
Program of the Sessions

Chapel Hill, North Carolina, October 24–25, 2003

Friday, October 24

Meeting Registration

7:30 AM – 4:30 PM Room 220, Phillips Hall

AMS Exhibit and Book Sale

7:30 AM – 4:30 PM Room 224, Phillips Hall

Special Session on Knots, Links, and Embedded Graphs, I

8:30 AM – 10:50 AM Room 304, Dey Hall

Organizers: **Joel S. Foisy**, SUNY at Potsdam
Erica L. Flapan, Pomona College

8:30AM *Total Curvature and Packing of Knots.*

- ▶ (1) **Jonathan K Simon***, University of Iowa, and
Gregory R Buck, St. Anselm College (991-57-152)

9:00AM *Polygonal Cable Links.* Preliminary report.

- ▶ (2) **Rollie Trapp**, California State University, San Bernardino (991-57-243)

9:30AM *Tying Knots with Stiff Rope.* Preliminary report.

- ▶ (3) **Eric J Rawdon***, Duquesne University, and **Greg Buck**, St. Anselm College (991-57-215)

10:00AM *Regular and Almost Regular Stick Numbers of Knots.*

- ▶ (4) **Timothy D Comar*** and **Jessica M Tyrus**, Benedictine University (991-57-30)

10:30AM *Tangle Solutions for a Family of DNA-Rearranging Proteins.*

- (5) **Dorothy Buck**, Brown University (991-57-194)

Special Session on Group Cohomology in Algebra and Geometry, I

8:30 AM – 10:50 AM Room 308, Hanes Hall

Organizers: **Richard M. Hain**, Duke University

Kevin P. Knudson, Mississippi State University

8:30AM *Rigid relations in mapping class groups.*

- (6) **Dan Margalit**, University of Utah (991-20-210)

9:00AM *Real vector bundles obtained from representations of pure braid groups, and fundamental groups of complex hyperplane complements.*

- (7) **F. R. Cohen***, University of Rochester, **A. Adem**, University of Wisconsin, Madison, and **D. C. Cohen**, Louisiana State University (991-55-196)

9:30AM *Cohomology of the boundary of a line arrangement.* Preliminary report.

- (8) **Daniel C. Cohen***, Louisiana State University, and **Alexander I. Suci**, Northeastern University (991-32-134)

10:00AM *Euler Classes and Group Actions.* Preliminary report.

- (9) **A Adem**, University of Wisconsin (991-55-172)

10:30AM *Koszul Duality and Graph Cohomology.* Preliminary report.

- (10) **T G Goodwillie**, Brown University, and **K Igusa***, Brandeis University (991-18-175)

Special Session on Association Schemes: 1973–2003, I

8:30 AM – 10:50 AM Room 309, Gardner Hall

Organizers: **William J. Martin**, Worcester Polytechnic Institute

Dijen K. Ray-Chaudhuri, Ohio State University

8:30AM *Tridiagonal pairs and the quantum affine algebra $U_q(\widehat{sl}_2)$.*

- (11) **Paul M Terwilliger***, University of Wisconsin, and **Tatsuro Ito**, Kanazawa University (991-05-58)

9:00AM *Taut distance-regular graphs of even diameter.*

- (12) **Mark S MacLean**, University of North Carolina at Asheville (991-05-197)

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 24, 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 *The Terwilliger algebra of a distance-regular graph that supports a spin model.* Preliminary report. (13)
John S Caughman*, Portland State University, and **Nadine Wolff**, University of British Columbia (991-05-283)
- 10:00AM *Modular Leonard triples.* (14)
Brian W Curtin, University of South Florida (991-15-67)
- 10:30AM *Type-II matrices, four-weight spin models and Nomura algebras.* (15)
Ada Chan, California Institute of Technology (991-05-238)

Special Session on Linear Operators on Function Spaces, I

8:30 AM – 10:50 AM Room 308, Gardner Hall

- Organizers: **Nathan S. Feldman**, Washington and Lee University
William T. Ross, University of Richmond
- 8:30AM *Radial Sets Whose Blaschke Sequences are D-Zero Sets.* Preliminary report. (16)
Boris Korenblum, University at Albany, SUNY (991-30-138)
- 9:00AM *Linear-Fractional Composition Operators.* (17)
Barbara D MacCluer* and **Rachel Weir**, University of Virginia (991-47-63)
- 9:30AM *Conditional Expectation and the Bergman Projection.* (18)
Brent Carswell*, Union College, and **Michael Stessin**, University at Albany (991-47-229)
- 10:00AM *C^* -algebras of composition operators.* Preliminary report. (19)
Michael T Jury, Purdue University (991-47-205)
- 10:30AM *The backward shift on the space of Cauchy transforms.* (20)
J A Cima*, University of North Carolina, Chapel Hill, **W T Ross**, University of Richmond, and **A Matheson**, Lamar University (991-30-09)

Special Session on Commutative Rings and Monoids, I

8:30 AM – 10:50 AM Room 215, Phillips Hall

- Organizer: **Scott Chapman**, Trinity University
- 8:30AM *An exceptional class of stable rings.* Preliminary report. (21)
Bruce M Olberding, New Mexico State University (991-13-158)
- 9:00AM *On the FIP property for extensions of commutative rings.* Preliminary report. (22)
David E Dobbs, University of Tennessee, **Bernadette Mullins**, Birmingham Southern College, **Gabriel Picavet** and **Martine Picavet-L'Hermitte***, Université Blaise Pascal (991-13-38)
- 9:30AM *On ϕ -Mori rings.* Preliminary report. (23)
Ayman Badawi, American University of Sharjah, and **Thomas G Lucas***, University of North Carolina Charlotte (991-13-117)
- 10:00AM *Completions, filtrations and ultrapowers of local domains.* (24)
Bruce Olberding, New Mexico State University, **Serpil Saydam**, University of Louisiana at Monroe, and **Jay Shapiro***, George Mason University (991-13-79)
- 10:30AM *Extension of the notion of a Prufer domain to rings with zero-divisors.* Preliminary report. (25)
Sarah Glaz, University of Connecticut (991-13-135)

Special Session on Algebras and Their Representations, I

8:30 AM – 10:50 AM Room 332, Phillips Hall

- Organizers: **Edward L. Green**, Virginia Polytech Institute & State University
Ellen E. Kirkman, Wake Forest University
- 8:30AM *Field Algebras.* (26)
Bojko Bakalov*, North Carolina State University, and **Victor G Kac**, MIT (991-17-207)
- 9:00AM *Hilbert series of prime PI algebras.* (27)
Jason P Bell, University of Michigan (991-16-45)
- 9:30AM *Basic Properties of Generalized Down-Up Algebras.* Preliminary report. (28)
Thomas Cassidy, Bucknell University (991-16-218)
- 10:00AM *Representations of Quantum Groups defined over Commutative Rings II: Weakly Hereditary Invariant Forms.* (29)
Ben L Cox, College of Charleston (991-17-102)
- 10:30AM *On twisted quantum toroidal algebras.* (30)
Naihuan Jing, North Carolina State Univ. (991-17-260)

Special Session on Mathematical Modeling in Physiology and Medicine, I

8:30 AM – 10:50 AM Room 305, Dey Hall

- Organizers: **Mary Ann Horn**, Vanderbilt University
Glenn Webb, Vanderbilt University
- 8:30AM *Modeling hormonal control of the menstrual cycle using a system of delay differential equations.* Preliminary report. (31)
James F Selgrade*, North Carolina State University, **Leona Harris Clark**, U.S. Environmental Protection Agency, and **Paul M Schlosser**, CIIT Centers for Health Research (991-92-132)
- 9:00AM *A Model for the Oscillatory Behavior of Single Dynein Molecules.* (32)
Mike Goedecke, North Carolina State University, **John Fricks** and **Tim Elston***, University of North Carolina (991-92-200)
- 9:30AM *Mixture models of cell-matrix mechanics in articular cartilage and alterations with osteoarthritis.* (33)
Mansoor A Haider, North Carolina State University (991-74-141)
- 10:00AM *A Physiologically Based Pharmacokinetic Model for 4-Methylimidazole.* (34)
Cammy E. Cole, Meredith College (991-92-123)
- 10:30AM *Probability and Neurobiology.* (35)
Michael C. Reed*, **Jacob J. Blum**, Duke University, and **Colleen Mitchell**, Boston University (991-92-231)

Special Session on Group Actions on Curves, I

9:00 AM – 10:50 AM Room 307, Hanes Hall

- Organizers: **Kay Magaard**, Wayne State University and University of Florida
Helmut Voelklein, University of Florida
- 9:00AM *Antecedent Schur multipliers and Frattini extensions of alternating Groups.* Preliminary report. (36)
Michael D Fried, UC Irvine and MSU Billings (991-11-36)

- 9:30AM *On Schur extensions for Modular Towers.*
(37) Preliminary report.
Darren Semmen, Yorba Linda, CA (991-20-262)
- 10:00AM *The eighth moment and Larsen's conjecture.*
(38) Preliminary report.
Robert M. Guralnick, University of Southern California, and **Pham Huu Tiep***, University of Florida (991-20-133)
- 10:30AM *Computation of Group Actions.* Preliminary report.
▶ (39) **Alexander J Hulpke**, Colorado State University (991-20-27)

Special Session on Homological Physics, I

9:00 AM – 10:50 AM **Room 106, Gardner Hall**

- Organizers: **Thomas J. Lada**, North Carolina State University
James Stasheff, University of North Carolina at Chapel Hill
- 9:00AM *What is Cohomological Physics and where is it going?* Preliminary report.
(40) **Jim Stasheff**, UNC-CH and UPenn (991-70-34)
- 9:30AM *Where do homotopy Batalin-Vilkovisky algebras come from?* Preliminary report.
(41) **Fusun Akman**, Coastal Carolina University (991-17-31)
- 10:00AM *Finite Dimensional L_∞ Algebras.*
(42) **Marilyn Daily**, North Carolina State University (991-55-28)
- 10:30AM *Classification of Strongly Homotopy Lie Algebras, Some Finite Dimensional Examples.*
(43) **Michael Robert Penkava**, University of Wisconsin-Eau Claire (991-18-83)

Special Session on Banach Algebras and Several Complex Variables, I

9:00 AM – 10:50 AM **Room 307, Gardner Hall**

- Organizers: **John T. Anderson**, College of the Holy Cross
Alexander J. Izzo, Bowling Green State University
- 9:00AM *Approximation problems on the unit sphere in C_2 .*
(44) Preliminary report.
John Wermer, Brown University (991-46-81)
- 9:30AM *Analytic structures on compact sets.* Preliminary report.
(45) **Evgeny A. Poletsky**, Syracuse University (991-32-201)
- 10:00AM *What Blaschke Products Do That Interpolating Blaschke Products Can't.* Preliminary report.
(46) **Pamela Gorkin***, Bucknell University, and **Raymond Mortini**, University of Metz (991-46-95)
- 10:30AM *Local Maximum Sets in Weakly Complete Complex Manifolds.*
(47) **Zbigniew Slodkowski***, University of Illinois at Chicago, and **Giuseppe Tomassini**, Scuola Normale Superiore, Pisa, Italy (991-32-296)

Special Session on Multi-scale Challenges in Soft Matter Materials, I

9:00 AM – 10:50 AM **Room 381, Phillips Hall**

- Organizers: **Gregory M. Forest**, University of North Carolina
Qi Wang, Florida State University
Ruhai Zhou, University of North Carolina

- 9:00AM *Theory and simulation of structure formation during flow-processing of nano-composite materials.*
▶ (48) **M Gregory Forest***, University of North Carolina, Chapel Hill, **Qi Wang**, Florida State University, **Hong Zhou**, University of California at Santa Cruz, and **Ruhai Zhou**, University of North Carolina, Chapel Hill (991-76-57)
- 9:30AM *Kinetic theories for nonhomogeneous liquid crystal polymers.*
▶ (49) **MG Forest**, UNC, CH, **Q. Wang***, FSU, and **R. Zhou**, UNC-CH (991-82-50)
- 10:00AM *Multi-scale stress analysis for heterogeneous media: estimation of over stressed zones and development of macroscopic failure criteria.*
(50) **Robert P. Lipton**, Louisiana State University (991-74-115)
- 10:30AM *Numerical Simulations of Flow Structure in Nematic Polymers.* Preliminary report.
▶ (51) **Ruhai Zhou***, **Gregory M. Forest**, University of North Carolina at Chapel Hill, and **Qi Wang**, Florida State University (991-76-221)

Special Session on Mathematical Molecular Biology, I

9:00 AM – 10:50 AM **Room 307, Dey Hall**

- Organizer: **Dorothy Buck**, Brown University
- 9:00AM *A Survey of Topological Chirality.*
▶ (52) **Erica L Flapan**, Pomona College (991-57-154)
- 9:30AM *3-string Tangle Analysis of Mu Transposase.* Preliminary report.
▶ (53) **John Luecke**, University of Texas at Austin, **Isabel K Darcy***, University of Iowa, and **Mariel Vazquez**, University of California at Berkeley (991-92-274)
- 10:00AM *A knot-theoretic look at the mu transpososome.* Preliminary report.
(54) **John E. Luecke***, University of Texas at Austin, **Darcy**, University of Iowa, and **Vasquez**, University of California, Berkeley (991-57-297)
- 10:30AM *Tangle solutions for the Integrase Family of DNA-rearranging proteins.*
(55) **Dorothy Buck**, Brown University, and **Cynthia Verjovsky Marcotte***, St. Edward's University (991-92-204)

Special Session on Current Topics in Optical Communications Systems, I

9:00 AM – 10:20 AM **Room 385, Phillips Hall**

- Organizers: **Rudy Horne**, University of North Carolina
Tobias Schaefer, University of North Carolina
- 9:00AM *Dispersion management for randomly varying optical fibers.* Preliminary report.
▶ (56) **Jamison T. Moeser*** and **Mark J. Ablowitz**, University of Colorado (991-35-233)
- 9:30AM *Shedding and interaction of solitons in weakly disordered optical fibers.*
(57) **Y Chung***, **M Chertkov**, Los Alamos National Laboratory, **A Dyachenko**, Landau Institute for Theoretical Physics, **I Gabbitov**, Los Alamos National Laboratory, **I Kolokolov** and **V Lebedev**, Landau Institute for Theoretical Physics (991-78-110)

- 10:00AM *Critical broadening of optical pulses: importance sampling applied to a problem exhibiting stochastic resonance.* Preliminary report.
(58) **Richard O. Moore***, Simon Fraser University, **Tobias Schaefer** and **Christopher K. R. T. Jones**, University of North Carolina-Chapel Hill (991-78-280)

Invited Address

11:05 AM – 12:05 PM Auditorium, Carroll Hall

- 11:05AM Welcoming Remarks
(59) *Scale-based geometry and its role in computer imaging.*
James N. Damon, University of North Carolina (991-51-01)

Invited Address

1:30 PM – 2:20 PM Auditorium, Carroll Hall

- (60) *Mathematical modeling and challenges in the development of drug resistance.*
Mary Ann Horn, Vanderbilt University (991-92-03)

Special Session on Group Actions on Curves, II

2:30 PM – 5:20 PM Room 307, Hanes Hall

Organizers: **Kay Magaard**, Wayne State University and University of Florida
Helmut Voelklein, University of Florida

- 2:30PM *Automorphism groups of modular curves in positive characteristic.* Preliminary report.
(61) **Robert M Guralnick**, University of Southern California (991-14-32)
- 3:00PM *Coverings of degree 5 from a genus 2 curve to an elliptic curve.*
(62) **T Shaska**, University of Idaho (991-14-21)
- 3:30PM *The Full Automorphism Group of a Fermat Curve.* Preliminary report.
(63) **Aaron D Wootton**, University of Arizona (991-20-228)
- 4:00PM *Automorphisms and moduli of generalized hyperelliptic surfaces.*
(64) **Anthony Weaver**, BCC of the City University of New York (991-14-122)
- 4:30PM *Riemann surfaces that possess $8(g+3)$ automorphisms.* Preliminary report.
(65) **Peter Turbek***, Purdue University Calumet, **Emilio Bujalance**, Universidad UNED, and **Francisco Javier Cirre**, Universidad Uned (991-20-258)
- 5:00PM *The Number of Genus 2 Covers of an Elliptic Curve.*
(66) **Ernst Kani**, Queen's University (991-14-302)

Special Session on Knots, Links, and Embedded Graphs, II

2:30 PM – 5:20 PM Room 304, Dey Hall

Organizers: **Joel S. Foisy**, SUNY at Potsdam
Erica L. Flapan, Pomona College

- 2:30PM *2-irreducibility of spatial graphs.*
(67) **Fengchun Lei**, Harbin Institute of Technology, **Kouki Taniyama***, Waseda University, and **Gengyu Zhang**, Harbin Institute of Technology (991-57-173)
- 3:00PM *Intersection graphs for string links.*
▶ (68) **Blake Mellor**, Loyola Marymount University (991-57-23)

- 3:30PM *Musings on Links, Planar Graphs and Plane Curves.* Preliminary report.
▶ (69) **Jeff Johannes**, SUNY Geneseo (991-57-82)
- 4:00PM *Intrinsically Linked Graphs, Kuratowski Minors, and Embeddings in Surfaces.*
▶ (70) **Thomas Fleming**, University of California San Diego (991-57-84)
- 4:30PM *Ends of 4-Manifolds.*
(71) **Sandy Ganzell**, Pomona College (991-57-263)
- 5:00PM *Minor deformation of graphs preserving achiral embeddability.* Preliminary report.
(72) **Kazuaki Kobayashi**, Tokyo Womans Christian University (991-05-35)

Special Session on Measurable, Complex, and Symbolic Dynamics, I

2:30 PM – 4:50 PM Room 206, Dey Hall

Organizers: **Jane M. Hawkins**, University of North Carolina at Chapel Hill
Karl E. Petersen, University of North Carolina at Chapel Hill

- 2:30PM *Symmetries of shifts of finite type.*
(73) **Daniel S Silver** and **Susan G Williams***, University of South Alabama (991-37-281)
- 3:00PM *Spectral analysis of substitution sequences in \mathbb{Z}^d .* Preliminary report.
(74) **Natalie Priebe Frank**, Vassar College (991-28-289)
- 3:30PM *An extension of the Moore and Myhill's Garden-of-Eden Theorem to \mathbb{Z}^2 -shifts of finite type.*
(75) **T. Hamachi**, Kyushu University (991-37-267)
- 4:00PM *Symbolic dynamics of the restricted collinear 3-body problem.*
(76) **Samuel R Kaplan***, UNC Asheville, **Ernesto A Lacomba**, Universidad Autonoma Metropolitana, Iztapalapa, and **Jaume Llibre**, Universitat Autònoma de Barcelona (991-70-120)
- 4:30PM *Rigidity of algebraic \mathbb{Z}^d shift dynamical systems.*
(77) **Bruce P Kitchens**, SUNY at Stony Brook (991-37-198)

Special Session on Group Cohomology in Algebra and Geometry, II

2:30 PM – 5:50 PM Room 308, Hanes Hall

Organizers: **Richard M. Hain**, Duke University
Kevin P. Knudson, Mississippi State University

- 2:30PM *On bounded cohomology of amalgamated products of groups.*
(78) **Igor V Erovenko**, University of North Carolina at Greensboro (991-20-07)
- 3:00PM *Calculations in $H^2(G, \mathbb{Q}/\mathbb{Z})$ Made Easy.*
(79) **Eric S. Brussel**, Emory University (991-16-166)
- 3:30PM *Introduction to the Rost invariant in Galois cohomology.*
(80) **Skip Garibaldi**, Emory University (991-11-164)
- 4:00PM *Ultraproducts and the Friedlander-Milnor conjecture.*
(81) **Tibor Beke**, University of Michigan (991-22-71)
- 4:30PM *A conjectural bridge from mod p arithmetic cohomology to characteristic 0.* Preliminary report.
(82) **Avner Ash**, Boston College (991-11-18)
- 5:00PM *Euler characteristics of arithmetic groups.*
(83) **Ivan E Horozov**, Brown University (991-11-112)

5:30PM *Vanishing of Some Cohomology Groups and Bounds for the Shafarevich-Tate Groups of Elliptic Curves.*
(84) **Byungchul Cha**, Johns Hopkins University (991-11-05)

4:30PM *Isolation and Component Structure in Spaces of Composition Operators.*
(94) **Christopher Hammond***, Connecticut College, and **Barbara D. MacCluer**, University of Virginia (991-47-08)
5:00PM *Remarks Concerning the Index of the Shift.*
(95) **John R Akeroyd**, University of Arkansas (991-47-48)

Special Session on Association Schemes: 1973–2003, II

2:30 PM – 5:20 PM Room 309, Gardner Hall

Organizers: **William J. Martin**, Worcester Polytechnic Institute
Dijen K. Ray-Chaudhuri, Ohio State University
2:30PM *A survey on the structure theory of association schemes.*
(85) **Paul-Hermann Zieschang**, University of Texas at Brownsville (991-20-256)
3:00PM *Amorphic Association Schemes I. From Folklore to Foundation.* Preliminary report.
(86) **Andrew Woldar***, Villanova University, **Edwin van Dam**, Tilburg University, **Mikhail Klin**, University of Delaware & Ben-Gurion University, and **Mikhail Muzychuk**, Netanya Academic College (991-05-170)
3:30PM *Amorphic association schemes. II. A positive answer on a question of Barlotti-Strambach.* Preliminary report.
(87) **Mikhail H. Klin***, University of Delaware, Newark and Ben-Gurion University of the Negev, Beer Sheva, and **Aiso Heinze**, University of Augsburg (991-05-208)
4:00PM *Decompositions of an Association Scheme.* Preliminary report.
(88) **Sung Yell Song**, Iowa State University (991-05-227)
4:30PM *Some new 3-class association schemes.* Preliminary report.
▶ (89) **Jianmin Ma**, Colorado State University (991-05-272)
5:00PM Discussion

Special Session on Linear Operators on Function Spaces, II

2:30 PM – 5:20 PM Room 308, Gardner Hall

Organizers: **Nathan S. Feldman**, Washington and Lee University
William T. Ross, University of Richmond
2:30PM *On the index of invariant subspaces in spaces of analytic functions in the unit ball of \mathbb{C}^d .* Preliminary report.
(90) **Jim Gleason**, **Stefan Richter*** and **Carl Sundberg**, University of Tennessee (991-47-146)
3:00PM *Conjugation, the Backward Shift, and Toeplitz Kernels.*
(91) **Stephan Ramon Garcia**, U.C. Santa Barbara (991-47-107)
3:30PM *Composition Operators on Uniform Algebras.* Preliminary report.
(92) **Pamela Gorkin***, Bucknell University, and **Raymond Mortini**, University of Metz (991-47-94)
4:00PM *A weakly hypercyclic operator that is not norm hypercyclic.*
(93) **Kit C Chan*** and **Rebecca Sanders**, Bowling Green State University (991-47-109)

Special Session on Nonlinear Wave Phenomena: Stability and Interactions, I

2:30 PM – 4:50 PM Room 383, Phillips Hall

Organizers: **Christopher Jones**, University of North Carolina at Chapel Hill
Bjorn Sandstede, The Ohio State University
2:30PM *Pulse Interaction in Damped Hyperbolic Systems.*
(96) **Keith S Promislow**, Michigan State University (991-35-219)
3:00PM *Interactions of traveling water waves.* Preliminary report.
(97) **C. Eugene Wayne**, Boston University (991-35-167)
3:30PM *A Dynamic Renormalization Approach to Self-Similar Collapse Type Phenomena.*
(98) **Panayotis Kevrekidis**, University of Massachusetts (991-35-143)
4:00PM *Absolute instabilities of standing pulses.*
(99) **Bjorn Sandstede**, Ohio-State University, and **Arnd Scheel***, University of Minnesota (991-35-103)
4:30PM *Inverse scattering and the linear stability of solitons.* Preliminary report.
(100) **Todd Kapitula**, University of New Mexico (991-35-88)

Special Session on Homological Physics, II

2:30 PM – 4:20 PM Room 106, Gardner Hall

Organizers: **Thomas J. Lada**, North Carolina State University
James Stasheff, University of North Carolina at Chapel Hill
2:30PM *Strongly homotopy Lie algebras and reduction of the “de Rham complex” of a Lagrangian field theory.*
(101) **Samer S Ashhab**, North Carolina State University (991-55-19)
3:00PM *The chain extensions of D-algebras and their applications.* Preliminary report.
(102) **Jining Gao**, North Carolina State University (991-81-25)
3:30PM *Symmetric brace algebras and gauge theory.*
(103) **Tom Lada**, N. C. State University (991-18-26)
4:00PM *Cohomology of Feynman graphs and L-infinity morphisms.*
(104) **Lucian M Ionescu**, Illinois State University (991-18-12)

Special Session on Banach Algebras and Several Complex Variables, II

2:30 PM – 5:20 PM Room 307, Gardner Hall

Organizers: **John T. Anderson**, College of the Holy Cross
Alexander J. Izzo, Bowling Green State University
2:30PM *Interpolation bodies for complex manifolds.* Preliminary report.
(105) **Brian J. Cole**, Brown University (991-30-301)

- 3:00PM L^2 Sampling and Interpolation on Riemann Surfaces. (106)
Dror Varolin, UIUC (991-30-171)
- 3:30PM *H. Bohr's phenomenon and its applications.* (107)
 ▶ Preliminary report.
Catherine Anne Beneteau, Seton Hall university, **Anders Dahlner**, University of Lund, and **Dmitry Khavinson***, University of Arkansas (991-30-62)
- 4:00PM Problem Session
- 4:30PM *A principle for constructing peak functions.* (108)
Gautam Bharali, University of Michigan (991-46-104)
- 5:00PM *The geometric characterization of algebraic surfaces that satisfy the strong Phragmén-Lindelöf condition.* Preliminary report. (109)
Rüdiger W Braun, **Reinhold Meise**, Heinrich-Heine-Universität, and **B A Taylor***, University of Michigan (991-32-65)

Special Session on Commutative Rings and Monoids, II

2:30 PM – 5:50 PM Room 215, Phillips Hall

- Organizer: **Scott Chapman**, Trinity University
- 2:30PM *SFT stability via power series extension.* (110)
Byung Gyun Kang, Postech (991-13-216)
- 3:00PM *On the Ideal generated by the Values of a Polynomial.* (111)
J-L Chabert, Université de Picardie, France (991-13-47)
- 3:30PM *Planar Zero-Divisor Graphs.* Preliminary report. (112)
 ▶ **Neal O Smith**, University of Tennessee (991-13-66)
- 4:00PM *The content of a Gaussian polynomial is invertible.* (113)
 Preliminary report.
K Alan Loper*, Ohio State University, and **Moshe Roitman**, University of Haifa (991-13-241)
- 4:30PM *The minimal generating sets of the multiplicative monoid of a finite commutative ring.* Preliminary report. (114)
David E Dobbs* and **Brian C Irick**, University of Tennessee (991-13-68)
- 5:00PM *Integer-valued polynomials on matrices.* Preliminary report. (115)
 ▶ **Sophie Frisch**, TU Graz, Austria (991-13-265)
- 5:30PM *Zero-Divisor Graphs of Polynomials and Power Series over Commutative Rings.* (116)
M. Axtell, Wabash College, **J. Coykendall**, North Dakota State University, and **J. Stickles***, University of Evansville (991-13-128)

Special Session on Multi-scale Challenges in Soft Matter Materials, II

2:30 PM – 4:20 PM Room 381, Phillips Hall

- Organizers: **Gregory M. Forest**, University of North Carolina
Qi Wang, Florida State University
Ruhai Zhou, University of North Carolina
- 2:30PM *On the Strength of Monodomain Attractors in Sheared Nematic Polymers.* (117)
Xiaoyu Zheng*, **Gregory M. Forest**, **Ruhai Zhou**, UNC-CH, and **Qi Wang**, FSU (991-37-155)
- 3:00PM *Kinetic simulations of nematic polymers in planar linear flows.* Preliminary report. (118)
 ▶ **Lingxing Yao***, **Greg Forest**, University of North Carolina at Chapel Hill, **Qi Wang**, Florida State University, and **Ruhai Zhou**, University of North Carolina at Chapel Hill (991-76-234)

- 3:30PM *2D Stochastic Simulations of Shear Flow of Liquid-Crystalline Polymers.* (119)
Joohee Lee*, **M.Gregory Forest** and **Ruhai Zhou**, University of North Carolina at Chapel Hill (991-76-151)
- 4:00PM Discussion

Special Session on Algebras and Their Representations, II

2:30 PM – 5:20 PM Room 332, Phillips Hall

- Organizers: **Edward L. Green**, Virginia Polytech Institute & State University
Ellen E. Kirkman, Wake Forest University
- 2:30PM *Admissible sequences and the preprojective component of a quiver.* Preliminary report. (120)
Mark Kleiner*, Syracuse University, and **Helene R. Tyler**, Manhattan College (991-16-76)
- 3:00PM *Fixed Subrings of Noetherian Graded Regular Rings.* Preliminary report. (121)
Ellen Kirkman and **James Kuzmanovich***, Wake Forest University (991-16-157)
- 3:30PM *Multiplicative invariants of finite groups.* (122)
 Preliminary report.
Martin Lorenz, Temple University (991-13-195)
- 4:00PM *Preprojective modules and Auslander-Reiten components.* (123)
Shiping Liu, University of Sherbrooke (991-16-100)
- 4:30PM *Separation of Variables for $U_q(\mathfrak{sl}_{n+1})^+$.* (124)
Samuel Antonio Lopes, University of Wisconsin - Madison (991-16-90)
- 5:00PM *Some Morita comparisons of quasihereditary algebras.* (125)
Leonard L Scott, University of Virginia (991-16-124)

Special Session on Mathematical Modeling in Physiology and Medicine, II

2:30 PM – 5:50 PM Room 305, Dey Hall

- Organizers: **Mary Ann Horn**, Vanderbilt University
Glenn Webb, Vanderbilt University
- 2:30PM *Precision of Neural Timing: The Small ϵ Limit.* (126)
 ▶ **Colleen C Mitchell**, Boston University (991-92-277)
- 3:00PM *Dynamics of Feedback-Regulated Flow in the Nephrons of the Kidney: Perturbations, Oscillations, and Compensation.* (127)
Darren R. Oldson*, Vanderbilt University, **Leon C. Moore**, SUNY Stony Brook, and **Harold E. Layton**, Duke University (991-92-168)
- 3:30PM *Irregular Oscillations in Nephron Flow Mediated by Tubuloglomerular Feedback.* Preliminary report. (128)
Anita T. Layton, University of North Carolina at Chapel Hill, **Leon C. Moore**, State University of New York at Stony Brook, and **Harold E. Layton***, Duke University (991-92-187)
- 4:00PM *Effective Equations Describing Blood Flow in Large and Small Arteries.* (129)
Suncica Canic, University of Houston (991-92-113)
- 4:30PM *Modeling baroreflex and autoregulation of cerebral blood flow velocity and finger pressure during posture change from sitting to standing.* (130)
M S Olufsen*, North Carolina State University, **J T Ottesen**, Roskilde University, **H T Tran**, North Carolina State University, **V Novak**, Beth Israel Deacones Hospital, and **L A Lipsitz**, Harvard Medical School (991-92-139)

- 5:00PM *Multiphase fluid mechanics in self-deforming tissues.*
(131) **Sharon R Lubkin**, NC State University (991-92-13)
- 5:30PM *The Immune System as a Fluid Organ:*
▶ (132) *anthrax-induced "vortices".* Preliminary report.
Thomas B Kepler, Duke University (991-92-199)

Special Session on Mathematical Molecular Biology, II

2:30 PM – 5:20 PM Room 307, Dey Hall

- Organizer: **Dorothy Buck**, Brown University
- 2:30PM *Hinged rod models for flexible sites in DNA.*
(133) **Robert S Manning**, Haverford College (991-92-293)
- 3:00PM Discussion
- 3:30PM *DNA Mechanics and the Regulation of Lac Operon in E. Coli.* Preliminary report.
▶ (134) **David Swigon***, **Wilma K Olson** and **Bernard D Coleman**, Rutgers University (991-92-232)
- 4:00PM Discussion
- 4:30PM *Random Segregation of Minicircles during Replication of Kinetoplast DNA.* Preliminary report.
▶ (135) **Alexander V Vologodskii**, New York University (991-92-298)
- 5:00PM Discussion

Special Session on Current Topics in Optical Communications Systems, II

2:30 PM – 3:50 PM Room 385, Phillips Hall

- Organizers: **Rudy Horne**, University of North Carolina
Tobias Schaefer, University of North Carolina
- 2:30PM *Randomly perturbed Integrable Systems in Optics.*
(136) **Jared C Bronski**, University of Illinois (991-78-286)
- 3:00PM *Optical pulse dynamics in nonlinear periodic structures.*
(137) **Alejandro B Aceves*** and **Tomas Dohnal**, The University of New Mexico (991-78-77)
- 3:30PM *Nonlinear optics, fibers and photonic crystal fibers- new paths for signal processing?*
(138) **Fiorenzo G Omenetto**, Los Alamos National Laboratory (991-94-270)

Special Session on Multi-scale Fluid Flow: Theory and Computation, I

2:30 PM – 5:20 PM Room 367, Phillips Hall

- Organizers: **Sorin M. Mitran**, University of North Carolina
Traian Iliescu, Virginia Tech
- 2:30PM *Multidimensional granular flows.*
(139) **Pierre Gremaud**, North Carolina State University (991-70-220)
- 3:00PM *Average Behavior of Viscous Instabilities in Miscible Porous Flow.*
(140) **John Trangenstein**, Duke University (991-76-185)
- 3:30PM *The small viscosity limit for curved, multidimensional Euler shocks.*
(141) **Mark Williams**, University of North Carolina (991-76-182)
- 4:00PM *Scale Similarity/deConvolution Models in LES: Is the closure problem in turbulence modeling solved?*
(142) **William Layton**, University of Pittsburgh (991-76-180)
- 4:30PM *Deconvolution LES Models - A Numerical Study.*
(143) **Traian Iliescu**, Virginia Tech (991-76-181)

- 5:00PM *A Study of LES Models Using Sensitivity Analysis.*
(144) **Jeff Borggaard**, Virginia Tech (991-76-269)

University of North Carolina Mathematics Department Reception

6:30 PM – 7:30 PM

Carolina Inn

Saturday, October 25

Meeting Registration

8:00 AM – NOON Room 220, Phillips Hall

AMS Exhibit and Book Sale

8:00 AM – NOON Room 224, Phillips Hall

Special Session on Group Cohomology in Algebra and Geometry, III

8:00 AM – 10:50 AM Room 308, Hanes Hall

Organizers: **Richard M. Hain**, Duke University
Kevin P. Knudson, Mississippi State University

- 8:00AM *Extensions for finite groups of Lie type in the defining characteristic.* Preliminary report.
(145) **Cornelius Pillen**, University of South Alabama (991-20-245)
- 8:30AM *Exponential maps for good characteristics.*
(146) Preliminary report.
Zongzhu Lin, Kansas State University (991-20-183)
- 9:00AM *Rational Schur algebras.* Preliminary report.
(147) **Stephen Doty**, Loyola University Chicago (991-16-144)
- 9:30AM *Quantum Weyl reciprocity for cohomology.*
(148) **Brian J Parshall*** and **Leonard L. Scott**, University of Virginia (991-20-136)
- 10:00AM *Extensions for Frobenius kernels.*
(149) **Christopher P Bendel***, University of Wisconsin-Stout, **Daniel K Nakano**, University of Georgia, and **Cornelius Pillen**, University of South Alabama (991-20-114)
- 10:30AM *Realization of orbit closures via cohomology and representation theory.*
(150) **Daniel K. Nakano***, University of Georgia, and **Toshiyuki Tanisaki**, Osaka City University (991-20-44)

Special Session on Association Schemes: 1973–2003, III

8:00 AM – 10:50 AM Room 309, Gardner Hall

Organizers: **William J. Martin**, Worcester Polytechnic Institute
Dijen K. Ray-Chaudhuri, Ohio State University

- 8:00AM *Designs on association schemes.*
(151) **R. A. Bailey**, Queen Mary, University of London (991-05-64)
- 8:30AM *Some non-existence results for partially balanced incomplete block designs.*
(152) **Malcolm Greig**, Greig Consulting (991-05-279)

- 9:00AM *Delsarte Polynomial and Designs*. Preliminary report. (153)
Mohan S. Shrikhande, Central Michigan University (991-05-29)
- 9:30AM *Perfect Codes in the Johnson Scheme*. (154)
Tuvi Etzion, Technion (991-05-56)
- 10:00AM *Inequalities for Association Schemes*. (155)
Jin Qian*, General Bandwidth, Inc, and **Dijen Ray-Chaudhuri**, Ohio State University (991-05-53)
- 10:30AM *Colouring Graphs from Association Schemes*. Preliminary report. (156)
Chris D Godsil, University of Waterloo (991-05-189)

Special Session on Banach Algebras and Several Complex Variables, III

8:00 AM – 10:50 AM Room 307, Gardner Hall

- Organizers: **John T. Anderson**, College of the Holy Cross
Alexander J. Izzo, Bowling Green State University
- 8:00AM *Geometric conditions which imply compactness of the $\bar{\partial}$ -Neumann operator*. (157)
Emil J Straube, Texas A&M University (991-32-121)
- 8:30AM *Global CR Approximation on a Non-rigid Hypersurface Graph in C^n* . Preliminary report. (158)
A Boggess*, Texas A&M University, and **R Dwilewicz**, University of Missouri at Rolla (991-32-61)
- 9:00AM *Compactness of the $\bar{\partial}$ -Neumann operator for Hartogs domains in C^2* . (159)
Michael Christ, University of California, Berkeley, and **Siqi Fu***, Rutgers University-Camden (991-32-268)
- 9:30AM Problem Session
- 10:00AM *Hartogs-Bochner type extension of CR functions in complex manifolds*. Preliminary report. (160)
Roman J Dwilewicz, University of Missouri (991-32-159)
- 10:30AM *Nonlinear Cauchy-Riemann Equations and Uniform Algebras*. Preliminary report. (161)
Richard Francis Basener, IBM Corporation (991-32-72)

Special Session on Commutative Rings and Monoids, III

8:00 AM – 10:50 AM Room 215, Phillips Hall

- Organizer: **Scott Chapman**, Trinity University
- 8:00AM *Enumerating the elasticities of Krull domains with divisor class group Z_{p^k}* . Preliminary report. (162)
Karl M. Kattchee, University of Wisconsin-La Crosse (991-13-257)
- 8:30AM *On Integral Morphisms*. (163)
Jack L Maney, North Dakota State University (991-13-163)
- 9:00AM *U-Factorizations: Rearrangements and Idealizations*. (164)
M. Axtell*, Wabash College, **J. Stickles**, University of Evansville, **S. J. Forman**, St. Joseph's University, and **N. Roermsa**, Wabash College (991-13-96)
- 9:30AM *On local half-factorial orders*. (165)
Florian Kainrath, Universitaet Graz (991-13-127)
- 10:00AM *Comaximal Factorization of Ideals*. Preliminary report. (166)
Stephen J McAdam*, University of Texas, and **Richard G Swan**, University of Chicago (991-13-69)

- 10:30AM *Every positive integer is the Frobenius number of a numerical semigroup with three generators*. (167)
J. I. Garcia-Garcia*, **P. A. Garcia-Sanchez** and **J. C. Rosales**, Universidad de Granada (991-20-212)

Special Session on Mathematical Modeling in Physiology and Medicine, III

8:00 AM – 10:50 AM Room 305, Dey Hall

- Organizers: **Mary Ann Horn**, Vanderbilt University
Glenn Webb, Vanderbilt University
- 8:00AM *The Critical Role of Nosocomial Transmission in the Toronto SARS Outbreak*. (168)
Glenn F Webb, Vanderbilt University (991-92-137)
- 8:30AM *Stability of Steady States and Existence of Traveling Waves in a Vector Disease Model*. Preliminary report. (169)
Shigui Ruan*, University of Miami and Dalhousie University, and **Dongmei Xiao**, Shanghai Jiaotong University (991-92-169)
- 9:00AM *Cultural Choices and the Control of HIV*. Preliminary report. (170)
Keith E Howard, Kenyon College (991-92-149)
- 9:30AM *Long Period Oscillations in a G_0 Model of Hematopoietic Stem Cells*. (171)
Laurent Pujol-Menjouet*, Vanderbilt University, Nashville TN, **Samuel Bernard**, McGill University, Montreal, Canada, and **Michael C. Mackey**, McGill University (991-34-145)
- 10:00AM *Optimal Control Applied to Cell-Kill Strategies*. (172)
K. Renee Fister*, Murray State University, and **J. Carl Panetta**, St. Jude Children's Research Hospital (991-34-10)
- 10:30AM *Can "Tunneling" Occur Between Cancer-Free and Cancerous States? Some Pre-Modeling Speculation*. Preliminary report. (173)
John A Adam, Old Dominion University (991-92-11)

Special Session on Group Actions on Curves, III

8:30 AM – 10:50 AM Room 307, Hanes Hall

- Organizers: **Kay Magaard**, Wayne State University and University of Florida
Helmut Voelklein, University of Florida
- 8:30AM *The Great Theorems of Cameron and Kantor*. (174)
Shreeram S Abhyankar, Purdue University (991-20-74)
- 9:00AM *A catalog of the loci of curves of low genus*. Preliminary report. (175)
Kay Magaard, Wayne State University, **Sergey Shpectorov***, Bowling Green State University, and **Helmut Voelklein**, University of Florida (991-20-303)
- 9:30AM *Computing braid group actions*. (176)
Juergen Klueeners, University Kassel (991-20-223)
- 10:00AM *Symmetric and alternating groups as monodromy groups*. (177)
Robert Guralnick, University of Southern California, and **John Shareshian***, Washington University (991-20-186)
- 10:30AM *Bounding the degree of an exceptional monodromy group of low genus*. Preliminary report. (178)
Daniel E. Frohardt, Wayne State University (991-20-230)

Special Session on Knots, Links, and Embedded Graphs, III

8:30 AM – 10:50 AM Room 304, Dey Hall

Organizers: **Joel S. Foisy**, SUNY at Potsdam
Erica L. Flapan, Pomona College

- 8:30AM *Graphs with disjoint links in every spatial embedding.*
▶ (179) **Anton Michael Dochtermann**, University of Washington (991-54-125)
- 9:00AM *Intrinsically knotted and linked graphs in 3-space.*
▶ (180) **Erica Flapan**, Pomona College, **Joel Foisy**, SUNY Postdam, **Ramin Naimi***, Occidental College, and **James Pommersheim**, Pomona College (991-57-52)
- 9:30AM *Two families of (minor minimal?) intrinsically knotted graphs.* Preliminary report.
(181) **Joel S Foisy**, SUNY Potsdam (991-57-78)
- 10:00AM *Delta edge-homotopy on theta curves.* Preliminary report.
(182) **Ryo Nikkuni**, Waseda University (991-57-73)
- 10:30AM *The size of links in spatial embeddings of graphs.*
▶ (183) **Brenda Johnson***, Union College, and **William Johnson**, New York, NY (991-55-242)

Special Session on Measurable, Complex, and Symbolic Dynamics, II

8:30 AM – 10:20 AM Room 206, Dey Hall

Organizers: **Jane M. Hawkins**, University of North Carolina at Chapel Hill
Karl E. Petersen, University of North Carolina at Chapel Hill

- 8:30AM *Rates of convergence and divergence.* Preliminary report.
(184) **Joseph Rosenblatt**, University of Illinois at Urbana-Champaign (991-28-60)
- 9:00AM *The Wiener-Wintner property for the helical transform.* Preliminary report.
(185) **James T Campbell***, University of Memphis, and **Michael Lacey**, Ga. Institute of Technology (991-37-240)
- 9:30AM *Polynomial Szemerédi theorem for countable modules over integral domains and finite fields.*
(186) **Randall G McCutcheon***, University of Memphis, **Vitaly Bergelson** and **Alexander Leibman**, Ohio State University (991-28-236)
- 10:00AM *On partitions with independent iterates.*
(187) **Boris Begun** and **Andres del Junco***, Univ. of Toronto (991-28-165)

Special Session on Linear Operators on Function Spaces, III

8:30 AM – 10:50 AM Room 308, Gardner Hall

Organizers: **Nathan S. Feldman**, Washington and Lee University
William T. Ross, University of Richmond

- 8:30AM *Uniformly discrete sets and Bergman spaces.* Preliminary report.
(188) **Peter Duren***, University of Michigan, **Alexander Schuster**, San Francisco State University, and **Dragan Vukotic**, Universidad Autonoma de Madrid (991-30-211)

- 9:00AM *Self-Commutators of Unbounded Bergman Operators.*
(189) **Sherwin Kouckekian***, University of South Alabama, and **James E Thomson**, Virginia Tech (991-47-162)

- 9:30AM *On Carleson embeddings of star-invariant subspaces.*
(190) **Joseph A Cima**, University of North Carolina at Chapel Hill, and **Alec L Matheson***, Lamar University (991-30-140)
- 10:00AM *Absolute Equivalence and Dirac Operators of Commuting Tuples of Operators.*
(191) **Jim Gleason***, University of Tennessee, and **John B. Conway**, National Science Foundation (991-47-75)
- 10:30AM *Univalent functions, Hardy spaces, and spaces of Dirichlet type.*
(192) **Albert Baernstein II***, Washington University, **Daniel Girela** and **Jose Angel Pelaez**, Universidad de Malaga (991-30-85)

Special Session on Homological Physics, III

8:30 AM – 10:50 AM Room 106, Gardner Hall

Organizers: **Thomas J. Lada**, North Carolina State University
James Stasheff, University of North Carolina at Chapel Hill

- 8:30AM *Cohomological variational principles and secondary classes.*
(193) **Ettore Aldrovandi**, Florida State University (991-18-22)
- 9:00AM *Algebraic structures on generalized strings.* Preliminary report.
(194) **Yuli B Rudyak***, University of Florida, and **Vladimir V Chernov**, Dartmouth College (991-55-37)
- 9:30AM *Affine linking and winding numbers and the study of front propagation.*
(195) **Vladimir V Chernov***, Dartmouth College, and **Yuli B Rudyak**, University of Florida, Gainesville (991-57-41)
- 10:00AM *Topological A-models on seamed Riemann surfaces.*
(196) **Lev Rozansky**, University of North Carolina at Chapel Hill (991-18-20)
- 10:30AM Discussion and Problems

Special Session on Algebras and Their Representations, III

8:30 AM – 10:50 AM Room 332, Phillips Hall

Organizers: **Edward L. Green**, Virginia Polytech Institute & State University
Ellen E. Kirkman, Wake Forest University

- 8:30AM *Unipotent Hecke algebras for finite groups of Lie type.*
(197) **Nathaniel Thiem**, University of Wisconsin-Madison (991-20-222)
- 9:00AM *Tensor Product Stabilization in Kac-Moody Algebras.*
(198) **Michael Kleber**, Brandeis University, and **Sankaran Viswanath***, U C Berkeley (991-17-108)
- 9:30AM *Filtrations in semisimple rings and Lie algebras.* Preliminary report.
(199) **Yiftach Barnea** and **Donald S Passman***, University of Wisconsin (991-16-49)

- 10:00AM *Finite dimensional representations of invariant differential operators.*
(200) **Ian M Musson***, University of Wisconsin-Milwaukee, and **Sonia L. Rueda**, Universidad de Almeria (991-16-54)
- 10:30AM *Stabilizing the Auslander - Reiten Formula.*
(201) Preliminary report.
Alex Martsinkovsky*, Northeastern University, and **Idun Reiten**, Norwegian University of Science and Technology (991-16-209)

Special Session on Nonlinear Wave Phenomena: Stability and Interactions, II

9:00 AM – 10:20 AM **Room 383, Phillips Hall**

- Organizers: **Christopher Jones**, University of North Carolina at Chapel Hill
Bjorn Sandstede, The Ohio State University
- 9:00AM *Existence of Dafermos Profiles for Singular Shocks.*
(202) **Stephen Schecter**, North Carolina State University (991-35-147)
- 9:30AM *The small viscosity limit for multidimensional viscous shocks.*
(203) **Mark Williams**, University of N. Carolina, Chapel Hill, NC (991-35-190)
- 10:00AM *Energy Decay for the Wave Equations in an Exterior Domain with a Localized Dissipation.*
(204) **Il Hyo Jung**, University(Pusan National Univ., Assistant Profssor) (991-35-192)

Special Session on Mathematical Molecular Biology, III

9:00 AM – 10:50 AM **Room 307, Dey Hall**

- Organizer: **Dorothy Buck**, Brown University
- 9:00AM Discussion
- 9:30AM *Bio-Geometry.*
▶ (205) **Herbert Edelsbrunner**, Duke University and Raindrop Geomagic (991-51-276)
- 10:00AM *Backbone motion by inverse kinematics for protein design.*
(206) **Jack Snoeyink***, **Andrew Leaver-Fay**, **Kimberly Noonan** and **David O'Brien**, UNC Chapel Hill, Computer Science (991-68-266)
- 10:30AM *Comparing Evolutionary Trees.* Preliminary report.
▶ (207) **Katherine St. John**, City University of New York (991-92-304)

Special Session on Current Topics in Optical Communications Systems, III

9:00 AM – 10:20 AM **Room 385, Phillips Hall**

- Organizers: **Rudy Horne**, University of North Carolina
Tobias Schaefer, University of North Carolina
- 9:00AM *Interaction of sine-Gordon solitons with defects.*
(208) **Roy H. Goodman**, New Jersey Institute of Technology (991-78-89)
- 9:30AM *Spectral analysis of NLS solitons relative to arbitrary backgrounds.*
(209) **Radu C Cascaval**, University of Colorado at Colorado Springs (991-35-246)
- 10:00AM *Bifurcation and instability in coupled nonlinear Schrödinger equations.*
(210) **Russell K. Jackson**, Boston University (991-78-156)

Special Session on Multi-scale Fluid Flow: Theory and Computation, II

9:00 AM – 10:50 AM **Room 367, Phillips Hall**

- Organizers: **Sorin M. Mitran**, University of North Carolina
Traian Iliescu, Virginia Tech
- 9:00AM *Hybrid atomistic-continuum formulations for gaseous and dense fluid flows.*
(211) **Nicolas G. Hadjiconstantinou**, Massachusetts Institute of Technology (991-76-179)
- 9:30AM *Hybrid Particle-Continuum Computation of Nonequilibrium Hypersonic Flows.*
(212) **Iain D. Boyd*** and **Wen-Lan Wang**, University of Michigan (991-76-178)
- 10:00AM *Multiscale Simulation of Micro- and Nano-Fluidics.*
(213) **Shiyi Chen**, Johns Hopkins University (991-76-193)
- 10:30AM *Continuum fluid simulations using microscopically computed constitutive laws.*
(214) **Sorin M. Mitran**, University of North Carolina (991-76-184)

Session for Contributed Papers

9:00 AM – 10:10 AM **Room 381, Phillips Hall**

- 9:00AM *Characterization of Hardy/Bergmann spaces, on multiply connected domains, that support compact composition operators.* Preliminary report.
▶ (215) **Abebaw Tadesse**, University Of Pittsburgh (991-47-17)
- 9:15AM *Semi-weak-delta Spaces and Metrizable Spaces.*
(216) Preliminary report.
G. R. Hiremath, UNCP (991-54-33)
- 9:30AM *On the Critical Number and its Variants.*
(217) **Michael A Freeze*** and **Jennifer S Eyl**, University of North Carolina at Wilmington (991-11-295)
- 9:45AM *Effects of Non-normality on Tests for Random Walk Models Using the t Distribution.*
(218) **Leslie Chandrakantha**, John Jay College (991-62-97)
- 10:00AM *A simple formulation of the concept of subdivision of a simplicial complex.*
(219) **Francis D. Lonergan**, Webster, MA (991-55-307)

AMS Special Presentation

9:30 AM – 10:50 AM **Room 228, Phillips Hall**

- TA development using case studies: A workshop for faculty. Part I*
Organizer: **Solomon Friedberg**, Boston College

Invited Address

11:05 AM – 11:55 AM **Auditorium, Carroll Hall**

- (220) *Topological symmetry groups of graphs embedded in the 3-sphere.*
Erica L. Flapan, Pomona College (991-57-02)

Invited Address

1:30 PM – 2:20 PM **Auditorium, Carroll Hall**

- (221) *Interactions between group theory and algebraic curves via Riemann's existence theorem.*
Helmut Voelklein, University of Florida (991-14-04)

Special Session on Group Actions on Curves, IV

2:30 PM – 4:50 PM Room 307, Hanes Hall

Organizers: **Kay Magaard**, Wayne State University and University of Florida
Helmut Voelklein, University of Florida

- 2:30PM *Lifting group actions on curves in mixed characteristic.* Preliminary report.
 (222) **Ted C Chinburg**, University of Pennsylvania, **Robert M Guralnick**, University of Southern California, and **David Harbater***, University of Pennsylvania (991-14-224)
- 3:00PM *Arithmetic of isolated covers of the affine line.*
 (223) **Rachel J Pries**, Colorado State University (991-11-160)
- 3:30PM *Special loci in moduli of curves with marked points.*
 (224) **Cui Yin**, Lycoming College (991-14-305)
- 4:00PM *Rational functions with large images over finite fields.*
John J Flynn, Haverford College (991-12-300)
- 4:30PM *Hyperelliptic curves with a -number at least two.*
 (226) **Darren B Glass***, Columbia University, and **Rachel Pries**, Colorado State University (991-11-24)

Special Session on Knots, Links, and Embedded Graphs, IV

2:30 PM – 5:20 PM Room 304, Dey Hall

Organizers: **Joel S. Foisy**, SUNY at Potsdam
Erica L. Flapan, Pomona College

- 2:30PM *Totally geodesic Seifert surfaces in hyperbolic knot and link complements.*
 (227) **Colin C Adams***, Williams College, and **Eric Schoenfeld**, Boston, MA (991-57-106)
- 3:00PM *3-manifolds with planar presentations and the width of satellite knots.*
 (228) **Martin Scharlemann***, U. C. Santa Barbara, and **Jennifer Schultens**, U. C. Davis (991-57-148)
- 3:30PM *Dihedral covers of two-bridge knot complements.*
 (229) **Genevieve S Walsh**, University of Texas at Austin (991-57-203)
- 4:00PM *Links, Mahler measure and Lehmer's Question.*
 (230) **Daniel S. Silver*** and **Susan G. Williams**, University of South Alabama (991-57-244)
- 4:30PM *Round Brunnian Links.* Preliminary report.
 (231) **Hugh Nelson Howards**, Wake Forest University (991-57-239)
- 5:00PM *Asymptotic Distance: Incompressible Surfaces, Graphs of Intersection and Dehn Filling.*
 (232) **Cynthia Verjovsky Marcotte**, St. Edward's University (991-57-206)

Special Session on Measurable, Complex, and Symbolic Dynamics, III

2:30 PM – 5:20 PM Room 206, Dey Hall

Organizers: **Jane M. Hawkins**, University of North Carolina at Chapel Hill
Karl E. Petersen, University of North Carolina at Chapel Hill

- 2:30PM *Connectivity Properties of Julia sets of Weierstrass Elliptic Functions.*
 (233) **Lorelei Koss***, Dickinson College, and **Jane Hawkins**, University of North Carolina at Chapel Hill (991-37-188)

- 3:00PM *Indecomposable Continua and the Julia Sets of Rational Maps.* Preliminary report.
 (234) **John C Mayer**, UAB (991-30-06)
- 3:30PM *Necessary conditions for the existence of wandering vertices for cubic polynomials.* Preliminary report.
 (235) **Alexander Blokh**, UAB, Birmingham, AL (991-37-70)
- 4:00PM *The simplest branched surface for a foliation (preliminary report).* Preliminary report.
 (236) **Sandi L Shields**, College of Charleston (991-57-153)
- 4:30PM *Mixing on a Class of Rank One Transformations.*
 (237) **Darren Creutz**, New York, New York, and **Cesar E. Silva***, Williams College (991-37-287)
- 5:00PM *Almost everywhere convergence of modulated one-sided Hilbert transform.* Preliminary report.
 (238) **Ciprian Demeter**, University of Illinois (991-37-261)

Special Session on Group Cohomology in Algebra and Geometry, IV

2:30 PM – 5:30 PM Room 308, Hanes Hall

Organizers: **Richard M. Hain**, Duke University
Kevin P. Knudson, Mississippi State University

- 2:30PM *A row-removal theorem for the Ext^1 quiver of symmetric groups and Schur algebras.*
 (239) **David J Hemmer**, University of Toledo (991-20-119)
- 3:00PM *The Hopf ring structure of the cohomology of the symmetric groups.* Preliminary report.
 (240) **Terrence P Bisson***, Canisius College, and **André Joyal**, Université du Québec à Montréal (991-55-217)
- 3:30PM *The Dade Group of Extraspecial p -Groups.* Preliminary report.
 (241) **Nadia P Mazza**, University of Georgia (991-20-235)
- 4:00PM *On Nilpotent Ideals in the Cohomology Ring of a Finite Group.*
 (242) **Jonathan N Pakianathan***, University of Rochester, and **Ergun Yalcin**, Bilkent University, Turkey (991-55-225)
- 4:30PM Problem Session

Special Session on Association Schemes: 1973–2003, IV

2:30 PM – 5:20 PM Room 309, Gardner Hall

Organizers: **William J. Martin**, Worcester Polytechnic Institute
Dijen K. Ray-Chaudhuri, Ohio State University

- 2:30PM *Open problems related to Association Schemes.*
 (243) **Paul F Camion**, University of Paris 6 (991-05-150)
- 3:00PM *Constructions of Pseudocyclic association schemes.* Preliminary report.
 (244) **Henk D L Hollmann**, Philips Research Labs, and **Qing Xiang***, University of Delaware (991-05-259)
- 3:30PM *Explicit Constructions of Families of LDPC Codes with Girth at Least Six.*
 (245) **Vera Pless***, University of Illinois at Chicago, **Jon-Lark Kim**, University of Nebraska, Lincoln, **Uri Peled** and **Irina Perpelitsa**, University of Illinois at Chicago (991-05-99)

- 4:00PM *Bounds on Distance Distributions in Codes of Known Size.* (246)
Alexei Ashikhmin*, Bell Labs/Lucent Technologies, **Gerard Cohen**, ENST, **Michael Krivelevich**, Tel Aviv University, and **Simon Litsyn**, Tel Aviv University (991-05-273)
- 4:30PM *Completely regular binary codes.* Preliminary report. (247)
Jack H Koolen, Korean Advanced Institute for Science and Technology (991-05-105)
- 5:00PM *The biweight enumerator of a binary code and the subconstituent algebra of the hypercube.* Preliminary report. (248)
William J. Martin, Worcester Polytechnic Institute (991-05-40)

Special Session on Linear Operators on Function Spaces, IV

2:30 PM – 4:50 PM Room 308, Gardner Hall

- Organizers: **Nathan S. Feldman**, Washington and Lee University
William T. Ross, University of Richmond
- 2:30PM *Nontangential limits in $P^l(\mu)$ spaces.* Preliminary report. (249)
Alexandru Aleman, Lund University, **Stefan Richter** and **Carl Sundberg***, University of Tennessee, Knoxville (991-30-161)
- 3:00PM *Weighted biharmonic Green functions.* (250)
Rachel J Weir, University of Virginia (991-30-129)
- 3:30PM *On C^* -algebras Generated by Subnormal Operators Preliminary Report.* Preliminary report. (251)
Nathan S Feldman, Washington and Lee University, and **Paul J McGuire***, Bucknell University (991-47-111)
- 4:00PM *Composition Operators and Linear Fractional Maps on the Unit Ball.* (252)
Alexander E. Richman*, Bucknell University, and **Carl C. Cowen**, Purdue University (991-47-214)
- 4:30PM *The lambda commutant of a normal operator.* (253)
Gabriel T Prajitura, SUNY Brockport (991-47-126)

Special Session on Banach Algebras and Several Complex Variables, IV

2:30 PM – 4:50 PM Room 307, Gardner Hall

- Organizers: **John T. Anderson**, College of the Holy Cross
Alexander J. Izzo, Bowling Green State University
- 2:30PM *Invitation to Bohr's Theorem.* Preliminary report. (254)
Harold P Boas, Texas A&M University (991-32-226)
- 3:00PM *A "floating body" approach to Fefferman's surface area.* Preliminary report. (255)
David E Barrett, University of Michigan (991-32-271)
- 3:30PM *Hulls of Non-orientable Surfaces in C^2 .* Preliminary report. (256)
John T Anderson, College of the Holy Cross (991-32-131)
- 4:00PM *On the algebra of holomorphic functions in a Banach space.* (257)
Imre Patyi, University of California at San Diego (991-32-92)

- 4:30PM *A Riemann-Hilbert boundary value problem in C^n and an application.* Preliminary report. (258)
Marshall A Whittlesey, California State University San Marcos (991-32-264)

Special Session on Commutative Rings and Monoids, IV

2:30 PM – 5:50 PM Room 215, Phillips Hall

- Organizer: **Scott Chapman**, Trinity University
- 2:30PM *On UMV-domains.* Preliminary report. (259)
Evan G Houston*, UNC Charlotte, and **Muhammad Zafrullah**, Idaho State University (991-13-237)
- 3:00PM *Factorizations with successive lengths in one-dimensional local domains.* (260)
Wolfgang Hassler, University of Nebraska Lincoln (991-13-46)
- 3:30PM *Localization with respect to endomorphisms.* (261)
Gabriel Picavet, Université Blaise Pascal (991-13-39)
- 4:00PM *Projective presentations of finitely generated modules with large annihilators.* Preliminary report. (262)
Bruce Olberding, New Mexico State University, and **A. Serpil Saydam***, University of Louisiana at Monroe (991-13-51)
- 4:30PM *Unmixedness and the Generalized Principal Ideal Theorem.* Preliminary report. (263)
Tracy Dawn Hamilton, California State University Sacramento (991-13-55)
- 5:00PM *A General Theory Of Splitting Sets.* Preliminary report. (264)
David F Anderson, University of Tennessee, **GyuWhan Chang**, Incheon University, and **Jeanam Park***, Inha University (991-13-142)
- 5:30PM *Properties of M-almost integrality.* (265)
James Coykendall and **Tridib Dutta***, North Dakota State University (991-13-294)

Special Session on Algebras and Their Representations, IV

2:30 PM – 4:50 PM Room 332, Phillips Hall

- Organizers: **Edward L. Green**, Virginia Polytech Institute & State University
Ellen E. Kirkman, Wake Forest University
- 2:30PM *Non-Koszul regular algebras of dimension 4.* Preliminary report. (266)
James J. Zhang, University of Washington (991-16-93)
- 3:00PM *Root multiplicities of the indefinite Kac-Moody algebras of symplectic type.* Preliminary report. (267)
Kailash C. Misra, North Carolina State University, and **Vicky L Williams***, Appalachian State University (991-17-98)
- 3:30PM *A Two-Parameter Chromatic Symmetric Function.* (268)
Ellison-Anne Williams, North Carolina State University (991-05-43)
- 4:00PM *More Quantum \mathbb{P}^3 s with Finitely Many Points, Part I.* Preliminary report. (269)
Darin R Stephenson, Hope College, MI, and **Michaela Vancliff***, University of Texas at Arlington, TX (991-16-202)
- 4:30PM *More Quantum \mathbb{P}^3 s with Finitely Many Points, Part II.* Preliminary report. (270)
Darin R. Stephenson*, Hope College, and **Michaela Vancliff**, University of Texas at Arlington (991-16-213)

Special Session on Mathematical Molecular Biology, IV

2:30 PM – 4:50 PM Room 307, Dey Hall

Organizer: **Dorothy Buck**, Brown University

2:30PM *Modeling the self-organization of microtubule asters.* (271)

Eric N Cytrynbaum, University of California, Davis (991-92-299)

3:00PM *The NCR circuit: a simple model for genetic regulatory networks.* Preliminary report. (272)

Konstantin Mischaikow, Georgia Institute of Technology (991-92-130)

▶ 4:00PM *Hamiltonian cycles in Conway's algebraic knots and their implications on rope length.* Preliminary report. (273)

Claus Ernst*, WKU, and **Yuanan Diao**, UNCC (991-57-285)

4:30PM *Combinatorial Insights Into RNA Secondary Structures.* (274)

Christine E. Heitsch, University of Wisconsin – Madison (991-92-275)

AMS Special Presentation

2:30 PM – 4:30 PM

Room 228, Phillips Hall

TA development using case studies: A workshop for faculty. Part II

Organizer: **Solomon Friedberg**, Boston College

John L. Bryant
Associate Secretary
Tallahassee, Florida

Special Session on Current Topics in Optical Communications Systems, IV

2:30 PM – 3:50 PM Room 385, Phillips Hall

Organizers: **Rudy Horne**, University of North Carolina

Tobias Schaefer, University of North Carolina

2:30PM *Effects of perturbations on collisions between optical solitons.* (275)

Avner Peleg, LANL (991-78-91)

3:00PM *Periodic-group-delay modules in optical fiber communications and collision-induced timing jitter.* (276)

Gino Biondini, Ohio State University (991-35-87)

3:30PM *Existence and Stability of Short Optical Pulses in a Model of Mixed Type.* (277)

N Costanzino, Brown University and UNC - Chapel Hill (991-35-191)

Special Session on Multi-scale Fluid Flow: Theory and Computation, III

2:30 PM – 3:50 PM Room 367, Phillips Hall

Organizers: **Sorin M. Mitran**, University of North Carolina

Traian Iliescu, Virginia Tech

▶ 2:30PM *An Internal Splash: Levitation of Falling Spheres in Stratified Fluids.* (278)

Richard M. McLaughlin*, **Nicole Abaid**, **David Adalsteinsson**, University of North Carolina, and **Akua Aguapong**, Hampton University (991-76-292)

3:00PM *Statistics and Structure in Sedimentation.* (279)

Peter J. Mucha, Georgia Institute of Technology (991-76-177)

3:30PM *Passive Scalar Intermittency and Eigenvalue Asymptotics.* (280)

Jared C Bronski, University of Illinois (991-76-284)