
Program of the Sessions

Pittsburgh, Pennsylvania, November 6–7, 2004

Saturday, November 6

Meeting Registration

7:30 AM – 4:00 PM Room 1175, Benedum Hall

AMS Exhibit Book Sale

7:30 AM – 4:00 PM Room 1175, Benedum Hall

Special Session on Modularity of Galois Representations and Serre's Conjecture, I

8:00 AM – 10:45 AM Room 521, Benedum Hall

Organizer: **Mark E. T. Dickinson**, University of Pittsburgh

- 8:00AM *An introduction to Serre's conjecture.*
(1) **Robert J Pollack**, Boston University (1002-11-46)
- 9:00AM *The nonexistence of certain Galois representations with small ramification.* Preliminary report.
(2) **Sharon Brueggeman**, University of Tennessee at Chattanooga (1002-11-29)
- 10:00AM *A generalization of Serre's conjecture to $GL(3)$.*
(3) **Avner Ash**, Boston College (1002-11-32)

Special Session on PDE-Based Methods in Imaging and Vision, I

8:00 AM – 10:50 AM Room 520, Benedum Hall

Organizers: **Stacey E. Levine**, Duquesne University
Yunmei Chen, University of Florida

- 8:00AM *A Numerical Scheme for Target Recognition.*
(4) **Mohsen Razzaghi**, Mississippi State University (1002-41-40)
- 8:30AM *Loss and Recovery of Fine Structures in PDE-based Image Denoising.* Preliminary report.
(5) **Seongjai Kim**, University of Kentucky (1002-65-159)

- 9:00AM *Theories and applications of minimizing nonstandard growth functionals.*
(6) **Yunmei Chen***, University of Florida, **Stacey Levine**, Duquesne University, **Murali Rao**, University of Florida, and **Jon Stanich**, Duquesne University (1002-35-202)
- 9:30AM *Image denoising using mean curvature information.*
(7) **Wei Zhu***, Courant Institute of Mathematical Sciences, New York, NY, **Tony Chan** and **Selim Esedoglu**, University of California Los Angeles (1002-35-136)
- 10:00AM *Fourth order diffusions for image processing.*
(8) **John B Greer**, Courant Institute (1002-35-112)
- 10:30AM *Decomposition of images into cartoon and texture using the total variation and $div(BMO)$.* Preliminary report.
(9) **Luminita Aura Vese*** and **Triet Le**, UCLA (1002-49-141)

Special Session on Convexity and Combinatorics, I

8:00 AM – 10:50 AM Room 1022, Benedum Hall

Organizers: **James F. Lawrence**, George Mason University
Valeriu Soltan, George Mason University

- 8:00AM *Reconstruction of polytopes as Eulerian posets.* Preliminary report.
(10) **Margaret M. Bayer**, University of Kansas (1002-52-21)
- 8:30AM *Simplicial Neighbourly 5-Polytopes with Nine Vertices.*
▶ (11) **Wendy A Finbow-Singh**, Acadia University (1002-52-31)
- 9:00AM *Some Construction Techniques for Convex Polytopes.* Preliminary report.
(12) **Carl W. Lee***, University of Kentucky, **Matt Menzel**, Marietta College, and **Laura Schmidt**, University of Wisconsin-Stout (1002-52-103)

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.

- 9:30AM *A Generalization of the Holt-Klee Theorem.*
 ► (13) **Walter D Morris***, George Mason University, **Bernd Gaertner** and **Leo Ruest**, Inst. Theor. CS, ETH Zurich (1002-52-78)
- 10:00AM *Orienting the Rigidity Matroid.* Preliminary report.
 (14) **Ileana Streinu**, Smith College (1002-52-240)
- 10:30AM *Multiplication in the Polytope Groups.*
 ► (15) **Jim Lawrence**, George Mason University Fairfax, VA 22030 (1002-52-171)

Special Session on The History of Mathematics, I

8:00 AM – 10:50 AM Room 426, Benedum Hall

Organizers: **Robert E. Bradley**, Adelphi University
Lawrence A. D'Antonio, Ramapo College of New Jersey

- 8:00AM *Graphs and Equations: an 18th Century Paradigm Shift.*
 ► (16) **Robert E. Bradley**, Adelphi University (1002-01-105)
- 8:30AM *The gap in Lambert's proof (1767) that pi is irrational.*
 ► (17) **Christopher Baltus**, SUNY College at Oswego (1002-01-153)
- 9:00AM *Mathematics the World Forgot: Euler's Work on the Elastic Curve.*
 ► (18) **Lawrence D'Antonio**, Ramapo College of New Jersey (1002-01-91)
- 9:30AM *Lagrange's Proof of the Fundamental Theorem of Algebra.* Preliminary report.
 ► (19) **Jeff A Suzuki**, Bard College (1002-01-53)
- 10:00AM *What's in the Library? (1730-1790).*
 ► (20) **Paul C. Pasles**, Villanova University (1002-01-118)
- 10:30AM *Thomas Clausen: Factoring Fermat numbers and Generating Graeco-Latin squares.*
 ► (21) **Lee J. Stemkoski**, Dartmouth College (1002-01-194)

Special Session on Partial Differential Equations and Applications, I

8:00 AM – 10:50 AM Room 420, Benedum Hall

Organizers: **Xinfu Chen**, University of Pittsburgh
Dehua Wang, University of Pittsburgh

- 8:00AM Discussion.
- 8:30AM *An alternative approach to $W^{2,p}$ estimates of the heat equation in a domain $\Omega \subset \mathbb{R}^n$.*
 (22) **Gavin J Waters**, University of Delaware (1002-35-211)
- 9:00AM *BV instability for Godunov and Lax-Friedrich schemes.*
 (23) **Helge Kristian Jenssen**, North Carolina State University (1002-35-65)
- 9:30AM *Semi-cooperative Strategies for Differential Games.*
 (24) **Alberto Bressan**, Penn State University, and **Wen Shen***, Math Dept., Penn State University, PA, USA (1002-35-210)
- 10:00AM *Burgers-type equations with vanishing hyper-viscosity.*
 (25) **Eitan Tadmor**, University of Maryland. College Park (1002-35-18)
- 10:30AM *Global solutions to the Camassa-Holm equations.* Preliminary report.
 (26) **Alberto Bressan**, Penn State University (1002-35-106)

Special Session on Multivariate Hypergeometric Functions: Combinatorial and Algebro-Geometric Aspects, I

8:00 AM – 10:20 AM Room 1020, Benedum Hall

Organizers: **Eduardo Cattani**, University of Massachusetts, Amherst
Alicia M. Dickenstein, Universidad de Buenos Aires
Laura Felicia Matusevich, Harvard University

- 8:00AM *Micro-support of solution sheaves of D-Modules.*
 (27) **Teresa Monteiro Fernandes**, CAUL and Universidade de Lisboa (1002-58-149)
- 8:30AM *On computing the characteristic cycles of localizations.* Preliminary report.
 (28) **Josep Àlvarez Montaner**, Universitat Politècnica de Catalunya, and **Anton Leykin***, University of Illinois at Chicago (1002-14-90)
- 9:00AM *Elliptic Generalizations and Applications of Certain Important Summation and Transformation Identities for Multiple Hypergeometric Series.*
 (29) **Hasan Coskun**, Texas A&M University-Commerce (1002-33-68)
- 9:30AM *Closed form summation of C-finite sequences.*
 ► (30) **Curtis Greene**, Haverford College, and **Herbert S. Wilf***, University of Pennsylvania (1002-05-69)
- 10:00AM *New Lambert series formulas for 12 and 20 squares, and multiple basic hypergeometric series.* Preliminary report.
 (31) **Stephen C. Milne**, The Ohio State University (1002-11-235)

Special Session on Geometric Analysis and Partial Differential Equations in Subelliptic Structures, I

8:20 AM – 10:50 AM Room 424, Benedum Hall

Organizers: **Cristian E. Gutierrez**, Temple University
Guozhen Lu, Wayne State University
Juan J. Manfredi, University of Pittsburgh

- 8:20AM *On Monge-Ampere type equations in the Heisenberg group.*
 (32) **Cristian E Gutierrez**, Temple University (1002-35-195)
- 9:00AM *The Comparison Principle for Viscosity Solutions to Some Fully Nonlinear Subelliptic Equations on Carnot Groups.* Preliminary report.
 (33) **ChangYou Wang**, University of Kentucky (1002-35-94)
- 9:30AM *Fefferman – Poincare inequality and regularity for quasilinear subelliptic equations.*
 (34) **Giuseppe Di Fazio*** and **Pietro Zamboni**, University of Catania - Italy (1002-35-38)
- 10:00AM *Convex functions on Carnot groups.* Preliminary report.
 (35) **Petri Juutinen**, University of Jyväskylä, **Guozhen Lu**, Wayne State University, **Juan Manfredi**, University of Pittsburgh, and **Bianca Stroffolini***, University of Naples (1002-35-87)
- 10:30AM *Properties of Cones in Riemannian Spaces.*
 (36) **Thomas J. Bieske**, University of South Florida (1002-35-128)

Special Session on Trends in Operator Theory and Banach Spaces, I

8:30 AM – 10:50 AM Room 423, Benedum Hall

Organizers: **Christopher J. Lennard**, University of Pittsburgh
Thomas A. Metzger, University of Pittsburgh

- 8:30AM (37) *New fixed point free nonexpansive maps on weakly compact, convex subsets of $L^1[0, 1]$.*
P. N. Dowling, Miami University, Oxford, OH, **C. J. Lennard**, University of Pittsburgh, and **B. Turett***, Oakland University (1002-46-146)
- 9:00AM (38) *New Criteria of Carleson Type Measures.*
 Preliminary report.
Ruhan Zhao, University of Toledo (1002-47-126)
- 9:30AM (39) *Type and order convexity of Marcinkiewicz and Lorentz spaces and applications.*
Nigel J Kalton, University of Missouri Columbia, and **Anna H Kamińska***, The University of Memphis (1002-46-142)
- 10:00AM (40) *Carleson embeddings with closed range.*
Alec L Matheson, Lamar University (1002-30-137)
- 10:30AM (41) *The Busemann-Petty problem for arbitrary measures.*
Artem Zvavitch, Kent State University (1002-52-116)

Special Session on Mathematical Biology, I

8:30 AM – 10:30 AM Room 820, Benedum Hall

Organizers: **Jonathan E. Rubin**, University of Pittsburgh
Bard Ermentrout, University of Pittsburgh

- 8:30AM (42) *Equilibrium states of chemical reaction networks.*
 Preliminary report.
David Swigon, University of Pittsburgh (1002-37-219)
- 8:55AM (43) *Pattern Formation in Small Arrays of Locally Coupled Oscillators.*
Rebecca Ellison, **Virginia Gardner**, **Joel Lepak**, **Meghan O'Malley**, **Joseph Poullet***, **Joseph Previte**, **Beth Ann Reid** and **Katy Vizzard**, Penn State Erie (1002-92-61)
- 9:20AM (44) *Chaos and Self-Oscillatory Regimes in Ecological System of two Competing Prey and One Predator.*
Tolibjon E. Buriyev* and **Vafokul Ergashevich Ergashev**, Samarkand State University (1002-34-24)
- 9:45AM (45) *A Reduced Model of the Immune Response to Endotoxin and Trauma with a Geometric Approach.*
Judy Day*, **Jonathan Rubin**, **Claudio Lagoa**, **Yoram Vodovotz**, **Gilles Clermont**, University of Pittsburgh, and **Carson C. Chow**, Laboratory for Biological Modeling, NIDDK, NIH (1002-37-247)
- 10:10AM (46) *Palindromes in random letter generation.*
 Preliminary report.
Anant P. Godbole, East Tennessee State University (1002-60-30)

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

8:30 AM – 10:50 AM Room 823, Benedum Hall

Organizers: **Marta M. Asaeda**, University of Maryland
Jozef H. Przytycki, George Washington University

Adam S. Sikora, SUNY at Buffalo

- 8:30AM (47) *Comparing Hopf-algebraic invariants of three-manifolds.* Preliminary report.
Fernando J. O. Souza*, University of Iowa, **Louis H. Kauffman** and **David E. Radford**, University of Illinois at Chicago (1002-57-239)
- 9:00AM Discussion.
- 9:30AM (48) *The representation of the Mapping Class Group induced by the TQFT(s) of the LMO and the universal quantum invariant of 3-manifolds.* Preliminary report.
Dorin Cheptea, SUNY at Buffalo (1002-57-230)
- 10:00AM (49) *Integral Lattices in TQFT.* Preliminary report.
Patrick M Gilmer*, Louisiana State University, and **Gregor Masbaum**, Institut de Mathematiques de Jussieu, Universite Paris 7 (1002-57-176)
- 10:30AM (50) *Eigenvalue varieties of 2-bridge links.* Preliminary report.
Jim Hoste*, Pitzer College, and **Patrick D. Shanahan**, Loyola Marymount University (1002-57-173)

Special Session on Multiscale Algorithms in Computational Fluid Dynamics, I

8:30 AM – 10:50 AM Room 522, Benedum Hall

Organizers: **William J. Layton**, University of Pittsburgh
Anastasios Liakos, U.S. Naval Academy

- 8:30AM (51) *Adaptive mortar upscaling for flow in porous media.*
Ivan Yotov, University of Pittsburgh (1002-65-157)
- 9:00AM (52) *Induced Pressure Regularization and Eddy Viscosity for Equilibrium Navier-Stokes Equations.* Preliminary report.
Leo G Rebholz, University of Pittsburgh (1002-76-150)
- 9:30AM (53) *Subgrid Stabilization of Evolutionary Convection-Diffusion Equations: Analysis and Experimental Results of a Finite Difference Scheme.* Preliminary report.
Noel F Heitmann, Millersville University of Pennsylvania (1002-76-242)
- 10:00AM (54) *Computational Methods for Feedback Control of Distributed Parameter Systems.*
Lizette Zietsman*, George Mason University, **Jeff T Borggaard** and **John A Burns**, Virginia Tech (1002-65-233)
- 10:30AM (55) *Sensitivity Analysis for Large Eddy Simulation Modeling.*
Jeff Borggaard*, **Traian Iliescu** and **Alexey Miroshnikov**, Virginia Tech (1002-76-229)

Special Session on Knots and Macromolecules, I

8:30 AM – 10:50 AM Room 722, Benedum Hall

Organizers: **Kenneth C. Millett**, University of California Santa Barbara
Eric J. Rawdon, Duquesne University

- 8:30AM (56) *Linear random knots and their scaling behaviour.*
Akos Dobay*, University of Lausanne, Laboratory of Ultrastructural Analysis, **Kenneth Millett**, University of California Santa Barbara, **Jacques Dubochet** and **Andrzej Stasiak**, University of Lausanne, Laboratory of Ultrastructural Analysis (1002-92-196)

Program of the Sessions – Pittsburgh, PA, Saturday, November 6 (cont'd.)

- 9:00AM *Counting almost unknotted embeddings.*
(57) Preliminary report.
De Witt Sumners, Florida State University, and **Stu Whittington***, University of Toronto (1002-57-67)
- 9:30AM *Probability distribution of distance between two given nodes of a random knot.*
(58) **Tetsuo Deguchi**, Department of Physics, Ochanomizu University (1002-82-120)
- 10:00AM *Topological Properties of Polymer Chains: The Influence of Model.* Preliminary report.
▶ (59) **Alex Vologodskii**, New York University (1002-82-132)
- 10:30AM *On the analogy between trivial knots and self-avoiding walks.*
(60) **Nathan T. Moore**, **Rhonald C. Lua** and **Alexander Y. Grosberg***, Physics Department, University of Minnesota, Minneapolis, MN (1002-82-169)
- 4:00PM *Characterization of Hardy/Bergmann Spaces on finitely connected domain that support compact composition operators.* Preliminary report.
(68) **Abebaw Tadesse**, University Of Pittsburgh (1002-47-25)
- 4:30PM *Convergence of a greedy algorithm in Bergman spaces.* Preliminary report.
(69) **Stephen J. Dilworth***, University of South Carolina, **Denka Kutzarova**, University of Illinois at Urbana-Champaign, and **Karen Shuman**, Grinnell College (1002-46-212)
- 5:00PM *Linear-fractional composition operators.*
(70) **Barbara D MacCluer**, University of Virginia (1002-47-71)
- 5:30PM *Schur multiplier projections on the von Neumann-Schatten classes.*
(71) **Ian Doust***, University of New South Wales, and **T A Gillespie**, University of Edinburgh (1002-47-37)

Special Session on Mathematical Finance, I

9:00 AM – 10:20 AM Room 1220, Benedum Hall

Organizers: **David Saunders**, University of Pittsburgh
John Chadam, University of Pittsburgh

- 9:00AM *Pricing Default Correlation Products within a structural framework.* Preliminary report.
(61) **Marcos Escobar** and **Luis A Seco***, University of Toronto (1002-60-237)
- 9:30AM *Valuation of Basket Default Swaps.*
(62) **Ian Iscoe** and **Alexander Kreinin***, Algorithmics Inc. (1002-60-101)
- 10:00AM *On a Representation for a Class of Self-financing Portfolios of Securities which Contain Equities Driven by Certain Geometric Lévy Processes.*
(63) **Vladimir Vinogradov**, Ohio University (1002-60-96)

Invited Address

11:10 AM – NOON Auditorium, Benedum Hall

- (64) *Geometric analysis on a class of degenerate elliptic operators.*
Der-Chen Chang, Georgetown University (1002-35-01)

Invited Address

2:00 PM – 2:50 PM Auditorium, Benedum Hall

- (65) *Ending laminations, tame ends, and the classification of hyperbolic 3-manifolds.*
Jeffrey F. Brock, Brown University (1002-57-03)

Special Session on Trends in Operator Theory and Banach Spaces, II

3:00 PM – 5:50 PM Room 423, Benedum Hall

Organizers: **Christopher J. Lennard**, University of Pittsburgh
Thomas A. Metzger, University of Pittsburgh

- 3:00PM *On convergence to the Denjoy-Wolff point.*
(66) **Paul S. Bourdon***, Washington and Lee University, **Valentin Matache**, University of Nebraska at Omaha, and **Joel H. Shapiro**, Michigan State University (1002-30-74)
- 3:30PM *Vector spaces contained in the zero set of a polynomial.*
▶ (67) **Richard M Aron**, Kent State University (1002-46-201)

Special Session on Mathematical Finance, II

3:00 PM – 5:20 PM Room 1220, Benedum Hall

Organizers: **David Saunders**, University of Pittsburgh
John Chadam, University of Pittsburgh

- 3:00PM *Interest Rate Explosions in HJM Bond Models.* Preliminary report.
(72) **Victor W. Goodman**, Indiana University (1002-60-225)
- 3:30PM *Inverse of First-Crossing Boundary Problem.*
(73) **Lan Cheng***, **Xinfu Chen**, **John Chadam** and **David Saunders**, University of Pittsburgh (1002-35-207)
- 4:00PM *Games with Exhaustible Resources.*
(74) **Chris Harris**, Department of Economics, University of Cambridge, **Sam Howison**, Mathematical Institute, Oxford University, and **Ronnie Sircar***, Department of Operations Research & Financial Engineering, Princeton University (1002-91-224)
- 4:30PM *On the two-times differentiability of the value functions in the problem of optimal investment in incomplete markets.*
(75) **Dmitry Kramkov**, Carnegie Mellon University (1002-60-83)
- 5:00PM *Risk-Tolerance Wealth Processes and Sensitivity Analysis of Utility Based Prices.*
(76) **Dmitry Kramkov**, Carnegie Mellon University, and **Mihai Sirbu***, Columbia University (1002-90-123)

Special Session on Geometric Analysis and Partial Differential Equations in Subelliptic Structures, II

3:00 PM – 5:20 PM Room 424, Benedum Hall

Organizers: **Cristian E. Gutierrez**, Temple University
Guozhen Lu, Wayne State University
Juan J. Manfredi, University of Pittsburgh

- 3:00PM *Mean curvature flow in the Heisenberg group.* Preliminary report.
(77) **Luca Capogna***, University of Arkansas, and **Mario Bonk**, University of Michigan (1002-35-135)
- 3:30PM *Minimal and constant mean curvature surfaces in Carnot groups.* Preliminary report.
(78) **Scott D. Pauls**, Dartmouth College (1002-53-145)
- 4:00PM *One side Liouville-type theorems for some classes of Hormander operators.*
(79) **Ermanno Lanconelli**, Università di Bologna (1002-35-191)

- 4:30PM (80) *On Regularity of Some Convex Functions in Carnot Groups*. Preliminary report.
Xiaoping Yang, School of Sciences, Nanjing University of Science & Technology (1002-35-119)
- 5:00PM (81) *A CR Poincare inequality on the sphere in complex space*.
Lijing Sun, Wayne State University (1002-35-113)

Special Session on Mathematical Biology, II

3:00 PM – 5:25 PM Room 820, Benedum Hall

Organizers: **Jonathan E. Rubin**, University of Pittsburgh
Bard Ermentrout, University of Pittsburgh

- 3:00PM (82) *Giant Squids and Hidden Canards*.
Martin Wechselberger, Mathematical Biosciences Institute, Ohio State University (1002-92-163)
- 3:25PM ▶ (83) *A Neuronal Circuit Implementing the Logic of Learning Behavior in Limax*. Preliminary report.
Pranay Goel*, Mathematical Biosciences Institute, and **Alan Gelperin**, Monell Chemical Senses Center (1002-92-218)
- 3:50PM (84) *Model of electrically induced phosphenes*.
Jonathan D Drover, University of Pittsburgh (1002-92-155)
- 4:15PM ▶ (85) *Thalamocortical cell relay fidelity with various pattern of internal pallidum input*. Preliminary report.
Yixin Guo*, MBI, The Ohio State University, **Jonathan Rubin**, University of Pittsburgh, and **David Terman**, The Ohio State University (1002-92-222)
- 4:40PM ▶ (86) *Frequency Separation in Neuronal Systems*. Preliminary report.
Alla Borisyuk, **Janet A. Best***, Mathematical Biosciences Institute, and **David H. Terman**, Mathematical Biosciences Institute and Ohio State University (1002-92-214)
- 5:05PM (87) *A Computational Study of the Role of Potassium Diffusion in the Generation and Propagation of Zero Ca²⁺ Non-Synaptic Sustained Epileptiform Activity*.
Eun-Hyoung Park* and **Dominique M. Durand**, Neural Engineering Center, Biomedical Engineering, Case Western Reserve University (1002-92-170)

Special Session on Modularity of Galois Representations and Serre's Conjecture, II

3:00 PM – 5:45 PM Room 521, Benedum Hall

Organizer: **Mark E. T. Dickinson**, University of Pittsburgh

- 3:00PM (88) *Dual Selmer Groups and the number of congruent eigenforms*.
R Ramakrishna, Cornell University (1002-11-47)
- 4:00PM (89) *Three-dimensional Galois representations and a generalization of Serre's conjecture*. Preliminary report.
Darrin M Doud, Brigham Young University (1002-11-39)
- 5:00PM (90) *Modular representations on some Riemann-Roch spaces of some modular curves*. Preliminary report.
David Joyner* and **Amy Ksir**, U.S. Naval Academy (1002-14-245)

Special Session on PDE-Based Methods in Imaging and Vision, II

3:00 PM – 5:50 PM Room 520, Benedum Hall

Organizers: **Stacey E. Levine**, Duquesne University
Yunmei Chen, University of Florida

- 3:00PM (91) *Threshold dynamics for the piecewise Mumford-Shah Functional*.
Richard Tsai*, University of Texas at Austin, and **Selim Esedoglu**, UCLA (1002-65-111)
- 3:30PM ▶ (92) *Computational Conformal Geometry and Its Applications*.
Xianfeng Gu, Computer Science, Stony Brook University (1002-68-199)
- 4:00PM ▶ (93) *A new approach for 3D segmentation of cellular tomograms obtained using three-dimensional electron microscopy*.
Alberto Bartesaghi*, **Guillermo Sapiro**, University of Minnesota, **Stanton Lee**, **Jon Lefman**, **Sharon Wahl**, **Sriram Subramaniam**, National Institutes of Health, and **Jan Orenstein**, George Washington University (1002-35-122)
- 4:30PM (94) *Maximum Likelihood Ultrasound Image Segmentation with Level Sets*.
Hemant D Tagare* and **Zhong Tao**, Yale University (1002-35-13)
- 5:00PM (95) *Image-based Elastic Registration for Patient-Specific Finite Element Model Generation*.
Omar Ghattas*, Carnegie Mellon University, **Larisa Goldmints**, RPI, and **Branislav Jaramaz**, Western Pennsylvania Hospital/CMU (1002-49-139)
- 5:30PM (96) *Application of local times of Markov processes to visual contours*.
Jonas August, Healthcare Robotics Center, Robotics Institute, Carnegie Mellon University (1002-35-236)

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

3:00 PM – 5:50 PM Room 823, Benedum Hall

Organizers: **Marta M. Asaeda**, University of Maryland
Jozef H. Przytycki, George Washington University
Adam S. Sikora, SUNY at Buffalo

- 3:00PM (97) *Rasmussen invariant, Slice-Bennequin Inequality, and sliceness of knots*.
Alexander N. Shumakovitch, Dartmouth College (1002-57-232)
- 3:30PM (98) *The Khovanov-Jacobsson number of a large class of knotted surfaces is trivial*.
J. Scott Carter, University of South Alabama (1002-57-243)
- 4:00PM (99) *Computing Khovanov-Homology*. Preliminary report.
Charles Frohman, The University of Iowa (1002-57-183)
- 4:30PM (100) *A Homology theory for graphs: From a graph, we produce a chain complex whose graded Euler Characteristic is the chromatic polynomial of the graph*. Preliminary report.
Laure Helme-Guizon* and **Yongwu Rong**, George Washington University (1002-05-234)
- 5:00PM (101) *Properties of the Khovanov type homology theory for graphs*. Preliminary report.
Yongwu Rong*, **Laure Helme-Guizon** and **Jozef Przytycki**, The George Washington University (1002-57-186)

5:30PM Discussion on Khovanov Homology.

Special Session on Convexity and Combinatorics, II

3:00 PM – 5:50 PM Room 1022, Benedum Hall

Organizers: **James F. Lawrence**, George Mason University
Valeriu Soltan, George Mason University

- 3:00PM (102) *Some new results on geometric graphs.*
Horst Martini, University of Technology Chemnitz (1002-52-16)
- 3:30PM (103) *Helly-type theorems for intersections of starshaped sets.*
Marilyn Breen, University of Oklahoma (1002-52-49)
- 4:00PM (104) *Large transversals to small families of unit disks.*
T. Bisztriczky*, University of Calgary, **F. Fodor**, University of Szeged, and **D. Oliveros**, University of Calgary (1002-52-11)
- 4:30PM (105) *On distinct distances from a vertex of a convex polygon.*
Adrian Dumitrescu, Computer Science, University of Wisconsin-Milwaukee (1002-52-77)
- 5:00PM (106) *A Dense Planar Set From Iterated Line Intersections.*
Dan Ismailescu, Hofstra University (1002-05-172)
- 5:30PM (107) *Sylvester-Gallai Theorems for Complex Numbers and Quaternions.*
Noam Elkies, Harvard University, **Lou M Pretorius**, University of Pretoria, and **Konrad J Swanepoel***, University of South Africa (1002-52-52)

Special Session on The History of Mathematics, II

3:00 PM – 6:20 PM Room 426, Benedum Hall

Organizers: **Robert E. Bradley**, Adelphi University
Lawrence A. D'Antonio, Ramapo College of New Jersey

- 3:00PM (108) *Purpose through Publication: Catalysts for Research by Junior Mathematicians in Nineteenth-Century Britain.*
Sloan Evans Despeaux, Western Carolina University (1002-01-164)
- 3:30PM (109) *Some Questions about the History of the Equivalence Problem.* Preliminary report.
Paul R Wolfson, West Chester University of Pennsylvania (1002-01-162)
- 4:00PM (110) *An Episode in the Early Development of Automated Deduction. Lewis Carroll's Symbolic Logic.* Preliminary report.
Francine F. Abeles, Kean University (1002-01-19)
- 4:30PM (111) *The Maturity of Mathematical Logic.* Preliminary report.
Thomas Drucker, University of Wisconsin-Whitewater (1002-01-26)
- 5:00PM (112) *The Social Role of Temperance Arithmetic.*
Antonella Cupillari*, Penn State Erie-The Behrend College, and **Jessica Pflueger**, Pittsburgh, PA (1002-01-27)
- 5:30PM (113) *What Teachers Taught and How: The Potential and the Pitfalls of the Study of the History of Mathematics Teaching.* Preliminary report.
Eisso J. Atzema, University of Maine (1002-01-166)
- 6:00PM (114) *What Can We Learn From the History of Enrollments.*
Walter Meyer, Adelphi University (1002-01-63)

Special Session on Partial Differential Equations and Applications, II

3:00 PM – 5:50 PM Room 420, Benedum Hall

Organizers: **Xinfu Chen**, University of Pittsburgh
Dehua Wang, University of Pittsburgh

- 3:00PM (115) *High energy tails for energy dissipative Boltzmann equations.*
Irene M. Gamba, The University of Texas at Austin (1002-35-246)
- 3:30PM (116) *Numerical methods for multiscale kinetic equations.*
Shi Jin, University of Wisconsin-Madison (1002-35-127)
- 4:00PM (117) *Two-dimensional regular shock reflection for systems of conservation laws.* Preliminary report.
Yuxi Zheng, Penn State (1002-35-73)
- 4:30PM (118) *Isentropic Gas Dynamics with Arbitrary BV Data.*
Robin Young, U Mass, Amherst (1002-35-188)
- 5:00PM (119) *Discontinuous Solutions for Some Hyperbolic Systems with Relaxation.*
Tao Luo, Georgetown University (1002-35-80)
- 5:30PM (120) *Wave breaking in a class of nonlocal dispersive wave equations.*
Hailiang Liu, Iowa State University (1002-35-175)

Special Session on Multiscale Algorithms in Computational Fluid Dynamics, II

3:00 PM – 5:20 PM Room 522, Benedum Hall

Organizers: **William J. Layton**, University of Pittsburgh
Anastasios Liakos, U.S. Naval Academy

- 3:00PM (121) *A New Strategy for Turbulence Simulation.*
Peyman Givi*, **Reza M.H. Sheikhi**, **Tom G Drozda** and **Server Levent Yilmaz**, University of Pittsburgh (1002-76-181)
- 3:30PM (122) *The approximate deconvolution method for the large eddy simulation of turbulent flows in a bounded domain.* Preliminary report.
Argus Adrian Dunca, Univ of Michigan at Ann Arbor (1002-76-156)
- 4:00PM (123) *Multiscale Algorithms and Models for Turbulent Flows.*
William J. Layton, University of Pittsburgh (1002-76-88)
- 4:30PM (124) *Boundary Conditions for Large Eddy Simulation of Transitional Turbulent Flows.* Preliminary report.
Traian Iliescu*, **Jeff Borggaard**, **Alexey Miroshnikov** and **Grant Boquet**, Virginia Tech (1002-76-130)
- 5:00PM (125) *Slip with friction boundary condition for the Navier-Stokes equations – numerical studies for time dependent laminar flows.* Preliminary report.
Anastasios Liakos*, U.S. Naval Academy, and **John Volker**, Otto-von-Guericke-University Magdeburg (1002-65-152)

Special Session on Knots and Macromolecules, II

3:00 PM – 5:20 PM Room 722, Benedum Hall

Organizers: **Kenneth C. Millett**, University of California Santa Barbara
Eric J. Rawn, Duquesne University

- 3:00PM (126) *Identifying Those Links in Solid Tori Which are Braids Made of Braids.* Preliminary report.
J. R. Bozeman, Lyndon State College (1002-57-45)

- 3:30PM *Local versus global structure in knot space.*
(127) **Kenneth C Millett**, University of California, Santa Barbara (1002-57-117)
- 4:00PM *C² Smooth Knots of Constant Curvature.*
(128) **Jenelle Marie McAtee**, University of Iowa (1002-54-98)
- 4:30PM *Braid Index, Genus and Crossing Number of Links.*
(129) Preliminary report.
Yuanan Diao*, UNC Charlotte, **Claus Ernst**, Western Kentucky University, and **Morwen Thistlethwaite**, University of Tennessee (1002-57-64)
- 5:00PM *Geometry and physics of proteins.*
▶ (130) **Jayanth R Banavar***, Penn State, and **Amos Maritan**, University of Padova (1002-82-89)

Special Session on Graph Polynomials, I

3:00 PM – 5:50 PM Room 523, Benedum Hall

Organizer: **E. Glen Whitehead, Jr.**, University of Pittsburgh

- 3:00PM *An Introduction to Graph Polynomials.*
(131) **Earl Glen Whitehead**, University of Pittsburgh (1002-05-99)
- 3:30PM *Totally Matchable Graphs.*
(132) **Kimberly J Burch***, Montclair State University, and **Earl Glen Whitehead, Jr.**, University of Pittsburgh (1002-05-86)
- 4:00PM *A brute-force method for studying chromatic equivalence of homeomorphic graphs.*
(133) **Ronald C. Read**, Department of Combinatorics and Optimization, University of Waterloo (1002-05-14)
- 4:30PM *A categorification for the chromatic polynomial.*
(134) **Yongwu Rong*** and **Laure Helme-Guizon**, The George Washington University (1002-05-187)
- 5:00PM *Computation of Tutte Polynomials.* Preliminary report.
▶ (135) **Gary Haggard***, Bucknell University, and **Gordon Royle**, University of Western Australia (1002-05-15)
- 5:30PM *A characteristic polynomial for chordal graphs and rooted graphs.*
▶ (136) **Elizabeth W. McMahon***, Lafayette College, **Beth Shimkus**, Lehigh University, and **Jessica Wolfson**, Lafayette College (1002-05-161)

Special Session on Multivariate Hypergeometric Functions: Combinatorial and Algebro-Geometric Aspects, II

3:00 PM – 5:20 PM Room 1020, Benedum Hall

Organizers: **Eduardo Cattani**, University of Massachusetts, Amherst
Alicia M. Dickenstein, Universidad de Buenos Aires
Laura Felicia Matusevich, Harvard University

- 3:00PM *Ranks of A-hypergeometric systems.*
(137) **Laura Felicia Matusevich***, University of Pennsylvania, **Ezra Miller**, University of Minnesota, and **Uli Walther**, Purdue University (1002-14-84)
- 3:30PM *Generalized A-hypergeometric systems and duality.*
(138) Preliminary report.
Uli Walther, Purdue University (1002-14-81)
- 4:00PM *The holonomic rank formula for A-hypergeometric system in the case where the rank of A is three.*
(139) Preliminary report.
Go Okuyama, Hokkaido University (1002-14-75)

- 4:30PM *A differential operators approach to rank-jumps in hypergeometric systems.* Preliminary report.
(140) **William N. Traves**, U.S. Naval Academy (1002-13-144)
- 5:00PM *Nonsolvability of Holonomic Systems of Equations by Quadratures.*
(141) **Askold Khovanskii**, University of Toronto, Independent University of Moscow and Institute for System Studies, Moscow (1002-35-131)

Session for Contributed Papers

3:00 PM – 4:55 PM Room 920, Benedum Hall

- 3:00PM *Mathematics in Ancient India.* Preliminary report.
▶ (142) **Vijay Kumar Bhat**, Banasthali Vidyapith, Rajasthan (1002-01-06)
- 3:15PM *Affine Cyclic Codes.* Preliminary report.
▶ (143) **Nuh Aydin**, Kenyon College (1002-05-138)
- 3:30PM *Letter Representations of Rectangular $m \times n \times p$ Proper Arrays.* Preliminary report.
▶ (144) **Jocelyn Quaintance**, Kutztown University (1002-05-54)
- 3:45PM *Nilpotent N-Lie Algebras.* Preliminary report.
(145) **Michael Peretzian Williams**, North Bethesda, MD (1002-17-108)
- 4:00PM *Notes on regularity and smoothness of outer measures.*
(146) **Carmen D Vlad**, Pace University, New York, NY. (1002-28-133)
- 4:15PM *Constraint-Preserving Boundary Conditions for Some Hyperbolic Systems of Differential Equations.*
(147) **Nicolae Tarfulea**, School of Mathematics, University of Minnesota (1002-35-35)
- 4:30PM *Generalizations of Kantrovich and Strang Inequalities.*
(148) **Morteza Seddighin**, Indiana University East (1002-47-34)
- 4:45PM *Development of The Phase Function Method for Systems of N Charged Particles.*
(149) **Lia Leon Chachanidze-Margolin**, University of Phoenix (1002-70-05)

Department of Mathematics of the University of Pittsburgh Reception

6:30 PM – 7:30 PM Ball Room, William Pitt Union

Sunday, November 7

Meeting Registration

8:00 AM – NOON Room 1175, Benedum Hall

AMS Exhibit and Book Sale

8:00 AM – NOON Room 1175, Benedum Hall

Special Session on Modularity of Galois Representations and Serre's Conjecture, III

8:00 AM – 10:45 AM Room 521, Benedum Hall

Organizer: **Mark E. T. Dickinson**, University of Pittsburgh

- 8:00AM *Eisenstein Deformation Rings.*
(150) **Francesco Calegari**, Harvard (1002-11-33)

- 9:00AM *Functoriality and Serre's Conjecture*. Preliminary report. (151)
David Pollack, Wesleyan University (1002-11-43)
- 10:00AM *Weights of Galois representations associated to Hilbert modular forms*. Preliminary report. (152)
Michael M. Schein, Harvard University (1002-11-28)

Special Session on PDE-Based Methods in Imaging and Vision, III

8:00 AM – 10:50 AM Room 520, Benedum Hall

Organizers: **Stacey E. Levine**, Duquesne University
Yunmei Chen, University of Florida

- 8:00AM *Information Theoretic Mean*. Preliminary report. (153)
 ▶ **Murali Rao**, University Of Florida (1002-94-200)
- 8:30AM *Nonlinear Energy Minimization in Signal/Image Analysis by Stochastic Differential Equations*. (154)
Hamid Krim*, North Carolina State University, and **Elena Zhizhina**, Institute for Information and Transmission Problems (1002-62-58)
- 9:00AM *Geometric Analysis of Statistical Manifolds with Applications to Object Recognition*. Preliminary report. (155)
Washington Mio* and **Dennis Badlyans**, Florida State University (1002-68-205)
- 9:30AM *Existence and Local Uniqueness of Certain Optimal Correspondences between Plane Curves*. (156)
David Groisser, University of Florida (1002-49-134)
- 10:00AM *Error Analysis for Image Inpainting*. Preliminary report. (157)
Tony Chan, University of California, Los Angeles, and **Sung Ha Kang***, University of Kentucky (1002-65-115)
- 10:30AM *Inpainting of BV Images in the Wavelets Domain*. (158)
Jackie Jianhong Shen*, University of Minnesota, **Haomin Zhou**, Georgia Institute of Technology, and **Tony F. Chan**, UCLA (1002-94-59)

Special Session on Invariants of Knots and 3-Manifolds, III

8:00 AM – 10:50 AM Room 823, Benedum Hall

Organizers: **Marta M. Asaeda**, University of Maryland
Jozef H. Przytycki, George Washington University
Adam S. Sikora, SUNY at Buffalo

- 8:00AM *Relative Framing of Transverse Knots*. (159)
Vladimir V. Chernov, Dartmouth College (1002-57-244)
- 8:30AM *Markov Traces on Framed Braids*. Preliminary report. (160)
Sofia Lambropoulou*, National Technical University of Athens, and **Jesus Juyumaya**, University of Valparaiso (1002-57-241)
- 9:00AM *Knot Polynomials vs. Hyperbolic Volume*. Preliminary report. (161)
Oliver T Dasbach*, Louisiana State University, Baton Rouge, and **Xiao-Song Lin**, University of California, Riverside (1002-57-174)
- 9:30AM *Anti-homotopy skein theory for hyperbolic 3-manifolds*. Preliminary report. (162)
Uwe Kaiser, Boise State University (1002-57-165)
- 10:00AM *Traces on the skein algebra of the torus*. (163)
Michael McLendon, Washington College (1002-55-125)

- 10:30AM *An Isomorphism Between Affine Birman-Murakami-Wenzl Algebras and Tangles in the Solid Torus*. Preliminary report. (164)
 ▶ **Frederick Goodman** and **Holly M Hauschild***, University of Iowa (1002-54-220)

Special Session on Convexity and Combinatorics, III

8:00 AM – 10:50 AM Room 1022, Benedum Hall

Organizers: **James F. Lawrence**, George Mason University
Valeriu Soltan, George Mason University

- 8:00AM *On the space of affine classes of convex bodies*. Preliminary report. (165)
Wlodzimierz Kuperberg, Auburn University (1002-52-124)
- 8:30AM *Ball-Polytopes*. (166)
Karoly Bezdek, University of Calgary (1002-52-179)
- 9:00AM *Determining a convex body by minor subsets of the boundary*. Preliminary report. (167)
 ▶ **David G. Larman***, University College London, London, U.K., and **Grzegorz Sojka**, Mathematics Institute, University of Warsaw (1002-52-51)
- 9:30AM *On Lebesgue's universal cover problem*. Preliminary report. (168)
 ▶ **Peter Brass**, City College New York, CUNY (1002-52-104)
- 10:00AM *On the number of mutually touching cylinders*. Preliminary report. (169)
Andras Bezdek, Auburn University, AL and Rényi Inst. of Mathematics, Budapest, Hungary (1002-52-184)
- 10:30AM *Covering with Fat Convex Discs*. (170)
 ▶ **Gábor Fejes Tóth**, Alfréd Rényi Mathematical Institute (1002-52-193)

Special Session on The History of Mathematics, III

8:00 AM – 10:50 AM Room 426, Benedum Hall

Organizers: **Robert E. Bradley**, Adelphi University
Lawrence A. D'Antonio, Ramapo College of New Jersey

- 8:00AM *Numbers: Regular, irregular and prime. Some thoughts on the Old Babylonian sexagesimal system*. (171)
Duncan J. Melville, St. Lawrence University (1002-01-158)
- 8:30AM *When did Trigonometry Begin?* (172)
 ▶ **Glen R. Van Brummelen**, Bennington College (1002-01-76)
- 9:00AM *Changing Proofs for the Quadrature of the Parabola*. Preliminary report. (173)
 ▶ **Gordon A. Swain**, Ashland University (1002-01-22)
- 9:30AM *The development of the mathematical thought of the young Descartes*. (174)
 ▶ **Michel Pierre Serfati**, Institut de Recherche sur l'Enseignement des Mathématiques. Université Paris VII. Denis Diderot. (1002-01-107)
- 10:00AM *How the Cartesian Revolution renders Plato's hope for a mathematical basis for philosophy implausible*. (175)
 ▶ **Samuel S Kutler**, St. John's College in Annapolis, Maryland (1002-01-109)
- 10:30AM *Gertrude Blanch of the WPA*. (176)
 ▶ **David Alan Grier**, George Washington University (1002-01-07)

Special Session on Partial Differential Equations and Applications, III

8:00 AM – 10:50 AM Room 420, Benedum Hall

Organizers: **Xinfu Chen**, University of Pittsburgh
Dehua Wang, University of Pittsburgh

8:00AM Discussion.

8:30AM *Global Existence for 3D Incompressible Isotropic Elastodynamics via the Incompressible Limit.*
(177) **Thomas C Sideris**, University of California, Santa Barbara, and **Becca Thomases***, Courant Institute of Mathematical Sciences, New York University (1002-35-82)

9:00AM *On Viscoelastic Fluids.* Preliminary report.
(178) **Chun Liu**, Penn State University (1002-35-129)

9:30AM *Another way to say subsolution: the maximum principle and sums of Green functions.*
(179) **Richard S. Laugesen***, University of Illinois, Urbana-Champaign, and **Neil A. Watson**, University of Canterbury (1002-35-92)

10:00AM *On a Multidimensional Model for the Dynamic Combustion of Compressible Reacting Flows.*
(180) **D. Donatelli**, University of L'Aquila, and **K. Trivisa***, University of Maryland at College Park (1002-35-60)

10:30AM *Lotka-Volterra competition model with small or intermediate diffusion coefficients.*
(181) **Yuan Lou**, The Ohio State University (1002-35-114)

Special Session on Knots and Macromolecules, III

8:00 AM – 10:50 AM Room 722, Benedum Hall

Organizers: **Kenneth C. Millett**, University of California Santa Barbara
Eric J. Rawdon, Duquesne University

8:00AM *The shape of DNA bound by Mu transposase.*
▶ (182) **Isabel K Darcy***, University of Iowa, **John Luecke**, UT Austin, and **Mariel Vazquez**, UC Berkeley (1002-92-213)

8:30AM *Classification of Tangle Solutions for Integrases.*
(183) **Dorothy Buck***, UC Davis and Imperial College, UK, and **Cynthia Verjovsky Marcotte**, St Edwards University (1002-92-192)

9:00AM *Packing, curvature, and tangling of filaments.*
▶ (184) **Jonathan K. Simon***, University of Iowa, and **Gregory R. Buck**, St. Anselm College (1002-53-216)

9:30AM *Periodic table of knots.* Preliminary report.
(185) **Alessandro Flammini**, School of Informatics, Indiana University, and **Andrzej Stasiak***, Université de Lausanne (1002-54-143)

10:00AM *Tight knots and links: a universal energy spectrum for physical systems.*
(186) **Thomas W Kephart***, TN, and **Roman V. Buniy**, U. of Oregon (1002-70-178)

10:30AM *On pearl-number and ropelength of knots and links.*
▶ (187) Preliminary report.
Rob Kusner*, Center for Geometry, Analysis, Numerics and Graphics (GANG), and **Wöden Kusner**, Haverford College (1002-52-228)

Special Session on Multivariate Hypergeometric Functions: Combinatorial and Algebraic-Geometric Aspects, III

8:00 AM – 10:20 AM Room 1020, Benedum Hall

Organizers: **Eduardo Cattani**, University of Massachusetts, Amherst

Alicia M. Dickenstein, Universidad de Buenos Aires

Laura Felicia Matusevich, Harvard University

8:00AM *Algebraic functions as solutions of holonomic systems of partial differential equations.*
(188) **Alicia Dickenstein**, University of Buenos Aires, Argentina, **Laura Felicia Matusevich**, Harvard University, and **Timur Sadykov***, The University of Western Ontario, London, Canada (1002-14-62)

8:30AM *Planar configurations and gkz-rationality.*
(189) **Alicia Dickenstein***, Universidad de Buenos Aires, and **Eduardo Cattani**, University of Massachusetts (1002-14-70)

9:00AM *Picard-Fuchs differential equation for the A_n family of Calabi-Yau varieties.*
(190) **H A Verrill**, Louisiana State University (1002-14-48)

9:30AM *Integral sub-variations of Hodge structure and moduli of Calabi-Yau complete intersections.* Preliminary report.
(191) **Charles Doran***, University of Washington, and **John Morgan**, Columbia University (1002-14-227)

10:00AM *Hypergeometric series and discriminant amoebas.*
(192) **Mikael Passare**, Stockholm University, Sweden (1002-33-203)

Special Session on Trends in Operator Theory and Banach Spaces, III

8:30 AM – 10:50 AM Room 423, Benedum Hall

Organizers: **Christopher J. Lennard**, University of Pittsburgh
Thomas A. Metzger, University of Pittsburgh

8:30AM *Positive functionals on general Operator Algebras.*
(193) **Victor I Lomonosov**, Kent State University (1002-47-221)

9:00AM *Subalgebras of Hardy spaces.*
(194) **Michael I Stessin**, SUNY at Albany (1002-30-72)

9:30AM *Banach lattices and tensor norms.* Preliminary report.
(195) **Joe N. Diestel**, Kent State University (1002-46-08)

10:00AM *Convexity properties of ψ -direct sums of Banach spaces.*
(196) **Patrick Dowling**, Miami University (1002-46-121)

10:30AM Discussion.

Special Session on Geometric Analysis and Partial Differential Equations in Subelliptic Structures, III

8:30 AM – 10:50 AM Room 424, Benedum Hall

Organizers: **Cristian E. Gutierrez**, Temple University
Guozhen Lu, Wayne State University
Juan J. Manfredi, University of Pittsburgh

8:30AM *Apollonian metric of domains in Heisenberg group.*
(197) Preliminary report.
Zair Ibragimov, University of Cincinnati (1002-30-57)

9:00AM *A generalization of the Coifman Lions Meyer and Semmes theorem to mappings between manifolds.*
(198) **Piotr Hajtasz**, University of Pittsburgh (1002-35-238)

9:30AM *Sharp weighted Young's inequalities and Moser-Trudinger inequalities in groups of Heisenberg type.* Preliminary report.
Jeremy T. Tyson, University of Illinois (1002-43-215)

10:00AM *The horizontal Hessian matrix of the distance function in the Heisenberg group.*
Fausto Ferrari, Università Piazza di Porta S. Donato and C.I.R.A.M. (1002-35-93)

10:30AM *About a Liouville phenomenon for supersolutions of elliptic partial differential equations.*
Vasilii V. Kurta, Mathematical Reviews, AMS (1002-35-147)

Special Session on Multiscale Algorithms in Computational Fluid Dynamics, III

8:30 AM – 10:50 AM Room 522, Benedum Hall

Organizers: **William J. Layton**, University of Pittsburgh
Anastasios Liakos, U.S. Naval Academy

8:30AM *Time Averaged Statistics and Navier-Stokes Equations.*
Carolina C Manica, University of Pittsburgh (1002-65-140)

9:00AM *FENE dumbbell model for complex fluids and its closure approximations.*
Qiang Du*, **Chun Liu** and **Peng Yu**, Penn State University (1002-65-95)

9:30AM *Local Dynamics of Navier-Stokes Equations in Exterior Domains.*
Giovanni P Galdi, Department of Mechanical Engineering, University of Pittsburgh, Pittsburgh, PA (1002-76-100)

10:00AM *Mathematical Analysis of Orientation of Rigid Bodies Falling in Newtonian and Non-Newtonian Fluids.*
Ashwin Vaidya, Carnegie Mellon University (1002-76-97)

10:30AM *Advances in MHD Flow Simulations.*
A. J. Meir*, Auburn University, and **P. G. Schmidt**, Mathematics and Statistics / Auburn University (1002-76-167)

Special Session on Graph Polynomials, II

8:30 AM – 10:50 AM Room 523, Benedum Hall

Organizer: **E. Glen Whitehead, Jr.**, University of Pittsburgh

8:30AM *Reconstructing (and not reconstructing) trees from probability data.*
David Eisenstat, University of Rochester, Rochester, NY, and **Gary Gordon***, Lafayette College, Easton, PA (1002-05-160)

9:00AM *On the sandpile group of regular trees.*
Evelin Toumpakari, University of Chicago (1002-05-41)

9:30AM *A strange tree-enumeration formula from electrical network theory.*
David G. Wagner, University of Waterloo C&O Department (1002-05-23)

10:00AM *Monomial Bases for NBC Complexes.* Preliminary report.
Jason I Brown, Dalhousie University, and **Bruce E Sagan***, Michigan State University (1002-05-102)

10:30AM *Properties of the interlace polynomial.*
Joanna Anthony Ellis-Monaghan*, St. Michael's College, and **Irasema Sarmiento**, CINEVESTAV, Mexico (1002-05-85)

AMS Workshop

9:30 AM – 2:00 PM Room 525, Benedum Hall

T.A. development using case studies: A workshop for faculty.
 Organizer: **Solomon Friedberg**, Boston University

Invited Address

11:10 AM – NOON Auditorium, Benedum Hall

(212) *The boosting approach to machine learning.*
Robert Schapire, Princeton University (1002-68-04)

Invited Address

2:00 PM – 2:50 PM Auditorium, Benedum Hall

(213) *Homogenization in asymmetrical random media: Recent results and challenges.*
Ofer Zeitouni, University of Minnesota, Minneapolis (1002-60-02)

Special Session on Modularity of Galois Representations and Serre's Conjecture, IV

3:00 PM – 5:45 PM Room 521, Benedum Hall

Organizer: **Mark E. T. Dickinson**, University of Pittsburgh

3:00PM *An algorithm for verifying Artin's conjecture.*
 Preliminary report.
Andrew R Booker, University of Michigan (1002-11-42)

4:00PM *The Birch and Swinnerton-Dyer Conjecture, Tamagawa Numbers, and Level Lowering.*
 Preliminary report.
William A Stein, Harvard University (1002-11-36)

5:00PM Problem session.

Special Session on Invariants of Knots and 3-Manifolds, IV

3:00 PM – 6:00 PM Room 823, Benedum Hall

Organizers: **Marta M. Asaeda**, University of Maryland
Jozef H. Przytycki, George Washington University
Adam S. Sikora, SUNY at Buffalo

3:00PM *Alexander groups of long virtual knots.*
 Preliminary report.
Daniel S. Silver and **Susan G Williams***, University of South Alabama (1002-57-204)

3:30PM *Knots and Lehmer's Question.*
 Preliminary report.
Daniel S Silver* and **Susan G Williams**, University of South Alabama (1002-57-209)

4:00PM *Presentations of groups of n-trivial knots.*
 Preliminary report.
Ted Stanford, New Mexico State University (1002-57-231)

4:30PM *On the quantization of the moduli space of flat SU(2)-connections on the torus.*
Razvan Gelca, Texas Tech University (1002-57-79)

- 5:00PM *String Link Invariants via Representation Theory.*
 (220) Preliminary report.
Craig Jackson, University of Chicago, and **Thomas Kerler***, The Ohio State University (1002-16-226)
- 5:30PM Discussion.

Special Session on Convexity and Combinatorics, IV

3:00 PM – 5:20 PM Room 1022, Benedum Hall

Organizers: **James F. Lawrence**, George Mason University
Valeriu Soltan, George Mason University

- 3:00PM *Tilings of the sphere with congruent spherical triangles.*
 ► (221) **Robert J. MacG. Dawson**, Saint Mary's University (1002-52-154)
- 3:30PM *Antipodality in Hyperbolic Space.*
 ► (222) **Karoly Bezdek**, **Marton Naszodi** and **Deborah Oliveros***, University of Calgary (1002-52-56)
- 4:00PM *An angle in Minkowski space.*
 (223) **Boris V. Dekster**, Mount Allison University (1002-51-09)
- 4:30PM *On the perimeter and area of the unit disc in Minkowski planes.* Preliminary report.
 ► (224) **Zokhrab Mustafaev**, Ithaca College (1002-52-10)
- 5:00PM *Pairs of Convex Bodies with Centrally Symmetric Intersections of Translates.*
 (225) **Valeriu Soltan**, George Mason University (1002-52-197)

Special Session on Mathematical Modeling of Nonlinear Phenomena in Biology and Mechanics

3:00 PM – 5:50 PM Room 720, Benedum Hall

Organizers: **Anna Vainchtein**, University of Pittsburgh
William C. Troy, University of Pittsburgh

- 3:00PM *On long range electrical interactions in DNA elasticity.*
 ► (226) **Bernard D Coleman**, Rutgers University, Department of Mechanics and Materials Science (1002-74-110)
- 3:25PM *Influence of intrinsic curvature and coupling on configurations of DNA minicircles.*
 (227) **David Swigon***, University of Pittsburgh, **Wilma K Olson** and **Bernard D Coleman**, Rutgers University (1002-74-217)
- 3:50PM *A two dimensional neural model.*
 ► (228) **William C Troy**, University of Pittsburgh (1002-92-189)
- 4:15PM *Modeling and Analysis of Two-Phase Equilibria of Bilayer Membranes.* Preliminary report.
 (229) **Tim Healey**, Theoretical & Applied Mechanics/Cornell University (1002-74-198)
- 4:40PM *Composites of Hyperelastic Materials with Prescribed Lavrentiev Gap Functions.* Preliminary report.
 (230) **Victor J. Mizel**, Carnegie Mellon University (1002-35-223)
- 5:05PM *Kinetics of lattice phase transitions.* Preliminary report.
 ► (231) **Anna Vainchtein***, University of Pittsburgh, Department of Mathematics, and **Lev Truskinovsky**, Ecole Polytechnique (1002-70-148)
- 5:30PM Discussion.

Special Session on Knots and Macromolecules, IV

3:00 PM – 5:50 PM Room 722, Benedum Hall

Organizers: **Kenneth C. Millett**, University of California Santa Barbara
Eric J. Rawdon, Duquesne University

- 3:00PM *Numeric results on upper bounds of rope length.*
 ► (232) Preliminary report.
Claus Ernst*, Western Kentucky University, **Yuanan Diao**, University of North Carolina, Charlotte, and **Uta Ziegler**, Western Kentucky University (1002-57-206)
- 3:30PM *Numerics issues in ropelength minimization.*
 (233) **Michael Piatek***, **Eric Rawdon**, Duquesne University, and **Jason Cantarella**, University of Georgia, Athens (1002-65-182)
- 4:00PM *What do we know about kinked tubes? On shortest curves of constrained curvature.* Preliminary report.
 (234) **Jason Cantarella***, **Joseph Fu**, University of Georgia, **Robert Kusner**, University of Massachusetts, **John Sullivan**, Technische Univeristat Berlin, and **Nancy Wrinkle**, Northern Illinois University (1002-53-208)
- 4:30PM *Upper Bounds for the Minimum Ropelength of Knots.*
 (235) **Justyna Baranska**, **Piotr Pieranski**, **Sylwester Przybyl**, Poznan Technical University, and **Eric J Rawdon***, Duquesne University (1002-57-180)
- 5:00PM Discussion.

Lesley M. Sibner
 Associate Secretary
 Brooklyn, New York