Program of the Sessions

Tucson, Arizona, November 13–15, 1998

Friday, November 13

Meeting Registration and AMS Book Sale and Exhibit

6:00 PM – 7:00 PM **Lobby, Mathematics**

Invited Address

7:00 PM – 7:50 PM **Room 201, Physics & Atmospheric Sciences**

(1) *Universality of the distribution functions of random matrix theory.*
Craig A. Tracy, University of California, Davis

Welcome Reception

8:00 PM – 10:00 PM **Ventana Room, Marriott University Park**

Saturday, November 14

Meeting Registration and AMS Book Sale and Exhibit

8:00 AM – 5:00 PM **Lobby, Mathematics**

Special Session on Integrable Systems and Random Matrix Theory, I

8:00 AM – 10:45 AM **Room 312, Physics & Atmospheric Sciences**

Organizers: **K. T-R McLaughlin**, University of Arizona
Craig A. Tracy, University of California, Davis

8:00AM (2) *On the asymptotic analysis of the Fredholm determinant related to the time dependent temperature correlation function of the Heisenberg XX0 ferromagnet.* Preliminary report.
Alexander R. Its, Indiana University - Purdue University Indianapolis (938-81-90)

9:00AM (3) *Fredholm determinants,random matrices and integrable perturbations.*
Mark A. Adler, Brandeis University (938-60-52)

10:00AM (4) *Distribution functions for random variables.*
Estelle L. Basor, California Polytechnic State University (938-82-51)

Special Session on Geometry and Lie Groups, I

9:00 AM – 10:50 AM **Room 501, Mathematics**

Organizers: **Samuel R. Evens**, University of Arizona
Jiang-Hua Lu, University of Arizona

9:00AM (5) *A triangularity result for associated varieties of highest weight modules.* Preliminary report.
William M. McGovern, University of Washington (938-17-27)

9:40AM (6) *Singular loci of Schubert varieties in a generalized flag variety.*
James B. Carrell, University of British Columbia (938-14-86)

10:20AM (7) *Patterns, smoothness and rational smoothness of Schubert varieties.*
Sara C. Billey, MIT (938-05-104)

Special Session on Spectral Geometry and Its Applications, I

9:00 AM – 10:50 AM **Room 402, Mathematics**

Organizers: **Xianzhe Dai**, University of Southern California
Leonid Friedlander, University of Arizona

9:00AM (8) *Singular Sturm-Liouville theory.*
Rafe Mazzeo*, Stanford University, and **Robert McOwen**, Northeastern University (938-58-19)

9:40AM (9) *Analytic torsion and R-torsion for manifolds with boundary.*
Xianzhe Dai*, UCSB and USC, and **Hao Fang**, Princeton University (938-58-121)

10:20AM (10) *Spectrum of complete noncompact manifolds.*
Jiaping Wang, Cornell University (938-58-15)

The time limit for each contributed paper in the sessions is ten minutes. 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 19, Issue 4 of *Abstracts of papers presented to the American Mathematical Society*, ordered according to the numbers in parentheses following the listings. The middle two digits, e.g., 897-**20**-1136, refer to the Mathematical Reviews subject classification assigned by the individual author. Groups of papers for each subject are listed chronologically in the *Abstracts*. The last one to four digits, e.g., 897-20-**1136**, refer to the receipt number of the abstract; abstracts are further sorted by the receipt number within each classification.

Special Session on Mathematics and Biology, I

9:00 AM – 10:50 AM **Room 220, Physics & Atmospheric Sciences**

Organizers: **Jim Cushing**, University of Arizona
Shandelle M. Henson, University of Arizona

9:00AM ▸ (11) *Hamiltonian limits and subharmonic resonance in ecological models: I. From the pendulum ....* **William M. Schaffer***, University of Arizona, and **Aaron A. King**, University of Arizona (938-92-75)

9:30AM ▸ (12) *Hamiltonian limits and subharmonic resonance in ecological models: II. ... to the lynx and the hare.* **Aaron A. King***, University of Arizona, and **William M. Schaffer**, University of Arizona (938-92-76)

10:00AM (13) *Variations on the complex formation approach in modeling predator prey relations, mating, and sexual disease transmission.* **Horst R. Thieme*** and **Jinling Yang**, Arizona State University (938-92-37)

10:30AM ▸ (14) *How to construct better high-dimensional population models.* Preliminary report. **Yang Kuang**, ASU (938-92-33)

Special Session on Classical and Quantum Mechanical Lattice Spin Systems, I

9:00 AM – 10:40 AM **Room 237, Bio Sciences West**

Organizer: **Tom Kennedy**, University of Arizona

9:00AM (15) *Non-mean-field behavior in finite-dimensional spin glasses.* **Charles M. Newman**, New York University, and **Daniel L. Stein***, University of Arizona (938-82-41)

9:35AM (16) *Phase structure of a lattice model of flux lines.* **Christian Borgs**, **Jennifer T. Chayes***, Microsoft Research, **Christopher King**, Northeastern University, and **Neal Madras**, York University (938-82-138)

10:10AM (17) *Edge states of quantum spin chains.* Preliminary report. **Bruno L. Nachtergaele**, University of California, Davis (938-82-105)

Special Session on Dynamical Systems, I

9:00 AM – 10:50 AM **Room 208, Bio Sciences West**

Organizers: **Marek Rychlik**, University of Arizona
Maciej P. Wojtkowski, University of Arizona

9:00AM (18) *Bootstrap estimates of chaotic dynamics.* **Eric Kostelich**, Arizona State University (938-58-44)

9:30AM (19) *Understanding renormalization.* **Ricardo Perez-Marco**, UCLA (938-30-47)

10:00AM (20) *The spectra of nonnegative integer matrices via formal power series.* **Ormes S. Nicholas***, University of Texas, **Ki H. Kim** and **Fred W. Roush**, Alabama State University (938-15-30)

10:30AM (21) *Rational attractors and irrational continua for maps in the Lozi family.* **Chris Cleveland**, Adjunct (938-58-22)

Special Session on Arithmetic Algebraic Geometry, I

9:00 AM – 10:50 AM **Room 219, Bio Sciences West**

Organizer: **Douglas Ulmer**, University of Arizona

9:00AM (22) *Low-degree points on curves: A worked example.* Preliminary report. **Joseph L. Wetherell**, University of Southern California (938-11-125)

9:30AM (23) *Arithmetic of some curves of high genus.* **Pavlos Tzermias**, University of Arizona (938-11-89)

10:00AM (24) *Jacobians of genus one curves.* **Sang Yook An**, **Seog Young Kim**, **David C. Marshall***, **Susan H. Marshall**, **William G. McCallum** and **Alexander R. Perlis**, The University of Arizona (938-14-134)

10:30AM (25) *Jacobians of genus one curves.* **Catherine H. O'Neil**, Harvard University (938-11-83)

Special Session on Filaments, Interfaces and Patterns, I

9:00 AM – 10:40 AM **Room 224, Physics & Atmospheric Sciences**

Organizers: **Nicholas Ercolani**, University of Arizona
Jerry Moloney, University of Arizona

9:00AM (26) *Phase field theories and material interfaces.* **Chaim Charach**, Ben-Gurion University, and **Paul C. Fife***, University of Utah (938-82-57)

9:30AM (27) *Boundary homogenization of kinetic and fluid models for thin film deposition.* **Christian A. Ringhofer**, Arizona State University (938-70-131)

10:15AM (28) *Atomistic, continuum and bulk models for epitaxial growth.* Preliminary report. **Russel E. Caflisch**, UCLA (938-82-78)

Special Session on Striking the Balance: Theory, Technique, and Applications in Lower Division Mathematics Courses, I

9:00 AM – 10:50 AM **Room 242E, Shantz**

Organizer: **Joseph Watkins**, University of Arizona

9:30AM ▸ (29) *A non-radical version of 'calculus reform'.* Preliminary report. **Neal Koblitz**, University of Washington (938-98-09)

10:00AM ▸ (30) *Balancing theory and applications in multivariable calculus.* Preliminary report. **William G. McCallum**, University of Arizona (938-98-115)

10:30AM ▸ (31) *Stirling's approximation for $\ln(n!)$: An elementary proof and applications.* Preliminary report. **Keith A. Brandt*** and **Anton S. Wallner**, Missouri Western State College (938-98-21)

Invited Address

11:15 AM – 12:05 PM **Room 201, Physics & Atmospheric Sciences**

▸ (32) *Poisson geometry and some applications.* **Jiang-Hua Lu**, University of Arizona (938-53-137)

Invited Address

1:30 PM – 2:20 PM **Room 201, Physics & Atmospheric Sciences**

(33) *On the asymptotic speed of a stochastic invasion.* **Mark A. Lewis**, University of Utah (938-60-140)

Special Session on Groups and Computation

3:00 PM – 4:20 PM **Room 404, Physics & Atmospheric Sciences**

Organizer: **Robert M. Beals**, University of Arizona

3:00PM (34) *Algorithms in representation theory.* Preliminary report.
Klaus M. Lux, University of Arizona (938-20-127)

3:30PM (35) *Algorithms for matrix groups over number fields.*
Robert M. Beals, University of Arizona (938-20-130)

4:00PM Discussion

Special Session on Geometry and Lie Groups, II

3:00 PM – 6:10 PM **Room 501, Mathematics**

Organizers: **Samuel R. Evens**, University of Arizona
Jiang-Hua Lu, University of Arizona

3:00PM (36) *Invariant theory and entanglement in quantum computing.* Preliminary report.
David Meyer and **Nolan Wallach***, University of California, San Diego (938-22-94)

3:40PM (37) *Representations and deformations of Lie bialgebroid.*
Arkady Vaintrob, New Mexico State University (938-53-107)

4:20PM (38) *Poisson brackets on projective spaces and trilinear forms.* Preliminary report.
Alexander Polishchuk, Harvard University (938-14-60)

5:00PM (39) *Moduli of polygons and n-pointed projective lines.* Preliminary report.
Philip A. Foth, Northwestern University, University of Arizona (938-14-61)

5:40PM (40) *Compact weakly symmetric spaces and spherical pairs.*
Hieu D. Nguyen, Rowan University (938-53-11)

Special Session on Spectral Geometry and Its Applications, II

3:00 PM – 4:50 PM **Room 402, Mathematics**

Organizers: **Xianzhe Dai**, University of Southern California
Leonid Friedlander, University of Arizona

3:00PM (41) *Inverse scattering problems in two-dimensional anisotropic media.*
Gregory Eskin* and **James V. Ralston**, UCLA (938-35-20)

3:40PM (42) *An invariant of the smooth structure related to the first eigenvalue of the Laplacian.*
Leonid Friedlander*, University of Arizona, and **Nikolai Nadirashvili**, University of Chicago (938-35-99)

4:20PM (43) *On the small-scale mass concentration of modes.* Preliminary report.
John A. Toth, McGill University (938-35-12)

Special Session on Mathematics and Biology, II

3:00 PM – 5:50 PM **Room 220, Physics & Atmospheric Sciences**

Organizers: **Jim Cushing**, University of Arizona
Shandelle M. Henson, University of Arizona

3:00PM (44) *Consistency and fluctuation theorems for discrete time structured population models having demographic stochasticity.*
Joseph C. Watkins, University of Arizona (938-92-56)

3:30PM (45) *From individuals to population dynamics: A method and an example.*
Wade Leitner, University of Arizona (938-60-96)

4:00PM (46) *A stochastic continuous-time age-structured population model.* Preliminary report.
Edward J. Allen* and **Maruful Chowdhury**, Texas Tech University (938-92-10)

4:30PM ▸ (47) *Estimating mean time to extinction: An overview of some popular methods.* Preliminary report.
Kevin R. Anderson*, Institute for Mathematics and Its Applications, and **Wade Leitner**, (938-92-31)

5:00PM ▸ (48) *A model of the population dynamics and coevolution of mutualisms.* Preliminary report.
Brian J. McGill, University of Arizona (938-92-123)

5:30PM ▸ (49) *Temperature based growth/mortality model for the Mountain Pine Beetle.* Preliminary report.
Peter W. White, Tarleton State University (938-92-66)

Special Session on Classical and Quantum Mechanical Lattice Spin Systems, II

3:00 PM – 5:15 PM **Room 237, Bio Sciences West**

Organizer: **Tom Kennedy**, University of Arizona

3:00PM (50) *Hyperscaling in percolation.*
Christian Borgs*, **Jennifer T. Chayes**, Microsoft Research, **Harry Kesten**, Cornell University, and **Joel Spencer**, New York University (938-82-139)

3:35PM (51) *Power-law corrections to exponential decay of connectivities and correlations.*
Kenneth S. Alexander, University of Southern California (938-60-102)

4:10PM (52) *Surprises in the hydrodynamics of driven lattice gases.*
Gregory Eyink, University of Arizona (938-70-117)

4:45PM (53) *Status of the two dimensional nonlinear Sigma models.*
Adrian Patrascioiu*, University of Arizona, and **Erhard Seiler**, Max Planck Institut fuer Physik (938-82-129)

Special Session on Dynamical Systems, II

3:00 PM – 5:50 PM **Room 208, Bio Sciences West**

Organizers: **Marek Rychlik**, University of Arizona
Maciej P. Wojtkowski, University of Arizona

3:00PM (54) *Multi-dimensional piecewise smooth expanding maps.*
William J. Cowieson, UCLA (938-58-48)

3:30PM (55) *Dynamics of Anosov diffeomorphisms with small holes.*
Nikolai Chernov, University of Alabama at Birmingham (938-58-50)

4:00PM (56) *Distribution of return times for rational maps.*
Nicolai T. A. Haydn, University of Southern California (938-58-55)

4:30PM ▸ (57) *On the Kolmogorov-Sinai entropy of the Chirikov Standard map.* Preliminary report.
Oliver R. Knill, University of Texas (938-58-54)

5:00PM (58) *Chaotic billiards on surfaces of constant curvature.*
Eugene Gutkin, USC (938-58-28)

5:30PM Discussion

Special Session on Arithmetic Algebraic Geometry, II

3:00 PM – 4:50 PM **Room 219, Bio Sciences West**

Organizer: **Douglas Ulmer**, University of Arizona

3:00PM (59) *The central derivative of certain Hecke series.* Preliminary report.
Tonghai Yang, SUNY at Stony Brook (938-11-88)

3:30PM (60) *Stark–type Conjectures "over $\mathbb{Z}$".* Preliminary report.
Cristian D. Popescu, University of Texas at Austin (938-11-64)

4:00PM (61) *Isogeny covariant differential modular forms.* Preliminary report.
Chris M. Hurlburt, University of New Mexico (938-14-40)

4:30PM (62) *Moduli of vector bundles on curves in characteristic $p > 0$.* Preliminary report.
Kirti Joshi and **Eugene Z. Xia***, University of Arizona (938-14-38)

Special Session on Filaments, Interfaces and Patterns, II

3:00 PM – 5:40 PM **Room 224, Physics & Atmospheric Sciences**

Organizers: **Nicholas Ercolani**, University of Arizona
Jerry Moloney, University of Arizona

3:00PM (63) *Modelling bioconvection patterns produced by swimming bacteria.*
Joceline C. Lega* and **Neil H. Mendelson**, University of Arizona (938-92-108)

3:30PM (64) *Convolution based methods for cellular automata models.*
Steven J. Ruuth*, **Barry Merriman** and **Stanley Osher**, UCLA (938-65-118)

4:00PM (65) *Dynamics of axial separation in long rotating drums.*
Igor S. Aranson, Argonne National Laboratory, and **Lev S. Tsimring***, University of California, San Diego (938-35-85)

4:45PM (66) *The stability of waves for modulation equations.*
Todd M. Kapitula, University of New Mexico (938-35-95)

5:15PM (67) *Singularities and defects in patterns far from threshold.*
Nicholas M. Ercolani*, **Robert Indik**, University of Arizona, **Alan C. Newell**, University of Warwick, and **Thierry Passot**, CNRS (938-35-110)

Special Session on Striking the Balance: Theory, Technique, and Applications in Lower Division Mathematics Courses, II

3:00 PM – 5:20 PM **Room 242E, Shantz**

Organizer: **Joseph Watkins**, University of Arizona

3:00PM ▸ (68) *Encouraging effective change within an atmosphere of flexibility.* Preliminary report.
John W. Hagood, Northern Arizona University (938-98-100)

3:30PM (69) *Within the balance, a tilt toward applications.*
Lynne B. Small, University of San Diego (938-98-81)

4:00PM (70) *Where will the applications be coming from?* Preliminary report.
Brad G. Osgood, Stanford University (938-98-18)

4:30PM ▸ (71) *The balance - a moving target: Experiences from 5 years teaching in an integrated engineering curriculum.*
Matthias Kawski, ASU (938-98-112)

5:00PM Discussion

Special Session on Integrable Systems and Random Matrix Theory, II

3:00 PM – 5:45 PM **Room 312, Physics & Atmospheric Sciences**

Organizers: **K. T-R McLaughlin**, University of Arizona
Craig A. Tracy, University of California, Davis

3:00PM (72) *An electrostatics model for zeros og general orthogonal polynomials.*
Mourad E.H. Ismail, University of South Florida (938-33-07)

4:00PM (73) *Statistics at the edge of the spectrum of Wigner random matrices.*
Yakov G. Sinai, Princeton University, and **Alexander B. Soshnikov***, California Institute of Technology (938-60-08)

5:00PM (74) *Determinantal formulas for the correlation functions and the infinite symmetric group.*
Alexei Borodin*, University of Pennsylvania, and **Grigori Olshanski**, Institute for Problems of Information Transmission (938-60-39)

Session for Contributed Papers

4:15 PM – 5:25 PM **Room 210, Bio Sciences West**

4:15PM (75) *Selected tessellations and the nature of the Schaffli numbers.*
C. S. Felicitas, Pan Asian Congress of Mathematicians (American and New York Branch) (938-14-01)

4:30PM (76) *Mathematics basic skills for the first three grades.* Preliminary report.
Abdullah Alharbey, King Abdulaziz University (938-96-06)

4:45PM ▸ (77) *Kernel inspired factorizations of partial differential operators.*
Alex Kasman, MSRI (938-35-29)

5:00PM ▸ (78) *The conditional empirical distribution as a decision making tool.* Preliminary report.
Rod A. Freed, California State University, Dominguez Hills (938-00-92)

5:15PM (79) *Generalized functions and approximate solutions to the abstract Cauchy problem.* Preliminary report.
Boris Baeumer, University of Nevada, Reno (938-44-109)

Sunday, November 15

Meeting Registration and AMS Book Sale and Exhibit

8:00 AM – NOON **Lobby, Mathematics**

Special Session on Integrable Systems and Random Matrix Theory, III

8:00 AM – 10:45 AM **Room 312, Physics & Atmospheric Sciences**

Organizers: **K. T-R McLaughlin**, University of Arizona
Craig A. Tracy, University of California, Davis

8:00AM ▸ (80) *Scaling limits for correlations between zeros of random polynomials.*
Pavel M. Bleher, IUPUI (938-60-23)

9:00AM (81) *On the distribution of the length of the longest increasing subsequence of random permutations.* **Jinho Baik**, **Percy A. Deift***, Courant Institute, and **Kurt Johansson**, Royal Institute of Technology (938-05-68)

10:00AM (82) *Zeros of the Jimbo, Miwa, Ueno tau function.* **John N. Palmer**, University of Arizona (938-34-43)

Special Session on Mathematics and Biology, III

8:30 AM – 10:50 AM **Room 220, Physics & Atmospheric Sciences**

Organizers: **Jim Cushing**, University of Arizona
Shandelle M. Henson, University of Arizona

8:30AM (83) *A mathematical model of microbial growth and competition in a plug flow reactor: A model of the gut.* **Hal L. Smith**, Arizona State University (938-92-49)

9:00AM ▸ (84) *Temporal and spatial synchronization in microbial ecology.* **Frank C. Hoppensteadt**, ASU (938-92-62)

9:30AM ▸ (85) *Differentiability and species coexistence.* Preliminary report. **Frederick R. Adler**, AMS (938-92-59)

10:00AM (86) *The dynamics of a simple food chain.* **Sophia R.-J. Jang**, Texas Tech University (938-92-101)

10:30AM (87) *A dynamical system modeling meristematic plant developement and reproducing the observed phyllotactic patterns.* Preliminary report. **Pau Atela**, **Christophe Gole**, Smith College, and **Scott Hotton***, University of California, Santa Cruz (938-92-106)

Special Session on Classical and Quantum Mechanical Lattice Spin Systems, III

8:30 AM – 10:45 AM **Room 237, Bio Sciences West**

Organizer: **Tom Kennedy**, University of Arizona

8:30AM (88) *Central limit theorem for stochastic Hamilton-Jacobi equations.* Preliminary report. **Fraydoun Rezakhanlou**, Associate Professor (938-35-82)

9:05AM (89) *Nonlinear wave equations with randomness.* **Jan Wehr**, University of Arizona (938-60-116)

9:40AM (90) *Localization of classical waves: A general framework.* **Andrew J. Koines*** and **Abel Klein**, University of California, Irvine (938-78-122)

10:15AM (91) *Generalized eigenfunction expansion of second order partial differential operators defined by quadratic forms.* Preliminary report. **Abel Klein** and **Maximilian Seifert***, University of California, Irvine (938-47-136)

Special Session on Geometry and Lie Groups, III

9:00 AM – 10:50 AM **Room 501, Mathematics**

Organizers: **Samuel R. Evens**, University of Arizona
Jiang-Hua Lu, University of Arizona

9:00AM (92) *Gauge equivalence of Poisson structures.* Preliminary report. **Alan Weinstein**, University of California, Berkeley (938-58-58)

9:40AM (93) *Groupoid and the integration of Lie algebroids.* **Victor Nistor**, Penn State (938-58-26)

10:20AM (94) *Braid representations and exceptional Lie groups.* Preliminary report. **Hans Wenzl*** and **Imre Tuba**, UC San Diego (938-22-70)

Special Session on Spectral Geometry and Its Applications, III

9:00 AM – 10:50 AM **Room 402, Mathematics**

Organizers: **Xianzhe Dai**, University of Southern California
Leonid Friedlander, University of Arizona

9:00AM ▸ (95) *Berstein-type theorem for Lagrangian stationary surfaces.* **Chikako Mese**, University of Southern California (938-53-16)

9:40AM (96) *Poisson problems, diffusions, and comparison theorems for complete Riemannian manifolds.* Preliminary report. **Patrick T. McDonald**, New College of USF (938-58-111)

10:20AM (97) *Ginzburg-Landau vortice and Mandelstam Diagram.* Preliminary report. **Jie Qing**, UCSC (938-58-17)

Special Session on Dynamical Systems, III

9:00 AM – 10:50 AM **Room 208, Bio Sciences West**

Organizers: **Marek Rychlik**, University of Arizona
Maciej P. Wojtkowski, University of Arizona

9:00AM (98) *Fast singular oscillating limits of 3D Euler-Boussinesq equations.* **Alex Mahalov***, Arizona State University, **Anatoli Babin**, UC Irvine, and MIIT, Moscow, and **Basil Nicolaenko**, Arizona State University (938-58-46)

9:30AM (99) *Exponential attractors and finite dimensional inertial dynamical systems for Navier-Stokes and general dissipative equations.* **Basil Nicolaenko**, Arizona State University (938-58-45)

10:00AM (100) *The Hill's region of the four-body problem.* **Quidong Wang**, UCLA (938-58-25)

10:30AM (101) *The horseshoe: Pruning and homoclinic families.* **Andre S. de Carvalho***, IMS - SUNY at Stony Brook, and **Toby Hall**, University of Liverpool (938-58-42)

Special Session on Arithmetic Algebraic Geometry, III

9:00 AM – 10:50 AM **Room 219, Bio Sciences West**

Organizer: **Douglas Ulmer**, University of Arizona

9:00AM (102) *The parameters of trace codes from curves over rings.* **Felipe Voloch**, University of Texas, and **Judy L. Walker***, University of Nebraska (938-11-77)

9:30AM (103) *Improved bounds for the number of rational points on curves over finite fields.* **Kristin E. Lauter**, University of Michigan (938-11-69)

10:00AM (104) *Trigonal modular curves.* Preliminary report. **Matthew H. Baker**, UC Berkeley (938-11-53)

10:30AM (105) *On a conjecture of Fontaine and Mazur.* **Yihsiang Liow**, University of Arizona (938-14-143)

Special Session on Filaments, Interfaces and Patterns, III

9:00 AM – 10:40 AM **Room 224, Physics & Atmospheric Sciences**

Organizers: **Nicholas Ercolani**, University of Arizona
Jerry Moloney, University of Arizona

9:00AM (106) *Spectra, multi-phase solutions of vortex filament flow, and knot types.* Preliminary report.
Annalisa M. Calini*, College of Charleston, and **Thomas A. Ivey**, Ball State University (938-35-80)

9:30AM ▸ (107) *Pulses, fronts and oscillations of an elastic rod.*
Alain Goriely*, Dept of Mathematics, and **Joceline Lega**, Department of Mathematics (938-73-65)

10:15AM (108) *Viscous nonlinear dynamics of twist and writhe.*
Raymond E. Goldstein, University of Arizona (938-35-36)

Special Session on Striking the Balance: Theory, Technique, and Applications in Lower Division Mathematics Courses, III

9:00 AM – 10:50 AM **Room 242E, Shantz**

Organizer: **Joseph Watkins**, University of Arizona

9:00AM ▸ (109) *Applications inspire student confidence.* Preliminary report.
Simon J. Bernau*, Cal Poly Pomona, and **Nancy C. Marcus**, University of Texas at El Paso (938-98-13)

9:30AM ▸ (110) *Modular pre calculus and clustering: Evolution of a successful program.* Preliminary report.
Simon J. Bernau, Cal Poly Pomona, and **Nancy C. Marcus***, University of Texas at El Paso (938-98-14)

10:00AM ▸ (111) *An introductory modeling course for non-science majors: Using Mathematica to convey mathematical concepts.*
Silvia P. Heubach, California State University Los Angeles (938-98-79)

10:30AM Discussion

Invited Address

11:15 AM – 12:05 PM **Room 201, Physics & Atmospheric Sciences**

(112) *Differential algebraic geometry and derivatives of integers.* Preliminary report.
Alexandru Buium, Univ of Illinois (938-14-35)

Invited Address

1:30 PM – 2:20 PM **Room 201, Physics & Atmospheric Sciences**

(113) *Renormalization group methods in Hamiltonian dynamics.*
Hans A. Koch, The University of Texas at Austin (938-70-103)

Special Session on Dynamical Systems

3:00 PM – 4:50 PM **Room 208, Bio Sciences West**

Organizers: **Marek Rychlik**, University of Arizona
Maciej P. Wojtkowski, University of Arizona

3:00PM ▸ (114) *Abundance of piecewise isometries with self-similar structure in dimension one and two.*
Arek Goetz, Boston University (938-58-133)

3:30PM (115) *Positive stretch and rigidity for group actions and foliations.*
Alberto Candel*, Caltech, and **Raul Quiroga-Barranco**, Cinvestav (938-53-126)

4:00PM (116) *Several examples of multi-valued dynamics.*
Marek R. Rychlik, University of Arizona (938-58-132)

4:30PM (117) *Magnetic flows and Gaussian thermostats.* Preliminary report.
Maciej P. Wojtkowski, University of Arizona (938-58-114)

Special Session on Arithmetic Algebraic Geometry, IV

3:00 PM – 4:50 PM **Room 219, Bio Sciences West**

Organizer: **Douglas Ulmer**, University of Arizona

3:00PM (118) *Arithmetic Schubert calculus.*
Harry Tamvakis, University of Pennsylvania (938-14-120)

3:30PM (119) *Deformations of large fundamental groups.*
Bruno N. De Oliveira*, Lecturer of Mathematics, and **Ludmil Katzarkov**, Assistant Professor (938-14-93)

4:00PM (120) *Algebraic cycles and arithmetic on degenerations.*
Caterina Consani, Massachusetts Institute of Technology (938-14-84)

4:30PM (121) *On Frobenius splittings and ordinary varieties.*
Kirti Joshi, University of Arizona (938-14-142)

Special Session on Filaments, Interfaces and Patterns, IV

3:00 PM – 5:40 PM **Room 224, Physics & Atmospheric Sciences**

Organizers: **Nicholas Ercolani**, University of Arizona
Jerry Moloney, University of Arizona

3:00PM (122) *A generalized level set method for computing the motion of filaments and objects of any codimension.* Preliminary report.
Li-Tien Cheng, **Paul Burchard**, **Barry Merriman***, **Stanley J. Osher** and **Steven J. Ruuth**, UCLA (938-65-128)

3:30PM (123) *A diffusion-generated approach to the curvature motion of filaments.* Preliminary report.
Steven J. Ruuth, **Barry Merriman**, University of California, Los Angeles, **Jack Xin**, University of Arizona, and **Stanley Osher***, University of California, Los Angeles (938-65-32)

4:00PM (124) *Dynamics of the geodynamo.*
Dieter Armbruster, Arizona State University (938-86-119)

4:45PM (125) *Average dynamics of the optical soliton in communication lines with dispersion management.*
Alejandro B. Aceves*, University of New Mexico, **C.K.R.T. Jones**, **Vadim Zharnitsky**, Brown University, and **Sergei K. Turitsyn**, University of Dusseldorf (938-78-97)

5:15PM (126) *Role of the critical collapse singularity in sustaining a novel femtosecond light guide.* Preliminary report.
Jerry V. Moloney, University of Arizona (938-78-135)

Special Session on Striking the Balance: Theory, Technique, and Applications in Lower Division Mathematics Courses, IV

3:00 PM – 4:50 PM **Room 242E, Shantz**

Organizer: **Joseph Watkins**, University of Arizona

3:00PM ▸ (127) *Institutional support for faculty members involved in teacher preparation and outreach.*
David Gay, University of Arizona (938-98-98)

3:30PM ▸ (128) *High standards: What are they and how do we achieve them?*
Deborah Hughes Hallett, University of Arizona (938-98-113)

4:00PM ▸ (129) *Providing challenges, interest, and comfort for incoming AP students.*
David O. Lomen, University of Arizona (938-98-63)

4:30PM Discussion

Bernard Russo
Associate Secretary
Irvine, California