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# Program of the Sessions

*Albuquerque, New Mexico, October 16–17, 2004*

## Saturday, October 16

### Meeting Registration

7:30 AM – 4:00 PM                      Atrium, Dana Smith Hall

### AMS Exhibit and Book Sale

7:30 AM – 4:00 PM                      Atrium, Dana Smith Hall

### Special Session on Regularity in PDEs and Harmonic Analysis, I

8:00 AM – 10:50 AM                      Room 325, Dana Smith Hall

Organizers: **Marianne Korten**, Kansas State University  
**Charles Nelson Moore**, Kansas State University  
**Maria C. Pereyra**, University of New Mexico

- 8:00AM (1) *Boundedness of bilinear pseudodifferential operators on Lebesgue and Sobolev spaces.*  
**Árpád Bényi\***, **Andrea Nahmod**, University of Massachusetts, and **Rodolfo H. Torres**, University of Kansas (1000-42-78)
- 8:30AM (2) *Limiting weak-type behavior of maximal functions on singular measures.* Preliminary report.  
**Prabhu Janakiraman**, University of Illinois, Urbana-Champaign (1000-42-130)
- 9:00AM (3) *"Reconstruction of convex bodies of revolution from the areas of their Shadows".*  
**Dmitry Ryabogin**, Kansas State University (1000-52-120)
- 9:30AM (4) *Local Hardy spaces and nonhomogeneous div-curl lemmas.*  
**Galia D. Dafni**, Concordia University (1000-42-62)

- 10:00AM (5) *Weighted inequalities for gradients on non-smooth domains.*  
**Caroline Sweezy\***, Department of Mathematical Sciences, New Mexico State University, and **J. Michael Wilson**, Department of Mathematics, University of Vermont (1000-35-47)
- 10:30AM (6) *Carleson measures and elliptic operators.*  
**Steven C. Hofmann**, University of Missouri (1000-42-151)

### Special Session on Braids and Knots, I

8:00 AM – 10:50 AM                      Room 127, Dana Smith Hall

Organizer: **Theodore Stanford**, New Mexico State University

- 8:00AM (7) *A Self-Linking Invariant of Virtual Knots.* Preliminary report.  
**Louis H. Kauffman**, University of Illinois at Chicago (1000-57-191)
- 8:30AM (8) *Khovanov Homology and Skein Modules.* Preliminary report.  
**Adam S. Sikora\***, SUNY Buffalo, **Marta M. Asaeda**, University of Iowa, and **Jozef H. Przytycki**, GWU (1000-57-187)
- 9:00AM (9) *Kauffman-Harary Conjecture for Montesinos links and closed 3-braids.*  
**Jozef H Przytycki\***, George Washington University, **Marta M Asaeda**, University of Iowa, and **Adam S Sikora**, SUNY at Buffalo (1000-57-97)
- 9:30AM (10) *Topology of knot spaces.*  
**Ryan D Budney**, Department of Mathematics, University of Oregon (1000-57-126)
- 10:00AM (11) *Spanning trees and Khovanov homology.* Preliminary report.  
**Abhijit Champanerkar**, University of South Alabama, **Ilya Kofman\***, Barnard College, Columbia University, and **Oleg Viro**, Uppsala University (1000-57-171)

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 25, 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.

- 10:30AM (12) *Mahler measure of Jones Polynomials under twisting.*  
**Abhijit Champanerkar\***, University of South Alabama, and **Ilya Kofman**, Barnard College, Columbia University (1000-57-165)

**Special Session on Probabilistic and Geometric Methods in Learning Theory, I**

8:00 AM – 10:40 AM Room 228, Dana Smith Hall

- Organizer: **Vladimir Koltchinskii**, University of New Mexico
- 8:00AM (13) *An empirical central limit theorem for pre-Gaussian classes of functions.* Preliminary report.  
**Shahar Mendelson**, Australian National University, and **Joel Zinn\***, TX (1000-60-114)
- 9:00AM (14) *Vapnik-Chervonenkis combinatorics of real-valued classes of functions: entropy and empirical processes.*  
**Roman Vershynin**, University of California, Davis (1000-60-82)
- 10:00AM (15) *Free energy in the generalized Sherrington-Kirkpatrick model.*  
**Dmitry Panchenko**, Massachusetts Institute of Technology (1000-60-57)

**Special Session on Mathematics for Secondary Teachers: Curriculum and Assessment, I**

8:00 AM – 10:40 AM Room 333, Dana Smith Hall

- Organizers: **Adriana Aceves**, University of New Mexico  
**Kristin Umland**, University of New Mexico
- 8:00AM (16) *Content Is Important, But ...*  
**Timothy J Middleton**, University of New Mexico and Bosque School (1000-97-183)
- 9:00AM Discussion
- 10:00AM (17) *Mathematics for Secondary School Teachers: Basics, Connections, and Extensions.* Preliminary report.  
**Ralph J. Bremigan\***, **Elizabeth George Bremigan** and **John D. Lorch**, Ball State University (1000-97-21)

**Special Session on Several Complex Variables and CR Geometry, I**

8:00 AM – 10:40 AM Room 327, Dana Smith Hall

- Organizers: **Peter Ebenfelt**, University of California San Diego  
**Marshall A. Whittlesey**, California State University, San Marcos
- 8:00AM (18) *A new compactness property in the theory of the  $\bar{\partial}$ -Neumann problem.* Preliminary report.  
**Emil J. Straube**, Texas A&M University (1000-32-93)
- 9:00AM (19) *Algebraic aspects of solutions of the Dirichlet problem.*  
**Peter Ebenfelt**, University of California at San Diego, La Jolla, **Dmitry Khavinson\***, University of Arkansas, and **Harold S. Shapiro**, Royal Institute of Technology (1000-35-26)
- 10:00AM (20) *Invariant CR Mappings.*  
**John P. D'Angelo**, University of Illinois at Urbana-Champaign (1000-32-54)

**Special Session on Financial Mathematics: The Mathematics of Derivative Securities, I**

8:00 AM – 10:40 AM Room 224, Dana Smith Hall

- Organizers: **Maria Cristina Mariani**, New Mexico State University  
**Oswaldo Mendez**, University of Texas at El Paso
- 8:00AM (21) *The method of upper and lower solutions for a generalized Black and Scholes equation.*  
**Pablo Amster**, Universidad de Buenos Aires (1000-35-27)
- 9:00AM (22) *Extending the Universality of the Heath-Jarrow-Morton Model.*  
**Dwight Grant** and **Gautam Vora\***, University of New Mexico (1000-91-115)
- 10:00AM (23) *Conjugate Duality in Pricing, Hedging, and Portfolio Optimization.* Preliminary report.  
**Jeremy Staum**, Northwestern University (1000-90-101)

**Special Session on Categories and Operads in Topology, Geometry, Physics and Other Applications, I**

8:00 AM – 10:50 AM Room 128, Dana Smith Hall

- Organizers: **Hanna Ewa Makaruk**, Los Alamos National Laboratory  
**Robert Michal Owczarek**, Los Alamos National Laboratory  
**Zbigniew Oziewicz**, Universidad Nacional Autónoma de México
- 8:00AM (24) *Categorification of the Kauffman bracket skein module of  $F \times I$ .*  
**Jozef H Przytycki\***, George Washington University, **Marta M Asaeda**, University of Iowa, and **Adam S Sikora**, SUNY at Buffalo (1000-57-48)
- 9:00AM (25) *Asymptotics of the Turaev-Viro invariant of 3-manifolds.* Preliminary report.  
**Charles Frohman**, University of Iowa, and **Joanna Kania-Bartoszyńska\***, Boise State University / National Science Foundation (1000-57-156)
- 9:30AM (26) *Frobenius operad.* Preliminary report.  
**Zbigniew Oziewicz**, Universidad Nacional Autónoma de México, Facultad de Estudios Superiores Cuautitlan (1000-18-169)
- 10:00AM (27) *Causal sites as a foundation for quantum gravity.*  
**Louis Crane\***, Mathematics Department, Kansas State University, and **Dan Christensen**, Mathematics Department, University of western Ontario (1000-83-37)
- 10:30AM (28) *Is there a relationship between geometry of complex networks and the 1/f noise?* Preliminary report.  
**Robert M. Owczarek**, Jemez Springs, NM (1000-52-137)

**Special Session on Spectral Geometry, I**

8:00 AM – 10:40 AM Room 326, Dana Smith Hall

- Organizers: **Ivan G. Avramidi**, New Mexico Institute of Mining and Technology  
**Thomas Patrick Branson**, University of Iowa
- 8:00AM (29) *The Robin Boundary Condition: A Technique and Spectral Consequences.*  
**Stephen A. Fulling**, Texas A&M University (1000-35-49)

- 8:30AM (30) *The Segal-Bargmann transform for noncompact symmetric spaces.*  
**Brian C. Hall**, Notre Dame University, and **Jeffrey J. Mitchell\***, Robert Morris University (1000-53-119)
- 9:00AM (31) *On the renormalized volume of conformally compact Einstein manifolds.* Preliminary report.  
**Alice Chang**, Princeton University, **Jie Qing\***, UC Santa Cruz, and **Paul Yang**, Princeton University (1000-53-161)
- 10:00AM (32) *Scaling and asymptotics of heat operators: A spectral duality.*  
**Palle E. T. Jorgensen**, University of Iowa (1000-46-05)

**Special Session on Multiscale Methods and Sampling in Time-Frequency Analysis, I**

8:30 AM – 10:50 AM Room 229, Dana Smith Hall

Organizers: **Jeffrey Andrew Hogan**, University of Arkansas  
**Joseph D. Lakey**, New Mexico State University

- 8:30AM (33) *Analysis of Blockwise Shrinkage Wavelet Estimates via Lower Bounds.*  
**Sam Efromovich**, University of New Mexico (1000-62-219)
- 9:00AM (34) *Matrix theory for the polyphase-with-advance representation of multirate filter banks.*  
**Christopher M. Brislawn\*** and **Brendt Wohlberg**, Los Alamos National Laboratory (1000-94-17)
- 9:30AM (35) *Optimality on compact sets of filter banks.*  
**Michelle D Quirk**, Los Alamos National Laboratories (1000-41-150)
- 10:00AM (36) *Wavelet examples built from redundant filter systems.*  
**Kathy D. Merrill**, Colorado College (1000-42-134)
- 10:30AM (37) *Construction of scaling functions in GMRA for wavelet sets.* Preliminary report.  
**John J Benedetto**, University of Maryland at College Park, and **Juan R Romero\***, Department of Mathematics at College Park (1000-43-23)

**Special Session on Nonlinear Partial Differential Equations Applied to Materials Science, I**

9:00 AM – 10:50 AM Room 225, Dana Smith Hall

Organizers: **Patricia Bauman**, Purdue University  
**Tiziana Giorgi**, New Mexico State University

- 9:00AM (38) *Convergence Analysis of a Space-Time Discontinuous Galerkin method for Scalar Conservation Laws.* Preliminary report.  
**Yangsuk Ko\***, California State University at Bakersfield, and **Robert Haber**, University of Illinois at Urbana-Champaign (1000-35-58)
- 9:30AM (39) *Singular limits in the Liouville type equations.*  
**Michal Kowalczyk**, Kent State University (1000-35-139)
- 10:00AM (40) *Long-time Limit For The Ginzburg-Landau System With Pinning.* Preliminary report.  
**Jianzhong Sun\***, University of North Carolina at Wilmington, and **Patricia Bauman**, Purdue University (1000-35-43)
- 10:30AM (41) *Scattering in Ginzburg-Landau equations.*  
**Stephen J Gustafson\***, University of British Columbia, **Kenji Nakanishi**, Nagoya University, and **Tai-Peng Tsai**, University of British Columbia (1000-35-208)

**Special Session on Analysis and Geometry in Carnot-Carathéodory Spaces, I**

9:00 AM – 10:50 AM Room 329, Dana Smith Hall

Organizers: **Luca Capogna**, University of Arkansas  
**Robert Smits**, New Mexico State University

- 9:00AM (42) *Comparison theorems for Hausdorff dimension in the Heisenberg group.*  
**Zoltan M. Balogh**, University of Berne, and **Jeremy T. Tyson\***, University of Illinois (1000-28-113)
- 9:30AM (43) *Regular submanifolds of the Heisenberg group.*  
**Bruno Franchi\***, Dept. Mathematics, University of Bologna (Italy), **Raul Serapioni** and **Francesco Serra Cassano**, Dept. Mathematics, University of Trento (Italy) (1000-22-131)
- 10:00AM (44) *Blow-up and coarea formula in Heisenberg groups.* Preliminary report.  
**Valentino Magnani**, University of Pisa (1000-28-110)
- 10:30AM (45)  *$C^{1,1}$  Hypersurfaces of the Heisenberg Group are  $N$ -Rectifiable.* Preliminary report.  
**Daniel R Cole**, Dartmouth College (1000-53-103)

**Special Session on Random Matrix Theory and Growth Processes, I**

9:00 AM – 10:40 AM Room 328, Dana Smith Hall

Organizer: **Craig A. Tracy**, University of California Davis

- 9:00AM (46) *Continuum Limits of Toda Lattices associated to a Random Matrix Partition Function.*  
**Nicholas M. Ercolani\***, **Kenneth T.-R. McLaughlin** and **Virgil Pierce**, University of Arizona (1000-05-45)
- 10:00AM (47) *Asymptotics of block Toeplitz determinants and the classical dimer model.*  
**Estelle L Basor**, California Polytechnic State University (1000-82-136)

**Special Session on Algebraic Geometry, I**

9:00 AM – 10:55 AM Room 136, Dana Smith Hall

Organizers: **Hirotschi Abo**, Colorado State University  
**Chris Peterson**, Colorado State University

- 9:00AM (48) *Relations in Tautological Rings by Localization.*  
**Fumitoshi Sato**, University of Utah (1000-14-84)
- 9:30AM (49) *On the base locus of the generalized theta divisor.*  
**Daniele Arcara**, University of Utah (1000-14-40)
- 10:00AM (50) *The Grothendieck-Lefschetz theorem for normal projective varieties.*  
**Ravindra V Girivaru\***, Washington University at St. Louis, and **Srinivas Vasudevan**, Tata Institute of Fundamental Research (1000-14-38)
- 10:30AM (51) *Smoothing a singular variety using toroidal embeddings.*  
**Wenxiang Wang**, California State University at San Bernardino (1000-14-12)

**Special Session on Arithmetic Geometry, I**

9:00 AM – 10:40 AM Room 129, Dana Smith Hall

Organizers: **Alexandru Buium**, University of New Mexico

**Michael J. Nakamaye**, University of New Mexico

- 9:00AM *Fractals related to  $K3$  surfaces*. Preliminary report.  
(52) **Arthur Baragar**, University of Nevada, Las Vegas (1000-14-22)
- 10:00AM *Arithmetic jet bundles*. Preliminary report.  
(53) **Paul Voita**, University of California, Berkeley (1000-14-174)

**Special Session on Interactions in Riemannian Geometry, I**

9:00 AM – 10:50 AM Room 324, Dana Smith Hall

Organizers: **Charles P. Boyer**, University of New Mexico  
**Krzysztof Galicki**, University of New Mexico

- 9:00AM *3-Sasakian spaces and positive sectional curvature*. Preliminary report.  
(54) **Wolfgang Ziller\***, University of Pennsylvania, **Karsten Grove**, University of Maryland, and **Burkhard Wilking**, University of Muenster (1000-53-186)
- 9:30AM *The topology of Eschenburg spaces and 3-Sasakian manifolds*. Preliminary report.  
(55) **Christine Escher\***, Oregon State University, and **Wolfgang Ziller**, University of Pennsylvania (1000-53-135)
- 10:00AM *Superpotentials and the Cohomogeneity One Einstein Equations*. Preliminary report.  
(56) **Andrew Dancer**, Oxford University, and **McKenzie Y Wang\***, McMaster University (1000-53-71)
- 10:30AM *CAT(0) cube complexes for non-discrete reflection groups*. Preliminary report.  
(57) **Krishnan Shankar**, University of Oklahoma, Norman (1000-20-74)

**Special Session on Mathematical Methods in Turbulence, I**

9:00 AM – 10:50 AM Room 226, Dana Smith Hall

Organizers: **Monika Nitsche**, University of New Mexico  
**Vachtang Poutkaradze**, University of New Mexico

- 9:00AM *Effects of surface tension on immiscible Rayleigh-Taylor turbulence*.  
(58) **Misha Chertkov**, Theoretical Division, Los Alamos National Laboratory (1000-76-195)
- 9:30AM *Cascade time-scales for energy and helicity in isotropic homogeneous turbulence*.  
(59) **Susan Kurien\***, Mathematical modeling and analysis group, Los Alamos National Laboratory, **Mark Taylor**, Sandia National Laboratory, Albuquerque, NM, and **Takeshi Matsumoto**, Kyoto University, Kyoto, Japan (1000-76-205)
- 10:00AM Discussion
- 10:30AM Discussion

**Invited Address**

11:00 AM – 11:50 AM Room 125, Dana Smith Hall

- (60) *Intersecting Schubert Varieties*.  
**Sara C. Billey\***, University of Washington, and **Ravi Vakil**, Stanford University (1000-05-160)

**Invited Address**

2:00 PM – 2:50 PM Room 125, Dana Smith Hall

- (61) *Knots modulo braids*.  
**Theodore Stanford**, New Mexico State University (1000-57-222)

**Special Session on Multiscale Methods and Sampling in Time-Frequency Analysis, II**

3:00 PM – 5:50 PM Room 229, Dana Smith Hall

Organizers: **Jeffrey Andrew Hogan**, University of Arkansas  
**Joseph D. Lakey**, New Mexico State University

- 3:00PM *Composition calculus for fourier integral operators with fold and blowdown singularities*.  
(62) **Raluca Felea**, Rochester Institute of Technology (1000-42-28)
- 3:30PM *Dyadic models for the equations of fluid motion*.  
(63) **Natasa Pavlovic**, Princeton University (1000-35-133)
- 4:00PM *Sharp Growth Estimates for Several  $T(b)$  Theorems*.  
(64) **Stephanie Anne Molnar**, UCLA (1000-43-184)
- 4:30PM *Non-Uniform Sampling Schemes in Rectangular and Radial Domains*.  
(65) **Stephen Casey**, American University (1000-42-107)
- 5:00PM *The Periodic Slepian Wavelets*. Preliminary report.  
▶ (66) **Xiaoping Shen**, Department of Mathematics, Ohio University (1000-42-83)
- 5:30PM *An implementable frame-based algorithm for the irregular sampling of bandlimited data*. Preliminary report.  
(67) **Jeffrey Hogan\***, University of Arkansas, and **Joseph Lakey**, New Mexico State University (1000-42-172)

**Special Session on Nonlinear Partial Differential Equations Applied to Materials Science, II**

3:00 PM – 5:20 PM Room 225, Dana Smith Hall

Organizers: **Patricia Bauman**, Purdue University  
**Tiziana Giorgi**, New Mexico State University

- 3:00PM *Dynamics of solitons in nonlinear Schrodinger equations with external potentials*.  
▶ (68) **I. M. Sigal**, University of Notre Dame, University of Toronto (1000-35-94)
- 3:30PM *Stability of Pinned Fundamental Vortices*. Preliminary report.  
(69) **Fridolin S.T. Ting**, Lakehead University (1000-35-86)
- 4:00PM *Stable vortex Solutions to the Ginzburg-Landau Energy*.  
(70) **Alberto Montero**, McMaster University (1000-35-153)
- 4:30PM *Vortices and pinning effects for the Ginzburg-Landau model in multiply connected domains*.  
(71) **Stan Alama** and **Lia Bronsard\***, McMaster University (1000-35-210)
- 5:00PM Discussion

**Special Session on Regularity in PDEs and Harmonic Analysis, II**

3:00 PM – 5:20 PM Room 325, Dana Smith Hall

Organizers: **Marianne Kortén**, Kansas State University  
**Charles Nelson Moore**, Kansas State University  
**Maria C. Pereyra**, University of New Mexico

- 3:00PM (72) *Norm estimates for inverses of singular integrals in two dimensions.*  
**Irina Mitrea**, University of Virginia (1000-45-152)
- 3:30PM (73) *Variational inequalities and free boundaries for the  $p$ -Laplace operator.*  
**Donatella Danielli\*** and **Arshak Petrosyan**, Purdue University (1000-35-192)
- 4:00PM (74) *Tornados and continuity for  $\Delta u = u^{-\alpha}$  and related equations.* Preliminary report.  
**Alexander M. Meadows**, Cornell University (1000-35-182)
- 4:30PM (75) *Equivalence of Solutions to the  $p$ -Laplace Equation in the Heisenberg Group.*  
**Thomas J. Bieske**, University of South Florida (1000-35-163)
- 5:00PM (76) *Unique continuation for second order elliptic operators: a non-Carleman approach.* Preliminary report.  
**Laura De Carli\*** and **Steve Hudson**, Florida International University (1000-35-56)

**Special Session on Analysis and Geometry in Carnot-Carathéodory Spaces, II**

3:00 PM – 5:20 PM Room 329, Dana Smith Hall

Organizers: **Luca Capogna**, University of Arkansas  
**Robert Smits**, New Mexico State University

- 3:00PM (77) *A regularity result for sub-elliptic systems in Carnot Groups.*  
**Emily D. Shores**, University of Arkansas, Fayetteville (1000-35-41)
- 3:30PM (78) *Fundamental Solution of Kohn Laplacian on quadratic CR manifold.* Preliminary report.  
**Jingzhi Tie\***, The University of Georgia, and **Der-Chen Chang**, Georgetown University (1000-32-88)
- 4:00PM (79) *Forward-backward diffusion in the continuous spectrum case.*  
**Jorge Araao**, Claremont McKenna College (1000-35-221)
- 4:30PM (80) *Doubly Nonlinear Parabolic Equations with singular lower order term on the Heisenberg group.*  
**Ismail Kombe**, Oklahoma City University (1000-35-128)
- 5:00PM Discussion

**Special Session on Braids and Knots, II**

3:00 PM – 5:50 PM Room 127, Dana Smith Hall

Organizer: **Theodore Stanford**, New Mexico State University

- 3:00PM (81) *Almost periodic flows on three-manifolds.*  
**Kelly Delp**, University of California at Santa Barbara (1000-57-75)

- 3:30PM (82) *Closed Essential Surfaces in the Complements of Large Volume Berge Knots.*  
**Ken Baker**, The University of Georgia at Athens (1000-57-145)
- 4:00PM (83) *Noncyclic covers of knot complements.*  
**Nathan Darrell Broaddus**, Cornell University (1000-57-112)
- 4:30PM Discussion
- 5:00PM (84) *Polygonal Links and Crossing Number.* Preliminary report.  
**Rollie Trapp**, California State University, San Bernardino (1000-57-91)
- 5:30PM (85) *Hyperbolic Volume vs. Knot Polynomials.* Preliminary report.  
**Oliver Dasbach\***, Louisiana State University, Baton Rouge, and **Xiao-Song Lin**, UC Riverside (1000-57-207)

**Special Session on Probabilistic and Geometric Methods in Learning Theory, II**

3:00 PM – 5:40 PM Room 228, Dana Smith Hall

Organizer: **Vladimir Koltchinskii**, University of New Mexico

- 3:00PM (86) *Local Rademacher averages and empirical minimization.*  
**Peter L Bartlett**, University of California at Berkeley (1000-60-141)
- 4:00PM (87) *Fast Rates to Bayes for Support Vector Machines.*  
**Ingo Steinwart**, Los Alamos National Laboratory (1000-60-203)
- 5:00PM (88) *Anomaly Detection is Classification.*  
**Clint Scovel**, Modeling, Algorithmics, and Informatics Group, CCS-3, Los Alamos National Laboratory (1000-60-202)

**Special Session on Mathematics for Secondary Teachers: Curriculum and Assessment, II**

3:00 PM – 5:50 PM Room 333, Dana Smith Hall

Organizers: **Adriana Aceves**, University of New Mexico  
**Kristin Umland**, University of New Mexico

- 3:00PM (89) *Computer Algebra Systems in the Preparation of Middle School and High School Mathematics Teachers.*  
**Gary A Harris**, Department of Mathematics and Statistics Texas Tech University (1000-97-44)
- 4:00PM (90) *Mathematics Content Courses for Middle School Teachers.* Preliminary report.  
**David R. Finston\*** and **Douglas S. Kurtz**, New Mexico State University (1000-97-100)
- 5:00PM Panel Discussion

**Special Session on Random Matrix Theory and Growth Processes, II**

3:00 PM – 4:40 PM Room 328, Dana Smith Hall

Organizer: **Craig A. Tracy**, University of California Davis

- 3:00PM (91) *Differential Equations for Dyson Processes.*  
**Craig A. Tracy**, University of California, Davis, and **Harold Widom\***, University of California, Santa Cruz (1000-60-50)

- 4:00PM *Averages of Characteristic Polynomials in Random Matrix Theory.*  
(92) **Alexei Borodin\***, Clay Mathematics Institute and California Institute of Technology, and **Eugene Strahov**, California Institute of Technology (1000-60-76)

**Special Session on Several Complex Variables and CR Geometry, II**

3:00 PM – 5:50 PM Room 327, Dana Smith Hall

Organizers: **Peter Ebenfelt**, University of California San Diego

**Marshall A. Whittlesey**, California State University, San Marcos

- 3:00PM *Super-rigidity for holomorphic mappings between hyperquadrics of different dimensions.* Preliminary report.  
(93) **M. S. Baouendi\***, University of California, San Diego, and **Xiaojun Huang**, Rutgers University (1000-32-180)
- 4:00PM *Effective Estimates of Subelliptic Gain for the  $\bar{\partial}$ -Neumann Problem.* Preliminary report.  
(94) **Andreea C Nicoara**, Harvard University (1000-32-102)
- 5:00PM *Convergence of formal holomorphic mappings between real-analytic hypersurfaces.*  
(95) **Robert Juhlin**, Department of Mathematics, University of California San Diego (1000-32-170)
- 5:30PM *Rational Approximation on the Unit Sphere in  $\mathbb{C}^2$ .*  
(96) Preliminary report.  
**John T Anderson\***, College of the Holy Cross, and **John Wermer**, Brown University (1000-32-34)

**Special Session on Algebraic Geometry, II**

3:00 PM – 5:25 PM Room 136, Dana Smith Hall

Organizers: **Hirotschi Abo**, Colorado State University

**Chris Peterson**, Colorado State University

- 3:00PM *Plane curves moving with a complete intersection threefold.* Preliminary report.  
(97) **Holger P Kley**, Colorado State University (1000-14-199)
- 3:30PM *Remarks on vector bundles on Projective spaces.*  
(98) **Mohan Kumar Neithalath**, Washington University in St. Louis (1000-14-144)
- 4:00PM *ACM Bundles on Hypersurfaces.* Preliminary report.  
(99) **A. Prabhakar Rao**, University of Missouri-St. Louis (1000-14-162)
- 4:30PM *Holomorphic surgery for vector bundles.*  
(100) Preliminary report.  
**Elizabeth T. Gasparim**, New Mexico State University (1000-14-108)
- 5:00PM *Dualities and Classical Geometry of the Moduli Space of Vector Bundles of Rank 3.*  
(101) **Quang Minh Nguyen**, University of Michigan - Department of Mathematics (1000-14-36)

**Special Session on Financial Mathematics: The Mathematics of Derivative Securities, II**

3:00 PM – 5:40 PM Room 224, Dana Smith Hall

Organizers: **Maria Cristina Mariani**, New Mexico State University  
**Oswaldo Mendez**, University of Texas at El Paso

- 3:00PM *On the Controversy over Tailweight of Distributions.*  
(102) **C C Heyde**, Australia National University and Columbia University, and **S G Kou\***, Columbia University (1000-90-08)
- 4:00PM *Multiscale Parameter Variation in Pricing of Derivatives.* Preliminary report.  
(103) **Knut Solna**, UC Irvine (1000-00-125)
- 5:00PM *A Model for Monetary Shocks.*  
(104) **Jerry L. Bona\***, University of Illinois at Chicago, and **Jenny X. Li**, The Pennsylvania State University (1000-90-09)

**Special Session on Categories and Operads in Topology, Geometry, Physics and Other Applications, II**

3:00 PM – 5:50 PM Room 128, Dana Smith Hall

Organizers: **Hanna Ewa Makaruk**, Los Alamos National Laboratory

**Robert Michal Owczarek**, Los Alamos National Laboratory

**Zbigniew Oziewicz**, Universidad Nacional Autónoma de México

- 3:00PM *Virtual Braids and the L-move.* Preliminary report.  
(105) **Sofia Lambropoulou\***, Department of Mathematics, National Technical University of Athens, and **Louis H. Kauffman**, Mathematics Department, University of Illinois at Chicago (1000-57-55)
- 4:00PM *Virtual Links and the Generalized Witten-Reshetikhin-Turaev Invariant.*  
(106) **H A Dye\***, United States Military Academy, and **Louis H Kauffman**, University of Illinois at Chicago (1000-57-42)
- 4:30PM *On Correlation Schemes.* Preliminary report.  
(107) **Fernando J. O. Souza**, University of Iowa (1000-05-214)
- 5:00PM *Graphs Applied in Theory of White-Box Software Testing.* Preliminary report.  
(108) **Nikita A Sakhanenko\***, Los Alamos National Laboratory/University of New Mexico, **Hanna E Makaruk** and **Robert M Owczarek**, Los Alamos National Laboratory (1000-68-65)
- 5:30PM *Vector space of paths and completeness of White-Box software testing.* Preliminary report.  
(109) **Hanna E. Makaruk\***, Los Alamos National Laboratory, Los Alamos NM, **Robert M. Owczarek**, Los Alamos National Laboratory, Los Alamos, NM, and **Nikita A. Sakhanenko**, University of New Mexico and Los Alamos National Laboratory (1000-68-146)

**Special Session on Arithmetic Geometry, II**

3:00 PM – 5:40 PM Room 129, Dana Smith Hall

Organizers: **Alexandru Buium**, University of New Mexico

**Michael J. Nakamaye**, University of New Mexico

- 3:00PM *Elliptic curves over function fields.* Preliminary report.  
(110) **J Felipe Voloch**, Dept. Math., Univ of Texas at Austin (1000-11-13)
- 4:00PM *Ranks of quadratic twists of elliptic curves and random matrix theory.* Preliminary report.  
(111) **Douglas Ulmer**, University of Arizona (1000-11-167)

5:00PM *A proof of the Semistable Conjecture.*  
(112) **Wieslawa Krystyna Niziol**, University of Utah  
(1000-11-177)

**Vachtang Poutkaradze**, University of  
New Mexico

3:00PM *Mathematical Analysis of Certain Analytic Sub-grid  
Scale Models of Turbulence.*  
(122)

**Edriss S Titi**, University of California -Irvine, and  
Weizmann Institute of Science (1000-76-217)

3:30PM *Equation-free multiscale computation for  
compressible fluid flows.* Preliminary report.  
(123) **Jimmy Fung**, California Institute of Technology  
(1000-76-197)

4:00PM *Kinematic Simulation of Log-Layer Turbulence using  
the Langevin Equation.*  
▶ (124) **Christopher A. Jeffery**, Los Alamos National  
Laboratory (1000-76-206)

4:30PM Discussion

5:00PM *Comparison of Euler-alpha and vortex blob  
regularization of vortex filaments and sheets.*  
▶ (125) **Monika Nitsche\***, University of New Mexico, **Darryl  
Holm**, Los Alamos National Laboratory/Imperial  
College, and **Vakhtang Putkaradze**, University of  
New Mexico (1000-35-99)

### Special Session on Spectral Geometry, II

3:00 PM – 6:10 PM Room 326, Dana Smith Hall

Organizers: **Ivan G. Avramidi**, New Mexico  
Institute of Mining and Technology  
**Thomas Patrick Branson**, University  
of Iowa

3:00PM *Patterson-Selberg zeta function for the BTZ black  
hole.*  
(113)

**Floyd L. Williams**, Dept.Math./Univ.Mass.at  
Amherst (1000-53-25)

4:00PM *Noncommutative residue and conformal invariants.*  
▶ (114)

**William J Ugalde**, Purdue University (1000-53-111)  
5:00PM *Two new Weyl-type bounds for the fixed membrane.*  
(115)

**Lotfi Hermi**, Department of Mathematics,  
University of Arizona (1000-35-11)

5:30PM *Beyond the classical Weyl and Colin de Verdière's  
formulas for Schrödinger operators with  
polynomial magnetic and electric fields.*  
(116)

**Mitya Boyarchenko**, Department of Mathematics,  
University of Chicago, and **Sergei Levendorskii\***,  
Department of Economics, University of Texas at  
Austin (1000-35-20)

### Special Session on Interactions in Riemannian Geometry, II

3:00 PM – 5:20 PM Room 324, Dana Smith Hall

Organizers: **Charles P. Boyer**, University of New  
Mexico  
**Krzysztof Galicki**, University of New  
Mexico

3:00PM *Hamiltonian two-forms in Kähler Geometry.*  
(117) **Vestislav Apostolov**, Université du Québec à  
Montréal (1000-53-148)

3:30PM *Weakly Bochner-flat Kähler metrics.* Preliminary  
report.  
(118)

**V. Apostolov**, UQAM, Montreal, **D. M.  
J. Calderbank**, University of Edinburgh, **P.  
Gauduchon**, Ecole Polytechnique, Palaiseau, France,  
and **C. W. Tonnesen-Friedman\***, Union College  
(1000-53-87)

4:00PM *The signature of smooth 4-manifolds with  $S^1$   
actions.*  
(119)

**Rafael Herrera\***, The City University of New York,  
CSI, and **Haydee Herrera**, Rutgers University,  
Camden (1000-53-127)

4:30PM *The geometry of compact homogeneous spaces with  
two isotropy summands.* Preliminary report.  
(120)

**William Dickinson**, Grand Valley State University,  
and **Megan M. Kerr\***, Wellesley College  
(1000-53-142)

5:00PM *Conformally-Einstein Kähler metrics on compact  
manifolds with boundary.* Preliminary report.  
(121)

**Gideon Maschler**, University of Toronto  
(1000-53-178)

### Special Session on Mathematical Methods in Turbulence, II

3:00 PM – 5:20 PM Room 226, Dana Smith Hall

Organizers: **Monika Nitsche**, University of New  
Mexico

### Session for Contributed Papers

3:15 PM – 4:25 PM Room 334, Dana Smith Hall

3:15PM *A Mean Value Theorem for Quadrinomials.*  
▶ (126) Preliminary report.  
**Mohammed A. Qazi**, Tuskegee University  
(1000-30-73)

3:30PM *Eliminating Redundant Linear Constraints in  
Semidefinite Programming.* Preliminary report.  
▶ (127) **Shafiu Jibrin\***, James Swift, Northern Arizona  
University, and **Daniel Stover**, Northern Arizona  
University (1000-90-61)

3:45PM *Techniques of Statistical Mechanics Applied to  
Macroeconomics.*  
▶ (128) **Rod Freed\***, California State University Dominguez  
Hills, and **Lily Llamas**, California State University at  
Dominguez Hills (1000-62-218)

4:00PM *A study on the Johnson noise in transient  
temperatures using the sum of random sinusoidal  
signals.* Preliminary report.  
(129) **Byung Soo Moon**, Utah State University  
(1000-65-209)

4:15PM *An initial value problem for eigenvalues of certain  
matrices.* Preliminary report.  
▶ (130) **Donald Beken**, University of North Carolina at  
Pembroke, and **Ralph DeMarr\***, University of New  
Mexico (1000-15-24)

### Reception (Hosted by the Department of Mathematics)

6:00 PM – 7:00 PM Atrium, Dana Smith Hall

## Sunday, October 17

### Meeting Registration

8:00 AM – NOON Atrium, Dana Smith Hall

### AMS Exhibit and Book Sale

8:00 AM – NOON Atrium, Dana Smith Hall

**Special Session on Regularity in PDEs and Harmonic Analysis, III**

8:00 AM – NOON Room 325, Dana Smith Hall

Organizers: **Marianne Korten**, Kansas State University  
**Charles Nelson Moore**, Kansas State University  
**Maria C. Pereyra**, University of New Mexico

- 8:00AM (131) *On the two phase Stefan problem.* Preliminary report.  
**Marianne Korten** and **Charles Moore\***, Kansas State University (1000-35-116)
- 8:30AM (132) *Generalized Gagliardo-Nirenberg inequalities and Hodge systems in  $\mathbb{R}^n$ .*  
**Loredana Lanzani\***, University of Arkansas, and **Elias M. Stein**, Princeton University (1000-35-89)
- 9:00AM (133) *The Hele-Shaw problem as a Mesa type limit of Stefan problems in exterior domains.*  
**Ivan A Blank\***, Worcester Polytechnic Institute, **Marianne K Korten** and **Charles N Moore**, Kansas State University (1000-35-164)
- 9:30AM (134) *On the pointwise jump condition at the free boundary in the one phase Stefan problem with a "mushy" zone.*  
**Marianne K Korten\***, Kansas State University, and **Donatella Danielli**, Purdue University (1000-35-129)
- 10:00AM (135) *Divergence-Measure Fields, Sets of Finite Perimeter, and Conservation Laws.*  
**Monica Torres\*** and **Gui-Qiang Chen**, Northwestern University (1000-35-79)
- 10:30AM (136) *Non-smooth change of variables.*  
**David Swanson**, University of Louisville (1000-26-175)

**Special Session on Braids and Knots, III**

8:00 AM – 10:50 AM Room 127, Dana Smith Hall

Organizer: **Theodore Stanford**, New Mexico State University

- 8:00AM (137) *Knots with Unknotting Number 1.* Preliminary report.  
**Cameron McA Gordon\*** and **John E Luecke**, University of Texas at Austin (1000-57-189)
- 8:30AM (138) *Discretized configuration spaces.* Preliminary report.  
**Aaron D. Abrams**, Emory University and MSRI (1000-57-213)
- 9:00AM (139) *Braid representations and braided tensor categories.* Preliminary report.  
**Imre Tuba**, Virginia Polytechnic Institute and State University (1000-20-223)
- 9:30AM Discussion
- 10:00AM (140) *Braid Groups on Graphs.*  
**Lucas A Sabalka\*** and **Daniel Farley**, U. of Illinois at Urbana-Champaign (1000-20-201)
- 10:30AM (141) *The Three-Eigenvalue Problem and Applications to the Braid Group.* Preliminary report.  
**Eric C Rowell\***, **Michael Larsen** and **Zhengan Wang**, Indiana University (1000-20-90)

**Special Session on Several Complex Variables and CR Geometry, III**

8:00 AM – 10:40 AM Room 327, Dana Smith Hall

Organizers: **Peter Ebenfelt**, University of California San Diego  
**Marshall A. Whittlesey**, California State University, San Marcos

- 8:00AM (142) *The minimum principle and disk envelopes.* Preliminary report.  
**Evgeny A. Poletsky**, Syracuse University (1000-32-121)
- 9:00AM (143) *CR Umbilic Points on Real Ellipsoids in Complex 2-Spaces.* Preliminary report.  
**Xiaojun Huang**, Rutgers University at New Brunswick (1000-32-140)
- 10:00AM (144) *Ideal sheaves in Banach spaces.* Preliminary report.  
**Laszlo Lempert**, Purdue University (1000-32-98)

**Special Session on Financial Mathematics: The Mathematics of Derivative Securities, III**

8:00 AM – 10:40 AM Room 224, Dana Smith Hall

Organizers: **Maria Cristina Mariani**, New Mexico State University  
**Oswaldo Mendez**, University of Texas at El Paso

- 8:00AM (145) *Pricing Functionals and Pricing Measures.* Preliminary report.  
**Ambar Niel Sengupta**, Louisiana State University (1000-91-06)
- 9:00AM (146) *Asymptotic option pricing under a pure jump process.*  
**Seongjoo Song**, Purdue University (1000-60-143)
- 10:00AM (147) *Consistent aggregation of risk factor models.*  
**Greg Anderson**, **Lisa Goldberg**, **Alec Kercheval\***, **Guy Miller** and **Kathy Sorge**, Florida State University (1000-90-173)

**Special Session on Categories and Operads in Topology, Geometry, Physics and Other Applications, III**

8:00 AM – 10:20 AM Room 128, Dana Smith Hall

Organizers: **Hanna Ewa Makaruk**, Los Alamos National Laboratory  
**Robert Michal Owczarek**, Los Alamos National Laboratory  
**Zbigniew Oziewicz**, Universidad Nacional Autónoma de México

- 8:00AM (148) *NonEquilibrium Systems and Irreversible Processes - from the perspective of Continuous Topological Evolution.*  
**R. M. Kiehn**, Physics Department, University of Houston (1000-80-31)
- 8:30AM (149) *Rota-Baxter algebras in renormalization of QFT.*  
**K Ebrahimi-Fard**, University of Bonn, Germany, **L Guo\***, Rutgers University at Newark, and **D Kreimer**, IHES (1000-81-200)
- 9:00AM (150) *MathAction - Collaborative Mathematics on the Web using Axiom and REDUCE.*  
**William S Page**, Kingston, Ontario (1000-68-157)
- 9:30AM (151) *A functor from cyclic operads to chain complexes.*  
**James Conant\***, University of Tennessee, Knoxville, and **Karen Vogtmann**, Cornell University (1000-18-63)

10:00AM *Non-Commutative Worlds and the Feynman-Dyson Derivation of Electromagnetism*. Preliminary report.  
 ▶ (152) **Louis H. Kauffman**, University of Illinois at Chicago (1000-78-193)

**Vachtang Poutkaradze**, University of New Mexico

8:30AM *The physical mechanisms of two-dimensional turbulence: Inverse and direct cascade processes*.  
 (162) **Robert E Ecke**, Los Alamos National Laboratory (1000-76-216)

**Special Session on Spectral Geometry, III**

8:00 AM – 10:50 AM Room 326, Dana Smith Hall

Organizers: **Ivan G. Avramidi**, New Mexico Institute of Mining and Technology  
**Thomas Patrick Branson**, University of Iowa

8:00AM *The spectral function for spinors*.  
 (153) **Doojin Hong**, Grinnell College (1000-53-168)

8:30AM *Zeta and eta invariants for chiral bag boundary conditions*.  
 (154) **Klaus Kirsten**, Baylor University (1000-58-46)

9:30AM *Topics in Spectral and Fractal Geometry*.  
 (155) **Michel L. Lapidus\***, University of California, Riverside, and **Ben Hambly**, Oxford University, UK (1000-58-35)

10:30AM *A tube formula for the Koch snowflake curve, with applications to complex dimensions*. Preliminary report.  
 (156) **Michel L. Lapidus** and **Erin P.J. Pearse\***, University of California, Riverside (1000-37-18)

**Special Session on Algebraic Geometry, III**

8:30 AM – 10:55 AM Room 136, Dana Smith Hall

Organizers: **Hirotschi Abo**, Colorado State University  
**Chris Peterson**, Colorado State University

8:30AM *Polyhedral geometry of representations of the McKay quiver*.  
 (157) **Alastair Craw**, SUNY Stonybrook, **Diane Maclagan\***, Rutgers University, and **Rekha R. Thomas**, University of Washington (1000-14-198)

9:00AM *The maximum likelihood degree and the likelihood equations*.  
 (158) **Fabrizio Catanese**, Universitaet Bayreuth, **Serkan Hosten\***, San Francisco State University, Mathematics Department, **Amit Khetan**, University of Massachusetts, Amherst, and **Bernd Sturmfels**, University of California, Berkeley (1000-14-185)

9:30AM *Associated primes of local cohomology modules and Frobenius powers*.  
 (159) **Anurag K. Singh**, Georgia Institute of Technology, and **Irena Swanson\***, New Mexico State University (1000-13-66)

10:00AM *Proper Actions of the Additive Group*. Preliminary report.  
 ▶ (160) **David R. Finston\***, New Mexico State University, and **James K. Deveney**, Virginia Commonwealth University (1000-14-104)

10:30AM *Construction of hyperplane arrangements with non-vanishing local system cohomology*.  
 (161) **Yukihito Kawahara**, MSRI / Tokyo Metropolitan University (1000-14-53)

**Special Session on Mathematical Methods in Turbulence, III**

8:30 AM – 10:50 AM Room 226, Dana Smith Hall

Organizers: **Monika Nitsche**, University of New Mexico

9:00AM *Shock-driven transition to turbulence: curiouser and curiouser*.  
 ▶ (163) **Peter Vorobieff**, The University of New Mexico (1000-76-204)

9:30AM *Hydrodynamic Spatio-temporal Complexity*.  
 (164) **Juan M Lopez**, Arizona State University (1000-76-122)

10:00AM *Simulation of geophysical turbulence: Dynamic grid deformation*.  
 (165) **Piotr K. Smolarkiewicz\***, National Center for Atmospheric Research, and **Joseph M. Prusa**, Iowa State University (1000-39-105)

10:30AM *Braiding Patterns on an Inclined Plane*.  
 (166) **Vakhtang Putkaradze\***, **Keith Mertens**, Dept. of Mathematics and Statistics, University of New Mexico, and **Peter Vorobieff**, Dept. of Mechanical Engineering, University of New Mexico (1000-76-154)

**Special Session on Nonlinear Partial Differential Equations Applied to Materials Science, III**

9:00 AM – 10:50 AM Room 225, Dana Smith Hall

Organizers: **Patricia Bauman**, Purdue University  
**Tiziana Giorgi**, New Mexico State University

9:00AM *Vortices in the Ginzburg-Landau model of superconductivity*.  
 (167) **Sylvia Serfaty**, Courant Institute of Mathematical Sciences (1000-35-124)

9:30AM *Localization of vortices for the Ginzburg-Landau energy functional*.  
 (168) **Daniel Spirn**, University of Minnesota (1000-35-96)

10:00AM *Vortices and current in the three-dimensional thin-film Ginzburg-Landau model of superconductivity*. Preliminary report.  
 (169) **Dmitry Glotov**, University of Connecticut (1000-35-194)

10:30AM *The Time-Dependent Ginzburg-Landau Equations in Three Dimensions*.  
 (170) **P. Bauman**, Purdue University, **H. Jadallah\***, New Mexico Tech, and **D. Phillips**, Purdue University (1000-35-176)

**Special Session on Analysis and Geometry in Carnot-Caratheodory Spaces, III**

9:00 AM – 10:50 AM Room 329, Dana Smith Hall

Organizers: **Luca Capogna**, University of Arkansas  
**Robert Smits**, New Mexico State University

9:00AM *Notions of convexity in Carnot groups*.  
 (171) **Duy-Minh Nhieu**, Department of Mathematics, Georgetown University (1000-26-92)

9:30AM *Properties of Subelliptic Cones in Carnot Groups*.  
 (172) **Thomas J. Bieske\***, University of South Florida, and **Juan J. Manfredi**, University of Pittsburgh (1000-35-158)

10:00AM *Intrinsic graphs and minimal surfaces in the Heisenberg group*. Preliminary report.  
 (173) **Francesco Serra Cassano**, Department of Mathematics-University of Trento (1000-49-109)

10:30AM (174) *Singular Integral Operators Associated to Curves with Rational Components.*  
**Magali Folch-Gabayet\***, Instituto de Matematicas, Universidad Nacional Autonoma de Mexico, and **James Wright**, School of Mathematics, University of Edinburgh (1000-43-39)

**Special Session on Random Matrix Theory and Growth Processes, III**

9:00 AM – 10:40 AM Room 328, Dana Smith Hall

Organizer: **Craig A. Tracy**, University of California Davis

9:00AM (175) *Distribution Functions for Edge Eigenvalues in Orthogonal and Symplectic Ensembles: Painlevé Representations.* Preliminary report.  
**Momar Dieng\*** and **Craig Tracy**, University of California, Davis (1000-60-159)

10:00AM (176) *Poisson statistics for the largest eigenvalues of Wigner and sample covariance random matrices with heavy tails of matrix entries distributions.*  
**Alexander Soshnikov**, University of California at Davis (1000-60-10)

**Special Session on Arithmetic Geometry, III**

9:00 AM – 10:40 AM Room 129, Dana Smith Hall

Organizers: **Alexandru Buium**, University of New Mexico  
**Michael J. Nakamaye**, University of New Mexico

9:00AM (177) *Moduli spaces of  $p$ -divisible groups with relation to the local Langlands correspondences.* Preliminary report.  
**Elena Mantovan**, University of California at Berkeley (1000-11-196)

10:00AM (178) *Variations on a Theme of Stark.* Preliminary report.  
**Stefan Erickson**, University of California, San Diego (1000-11-190)

**Special Session on Interactions in Riemannian Geometry, III**

9:00 AM – 10:50 AM Room 324, Dana Smith Hall

Organizers: **Charles P. Boyer**, University of New Mexico  
**Krzysztof Galicki**, University of New Mexico

9:00AM (179) *On Lagrangian Catenoids.* Preliminary report.  
**David E. Blair\***, Michigan State University, and **Alfonso Carriazo**, Universidad de Sevilla (1000-53-149)

9:30AM (180) *Isoparametric hypersurfaces by Lie sphere geometry.* Preliminary report.  
**Gary R. Jensen\***, Washington University, **Thomas E. Cecil**, College of the Holy Cross, and **Quo-Shin Chi**, Washington University (1000-53-117)

10:00AM (181) *Weyl curvature and almost Kahler geometry.* Preliminary report.  
**Tedi Draghici**, Florida International University (1000-53-59)

10:30AM (182) *K-nullity interactions with contact metric geometry.*  
**Philippe Rukimbira**, Florida International University (1000-53-80)

**Invited Address**

11:00 AM – 11:50 AM Room 125, Dana Smith Hall

(183) *The universality of the distribution functions of random matrix theory.* Preliminary report.  
**Craig A. Tracy\***, UC Davis, and **Harold Widom**, UC Santa Cruz (1000-60-04)

**Invited Address**

2:00 PM – 2:50 PM Room 125, Dana Smith Hall

(184) *Analytic and geometric properties of CR manifolds and their mappings.*  
**Peter Ebenfelt**, University of California San Diego (1000-32-02)

**Special Session on Nonlinear Partial Differential Equations Applied to Materials Science, IV**

3:00 PM – 5:20 PM Room 225, Dana Smith Hall

Organizers: **Patricia Bauman**, Purdue University  
**Tiziana Giorgi**, New Mexico State University

3:00PM (185) *Mathematical problems of gel swelling.*  
**M C Calderer**, University of Minnesota, Minneapolis (1000-35-226)

3:30PM (186) *The phase transition between the chiral nematic and smectic liquid crystals.*  
**Sookyung Joo\***, IMA, University of Minnesota, and **Daniel Phillips**, Purdue University (1000-35-60)

4:00PM (187) *Time Evolution of Nematic Liquid Crystals.*  
**Dmitry Golovaty**, The University of Akron (1000-35-211)

4:30PM (188) *Continuum theory for flows of liquid crystal polymers.*  
**Qi Wang** and **Zhenlu Cui\***, Florida State University (1000-76-224)

5:00PM Discussion

**Special Session on Regularity in PDEs and Harmonic Analysis, IV**

3:00 PM – 5:50 PM Room 325, Dana Smith Hall

Organizers: **Marianne Korten**, Kansas State University  
**Charles Nelson Moore**, Kansas State University  
**Maria C. Pereyra**, University of New Mexico

3:00PM (189) *On the positive solutions to the linearized Monge-Ampere equation.* Preliminary report.  
**Diego M Maldonado**, University of Kansas (1000-35-77)

3:30PM (190) *Decay and Strichartz estimates for the discrete Schrödinger and Klein-Gordon equations.*  
**Atanas Stefanov\***, University of Kansas, and **Panos Kevrekidis**, University of Massachusetts (1000-35-69)

4:00PM (191) *On some Schrödinger and wave equations with time dependent potentials.*  
**Virginia Naibo\*** and **Atanas Stefanov**, Department of Mathematics. University of Kansas. (1000-35-70)

4:30PM (192) *Weak solutions for semilinear wave equations with damping and source terms.*  
**Petronela Radu**, University of Nebraska, Lincoln (1000-35-64)

- 5:00PM *Conditions sufficient for partial regularity of a minimizer in nonlinear elasticity.*  
(193) **Mikil Foss**, Kansas State University (1000-49-51)
- 5:30PM *Harmonic Tangent Unit Vector Fields on Polyhedra.*  
(194) **A Majumdar**, Department of Mathematics, University of Bristol, and Hewlett Packard Laboratories, Bristol, UK, **J M Robbins** and **M Zyskin\***, Department of Mathematics, University of Bristol (1000-35-29)

- 4:00PM *American options: the EPV pricing model.*  
(203) **Svetlana Boyarchenko** and **Sergei Levendorskii\***, Department of Economics, The University of Texas at Austin (1000-90-19)

**Special Session on Categories and Operads in Topology, Geometry, Physics and Other Applications, IV**

**Special Session on Braids and Knots, IV**

3:00 PM – 4:50 PM Room 127, Dana Smith Hall

Organizer: **Theodore Stanford**, New Mexico State University

- 3:00PM *Alexander invariants of line arrangements and great circle links.*  
(195) **Michael Falk**, Northern Arizona University and MSRI (1000-57-220)
- 3:30PM  *$L^2$ -Alexander invariants for knots.*  
(196) **Weiping Li**, Oklahoma State University (1000-58-155)
- 4:00PM *Towards the computation of the noncommutative  $A$ -polynomial of twist knots.* Preliminary report.  
▶ (197) **Razvan Gelca\***, Texas Tech University, and **Fumikazu Nagasato**, Kyushu University (1000-57-215)
- 4:30PM *A variation on finite type knot invariants.*  
(198) **James Conant\***, University of Tennessee, Knoxville, **Jacob Mostovoy**, Instituto de Matematicas (Unidad Cuernavaca) Universidad Nacional Autonoma de Mexico, and **Ted Stanford**, New Mexico State University (1000-57-81)

**Special Session on Several Complex Variables and CR Geometry, IV**

3:00 PM – 4:20 PM Room 327, Dana Smith Hall

Organizers: **Peter Ebenfelt**, University of California San Diego  
**Marshall A. Whittlesey**, California State University, San Marcos

- 3:00PM *Compact Solution Operators for  $\bar{\partial}_b$ .*  
(199) **P. S. Harrington**, University of South Dakota (1000-32-123)
- 3:30PM *Examples for the  $\bar{\partial}_b$ -Neumann problem.*  
(200) **Robert K Hladky**, Dartmouth College (1000-32-188)
- 4:00PM *Semi-global approximation of CR functions on Bloom-Graham model graphs in  $\mathbb{C}^n$ .*  
(201) **Albert Boggess** and **Daniel Jupiter\***, Texas A & M University (1000-32-33)

**Special Session on Financial Mathematics: The Mathematics of Derivative Securities, IV**

3:00 PM – 4:40 PM Room 224, Dana Smith Hall

Organizers: **Maria Cristina Mariani**, New Mexico State University  
**Oswaldo Mendez**, University of Texas at El Paso

- 3:00PM *Origin of Crashes in 3 US stock markets: Shocks and Bubbles.*  
(202) **Anders Johansen**, Humlebaek, Denmark (1000-90-15)

3:00 PM – 5:50 PM Room 128, Dana Smith Hall

Organizers: **Hanna Ewa Makaruk**, Los Alamos National Laboratory  
**Robert Michal Owczarek**, Los Alamos National Laboratory  
**Zbigniew Oziewicz**, Universidad Nacional Autónoma de México

- 3:00PM *Applications of Hopf algebra cohomology in quantum field theory and representation theory.*  
(204) **Bertfried Fauser**, Max Planck Institut fuer Mathematik in den Naturwissenschaften (1000-16-132)
- 4:00PM *Classical mechanics on Lie algebras, and more.*  
▶ (205) Preliminary report.  
**Jerzy Kocik**, Mathematics Department, Southern Illinois University at Carbondale (1000-53-181)
- 4:30PM *Magnus mapping for free loops.* Preliminary report.  
▶ (206) **Liudmila Sabinina\***, UAEM, Cuernavaca, Morelos, Mexico, and **Ricardo Diaz Gutierrez**, UAEM, Cuernavaca, Morelos, Mexico (1000-20-179)
- 5:00PM *On the full "momentum space" in Double Special Relativity.* Preliminary report.  
(207) **Piotr Stachura**, University of Warsaw, Warsaw, Poland (1000-20-166)
- 5:30PM *Einstein's Special Theory of Relativity and its Two Complementary Theories.*  
▶ (208) **Pavol Valent**, University KF Nitra, Slovak Republik, Europe (1000-83-67)

**Special Session on Interactions in Riemannian Geometry, IV**

3:00 PM – 5:20 PM Room 324, Dana Smith Hall

Organizers: **Charles P. Boyer**, University of New Mexico  
**Krzysztof Galicki**, University of New Mexico

- 3:00PM *Non-zero contact and Sasakian reduction.*  
(209) **Oana Drăgulete**, EPFL (Lausanne) and University "Politehnica" of Bucharest, and **Liviu Ornea\***, University of Bucharest (Romania) and UNM at Albuquerque (1000-53-30)
- 3:30PM *Kodaira surface, its extended deformation and mirror image.*  
(210) **Yat Sun Poon**, University of California, Riverside (1000-53-95)
- 4:00PM *Dirac structures and Riemannian Geometry.*  
(211) **Aissa Wade**, Penn State University (1000-53-147)
- 4:30PM *Deformations of Hypercomplex Structures associated to Heisenberg Groups.* Preliminary report.  
(212) **G Grantcharov\***, Florida International University, **H. Pedersen**, Southern Denmark University, and **Y.S. Poon**, University of California Riverside (1000-53-118)
- 5:00PM  *$p$ -harmonic morphisms, minimal foliations, and rigidity of metrics.*  
(213) **Ye-Lin Ou**, University of Oklahoma, USA. (1000-53-85)

**Special Session on Mathematical Methods in  
Turbulence, IV**

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3:00 PM – 4:20 PM                      Room 226, Dana Smith Hall

Organizers: **Monika Nitsche**, University of New  
Mexico

**Vachtang Poutkaradze**, University of  
New Mexico

3:00PM *Modeling Small Vortical Scales as Nonlinear Solitary  
▶ (214) Waves.*

**John Steinhoff**, University of Tennessee Space  
Institute (1000-76-212)

3:30PM Discussion

4:00PM *New Scenario for Transition to slow Turbulence.*

(215) *Turbulence like quantum chaos in three  
dimensional model of Euclidian quantum field  
theory.* Preliminary report.

**Foukzon JSF Jaykov**, Israel Institute of  
Technology, Israel, Tel-Aviv (1000-76-07)

**Michel L. Lapidus**  
Associate Secretary  
Riverside, California