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# Program of the Sessions

*Las Vegas, Nevada, April 21–22, 2001*

## Saturday, April 21

### Meeting Registration

8:00 AM – 4:30 PM      **First Floor Foyer, Classroom Building Complex A**

### Special Session on Finite Element Analysis and Applications, I

8:00 AM – 10:50 AM      **Room 223, Classroom Building Complex C, Classroom Building Complex C**

Organizers: **Jichun Li**, University of Nevada  
**Michael Marcozzi**, University of Nevada  
**George Miel**, University of Nevada  
**Darrell W. Pepper**, University of Nevada

- 8:00AM (1) *Valuation of derivative securities by variational methods.*  
**Michael D Marcozzi**, University of Nevada, Las Vegas (965-90-27)
- 8:30AM (2) *Conservative Galerkin finite element methods and local flux recovery.*  
**So-Hsiang Chou**, Bowling Green State University (965-65-106)
- 9:00AM (3) *Approximations of degenerate extended Williamson fluids based on Heindl elements.*  
**Shue-Sum Chow\***, Brigham Young University,  
**Graham F Carey** and **William Barth**, University of Texas at Austin (965-65-196)
- 9:30AM (4) *Comparison of Finite Elements and Finite Differences Methods in Option Pricing.* Preliminary report.  
**George Miel\*** and **Jack Schofield**, University of Nevada (965-65-199)

- 10:00AM (5) *A Posteriori Finite Element Error Estimation for Hyperbolic Partial Differential Equations.*  
**Slimane Adjerid\***, Department of Mathematics, Virginia Polytechnic Institute, **Joseph E Flaherty** and **Lilia Krivodonova**, Rensselaer Polytechnic Institute (965-65-184)
- 10:30AM (6) *Finite Element Methods for Schrödinger Systems.*  
**Graeme Fairweather**, Colorado School of Mines (965-65-197)

### Special Session on Physical Knotting and Unknotting, I

8:00 AM – 10:50 AM      **Room 215, Classroom Building Complex C, Classroom Building Complex C**

Organizers: **Jorge Alberto Calvo**, North Dakota State University  
**Kenneth C. Millett**, University of California Santa Barbara  
**Eric J. Rawdon**, Chatham College

- 8:00AM (7) *Upper Bounds on Linking Numbers of Thick Links.* Preliminary report.  
**Yuanan Diao\***, UNC Charlotte, **Claus Ernst**, Western Kentucky Univ., and **Jance Van E Rensburg**, York University (965-57-33)
- 8:30AM (8) *On the gyration radius of random knots and its critical exponent.*  
**Tetsuo Deguchi\*** and **Miyuki K Shimamura**, Department of Physics, Faculty of Science, and Graduate School of Humanities and Sciences, Ochanomizu University (965-65-68)
- 9:00AM (9) *Optimal shapes of elastic filaments with finite thickness.*  
**Oscar Gonzalez**, University of Texas, Austin (965-74-167)
- 9:30AM (10) *Localization of breakage points in knotted strings.*  
**Piotr Pieranski**, Poznan University of Technology, **Sandor Kasas**, **Giovanni Dietler\***, **Jacques Dubochet** and **Andrzej Stasiak**, University of Lausanne (965-74-67)

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**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 22, Issue 2 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.

- 10:00AM *Predicting Optimal Lengths of Random Knots.*  
 ► (11) **Akos Dobay**, University of Lausanne/Laboratory of Ultrastructural Analysis, **Pierre-Edouard Sottas**, Swiss Federal Institute of Technology/Center for Neuromimetic Systems, **Jacques Dubochet** and **Andrzej Stasiak\***, University of Lausanne/Laboratory of Ultrastructural Analysis (965-92-101)
- 10:30AM *Ideal trefoil knot.*  
 (12) **Piotr Pieranski\*** and **Sylwester Przybyl**, Poznan University of Technology (965-51-177)

**Special Session on Set Theory, I**

8:00 AM – 10:50 AM Room 221, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **Douglas Burke**, University of Nevada, Las Vegas  
**Derrick Dubose**, University of Nevada, Las Vegas
- 8:00AM *Connections between AD and AC.*  
 (13) **Steve C Jackson**, University of North Texas (965-03-138)
- 8:30AM *Some theorems and questions in descriptive set theory.*  
 (14) **Howard S Becker**, University of South Carolina (965-03-117)
- 9:00AM *Equivalence between Wadge and Lipschitz determinacy.*  
 (15) **Alessandro Andretta\***, Università di Torino, Italy, and **Donald A. Martin**, University of California Los Angeles (965-03-29)
- 9:30AM *Seemingly weak versions of Blackwell determinacy.*  
 (16) **Benedikt Löwe**, Rheinische Friedrich-Wilhelms-Universität Bonn (965-03-87)
- 10:00AM *Some Applications of the Adams-Kechris Technique.*  
 (17) **Su Gao**, California Institute of Technology (965-03-104)
- 10:30AM *Non-standard applications of Gandy-Harrington.*  
 (18) **Greg Hjorth**, UCLA (965-03-38)

**AMS Exhibit and Book Sale**

8:00 AM – 4:30 PM First Floor Foyer, Classroom Building Complex A

**Special Session on Geometric and Computational Group Theory, I**

8:30 AM – 10:50 AM Room 225, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **Eric M. Freeden**, Southern Utah University  
**Eric L. Swenson**, Brigham Young University
- 8:30AM *The density of graphical sets and primitive elements in free groups.*  
 (19) **Enric Ventura**, City College of New York & Univ. Pol. Catalunya (965-20-217)
- 9:00AM *Out( $F_n$ ) has no parabolic elements.*  
 (20) **Emina Alibegovic**, University of Utah (965-20-158)
- 9:30AM *Relative growth of groups of automorphisms.*  
 ► (21) Preliminary report.  
**Alexei Myasnikov** and **Vladimir Shpilrain\***, The City College of New York (965-20-129)
- 10:00AM *Rotation Distance and Thompson's Group F.*  
 (22) **Sean Cleary**, City College of New York (965-20-32)

- 10:30AM *Bounded cohomology, amenable groups, and hyperbolic groups.*  
 (23) **Igor Mineyev**, University of South Alabama (965-20-94)

**Special Session on Graphs and Digraphs, I**

8:30 AM – 10:55 AM Room 214, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **Michael Jacobson**, University of Louisville  
**K. Brooks Reid**, California State University, San Marcos
- 8:30AM *Packing Caterpillars Into Complete Graphs.*  
 ► (24) **John J Watkins\***, Colorado College, and **Jesse Gilbert**, Lawrence University (965-05-40)
- 9:00AM *Directed Cycle Decompositions of the Complete Symmetric Digraph, Part I.*  
 (25) **Brian Alspach**, University of Regina, **Heather Gavlas\***, Grand Valley State University, **Mateja Sajna**, Nova Gorica Polytechnic, and **Helen Verrall**, Portland, Oregon (965-05-78)
- 9:30AM *Directed Cycle Decompositions of the Complete Symmetric Digraph, Part II.*  
 (26) **Brian Alspach\***, University of Regina, **Heather Gavlas**, Grand Valley State University, **Mateja Šajna**, Capilano College, and **Helen Verrall**, Portland, Oregon (965-05-110)
- 10:00AM *Partitioning Vertices of a Tournament into Independent Cycles.*  
 (27) **Guantao Chen**, Georgia State University, **Ronald J Gould\***, Emory University, and **Li Hao**, Université Paris-Sud (965-05-88)
- 10:30AM *Hamiltonian decomposition of prisms over cubic graphs.* Preliminary report.  
 ► (28) **Roman Čada**, University of West Bohemia, **Moshe Rosenfeld\***, University of Washington, Tacoma, and **Zdeněk Ryjáček**, University of West Bohemia (965-05-195)

**Special Session on PDEs from Fluid Mechanics: Applied Analysis and Numerical Methods, I**

8:30 AM – 10:45 AM Room 217, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **L. Steven Hou**, York University and Iowa State University  
**Xiaoming Wang**, Iowa State University
- 8:30AM *Spectral approximation of a dissipative model for liquid crystals flow.*  
 (29) **Qiang Du**, Iowa State University (965-65-41)
- 8:45AM *An Application of Optimal Control Theory to Crystal Growth.*  
 ► (30) **James C Turner**, Florida State University (965-49-112)
- 9:15AM *Finite-Element Simulation of Electromagnetically and Thermally Driven MHD Flows.*  
 (31) **A. J Meir\*** and **Paul G Schmidt**, Department of Mathematics, Auburn University (965-76-76)
- 9:30AM break
- 9:45AM *Computations of Compressible Vortices.* Preliminary report.  
 (32) **Thomas P Svobodny**, Wright State University (965-76-93)

- 10:00AM (33) *Stabilization of a quasilinear parabolic equation or the 2D Navier-Stokes system by boundary feedback control.*  
**Andrei V Fursikov**, Moscow State University (965-93-83)
- 10:15AM (34) *Exact controllability of an elastic membrane coupled with a potential fluid.*  
**Scott Hansen**, Iowa State University (965-93-86)
- 10:30AM (35) *Analysis of viscous incompressible flows around a moving rigid body.*  
**Hyung-Chun Lee**, Ajou University (965-76-120)

### Special Session on Waves in Heterogeneous Media, I

8:30 AM – 10:45 AM Room 219, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **Randall J. LeVeque**, University of Washington  
**Knut Solna**, University of California Irvine
- 8:30AM (36) *Imaging in a random environment.*  
**George C Papanicolaou**, Department of Mathematics Stanford University (965-60-208)
- 9:05AM (37) *Absence of slow time behaviour in waves in random media.* Preliminary report.  
**Abel Klein**, University of California, Irvine (965-35-141)
- 9:40AM break
- 10:00AM (38) *Turbulence Induced Beam Spreading of Higher Order Mode Optical Waves.*  
**Cynthia Y Hopen\***, University of Central Florida, **Yadira V Gilchrest** and **Brian R Macon**, Department of Mathematics, UCF (965-33-77)
- 10:25AM (39) *Nonlinear wave propagation in random layered media.* Preliminary report.  
**J B Thoo\***, Yuba College, and **J K Hunter**, Univ. of California, Davis (965-35-192)

### Special Session on Topology of Links, I

9:00 AM – 10:50 AM Room 212, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **Jeff Johannes**, University of Nevada, Las Vegas  
**Swatee Naik**, University of Nevada, Reno
- 9:00AM (40) *Intrinsically Knotted and Linked Graphs.* Preliminary report.  
**Erica L Flapan**, Pomona College (965-57-62)
- 9:30AM (41) *A-polynomials and twisted Alexander polynomials.* Preliminary report.  
**Andrius Tamulis**, Cardinal Stritch University (965-57-157)
- 10:00AM (42) *Remarks on Khovanov's knot homology.* Preliminary report.  
**Oliver T Dasbach\***, University of California, Riverside, and **Arkady Vaintrob**, University of Oregon, Eugene (965-57-194)
- 10:30AM (43) *New developments in arithmetic topology.* Preliminary report.  
**Adam S. Sikora**, CRM/ISM, Montreal (965-57-220)

### Special Session on Analysis and Applications of Nonlinear PDEs, I

9:00 AM – 10:40 AM Room 213, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **David G. Costa**, University of Nevada, Las Vegas  
**Zhonghai Ding**, University of Nevada, Las Vegas  
**Hossein Tehrani**, University of Nevada, Las Vegas
- 9:00AM (44) *Boundary-value Problems for Nonlinear Wave Equations.*  
**Jerry L Bona**, University of Texas at Austin (965-35-156)
- 9:35AM (45) *Stability of multidimensional traveling waves for a nonlocal Allen-Cahn equation.*  
**Peter W Bates\***, Brigham Young University, and **Fengxin Chen**, University of Texas, San Antonio (965-35-128)
- 10:10AM (46) *Boundary value problems with bounded nonlinearities.* Preliminary report.  
**James R Ward**, University of Alabama at Birmingham (965-35-132)

### Special Session on Number Theory with a Geometric Flavor, I

9:00 AM – 10:50 AM Room 210, Classroom Building Complex C, Classroom Building Complex C

- Organizer: **Arthur Baragar**, University of Nevada, Las Vegas
- 9:00AM (47) *Rational curves on  $K3$  surfaces – A geometrical interpretation.*  
**Arthur Baragar**, UNLV (965-14-182)
- 9:30AM (48) *Explicit covering techniques for hyperelliptic curves.* Preliminary report.  
**Nils Bruin**, PIMS, SFU, UBC (965-11-66)
- 10:00AM (49) *Geometry of the affine line modulo isogeny.*  
**Mugurel A Barcau**, University of New Mexico (965-11-14)
- 10:30AM (50) *Apollonian Circle Packings: Number Theory.*  
**Ron L Graham**, Univ. of Calif. at San Diego, **Jeff C Lagarias**, AT&T Labs, **Colin L Mallows**, **Allan R Wilks**, AT&T Labs, and **Catherine H Yan\***, Texas A&M Univ and IAS (965-11-46)

### Special Session on History of Mathematics, I

9:30 AM – 10:50 AM Room 216, Classroom Building Complex C, Classroom Building Complex C

- Organizers: **Shawnee L. McMurrin**, California State University, San Bernadino  
**Adrian Rice**, Randolph-Macon College  
**James Tattersall**, Providence College
- 9:30AM (51) *The Effect of Funding on Mathematical Logic.* Preliminary report.  
**Florence D. Fasanelli**, The College Board (965-01-122)
- 10:00AM (52) *The Influence of Relativity on Invariant Theory.* Preliminary report.  
**Paul R Wolfson**, West Chester University (965-01-123)
- 10:30AM (53) *The Notebooks Gian-Carlo Rota.* Preliminary report.  
**Joel Stein**, California State University San Bernardino (965-01-153)

**Invited Address**

11:10 AM – NOON Auditorium A-108, Classroom Building Complex A

- (54) *How much do the Hecke operators actually tell us about modular forms?*  
**Lynne H. Walling**, University of Colorado (965-11-04)

**Invited Address**

1:30 PM – 2:20 PM Auditorium A-108, Classroom Building Complex A

- ▶ (55) *Numerical methods for wave propagation in heterogeneous media: Solving hyperbolic PDEs with discontinuous coefficients.* Preliminary report.  
**Randall J LeVeque**, University of Washington (965-65-150)

**Special Session on Finite Element Analysis and Applications, II**

3:00 PM – 6:20 PM Room 223, Classroom Building Complex C, Classroom Building Complex C

Organizers: **Jichun Li**, University of Nevada  
**Michael Marcozzi**, University of Nevada  
**George Miel**, University of Nevada  
**Darrell W. Pepper**, University of Nevada

- 3:00PM *Interface tracking using discrete methods. What are we computing?* Preliminary report.  
 ▶ (56) **Juan C Heinrich\*** and **Pinghua Zhao**, University of Arizona (965-65-187)
- 3:30PM *A Comparison Study of the Method of 2nd Moments vs h-Adaptation in Finite Elements for Advection-Diffusion Equations.*  
 (57) **Darrell W. Pepper\*** and **David B. Carrington**, University of Nevada Las Vegas (965-76-222)
- 4:00PM *Non-conforming hp mortar finite element methods for Stokes Problems.* Preliminary report.  
 (58) **Padmanabhan Seshaiyer\***, Texas Tech University, and **Lawrence K Chilton**, Air Force Institute of Technology (965-65-160)
- 4:30PM *Solving degenerate reaction-diffusion equations via adaptive splitting.*  
 (59) **Qin Sheng**, University of Louisiana at Lafayette (965-65-102)
- 5:00PM *Mixed Discontinuous Finite Element Methods and Their Applications.* Preliminary report.  
 ▶ (60) **Zhangxin Chen**, Southern Methodist University (965-65-23)
- 5:30PM *An analysis of the numerical solution based on moving meshes for advection dominated problems.* Preliminary report.  
 (61) **Weiming Cao**, University of Texas at San Antonio (965-65-173)
- 6:00PM *Finite Element Analysis for a Nonlinear Diffusion Model in Image Processing.*  
 (62) **Jichun Li**, University of Nevada, Las Vegas (965-65-73)

**Special Session on Graphs and Digraphs, II**

3:00 PM – 5:55 PM Room 214, Classroom Building Complex C, Classroom Building Complex C

Organizers: **Michael Jacobson**, University of Louisville

**K. Brooks Reid**, California State University, San Marcos

- 3:00PM *Anti-Ramsey numbers of graphs.* Preliminary report.  
 ▶ (63) **Tao Jiang**, Michigan Technological University (965-05-74)
- 3:30PM *On Edge and Path Ordered Graphs.*  
 (64) **Guantao Chen**, Georgia State University, **Ralph Faudree**, University of Memphis, **Ronald Gould**, Emory University, **Michael Jacobson**, University of Louisville, **Linda Lesniak\***, Drew University, and **Florian Pfender**, Emory University (965-05-70)
- 4:00PM *On equimatchable polytopes.*  
 (65) **Ken-ichi Kawarabayashi**, Keio University, **Michael D. Plummer\***, Vanderbilt University, and **Akira Saito**, Nihon University (965-05-56)
- 4:30PM *Generalizing the Alon-Tarsi Theorem to hypergraphs.*  
 (66) **Radhika Ramamurthi** and **Douglas B West\***, University of Illinois (965-05-107)
- 5:00PM *On local and global independence numbers of a graph.* Preliminary report.  
 (67) **Ralph J Faudree\***, **Richard H Schelp**, University of Memphis, and **Zdeněk Ryjáček**, University of West Bohemia (965-05-61)
- 5:30PM *The Present Picture of Pebbling.*  
 ▶ (68) **Glenn H Hurlbert**, Arizona State University (965-05-175)

**Special Session on Physical Knotting and Unknotting, II**

3:00 PM – 6:20 PM Room 215, Classroom Building Complex C, Classroom Building Complex C

Organizers: **Jorge Alberto Calvo**, North Dakota State University  
**Kenneth C. Millett**, University of California Santa Barbara  
**Eric J. Rawdon**, Chatham College

- 3:00PM *Infinitesimally Locked Linkages with Applications to Locked Trees.*  
 (69) **Robert Connelly**, Cornell University, **Erik D Demaine\***, University of Waterloo, and **Günter Rote**, Freie Universität Berlin (965-51-168)
- 3:30PM *Two recent results on flipping and floipturns.*  
 ▶ (70) **Pat Morin**, McGill University (965-51-183)
- 4:00PM *Convexifying Polygons in 3D: A Survey.*  
 (71) **Michael Soss** and **Godfried T Toussaint\***, McGill University (965-51-108)
- 4:30PM *Knotting in Adsorbing Lattice polygons.* Preliminary report.  
 ▶ (72) **Buks Janse van Rensburg**, Mathematics and Statistics, York University (965-82-118)
- 5:00PM *Examples of Lattice Links and Knots.*  
 ▶ (73) **Claus Ernst\***, Western Kentucky University, **Marnie Phipps**, University of Northern Colorado, and **Jance Van E Rensburg**, York University (965-54-52)
- 5:30PM *On the classification of rational knots.* Preliminary report.  
 ▶ (74) **Sofia Lambropoulou\***, National Technical University of Athens, and **Louis H Kauffman**, University of Illinois at Chicago (965-57-176)
- 6:00PM *Biologic, Tangles and DNA.*  
 ▶ (75) **Louis H. Kauffman\***, UIC, and **Sofia Lambropoulou**, National Technical University at Athens, Greece (965-57-96)

**Special Session on Set Theory, II**

3:00 PM – 5:20 PM Room 221, Classroom Building  
Complex C, Classroom Building Complex C

Organizers: **Douglas Burke**, University of Nevada,  
Las Vegas  
**Derrick Dubose**, University of Nevada,  
Las Vegas

- 3:00PM *The Consistency of Hamkins's Axiom.*  
(76) **W. Hugh Woodin**, UC Berkeley (965-03-149)
- 3:30PM *On Martin's Conjecture.*  
(77) **Theodore A Slaman**, University of California,  
Berkeley (965-03-142)
- 4:00PM *The core model up to a Woodin cardinal.*  
(78) Preliminary report.  
**William J Mitchell**, University of Florida  
(965-03-178)
- 4:30PM *The consistency strength of the failure of the*  
(79) *Unique Branches Hypothesis.*  
**John R Steel**, U.C. Berkeley (965-03-143)
- 5:00PM *Making copy embeddings generic.*  
(80) **Itay Neeman**, UCLA (965-03-130)

**Special Session on Topology of Links, II**

3:00 PM – 6:00 PM Room 212, Classroom Building  
Complex C, Classroom Building Complex C

Organizers: **Jeff Johannes**, University of Nevada,  
Las Vegas  
**Swatee Naik**, University of Nevada,  
Reno

- 3:00PM *On integrality of the colored Jones polynomial and*  
(81) *the Ohtsuki invariants.*  
**Thang T Le**, SUNY Buffalo (965-57-170)
- 3:30PM *Bounds on the exponential growth rate of the*  
(82) *colored Jones polynomial.* Preliminary report.  
**Oliver Dasbach** and **Xiao-Song Lin\***, University of  
California, Riverside (965-57-190)
- 4:00PM *On the nonexistence of a mod 2 Kontsevich integral.*  
(83) Preliminary report.  
**Ted Stanford**, New Mexico State University  
(965-57-75)
- 4:30PM *The first Hochschild homology of  $K_t(T^2)$ .*  
(84) Preliminary report.  
**Michael McLendon**, University of Iowa (965-57-80)
- 5:00PM *Integrality for TQFTs.* Preliminary report.  
(85) **Patrick M Gilmer**, Louisiana State University  
(965-57-97)
- 5:30PM *The Homflypt Skein Module of a Connected Sum of*  
(86) *3-Manifolds.* Preliminary report.  
**Jianyuan K. Zhong\***, Louisiana Tech University, and  
**Patrick M Gilmer**, Louisiana State University  
(965-57-45)

**Special Session on Analysis and Applications of  
Nonlinear PDEs, II**

3:00 PM – 5:15 PM Room 213, Classroom Building  
Complex C, Classroom Building Complex C

Organizers: **David G. Costa**, University of Nevada,  
Las Vegas  
**Zhonghai Ding**, University of Nevada,  
Las Vegas  
**Hossein Tehrani**, University of  
Nevada, Las Vegas

- 3:00PM *Elliptic PDEs with critical exponents and singular*  
(87) *potentials.*  
**Nassif Ghousseub**, Pacific Institute for the  
Mathematical Sciences (965-35-169)
- 3:35PM *Bilinear control for global controllability of the*  
(88) *semilinear parabolic equation with superlinear*  
*term.*  
**Alexander Khapalov**, Washington State University  
(965-35-16)
- 4:10PM *On a Free Boundary Problem with superheating*  
(89) *arising in microwave heating processes.*  
**Hong-Ming Yin**, Washington State University  
(965-35-10)
- 4:45PM *Diffusive Logistic Equation with Constant Effort*  
(90) *Harvesting.*  
**Shobha Oruganti**, Mississippi State University,  
**Junping Shi**, College of William & Mary, and  
**Ratnasingham Shivaji\***, Mississippi State  
University (965-35-39)

**Special Session on PDEs from Fluid Mechanics:  
Applied Analysis and Numerical Methods, II**

3:00 PM – 5:50 PM Room 217, Classroom Building  
Complex C, Classroom Building Complex C

Organizers: **L. Steven Hou**, York University and  
Iowa State University  
**Xiaoming Wang**, Iowa State University

- 3:00PM *Some open problems concerning the energy*  
► (91) *dissipation rate for incompressible turbulence.*  
Preliminary report.  
**Charles R Doering**, University of Michigan  
(965-76-72)
- 3:20PM *On The Global Existence Of Weak Solutions To A*  
(92) *Shallow Water Equation.* Preliminary report.  
**Zhouping Xin**, The Chinese University of Hong  
Kong and New York University (965-35-89)
- 3:40PM *On conditions for 2-D fully developed turbulence in*  
(93) *the Navier-Stokes equations.* Preliminary report.  
**Ciprian Foias**, Indiana University/Texas A&M,  
**Michael S Jolly\***, Indiana University, **Oscar Manley**,  
Gaithersburg, MD, and **Ricardo Rosa**, Universidade  
Federal do Rio De Janeiro (965-76-98)
- 4:00PM *On efficient numerical methods for Landau-Lifshitz*  
(94) *Equations.*  
**Xiao-ping Wang**, Hong Kong Univ. of Sci. Tech  
(965-65-174)
- 4:20PM break
- 4:30PM *Mixed Pseudospectral Method For Incompressible*  
(95) *Fluid Flow In Unbounded Domains.*  
**Ben-yu Guo\***, Shanghai Normal University, and  
**Cheng-long Xu**, Shanghai University (965-65-82)
- 4:50PM *The Existence of Non-topological multivortex*  
(96) *solutions in the Relativistic Self-Dual Chern-Simons*  
*Theory.*  
**Oleg Imanuvilov**, Iowa State University (965-35-85)
- 5:10PM *Complex fluids: liquid crystals, mixtures and*  
(97) *polymeric materials.* Preliminary report.  
**Liu Chun**, Penn State University (965-35-42)
- 5:30PM *New topological method for dynamics of dissipative*  
(98) *PDE's. Computer assisted proof of existence of fixed*  
*points for Kuramoto-Sivashinsky equation.*  
**Piotr Zgliczynski**, Indiana University, Bloomington  
(965-35-64)

**Special Session on History of Mathematics, II**

3:00 PM – 4:50 PM Room 216, Classroom Building  
Complex C, Classroom Building Complex C

Organizers: **Shawnee L. McMurran**, California State University, San Bernadino  
**Adrian Rice**, Randolph-Macon College  
**James Tattersall**, Providence College

- 3:00PM *Inexplicable? The status of complex numbers in Britain, 1750-1850.*  
▶ (99) **Adrian Rice**, Randolph-Macon College (965-01-55)
- 3:30PM *Harmonic functions in the unit disc.*  
(100) **Victor L. Shapiro**, University of California, Riverside (965-01-30)
- 4:00PM *The Birth of an Independent Trigonometry: Revolution and Conflict in Tenth-Century Islamic Spherical Astronomy.*  
▶ (101) **Glen R Van Brummelen**, Bennington College (965-01-21)
- 4:30PM *Noneuclidean Geometry Before Euclid?* Preliminary report.  
▶ (102) **Hardy Grant**, York University, Toronto (965-01-51)

**Special Session on Number Theory with a Geometric Flavor, II**

3:00 PM – 5:50 PM Room 210, Classroom Building  
Complex C, Classroom Building Complex C

Organizer: **Arthur Baragar**, University of Nevada, Las Vegas

- 3:00PM *Siegel Differential Modular Forms.* Preliminary report.  
(103) **Mugurel Barcau** and **Alexandru Buium\***, University of New Mexico (965-11-13)
- 3:30PM *Arithmetic on a family of K3 surfaces.*  
(104) **David K Penniston\***, Furman University, **Scott Ahlgren**, Colgate University, and **Ken Ono**, University of Wisconsin (965-11-125)
- 4:00PM *Relationships between conjectures on the structure of pro-p Galois groups unramified outside p.*  
(105) **Romyar T Sharifi**, University of Arizona (965-11-65)
- 4:30PM *Heron triangles with prime power sides.*  
▶ (106) **Florian Luca**, UNAM (965-11-18)
- 5:00PM *Trees, Hecke Operators, and Quadratic Forms.*  
(107) Preliminary report.  
**Holly J Rosson**, Trinity University (965-11-119)
- 5:30PM *Theta functions of quadratic forms.*  
(108) **Olav K Richter**, UC Santa Cruz (965-11-136)

**Special Session on Waves in Heterogeneous Media, II**

3:00 PM – 5:50 PM Room 219, Classroom Building  
Complex C, Classroom Building Complex C

Organizers: **Randall J. LeVeque**, University of Washington  
**Knut Solna**, University of California Irvine

- 3:00PM *Nonlinear wave interaction in periodic dielectric media.*  
(109) **Alexander Figotin**, University of California at Irvine (965-78-53)
- 3:35PM *Random Scattering in Magnetotellurics.*  
(110) **Benjamin S. White\***, ExxonMobil Corporate Strategic Research, **Werner E. Kohler**, Virginia Polytechnic Inst and State Univ, and **Leonard J. Srnka**, ExxonMobil Upstream Research Company (965-86-225)

- 4:10PM break
- 4:30PM *High Resolution Radar via Precursors.* Preliminary report.  
▶ (111) **Tim Olson**, University of Florida (965-78-226)
- 5:05PM *Numerical Computation of Wave Propagation in Dynamic Materials.* Preliminary report.  
(112) **Suzanne L Weekes**, Worcester Polytechnic Institute (965-65-134)
- 5:35PM *Bounds for group velocity of electromagnetic signals.*  
(113) **Knut Solna**, University of CA at Irvine (965-00-171)

**Contributed Paper Session**

3:00 PM – 6:25 PM Room 211, Classroom Building  
Complex C, Classroom Building Complex C

- 3:00PM *Value distribution theory and some of its applications.*  
(114) **Chung-Chun Yang**, The Hong Kong University of Sci. & Tech. (965-30-35)
- 3:15PM *Euler characters and submanifolds of constant positive curvature.*  
(115) **John D Moore**, University of California, Santa Barbara (965-53-20)
- 3:30PM *Classifying homeomorphisms of compact graphs up to conjugacy: Preliminary report.* Preliminary report.  
(116) **Patrick W Friel**, UCLA (965-03-205)
- 3:45PM *Asymptotic almost periodic functions.* Preliminary report.  
(117) **Suren A. Grigoryan\***, University of Montana-Missoula/Kazan State University, Russia, and **Thomas Tonev**, University of Montana-Missoula (965-46-121)
- 4:00PM *Minimum Degree and Connectivity Bounds that Imply Property  $B_{d,i,j}$ .* Preliminary report.  
(118) **Michael C Ackerman**, Murray State University (965-05-180)
- 4:15PM *A free boundary problem from the process of a crystal growth.* Preliminary report.  
(119) **W. Xie**, Cal Poly Pomona (965-35-151)
- 4:30PM *Consistent Estimates of a Certain Type of Conditional Expectation.* Preliminary report.  
▶ (120) **Rod A Freed**, California State University at Dominguez Hills (965-60-144)
- 4:45PM *A note on the Inverse Generalized Eigenvalue Problem  $Ax = \lambda Bx$ .*  
(121) **Kazem KG Ghanbari\*** and **Angelo Mingarelli**, Carleton University (965-15-91)
- 5:00PM *Taylor Integral Remainders and Moduli of Smoothness.* Preliminary report.  
(122) **George A Anastassiou**, The University of Memphis (965-26-12)
- 5:15PM *AIEP  $\mathbb{Z}_n$  – Modules.* Preliminary report.  
▶ (123) **Lenny Jones**, **Darin Kapanjie\*** and **Chad T Lower**, Shippensburg University (965-15-147)
- 5:30PM *On the climbing stairs problem.*  
▶ (124) **Mohammad K. Azarian**, University of Evansville (965-11-100)
- 5:45PM *Simplification and classification of linear origin differential equation.*  
▶ (125) **Ali A. Salim**, amman (965-34-60)
- 6:00PM *Algebraic Cryptian, Number Fields, Applications, Notable Failures.*  
(126) **Dr.Tiphoney S. Brujger;MD,PhD\***, Pan Asian Congress of Mathematicians, and **Dr.Petra F. Svisselle;MD,PhD**, Marihattrices Foundation (965-82-15)

6:15PM *The Hokey Pokey and Abigail Jan Struttgarten Problem.*  
(127) **C. S. Felicitas** and **M. W. Auslander\***, CFCTE Foundation and the Gottlieb Library (965-92-05)

10:00AM *Hall's Condition and List Mutli-colorings.*  
▶ (138) **Evan B Wantland\***, UM-Missoula/UM-Western, and **Peter D Johnson, Jr.**, Auburn University (965-05-216)

10:30AM *Cayley maps.* Preliminary report.  
(139) **Michelle Schultz**, University of Nevada Las Vegas (965-05-161)

## Sunday, April 22

### Meetings Registration

8:00 AM – NOON First Floor Foyer, Classroom Building Complex A

### Special Session on Geometric and Computational Group Theory, II

8:00 AM – 10:50 AM Room 225, Classroom Building Complex C, Classroom Building Complex C

Organizers: **Eric M. Freden**, Southern Utah University  
**Eric L. Swenson**, Brigham Young University

8:00AM *On the profinite topology on Coxeter groups.*  
(128) **Rita Gitik**, IHES (965-20-215)

8:30AM *On the rigidity of hyperbolic Coxeter groups.*  
(129) Preliminary report.  
**John G. Ratcliffe\*** and **Steven T. Tschantz**, Vanderbilt University (965-20-50)

9:00AM *Classification of Maximal FA-Subgroups of Coxeter Groups.* Preliminary report.  
(130) **Michael L Mihalik**, Vanderbilt University (965-20-105)

9:30AM *Symmetries of Surfaces.*  
(131) **Anthony Weaver**, City University of New York (Bronx Community College) (965-20-44)

10:00AM *CAT(0) groups with well-defined boundaries.*  
(132) Preliminary report.  
**Christopher Hruska**, Cornell University (965-20-57)

10:30AM *Topology at infinity for CAT(0) complexes.*  
(133) Preliminary report.  
**John Meier**, Lafayette College (965-20-201)

### Special Session on Graphs and Digraphs, III

8:00 AM – 10:55 AM Room 214, Classroom Building Complex C, Classroom Building Complex C

Organizers: **Michael Jacobson**, University of Louisville  
**K. Brooks Reid**, California State University, San Marcos

8:00AM *On Probe-Clone Bipartite Interval Graphs.*  
▶ (134) **David E Brown, J. Richard Lundgren\*** and **Carrie A Miller**, University of Colorado-Denver (965-05-26)

8:30AM *A survey of sphere-of-attraction graphs.*  
(135) **Fred R McMorris**, Illinois Institute of Technology (965-05-92)

9:00AM *A new lower bound for the size of edge chromatic critical graphs.*  
(136) **Yue Zhao**, Department of Mathematics, University of Central Florida (965-05-22)

9:30AM *The chromatic neighborhood sequence of a graph.*  
(137) **Andre Kundgen\***, CSU San Marcos, and **Mike Molloy**, University of Toronto (965-05-155)

### Special Session on Physical Knotting and Unknotting, III

8:00 AM – 10:50 AM Room 215, Classroom Building Complex C, Classroom Building Complex C

Organizers: **Jorge Alberto Calvo**, North Dakota State University  
**Kenneth C. Millett**, University of California Santa Barbara  
**Eric J. Rawdon**, Chatham College

8:00AM *Untangling some spheres in  $R^4$  by energy minimizing flow.* Preliminary report.  
(140) **Dennis M Roseman**, University of Iowa (965-58-200)

8:30AM *The Second Hull of a Knotted Curve.*  
▶ (141) **John M Sullivan\***, Univ of Illinois, **Jason Cantarella**, Univ of Georgia, **Rob Kusner**, UMass/Amherst, and **Greg Kuperberg**, UC Davis (965-51-49)

9:00AM *Energy of knots and the infinitesimal cross-ratio.*  
(142) **Jun O'Hara**, Dept. of Maht., Tokyo Metropolitan University (965-57-137)

9:30AM *Most knot energies are minimized by circles.*  
▶ (143) **Aaron Abrams**, **Jason Cantarella\***, **Joe Fu**, University of Georgia, **Mohammad Ghomi** and **Ralph Howard**, University of South Carolina (965-53-181)

10:00AM *On ropelength, thickness and conformal moduli of knots and links.* Preliminary report.  
▶ (144) **Robert B Kusner**, University of Massachusetts (965-57-90)

10:30AM *Characterizing Polygons with a Small Number of Edges in  $\mathbb{R}^3$ .* Preliminary report.  
▶ (145) **Jorge Alberto Calvo**, North Dakota State University (965-57-140)

### Special Session on Set Theory, III

8:00 AM – 10:50 AM Room 221, Classroom Building Complex C, Classroom Building Complex C

Organizers: **Douglas Burke**, University of Nevada, Las Vegas  
**Derrick Dubose**, University of Nevada, Las Vegas

8:00AM *Perfectly meager and universally null sets.*  
(146) **Tomek Bartoszynski**, Boise State University (965-03-145)

8:30AM *Consistently, every sup-measurable function is measurable.* Preliminary report.  
(147) **Andrzej Roslanowski\***, University of Nebraska at Omaha, and **Saharon Shelah**, The Hebrew University of Jerusalem (965-03-116)

9:00AM *Partition theorems for some nearly adequate sets.*  
(148) Preliminary report.  
**Andreas R Blass**, University of Michigan (965-03-139)

9:30AM *Playing with partitions.* Preliminary report.  
(149) **Jean A Larson**, University of Florida (965-03-124)

- 10:00AM *Selection principles in separable metric spaces.*  
(150) Preliminary report.  
**Liljana Babinkostova**, University of St. Cyril and Methodius, and **Marion Scheepers\***, Boise State University (965-03-172)
- 10:30AM *Canonical Approximations using Elementary Submodels.* Preliminary report.  
(151) **Adrienne M Stanley\***, **Todd Eisworth** and **Doug Mupasiri**, University of Northern Iowa (965-54-179)

- 9:40AM *A local min-orthogonal method for finding multiple saddle points and its application to sublinear elliptic PDE.*  
(160) **Jianxin Zhou**, Texas A&M University (965-35-69)
- 10:15AM *Some inequalities related to isoperimetric inequalities with partial free boundary.*  
(161) **Meijun Zhu**, University of Oklahoma (965-35-48)

**Special Session on Topology of Links, III**

- 8:00 AM – 10:50 AM **Room 212, Classroom Building Complex C, Classroom Building Complex C**  
Organizers: **Jeff Johannes**, University of Nevada, Las Vegas  
**Swatee Naik**, University of Nevada, Reno
- 8:00AM *Torsion in Knot Concordance.*  
(152) **Charles Livingston**, Indiana University, and **Swatee Naik\***, University of Nevada, Reno (965-57-198)
- 8:30AM *Classification of non-simple 2 generator knots, links, and 3-manifolds.* Preliminary report.  
(153) **Steven A Bleiler\***, Portland State University, **David Bachmann**, University of Illinois-Chicago, and **Amelia Jones**, Salt Lake City, Utah (965-57-152)
- 9:00AM *Non-integral exceptional Dehn surgeries.* Preliminary report.  
(154) **Cameron McA. Gordon\*** and **John E. Luecke**, University of Texas at Austin (965-57-185)
- 9:30AM *Polynomial splitting of Casson-Gordon invariants.*  
(155) **Se-Goo Kim**, Indiana University (965-57-115)
- 10:00AM *Whitney disks in 3-dimensional knot theory.*  
(156) **Rob R Schneiderman**, UC Berkeley (965-57-109)
- 10:30AM *Shadow world evaluation of the Yang-Mills measure.*  
(157) **Charles Frohman**, University of Iowa, and **Joanna Kania-Bartoszyńska\***, Boise State University (965-57-164)

**AMS Exhibit and Book Sale**

- 8:00 AM – NOON **First Floor Foyer, Classroom Building Complex A**

**Special Session on Analysis and Applications of Nonlinear PDEs, III**

- 8:30 AM – 10:45 AM **Room 213, Classroom Building Complex C, Classroom Building Complex C**  
Organizers: **David G. Costa**, University of Nevada, Las Vegas  
**Zhonghai Ding**, University of Nevada, Las Vegas  
**Hossein Tehrani**, University of Nevada, Las Vegas
- 8:30AM *Computation and visualization of multiple solutions of Lane-Emden type semilinear elliptic equations in 3D by the finite element method.*  
(158) **Goong Chen\***, Texas A&M University, **Wei-Ming Ni**, University of Minnesota, **Alain Perronnet**, Universite de Pierre et Marie Curie, and **Jianxin Zhou**, Texas A&M University (965-35-11)
- 9:05AM *Sharp layer solutions of semilinear elliptic equations.*  
(159) **Junping Shi**, College of William and Mary (965-35-127)

**Special Session on Waves in Heterogeneous Media, III**

- 8:30 AM – 10:45 AM **Room 219, Classroom Building Complex C, Classroom Building Complex C**  
Organizers: **Randall J. LeVeque**, University of Washington  
**Knut Solna**, University of California Irvine
- 8:30AM *Multiscale Computational Methods for Flow and Transport in Strongly Heterogeneous Porous Media.*  
▶ (162) **Thomas Y Hou**, Caltech (965-65-81)
- 9:05AM *Three Point Finite Difference Schemes, Pade, and the Spectral Galerkin Method.*  
(163) **Vladimir Druskin**, Schlumberger-Doll Research, and **Shari Moskow\***, University of Florida (965-65-221)
- 9:40AM break
- 10:00AM *Inversion of seismic data using a scattering angle transform.*  
(164) **Christiaan C Stolk**, Rice University (965-35-191)
- 10:25AM *Finite Volume Methods for Elasto-Plastic Waves in Heterogeneous Media.* Preliminary report.  
▶ (165) **Tiernan R Fogarty**, Applied Math Department, University of Washington (965-65-163)

**Special Session on History of Mathematics, III**

- 9:00 AM – 10:50 AM **Room 216, Classroom Building Complex C, Classroom Building Complex C**  
Organizers: **Shawnee L. McMurrin**, California State University, San Bernardino  
**Adrian Rice**, Randolph-Macon College  
**James Tattersall**, Providence College
- 9:00AM *Mina Rees's Influence on Graduate Education.* Preliminary report.  
▶ (166) **Amy E Shell**, United States Military Academy (965-01-06)
- 9:30AM *Lewis Carroll's "Game" of Voting.*  
▶ (167) **Francine F Abeles**, Kean University (965-91-09)
- 10:00AM *Paul Dirac and the Applications of Beautiful Mathematics.* Preliminary report.  
▶ (168) **Shawnee L McMurrin**, California State University San Bernardino (965-01-154)
- 10:30AM *French Contributions to the Educational Times.* Preliminary report.  
▶ (169) **James J Tattersall\***, Providence College, and **Shawnee L McMurrin**, California State University San Bernardino (965-01-37)

**Special Session on Number Theory with a Geometric Flavor, III**

- 9:00 AM – 10:50 AM **Room 210, Classroom Building Complex C, Classroom Building Complex C**  
Organizer: **Arthur Baragar**, University of Nevada, Las Vegas
- 9:00AM *Badly approximable pairs and Hausdorff dimension.*  
(170) **Andrew D Pollington\***, BYU, and **Sanju Velani**, QMC, London (965-11-218)

- 9:30AM (171) *Explicit special complex multiplication points in fundamental domains of Shimura curves.*  
Preliminary report.  
**Montserrat Alsina\***, Grad Center (CUNY) - Univ. Pol. Catalunya (Spain), and **Pilar Bayer**, Univ. Barcelona (Spain) (965-11-71)
- 10:00AM (172) *Chabauty techniques over number fields.*  
Preliminary report.  
**Joseph L Wetherell**, UC Berkeley (965-11-210)
- 10:30AM (173) *Elliptic curves over function fields with large Mordell-Weil rank.*  
**Douglas Ulmer**, University of Arizona (965-11-131)

**Invited Address**

11:10 AM – NOON **Auditorium A-108, Classroom Building Complex A**

- (174) *Regularity of Interfaces in Degenerate Diffusion.*  
**Panagiota Daskalopoulos**, University of California, Irvine (965-35-165)

**Invited Address**

1:30 PM – 2:20 PM **Auditorium A-108, Classroom Building Complex A**

- (175) *Lie superalgebras: representations and geometry.*  
**Vera Serganova**, uc berkeley (965-22-202)

**Special Session on Geometric and Computational Group Theory, III**

3:00 PM – 4:20 PM **Room 225, Classroom Building Complex C, Classroom Building Complex C**

Organizers: **Eric M. Freden**, Southern Utah University  
**Eric L. Swenson**, Brigham Young University

- 3:00PM (176) *Test sets and automorphism class representatives in finitely generated abelian groups.* Preliminary report.  
**Edward C Turner**, University at Albany (965-20-34)
- 3:30PM (177) *Stable Exponents.* Preliminary report.  
**Gregory R Conner\***, Brigham Young University, and **Michel Coornaert**, Institut de Recherche Mathématique Avancée, Université Louis Pasteur (965-20-84)
- 4:00PM (178) *Uniform Exponential Growth and  $GL_2$ .* Preliminary report.  
**Roger C Alperin**, San Jose State University (965-20-126)

**Special Session on Physical Knotting and Unknotting, IV**

3:00 PM – 5:20 PM **Room 215, Classroom Building Complex C, Classroom Building Complex C**

Organizers: **Jorge Alberto Calvo**, North Dakota State University  
**Kenneth C. Millett**, University of California Santa Barbara  
**Eric J. Rawdon**, Chatham College

- 3:00PM (179) *Calculating in the space of knots or links.* Preliminary report.  
**Richard Randell**, University of Iowa (965-57-135)

- 3:30PM (180) *Investigations of Polygonal Knot Space and Ideal Physical Knot Configurations.*  
**Kenneth C Millett**, University of California, Santa Barbara (965-57-203)
- 4:00PM (181) *A spectrum for natural knotting?*  
**Gregory R Buck\***, Saint Anselm College, and **Robert G Scharein**, University of British Columbia (965-82-166)
- 4:30PM (182) *Hyperbolic reflections of polygonal knots.* Preliminary report.  
**Richard Randell**, **Jonathan Simon\*** and **Joshua Tokle**, University of Iowa (965-57-186)
- 5:00PM (183) *Inscribing Smooth Knots in Polygonal Knots to Determine Minimal Ropelength.* Preliminary report.  
**Eric J Rawdon**, Chatham College (965-57-159)

**Special Session on Set Theory, IV**

3:00 PM – 5:20 PM **Room 221, Classroom Building Complex C, Classroom Building Complex C**

Organizers: **Douglas Burke**, University of Nevada, Las Vegas  
**Derrick Dubose**, University of Nevada, Las Vegas

- 3:00PM (184) *Cocovering and factoring.*  
**MC (Mack) Stanley**, San Jose State (965-03-162)
- 3:30PM (185) *Elementary embeddings  $j : V \rightarrow V$  with Choice.* Preliminary report.  
**Paul J Corazza**, Boise State University (965-03-95)
- 4:00PM (186) *Axioms which imply GCH.*  
**Jan Mycielski**, University of Colorado, Boulder (965-03-103)
- 4:30PM (187) *On the strength of an  $\omega_1$ -dense ideal and the Continuum Hypothesis.* Preliminary report.  
**Richard O Ketchersid**, UCLA (965-03-146)
- 5:00PM (188) *A Paradoxical Rearrangement of the Cube.* Preliminary report.  
**John C Simms**, Marquette University (965-03-224)

**Special Session on Topology of Links, IV**

3:00 PM – 4:50 PM **Room 212, Classroom Building Complex C, Classroom Building Complex C**

Organizers: **Jeff Johannes**, University of Nevada, Las Vegas  
**Swatee Naik**, University of Nevada, Reno

- 3:00PM (189) *Grope Cobordism of Classical Knots.*  
**Jim Conant\***, Cornell University, and **Peter Teichner**, University of California, San Diego (965-57-43)
- 3:30PM (190) *Seifert Surfaces and Milnor's Invariants.* Preliminary report.  
**Blake Mellor\***, Honors College, Florida Atlantic University, and **Paul Melvin**, Bryn Mawr College (965-57-63)
- 4:00PM (191) *On  $n$ -equivalence and knot genus.* Preliminary report.  
**Effie Kalfagianni**, MSU (965-57-206)
- 4:30PM (192) *Symplectic form on  $t$ -colorings of tangles.* Preliminary report.  
**Jozef H Przytycki**, George Washington University (965-57-204)

***Special Session on Analysis and Applications of  
Nonlinear PDEs, IV***

3:00 PM – 4:40 PM                      **Room 213, Classroom Building  
Complex C, Classroom Building Complex C**

Organizers: **David G. Costa**, University of Nevada,  
Las Vegas  
**Zhonghai Ding**, University of Nevada,  
Las Vegas  
**Hossein Tehrani**, University of  
Nevada, Las Vegas

3:00PM (193) *A Sign-Changing Solution for a Superlinear Dirichlet Problem, II.*  
**John M. Neuberger\***, Northern Arizona University,  
**Alfonso Castro**, University of Texas, San Antonio,  
and **Pavel Drábek**, University of West Bohemia  
(965-35-111)

3:35PM (194) *Characterizing the Second Eigenvalue for a Class of Nonhomogeneous Quasilinear Problems.*  
**Stephen B Robinson**, Wake Forest University  
(965-35-133)

4:10PM (195) *The Dirichlet Problem for Harmonic Maps from the Disk into the 2-Sphere with Symmetric Boundary Conditions.* Preliminary report.  
**Michael A Brilleslyper**, U.S. Air Force Academy  
(965-58-36)

***Special Session on Waves in Heterogeneous Media, IV***

3:00 PM – 5:35 PM                      **Room 219, Classroom Building  
Complex C, Classroom Building Complex C**

Organizers: **Randall J. LeVeque**, University of  
Washington  
**Knut Solna**, University of California  
Irvine

3:00PM (196) *Derivation of transport for Schrödinger equations in the high frequency regime with fast oscillatory time-dependent potential.*  
**Guillaume Bal\***, University of Chicago, **George Papanicolaou**, Stanford University, and **Leonid Ryzhik**, University of Chicago (965-35-193)

3:35PM (197) *Polarization Phenomena in Heterogeneous Media.*  
**Arnold D Kim\*** and **Miguel Moscoso**, Stanford University (965-78-19)

4:10PM break

4:30PM (198) *Embedded Finite Difference Methods for Wave Problems in Complex Geometries and Heterogeneous Media.*  
**Jan S Hesthaven**, Brown University (965-65-79)

5:05PM (199) *Solving boundary-value problems for systems of hyperbolic conservation laws with rapidly varying coefficients.*  
**Darryl H Yong**, Harvey Mudd College (965-35-114)

**Bernard Russo**  
Associate Secretary  
Irvine, California