Luis Montejano, National University of Mexico (962-52-1291)

4:00PM (1190) *Unit chords of a convex body.* Preliminary report.
Bernardo M Abrego and **Silvia Fernandez***, Rutgers University (962-52-1233)

4:30PM (1191) *Finite point sets with many similar copies of a given pattern.* Preliminary report.
Bernardo M Abrego*, Rutgers University, **Gyorgy Elekes**, Eotvos University, and **Silvia Fernandez**, Rutgers University (962-52-1232)

5:00PM (1192) *A Polytopal Generalization of Sperner's Lemma.*
Elisha B Peterson, Oxford University, and **Francis Edward Su***, Harvey Mudd College (962-52-213)

AMS Special Session on Interaction of Inverse Problems and Image Analysis, III

1:00 PM – 5:50 PM

Organizers: **M. Zuhair Nashed**, University of Delaware
Otmar Scherzer, Ludwig-Maximilians-Universitat Munchen

1:00PM (1193) *Regularization Methods in Image Sequence Analysis.* Preliminary report.
Joachim Weickert* and **Christoph Schnoerr**, University of Mannheim, Germany (962-49-1119)

1:30PM (1194) *Image Registration of Histological Sections of the Human Brain.* Preliminary report.
Jan Modersitzki, Medical University of Luebeck (962-65-673)

2:00PM (1195) *Models for non-texture inpaintings.* Preliminary report.
Tony F Chan, UCLA, and **Jianhong (Jackie) Shen***, University of Minnesota & IMA (962-68-595)

2:30PM ▶ (1196) *Hybrid steepest descent method and its application to convexly constrained inverse problems.* Preliminary report.
Isao Yamada, Tokyo Institute of Technology, Japan (962-65-783)

3:00PM (1197) *Inverse Problems in Sampling Theory.* Preliminary report.
Ahmed I Zayed, University of Central Florida (962-34-684)

3:30PM (1198) *A nonstationary iterated Tikhonov-Morozov method.*
Charles W Groetsch*, University of Cincinnati, and **Otmar Scherzer**, Universitaet Bayreuth (962-65-681)

4:00PM (1199) *Models for image interpolation based on the optical flow.*
Walter Hinterberger, Linz, and **Otmar Scherzer***, Bayreuth (962-49-653)

4:30PM ▶ (1200) *Inverse spectral problem for the fourth order differential operator.*
Amin Boumenir, Moravian College (962-34-829)

5:00PM (1201) *Image reconstruction and its application in mathematical biology.* Preliminary report.
Mike Mayergoiz, Rockville, Maryland (962-49-121)

5:30PM (1202) *Continuous algorithm for solving nonlinear ill-posed problems with simultaneous regularized inversion of the Fréchet derivative operator.*
Alexandra B Smirnova, Georgia State University (962-65-1038)

MAA Minicourse #11: Part B

1:00 PM – 3:00 PM

The mathematics of decision making.

Organizers: **Deborah Hughes Hallett**, University of Arizona
William G. McCallum, University of Arizona
Richard B. Thompson, University of Arizona

MAA Minicourse #14: Part B

1:00 PM – 3:00 PM

Discrete dynamical systems, mathematics, methods, and models.

Organizers: **David C. Arney**, U.S. Military Academy
Frank R. Giordano, Marina, CA
John S. Robertson, Georgia College & State University
Maurice D. Weir, Naval Postgraduate School

MAA Minicourse #5: Part B

1:00 PM – 3:00 PM

Creating and exporting computer animations to the Web.

Organizers: **William D. Emerson**, Metropolitan State College of Denver
Louis A. Talman, Metropolitan State College of Denver
Bradford Kline, Metropolitan State College of Denver

AMS Session on Ordinary Differential Equations

1:00 PM – 4:55 PM

1:00PM (1203) *Monotone iterative techniques for nonlinear problems involving the difference of two monotone functions.* Preliminary report.
T G Bhaskar, Indian Institute of Technology, Delhi, and **Farzana A McRae***, Catholic University of America (962-34-1138)

1:15PM (1204) *Stability Analysis of Solutions to a System of Nolinear FDE's with State-Dependent Delay.*
Sanjay Rai, Jacksonville University, and **Robert L Robertson***, Huntingdon College (962-34-1150)

1:30PM (1205) *Eigenparameter dependent Inverse Sturm-Liouville problems.* Preliminary report.
C. Maeve McCarthy*, Murray State University, and **William Rundell**, Texas A&M University (962-34-1187)

1:45PM ▶ (1206) *A geometric proof of Lie's formula for symmetries and integrating factors of first-order o.d.e's.* Preliminary report.
Terrance J Quinn* and **Scott Simmons**, Texas A&M International University (962-34-1188)

2:00PM (1207) *Monotone-iterative Technique for Impulsive Hybrid Equations.*
Snezhana G. Hristova, Georgia Southern University (962-34-1285)

2:15PM (1208) *Eigenvalues of Regular Fourth Order Sturm-Liouville Problems Using Sampling Theory.*
Bilal Chanane, KFUPM, Dhahran, Saudi Arabia (962-34-1287)

2:30PM (1209) *A Comparison of Eigenvalues for a Sturm-Liouville Boundary Value Problem on a Measure Chain.*
Bonita A. Lawrence*, University of South Carolina Beaufort, and **Denise T. Reid**, Valdosta State University (962-34-1300)

2:45PM (1210) *Existence of Neutral Stochastic Functional Differential Equations with Abstract Volterra Operators.* Preliminary report.
Zephyrinus C Okonkwo*, Albany State University, and **James C Turner Jr.**, Florida State University (962-34-1329)

3:00PM ▶ (1211) *The Center Variety of Polynomial Differentail Systems.*
Abdul Salam M Jarrah, New Mexico State University (962-34-1368)

3:15PM Break.

3:30PM (1212) *Geometric Aspects of Sturm-Liouville Problems Space of Boundary Conditions for Left-Definitness.*
Kevin J Haertzen*, **Qingkai Kong**, **Hongyou Wu** and **Anton Zettl**, Northern Illinois University (962-34-525)

3:45PM (1213) *Modified Wiener Equations.* Preliminary report.
Will Watkins, University of Texas-Pan American (962-34-703)

4:00PM (1214) *Dynamics of Systems with Discrete-Continuous time and Impulsive effects.*
Sivasundaram Seenith, Embry-Riddle Aeronautical University, Daytona Beach, Florida (962-34-786)

4:15PM ▶ (1215) *Existence and Uniqueness for a Class of Delay Differential-Algebraic Equations.* Preliminary report.
Dan I Coroian, Indiana-Purdue University Fort Wayne (962-34-811)

4:30PM (1216) *Singularities of second order implicit differential equations: A geometrical approach.*
Michelle C LeMasurier, Franklin and Marshall College (962-34-836)

4:45PM (1217) *Positive Solutions for Classes of Multiparameter Boundary Value Problems.*
Patrick S Caldwell, Mississippi State University (962-34-876)

AMS Session on Real Analysis

1:00 PM – 4:55 PM

1:00PM (1218) *Inclusion Theorems for Euler Submethods.* Preliminary report.
Jeffrey A Osikiewicz* and **Mohammad K Khan**, Kent State University (962-40-1141)

1:15PM (1219) *On the convergence of functions defined on compact Hausdorff speces.*
Arthur A Danielyan, University of Central Florida (962-40-1431)

1:30PM (1220) *On the degreee of approximation of fuctions belonging to a weighted class by (E, 1)H means.*
Billy E Rhoades, Indiana University (962-40-165)

1:45PM (1221) *Jayasri Summability.*
Jerry P King, Lehigh University (962-40-803)

2:00PM (1222) *Multipliers and Factorizations for Bounded Statistically Convergent Sequences.*
J. Connor*, Ohio University, **K. Demirci**, Kirikkale University, and **C. Orhan**, Ankara University (962-40-946)

2:15PM (1223) *On Polynomials Monotonic on the Unit Interval.*
Mohammed A Qazi, Tuskegee University (962-41-1004)

2:30PM (1224) *Asymptotic Behavior of Szegö Polynomials with Respect to a Weak-star Convergent Sequence of Measures on the Unit Circle.*
Michael J Arciero, University of Rhode Island (962-41-1173)

2:45PM ▶ (1225) *An Algorithm for Solving Boundary Value Problems.*
Elias Deeba*, **Shishen Xie**, University of Houston-Downtown, and **Suheil Khuri**, American University of Sharjah (962-41-42)

3:00PM (1226) *Generalized Bernstein Polynomials and Symmetric Functions.* Preliminary report.
Robert P Boyer, Drexel University, and **Linda C Thiel***, Ursinus College (962-41-816)

3:15PM (1227) *Formulas Relating the Fourier and Wavelet Transforms of Distributions.*
George K Yang, Tennessee State University (962-42-1040)

3:30PM (1228) *Maximal and Square Functions for Wavelets.* Preliminary report.
Sarah V Cook, Washburn University (962-42-1153)

3:45PM (1229) *L^p Sobolev inequalities on R^n.* Preliminary report.
Michael Pearson, Mississippi State University (962-42-1186)

4:00PM (1230) *Smoothness of Refinable Function Vectors.*
Denise A Jacobs, Georgia Tech (962-42-131)

4:15PM (1231) *Characterization of Fourier series of Stepanov almost-periodic functions.*
Gerard T. LaVarnway*, Norwich University, and **Roger L. Cooke**, University of Vermont (962-42-34)

4:30PM (1232) *A two-parameter Littlewood-Paley inequality.*
Robert D Poodiack, Norwich University (962-42-53)

4:45PM (1233) *Translation-Invariant Multiwavelet Transforms.*
Peter R Massopust*, Tuboscope Vetco Pipeline Services, and **Kathrin Berkner**, Ricoh Silicon Valley, Inc. (962-42-760)

AMS Session on Combinatorics, III

1:00 PM – 4:40 PM

1:00PM (1234) *Bipartite distance-regular graphs and their primitive idempotents.*
Mark S MacLean, University of Wisconsin-Madison (962-05-621)

1:15PM ▶ (1235) *Runs in Lotto - A Combinatorial Analysis.*
Patricia B Humphrey* and **David R Stone**, Georgia Southern University (962-05-634)

1:30PM (1236) *The Petersen block.* Preliminary report.
Joseph P Kung, University of North Texas (962-05-635)

1:45PM ▶ (1237) *Pebbling Numbers of Graphs.*
Sivaram K Narayan and **Matthew R Zuckero***, Central Michigan University (962-05-677)

2:00PM (1238) *Exploring the Bose-Burton Geometries.*
Rachelle M Ankney, George Washington University (962-05-720)

2:15PM ▶ (1239) *(16,6) Configurations of Points and Planes in $\mathbf{P}^3$.*
Sharon L Sullivan, University of Kentucky (962-05-734)

2:30PM (1240) *Partition theorems for left and right variable words.*
Neil Hindman*, Howard University, and **Randall McCutcheon**, University of Maryland (962-05-792)

2:45PM (1241) *Partitioning the Boolean lattice into chains of large minimum size, Part I.*
Tim Hsu, Pomona College, **Mark J Logan**, Claremont McKenna College, **Shahriar Shahriari**, Pomona College, and **Christopher Towse***, Scripps College (962-05-805)

3:00PM (1242) *Partitioning the Boolean lattice into chains of large minimum size, Part II.*
Tim Hsu, Pomona College, **Mark J Logan***, Claremont McKenna College, **Shahriar Shahriari**, Pomona College, and **Christopher Towse**, Scripps College (962-05-806)

3:15PM ▶ (1243) *The Poincare Polynomial of a Graph.*
Jonathan J Wiens, University of Alaska Fairbanks (962-05-838)

3:30PM (1244) *Parameter inequalities for asymmetric orthogonal arrays.* Preliminary report.
Wiebke S Diestelkamp, University of Dayton (962-05-846)

3:45PM (1245) *A Restriction on Tree-Tolerance Representations for Cycles.* Preliminary report.
Mary Ann Saadi, University of Rhode Island (962-05-848)

4:00PM (1246) *Average Cayley Genus for Cayley Maps with Dihedral Groups.*
Jamie Langille* and **Michelle Schultz**, University of Nevada, Las Vegas (962-05-899)

4:15PM ▶ (1247) *Geometric Representations of Ordered Sets.* Preliminary report.
Joshua D Laison, Dartmouth College (962-05-977)

4:30PM ▶ (1248) *On the independence number of the Cartesian product of caterpillars.*
Jeffrey S Powell*, **Scott P Martin** and **Douglas F Rall**, Furman University (962-05-949)

AMS Session on Algebraic Geometry and Linear Algebra

1:00 PM – 2:40 PM

1:00PM ▶ (1249) *AIEP $\mathbb{Z}$-modules.* Preliminary report.
Darin Kapanjie* and **Lenny K Jones**, Shippensburg University (962-15-1212)

1:15PM (1250) *On the Minimum Distance of a Class of 2-D Cyclic Codes Using Artin-Schreier Curves.* Preliminary report.
Cem Guneri, Louisiana State University (962-14-1027)

1:30PM (1251) *An elementary construction of certain affine open subschemes of the Hilbert scheme of n points of the affine plane.* Preliminary report.
Mark E Huibregtse, Skidmore College (962-14-1347)

1:45PM (1252) *A note on a class of rings found as Ga-invariants for locally trivial actions on normal affine varieties.*
Kristofer D Jorgenson, Laurel Technical Services (962-14-210)

2:00PM (1253) *Effective Divisor Classes on a Ruled Surface.*
Jeffrey A Rosoff, Gustavus Adolphus College (962-14-645)

2:15PM ▶ (1254) *On Rational Sections of Yoshida Elliptic Surfaces.*
Charles F Schwartz*, Rider University, and **William L Hoyt**, Rutgers University (962-14-891)

2:30PM (1255) *Points on Quantum Projectivizations.*
Adam Nyman, University of Washington (962-14-983)

MAA Session on Classroom Demonstrations and Course Projects That Make a Difference, II

1:00 PM – 2:55 PM

Organizers: **David R. Hill**, Temple University
Sarah L. Mabrouk, Boston University
Lila F. Roberts, Georgia Southern University

1:00PM ▶ (1256) *Creating WWW-based demonstrations using the JavaSketchpad.*
David A Thomas, Ball State University (962-L1-146)

1:15PM ▶ (1257) *A Community Based Modeling Project - The Human Cost of Census Undercounting.* Preliminary report.
Rebekah Dupont, Augsburg College (962-L1-422)

1:30PM ▶ (1258) *Probability Involving a TV Game.*
Susie M Lanier* and **Sharon M Barrs**, Georgia Southern University (962-L1-370)

1:45PM ▶ (1259) *Exploring the theory of the rainbow.* Preliminary report.
Gerbrand Hagmolen of ten Have, Utrecht University, the Netherlands (962-L1-517)

2:00PM ▶ (1260) *College Algebra and Analysis of Stock Market Investing.*
Paul D Sisson, LSU - Shreveport (962-L1-562)

2:15PM ▶ (1261) *Enhancing Student Learning and Perceptions in Calculus Using Internet Based Projects.* Preliminary report.
Clifton Wingard, Delta State University (962-L1-340)

2:30PM ▶ (1262) *CLT Revisited: A Demonstration of the Central Limit Theorem for an Introductory Statistics Course.*
Jacqueline A Hall, Longwood College (962-L1-364)

2:45PM ▶ (1263) *Shake a Stick at Ill-Conditioning.*
Jeff L Stuart, U. of Southern Mississippi (962-L1-542)

MAA Session on College Mathematics in Depth with Dynamic Mathematics Software, II

1:00 PM – 5:50 PM

Organizers: **E. Paul Goldenberg**, Education Development Center
Jean-Marie Laborde, Laboratoire Leibnitz
Barbara J. Pence, San Jose State University

1:00PM ▶ (1264) *New technologies as a bridge between various areas of mathematics.*
Colette Laborde, University of Grenoble and University Institute for Teacher Education, France (962-N1-1272)

1:30PM ▶ (1265) *Approaching affine geometry concepts with dynamic software: Invariance, concurrence, area theorems, barycentric coordinates and splines.* Preliminary report.
James R. King, University of Washington (962-N1-387)

2:00PM ▶ (1266) *Shears as a unifying topic through the high school and college curriculum.*
Susan L Addington, California State University, San Bernardino (962-N1-611)

2:30PM ▶ (1267) *Dynamic geometry visualization in algebra.*
Nicholas Jackiw, KCP Technologies (962-N1-1281)

3:00PM ▶ (1268) *Properties of measures—Statistics investigations with Fathomm.*
William Finzer, KCP Technologies (962-N1-1273)

3:30PM ▶ (1269) *Dynamic Interactive Tools for Visualizing Concepts in Multivariate Calculus.* Preliminary report.
Jean Marie McDill*, California Polytechnic State University, San Luis Obispo, and **Agnes M Rash**, St. Joseph's University, Philadelphia (962-N1-487)

4:00PM ▶ (1270) *PascalGT: Conjectures, Explorations, and Reasoning in Mathematics.* Preliminary report.
Kathleen M Shannon* and **Michael J Bardzell**, Salisbury State University (962-N1-342)

4:30PM ▶ (1271) *Using Dynamic Geometry Software to Simulate Motion Graphs with a Data Collection Device.* **Douglas A Lapp**, Central Michigan University (962-N1-156)

5:00PM ▶ (1272) *Integration By Parts as a Curve Drawing Machine: Leibniz's Transmutation of Curves as a Critical Experiment Testing the Ability of Formal Languages to Model Geometry.* **David Dennis**, University of Texas at El Paso (962-N1-609)

5:30PM ▶ (1273) *Algebraic curves in a Dynamic Interactive Geometry Environment like Cabri.* **Jean-Marie Laborde**, CNRS and University Joseph Fourier (Grenoble), France (962-N1-1328)

MAA Session on General Contributed Papers, III

1:00 PM – 5:10 PM

Organizers: **Howard L. Penn**, United States Naval Academy
Elizabeth M. Mayfield, Hood College
Jay A. Malmstrom, Oklahoma City Community College
William P Wardlaw, United States Naval Academy

1:00PM ▶ (1274) *A Final Exam Schedule.* **Pascal M Bedrossian**, Christian Brothers University (962-T1-590)

1:15PM ▶ (1275) *Variability of Referee Ratings of Conference Papers.* **Henry M Walker***, Grinnell College, **Weichao Ma**, Boston University, and **Dorene Mboya**, Northeastern University (962-T1-199)

1:30PM ▶ (1276) *Exploring Finite Topologies.* **Jeffrey W Clark**, Elon College (962-T1-258)

1:45PM (1277) *A Canonical Basis for Ohtsuki's Finite Type Invariants of Integral Homology 3-Spheres.* Preliminary report. **Daylene Zielinski**, Bellarmine University (962-T1-617)

2:00PM ▶ (1278) *Palindromic Prime Pyramids.* **Chris K Caldwell***, University of Tennessee, Martin, and **G. L Honaker**, Bristol, Tennessee (962-T1-382)

2:15PM ▶ (1279) *Square-Banded Polygons and Affine Regularity.* **Duane DeTemple*** and **Matthew Hudelson**, Washington State University (962-T1-262)

2:30PM (1280) *Weak Bourbaki Unmixed Rings: A Step Towards Non-Noetherian Cohen-Macaulayness.* Preliminary report. **Tracy D Hamilton**, Western Illinois University (962-T1-365)

2:45PM ▶ (1281) *Root Multiplicities of Kac-Moody Lie Algebras of Indefinite Type.* Preliminary report. **Jennifer M Hontz**, Meredith College (962-T1-482)

3:00PM ▶ (1282) *Generalizing the "Equal Area Zones Property" of the Sphere.* **Jeff Dodd***, Jacksonville State University, and **Vincent Coll**, Ambler, PA (962-T1-352)

3:15PM (1283) *Nondegenerate Rational Approximation.* **Franklin Kemp**, Plano, Texas (962-T1-173)

3:30PM ▶ (1284) *Angular Ratio Transference.* Preliminary report. **James H Mulberry**, Houston, TX (962-T1-169)

3:45PM ▶ (1285) *Asymmetric Binomial Coefficients.* **Bruce E O'Neill**, American University in Cairo (962-T1-376)

4:00PM ▶ (1286) *Unit Step and Impulse Functions in Gene Dynamics.* Preliminary report. **Robert L Fulton*** and **Beth Bradley**, University of Louisville (962-T1-453)

4:15PM (1287) *The Numerical solution of exterior Dirichlet problem for Helmholtz's equation via modified Green's functions approach.* **Yajni M Warnapala-Yehiya***, Roger Williams University, and **Tzu C Lin**, University of Wisconsin-MIlwaukee (962-T1-198)

4:30PM (1288) *The Existence of Solutions of Parabolic Equations with Barrier Boundary Condition.* **Chi-Kan Chen**, University of Central Arkansas (962-T1-166)

4:45PM ▶ (1289) *A Study of Length-biased Distributions and Their Transformations.* **Prashant S Sansgiry** and **Olcay Akman***, Coastal Carolina University (962-T1-357)

5:00PM ▶ (1290) *What Is a Mathematical Entity?* Preliminary report. **Roger A Simons**, Rhode Island College (962-T1-564)

AMS-MAA Joint Panel Discussion

1:00 PM – 2:30 PM

Philosophy of mathematics: That which is of interest to mathematicians.

Organizers: **Joseph Auslander**, University of Maryland
Bonnie Gold, Monmouth University

Panelists: **Chandler David**, University of Toronto
Reuben Hersh, University of New Mexico
Saunders Mac Lane, University of Chicago
Kenneth Manders, University of Pittsburgh

MAA Panel Discussion

1:00 PM – 2:30 PM

Calculus Renewal: Issues for Undergraduate Mathematics Education in the Next Decade.

Organizer: **Susan L. Ganter**, Clemson University

Panelists: **Jack Bookman**, Duke University
Wade Ellis Jr., West Valley College
James H. Lightbourne, III, National Science Foundation
William G. McCallum, University of Arizona

MAA Panel Discussion

1:00 PM – 2:30 PM

Qualities Needed in Department Chairs.

Organizers: **Gerald A. Alexanderson**, Santa Clara University
Catherine M. Murphy, Purdue University Calumet

Panelists: **Keith Devlin**, St. Mary's College
Ronald G. Douglas, Texas A&M University
Anita E. Solow, Randolph-Macon Woman's College

MAA Task Force on Articulation Panel Discussion

1:00 PM – 2:30 PM

Articulation: Is the transition to college mathematics as smooth as we think it is?

Moderator: **Linda Boyd**, Georgia Perimeter College

Organizers: **Sheldon P. Gordon**, SUNY at Farmingdale
Bernard L. Madison, University of Arkansas
Panelists: **Bernard L. Madison**
Lee Jones, College Board
Susan L. Forman, Bronx Community College
Daniel Kennedy, Baylor School

MAA Panel Discussion

1:00 PM – 2:30 PM

Professor for the Future programs in mathematics.
Organizer: **Thomas W. Rishel**, MAA
Panelists: **Amy Cohen-Corwin**, Rutgers University
Luise Charlotte Kappe, Binghamton University
Matthias Kawski, Arizona State University
Kathryn L. Nyman, Cornell University
Eileen T. Shugart, Virginia Polytechnic Institute and State University
Virginia M. Warfield, University of Washington

ASL Invited Address

1:30 PM – 2:20 PM

(1291) *Ramsey's theorem and computability theory: A survey.*
Tamara J. Hummel, Allegheny College

AWM Workshop: Research Talks by Recent Women Ph.D.s, II

2:00 PM – 4:10 PM

2:00PM (1292) *Spectral properties of elliptic layer potentials on non-smooth domains.*
Irina Mitrea, Institute for Advanced Study

2:30PM (1293) *Factorization of formal exponentials and uniformization.*
Katrina Barron, University of California, Santa Cruz

3:00PM (1294) *Hidden Symmetries for a Renormalized Integral of Eisenstein Series.*
Jennifer E. Beineke, Trinity College, Hartford

3:30PM (1295) *The Witten Genus and Equivariant Elliptic Cohomology.*
Maria Basterra, University of Illinois at Urbana-Champaign

4:00PM AWM Workshop closing remarks.

AMS Invited Address

2:15 PM – 3:05 PM

(1296) *Mathematical problems suggested by Analog-to-Digital conversion.*
Ingrid Daubechies, Princeton University (962-94-23)

ASL Invited Address

2:30 PM – 3:20 PM

(1297) *The core model induction.*
John Steel, University of California Berkeley

MAA Open Discussion on Reforming College Algebra

2:45 PM – 4:15 PM

Organizer: **Donald B. Small**, U.S. Military Academy
Panelists: **Della D. Bell**, Texas Southern University
Sarah Bush, Wiley College

MAA Panel Discussion

2:45 PM – 4:15 PM

Mathematics and the mathematical sciences in 2010: What should graduates know?
Organizer: **Thomas R. Berger**, Colby College

MAA Session on Courses and Programs That Illustrate Recommendations of the Mathematical Education of Teachers Document, III

3:00 PM – 4:50 PM

Organizer: **Judith L. Covington**, LSU-Shreveport

3:00PM (1298) *Mathematics for Future Elementary School Teachers in a Core Liberal Arts Program.* Preliminary report.
E. F. Donoghue* and **D. S. Franzblau**, CUNY, College of Staten Island (962-F1-470)

3:30PM ▶ (1299) *A Course in Statistics and Probability that Illustrates the Recommendations of the MET Document.*
Christine A Franklin, University of Georgia (962-F1-574)

4:00PM ▶ (1300) *Course Portfolios for Assessing Learning in an Investigations Based Class.*
Maura A Murray, Salem State College (962-F1-641)

4:30PM ▶ (1301) *Impact of the Missouri Middle Mathematics Project on the Preparation of Prospective Middle School Teachers.*
Ira J Papick*, **John K Beem**, **Barbara J Reys** and **Robert E Reys**, University of Missouri-Columbia (962-F1-15)

MAA Session on The Undergraduate Seminar in Mathematics, II

3:00 PM – 5:10 PM

Organizers: **Barry J. Arnow**, Kean University of New Jersey
George A. Avirappattu, Kean University of New Jersey

3:00PM ▶ (1302) *Banach-Tarski in Senior Seminar.*
William P Abrams, Longwood College (962-I1-308)

3:15PM ▶ (1303) *Keeping Students on Task.* Preliminary report.
Jeremy S Case, Taylor University (962-I1-603)

3:30PM (1304) *Philosophy of Mathematics.*
Alvin White, Harvey Mudd College (962-I1-371)

3:45PM ▶ (1305) *The History of Mathematics as a Seminar.*
Herbert E Kasube, Bradley University (962-I1-303)

4:00PM ▶ (1306) *Undergraduate Seminars in Mathematics at Alma College.*
Aklilu Zeleke, Alma College (962-I1-236)

4:15PM (1307) *Strategies for a Successful Undergraduate Seminar.*
D. S. Franzblau, CUNY, College of Staten Island (962-I1-568)

4:30PM ▶ (1308) *The Senior Mathematics Seminar as a Capstone Experience.*
Janet C. Woodland, University of Arkansas (962-I1-573)

4:45PM ▶ (1309) *A History of Math Course as a Senior Seminar.*
Betty Mayfield, Hood College (962-I1-182)

5:00PM (1310) *Creating a Useful Senior Seminar Experience.*
Robert T Harger, High Point University (962-I1-540)

MAA Session on Innovative Uses of the World Wide Web in Teaching Mathematics, III

3:10 PM – 5:45 PM

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

3:10PM ▶ (1311) *Teaching Upper-level Math Courses in the 21st Century.*
James M Parks, SUNY Potsdam (962-C1-176)

3:30PM ▶ (1312) *Using Applets in Teaching Mathematics.* Preliminary report.
Garrett D Heath, United States Military Academy (962-C1-477)

3:50PM ▶ (1313) *Using the Web to Communicate.*
Richard M Rubin, Christian Brothers University (962-C1-552)

4:10PM ▶ (1314) *Stuck in Traffic in Chicago: A World Wide Web Project.*
Elyn Rykken*, Muhlenberg College, and **Maureen T Carroll**, University of Scranton (962-C1-515)

4:30PM ▶ (1315) *Development of e-tutorials for Remedial Mathematics Courses.*
James M Sobota, Univ Wis - LaCrosse (962-C1-388)

4:50PM ▶ (1316) *Audiographics as a Mathematics Course Delivery System.*
Paul A Sundheim, University of Wisconsin Waukesha (962-C1-1436)

5:30PM (1317) *Using Blackboard CourseInfo 4.0 to Teach Internet Courses in College Algebra, Finite Mathematics, and Mathematics for Elementary School Teachers.*
Ron Tuttle, University of South Carolina Beaufort (962-C1-60)

MAA Minicourse #3: Part B

3:15 PM – 5:15 PM

Teaching contemporary statistics with active learning.

Organizers: **Allan J. Rossman**, Dickinson College
Beth L. Chance, California Polytechnic State University
Robin H. Lock, St. Lawrence University
Mary R. Parker, Austin Community College

AMS Session on Dynamical Systems and Finite Differences

3:30 PM – 4:55 PM

3:30PM (1318) *A criterion for minimality of restrictions of compact minimal Abelian flows.*
Alica Miller, Michigan State University (962-37-141)

3:45PM (1319) *Global Behavior of Solutions of x[n+1] = max A, x[n] / (x[n]x[n-1]).*
Jeffrey Feuer, Coastal Carolina University, **Edward Janowski**, **Gerasimos Ladas**, University of Rhode Island, and **Christopher T Teixeira***, Rhode Island College (962-39-1219)

4:00PM ▶ (1320) *Control problems for the linear Cauchy functional equation.* Preliminary report.
Donald R. Snow, Brigham Young University (962-39-1419)

4:15PM (1321) *Compact Operators and Delay Differential Equations.* Preliminary report.
Jonathan D Bihari, Duke University (962-39-150)

4:30PM (1322) *Asymptotic behavior of solutions of difference adiabatic oscillator.* Preliminary report.
Alexei V Bourd, QUALCOMM Inc. (962-39-780)

4:45PM ▶ (1323) *On Non-homogeneous Cauchy Difference Equations of a Special Type.*
Bruce R Ebanks, Mississippi State University (962-39-713)

MAA Committee on Two-Year Colleges Panel Discussion

3:45 PM – 5:15 PM

Teaching to attract potential teachers.

Moderator: **Jay A. Malmstrom**, Oklahoma City Community College

Organizers: **Mary Robinson**, University of New Mexico-Valencia Campus
Janet P. Ray, Seattle Central Community College
Gary L. Britton, University of Wisconsin Washington County

Panelists: **Joanne Peeples**, El Paso Community College
Patricia Stone, Tomball College
Susan D. Parsons, Cerritos College
Arnold M. Ostebee, St. Olaf College

ASL Special Presentations in Set Theory

4:00 PM – 6:00 PM

AMS Banquet

6:30 PM – 10:00 PM

Lesley M. Sibner
AMS Associate Secretary
Brooklyn, New York

James J. Tattersall
MAA Associate Secretary
Providence, Rhode Island