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# Program of the Sessions

Birmingham, Alabama, November 10–12, 2000

## Friday, November 10

### Meeting Registration

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12:30 PM – 5:00 PM First Floor, Educational Building

### AMS Exhibit and Book Sale

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12:30 PM – 5:00 PM First Floor, Educational Building

### Opening Remarks and Welcome

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1:15 PM – 1:25 PM Auditorium, Hill University Center

### Invited Address

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1:25 PM – 2:15 PM Auditorium, Hill University Center

- (1) *Perturbation theory on integrable systems.*  
**Xin Zhou\***, Duke University, and **Percy Deift**, New York University-Courant Institute (960-35-02)

### Special Session on Inverse Problems, I

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2:30 PM – 5:50 PM Room 134, Educational Building

Organizers: **Ian Walker Knowles**, University of Alabama at Birmingham  
**Rudi Weikard**, University of Alabama at Birmingham

- 2:30PM *On Determining a Riemannian Manifold from the Dirichlet-to-Neumann map.*  
(2) **Gunther Uhlmann**, University of Washington (960-35-183)
- 3:00PM *Electrical Impedance Imaging.*  
(3) **David Isaacson**, RPI (960-78-223)
- 3:30PM *Gradients with respect to metrics: Applications to superconductivity.*  
(4) **John W Neuberger**, University of North Texas (960-35-25)
- 4:00PM break

4:30PM *Algorithms for making time reversal mirror calculations in wave guides.*  
(5) **Joyce R. McLaughlin**, Rensselaer Polytechnic Institute, Troy, New York (960-35-237)

5:00PM *Time-Reversal Acoustics for Multiple Targets.*  
(6) **James G Berryman**, Lawrence Livermore Lab (960-35-196)

5:30PM *Super-resolution Processing of Multi-static Data Using Time Reversal and MUSIC.*  
(7) **Anthony J Devaney**, Northeastern University (960-15-192)

### Special Session on Relations Between Spectral Theory and Analytic Number Theory, I

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2:30 PM – 4:50 PM Room 128, Educational Building

Organizers: **Robert M. Kauffman**, University of Alabama at Birmingham  
**Martin N. Huxley**, Cardiff University, Wales

2:30PM *Some old ideas on the Riemann Hypothesis.*  
(8) **Martin N Huxley**, University of Cardiff (960-11-151)

3:00PM discussion

3:30PM *Boundary Distributions of Automorphic Forms and Their L-functions.* Preliminary report.  
(9) **Stephen D Miller**, Yale University (960-11-139)

4:00PM *Eigenfunctions of Quantized Cat Maps.*  
(10) **Par Kurlberg**, University of Georgia (960-11-255)

4:30PM *Trace formulas, resonances, and asymptotics of the length spectrum for hyperbolic manifolds of infinite volume.*  
(11) **Peter A Perry**, University of Kentucky (960-58-205)

### Special Session on Billiards and Related Topics, I

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2:30 PM – 5:20 PM Room 148, Educational Building

Organizers: **Nikolai I. Chernov**, University of Alabama at Birmingham  
**Nandor Simanyi**, University of Alabama at Birmingham

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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 21, 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.

- 2:30PM (12) *Topological entropy of convex billiards with small obstacles.*  
**Roberto Markarian**, IMERL, Universidad de la República, Uruguay (960-58-90)
- 3:00PM (13) *Measurements of decay of correlations in large particle systems.*  
**Marek R Rychlik**, University of Arizona (960-70-233)
- 3:30PM (14) *Search light in billiard tables.*  
**Gregory Galperin**, Eastern Illinois University (960-37-157)
- 4:00PM (15) *Decay of correlations for some almost Anosov systems.* Preliminary report.  
**Huyi Hu**, The University of Southern California (960-37-210)
- 4:30PM (16) *Nonholonomic constraints, normal form and high frequency oscillations.* Preliminary report.  
**Mark Levi\***, Penn State University, and **Warren Weckesser**, University of Michigan (960-37-134)
- 5:00PM (17) *Polyhedral billiards and a caricature on the Boltzmann-Sinai gas.* Preliminary report.  
**Eugene Gutkin**, Santa Monica, California (960-37-43)

**Marcel Griesemer**, University of Alabama at Birmingham

- 2:30PM (24) *On the existence of resonances for the Laplacian on waveguides.*  
**Julian K Edward**, Florida International University (960-35-174)
- 3:00PM (25) *Small-energy asymptotics of the scattering matrix for the matrix Schrödinger equation on the line.*  
**Martin Klaus\***, Virginia Tech, **Tuncay Aktosun**, North Dakota, and **Cornelis Van der Mee**, University of Cagliari (960-34-162)
- 3:30PM (26) *Quantum scattering with a homogeneous potential of degree zero.* Preliminary report.  
**Ira Herbst\***, University of Virginia, and **Erik Skibsted**, Aarhus University (960-81-185)
- 4:00PM break
- 5:00PM (27) *An Exponentially Accurate Time-Dependent Born-Oppenheimer Approximation.*  
**George A. Hagedorn**, Virginia Polytechnic Institute and State University (960-81-101)
- 5:30PM (28) *Stability of fronts for the Cahn-hilliard equation.*  
**Eric A Carlen\***, Georgia Tech, **M C Carvalho**, Georgia Tech, and **Enza Orlandi**, University of Rome III (960-35-215)

**Special Session on Spectral and Transport Problems in Solid State Physics, I**

2:30 PM – 5:50 PM Room 129, Educational Building

Organizers: **Peter D. Hislop**, University of Kentucky  
**Yulia Karpeshina**, University of Alabama at Birmingham  
**Gunter H. Stolz**, University of Alabama at Birmingham

- 2:30PM (18) *The Creation of Spectral Gaps by Graph Decoration.*  
**Jeffrey H Schenker\*** and **Michael Aizenman**, Princeton University (960-47-167)
- 3:00PM (19) *Finite rank perturbations of spectra.*  
**Alexei Poltoratski**, Texas A&M University (960-47-75)
- 3:30PM Break.
- 4:00PM (20) *Liouville theorems and dispersion relations for periodic elliptic equations.*  
**Peter Kuchment\***, Wichita State University, and **Yehuda Pinchover**, Technion - Israel Institute of Technology (960-35-51)
- 4:30PM (21) *Random Excitation of the Linear Mechanical Systems.* Preliminary report.  
**Boris P. Belinskiy\*** and **Peter Caithamer**, University of Tennessee at Chattanooga (960-60-20)
- 5:00PM (22) *The Spectral Shift Function for  $2 \times 2$  Operator Matrices.* Preliminary report.  
**Konstantin A Makarov**, University of Missouri-Columbia (960-47-206)
- 5:30PM (23) *Dynamical and Exponential Localization for One Dimensional, Continuum, Bernoulli-Anderson Models.*  
**David Damanik**, California Institute of Technology, **Robert Sims\*** and **Gunter Stolz**, University of Alabama at Birmingham (960-81-253)

**Special Session on Analytical Problems in Mathematical Physics, I**

2:30 PM – 5:50 PM Room 130, Educational Building

Organizers: **Roger T. Lewis**, University of Alabama at Birmingham  
**Michael P. Loss**, Georgia Institute of Technology

**Special Session on Operator Algebras and Their Representations, I**

2:30 PM – 5:50 PM Room 133, Educational Building

Organizers: **Alan Hopenwasser**, University of Alabama  
**Justin R. Peters**, Iowa State University

- 2:30PM (29) *Two operator relations used in the construction of wavelets.*  
**Palle E.T. Jorgensen**, The University of Iowa (960-47-33)
- 3:00PM (30) *A prewavelet and its Ruelle operator.*  
**Beth P Peterson**, Lamar University (960-47-214)
- 3:30PM (31) *Remarks on Operator Theory and the Corona Problem for the Bidisk.* Preliminary report.  
**Tavan T Trent**, University of Alabama (960-47-84)
- 4:00PM (32) *Families Index Theory for Operators in Subspaces.* Preliminary report.  
**Carla Farsi**, University of Colorado (960-46-106)
- 4:30PM (33) *Square-Summable Sequences Of Hilbert Space Operators And The Theory Of Frames.*  
**David R Larson**, Texas A&M University (960-47-141)
- 5:00PM (34) *Frame Wavelet Sets in  $R^d$ .* Preliminary report.  
**Xingde Dai**, **Yuanan Diao\***, UNC Charlotte, and **Qing Gu**, Beijing Univ (960-42-88)
- 5:30PM (35) *The symmetric imprimitivity theorem and regularity of induced representations.*  
**Astrid an Huef\***, University of Denver, and **Iain Raeburn**, University of Newcastle, Australia (960-46-111)

**Special Session on Dynamics and Low-Dimensional Topology, I**

2:30 PM – 5:50 PM Room 131, Educational Building

Organizers: **Alexander M. Blokh**, University of Alabama at Birmingham  
**Lex G. Oversteegen**, University of Alabama at Birmingham  
**John C. Mayer**, University of Alabama at Birmingham

- 2:30PM (36) *Regular Branched Covering Spaces and Chaotic Maps on Riemann Sphere*. Preliminary report.  
**Joo Sung Lee**, Dept. of Math. Dongguk University, Univ. of Florida (960-37-204)
- 3:00PM (37) *Compact One-dimensional Minimal Sets*. Preliminary report.  
**Alex D Clark**, University of North Texas (960-37-170)
- 3:30PM (38) *Topology in Mixing Problems*. Preliminary report.  
**Judy A. Kennedy**, University of Delaware (960-37-148)
- 4:00PM (39) *Dynamical decomposition of a topological space*.  
**Robbert Fokkink**, Delft University (960-54-108)
- 4:30PM (40) *Minimal Flows and Global Cross Sections which are Disks*. Preliminary report.  
**Bill F Basener**, Boston University / Colby Sawyer College (960-37-67)
- 5:00PM (41) *Attractors which Contain All Chainable Continua*.  
**Brian F Martensen**, Montana State University - Bozeman (960-37-179)
- 5:30PM (42) *Real laminations and topological dynamics of complex polynomials*. Preliminary report.  
**Jan Kiwi**, P.Universidad Catolica de Chile (960-37-229)
- 2:30PM (50) *Weak Solutions to a Nonlinear Variational Wave Equation*.  
**Ping Zhang**, Academia Sinica, and **Yuxi Zheng\***, Indiana University (960-35-182)
- 3:00PM (51) *Wind-Driven Ocean Circulation*.  
**Reza Malek-Madani**, U. S. Naval Academy (960-35-26)
- 3:30PM (52) *Sharp Well-Posedness Theory for the BBM Equation*.  
**Jerry L Bona\***, University of Texas at Austin, and **Nickolay Tzvetkov**, Université de Paris Sud (960-35-23)
- 4:00PM (53) *Wave Interactions in Nonlinear Elastic Strings*.  
**Robin C Young**, Univ of Mass (960-35-254)
- 4:30PM (54) *A discrete model for an ill-posed nonlinear parabolic PDE*.  
**David G Schaeffer**, Duke University (960-35-241)
- 5:00PM (55) *Nonlinear problems in magnetohydrodynamics and related equations*.  
**Dehua Wang**, University of Pittsburgh (960-35-226)

**Special Session on Nonlinear Methods in Approximation, I**

**Special Session on Nonlinear Differential Equations and Applications, I**

2:30 PM – 5:50 PM Room 151, Educational Building

- Organizers: **James R. Ward, Jr.**, University of Alabama at Birmingham  
**Wenzhang Huang**, University of Alabama at Huntsville
- 2:30PM (43) *A duality principle for periodic solutions of nonlinear telegraph equations*. Preliminary report.  
**Rafael Ortega\*** and **Aureliano Robles-Perez**, Universidad de Granada (960-35-11)
- 3:00PM (44) *Persistence, Coexistence and Extinction in Almost Periodic Competition Diffusion Systems*. Preliminary report.  
**Georg Hetzer** and **Wenxian Shen\***, Auburn University, Alabama (960-35-120)
- 3:30PM (45) *Global Regularity of Solutions to the Three-Dimensional Incompressible Navier-Stokes Equations with Pipe-Flow Boundary Conditions*.  
**Douglas A Riley**, Birmingham-Southern College (960-76-154)
- 4:00PM (46) *Generalized Harmonic Oscillators: Velocity Dependent Frequencies*.  
**Ronald E Mickens**, Clark Atlanta University (960-34-27)
- 4:30PM (47) *Existence and Multiplicity Results for Classes of  $p$ -Laplacian Equations*.  
**Ratnasingham Shivaji**, Mississippi State University (960-35-135)
- 5:00PM (48) *Abstract Integrodifferential Equation and Viscoelastic Equation*.  
**Min He**, Kent State University Trumbull Campus (960-35-240)
- 5:30PM (49) *Superlinear indefinite equations on the real line*.  
**Anna Capietto\***, University of Torino, Italy, **Walter Dambrosio**, University of Torino, and **Duccio Papini**, International School for Advanced Studies (960-34-126)

**Special Session on Nonlinear Partial Differential Equations and Applications, I**

2:30 PM – 5:20 PM Room 144, Educational Building

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

2:30 PM – 4:50 PM Room 146, Educational Building

Organizer: **Vladimir N. Temlyakov**, University of South Carolina

- 2:30PM (56) *On the representation of band-limited signals using finitely many bits*. Preliminary report.  
**Hrushikesh N Mhaskar**, California State University, Los Angeles (960-41-93)
- 3:00PM (57) *Triebel-Lizorkin spaces and  $N$ -term wavelet approximation*. Preliminary report.  
**Guergana P Petrova**, University of Michigan (960-41-220)
- 3:30PM (58) *Kolmogorov and linear widths of weighted Sobolev-type classes on a finite interval*.  
**Dany Leviatan\***, Univ. of South Carolina, and **Victor A Konovalov**, National Academy of Sciences of Ukraine (960-41-228)
- 4:00PM (59) *Algorithms for Tree Approximations*.  
**Peter G Binev**, University of South Carolina (960-41-248)
- 4:30PM (60) *Interpolation by Polynomials on the plane and in higher dimensions*.  
**Boris Shekhtman**, University of South Florida (960-41-199)

**Special Session on Wavelets, Frames, Sampling, and Time-Frequency Representations, I**

2:30 PM – 5:50 PM Room 237, Educational Building

Organizer: **Akram Aldroubi**, Vanderbilt University

- 2:30PM (61) *Optimal Weyl-Heisenberg Sets for Two Stochastic Models*. Preliminary report.  
**Radu V Balan**, Siemens Corporate Research (960-42-63)
- 3:00PM (62) *Frequency estimation algorithms*. Preliminary report.  
**Carlos A Berenstein**, Univ. of Maryland (960-42-222)
- 3:30PM (63) *Classifying certain irregular Weyl-Heisenberg (Gabor) frames*.  
**Peter G Casazza\***, University of Missouri - Columbia, and **Ole Christensen**, Technical University of Denmark (960-43-28)
- 4:00PM (64) *Gabor Expansions in  $L^p$* . Preliminary report.  
**Karlheinz Gröchenig**, University of Connecticut, and **Christopher Heil\***, Georgia Tech (960-42-31)

- 4:30PM (65) *Generalized frame multiresolution analysis of abstract Hilbert spaces*. Preliminary report.  
**Manos I Papadakis**, University of Houston (960-41-87)
- 5:00PM (66) *Tight Spline Frames and Sibling Frames*.  
**Joachim Stöckler**, University of Missouri-St. Louis (960-41-259)
- 5:30PM (67) *Robertson Type Theorems for Frames*.  
**Eric Weber**, Texas A&M University (960-42-146)

**Special Session on Operators and Function Theory on Holomorphic Space, I**

2:30 PM – 4:50 PM Room 127, Educational Building

Organizers: **James L. Wang**, University of Alabama  
**Zhijian Wu**, University of Alabama

- 2:30PM (68) *Subnormal Operators and their duals*.  
**Robert F Olin**, University of Alabama (960-47-238)
- 3:00PM (69) *Invariant subspaces, quasi-invariant subspaces and Hankel operators*.  
**Dechao Zheng\***, Vanderbilt University, and **Kunyu Guo**, Fudan University (960-47-70)
- 3:30PM (70) *The Density Problem for Unbounded Bergman Operators*.  
**Sherwin Kouchekian**, Virginia Tech (960-47-69)
- 4:00PM (71) *The Cesàro operator on the Bergman space*.  
**Thomas L Miller**, Mississippi State University (960-47-178)
- 4:30PM (72) *Bergman-type reproducing kernels, contractive divisors, and dilations*.  
**Scott McCullough\***, University of Florida, and **Stefan Richter**, University of Tennessee (960-47-74)

**Special Session on Integrable Systems and Riemann-Hilbert Problems, I**

2:30 PM – 5:40 PM Room 147, Educational Building

Organizers: **Xin Zhou**, Duke University  
**Kenneth McLaughlin**, University of Arizona

- 2:30PM (73) *Asymptotic Solution of the Second Harmonic Generation Equations*.  
**David J. Kaup**, Clarkson University (960-78-145)
- 3:10PM (74) *Asymptotics for Racah Coefficients and Polynomials*.  
**Mourad E Ismail**, University of South Florida, and **Plamen C Simeonov\***, University of Houston-Downtown (960-33-53)
- 3:50PM (75) *The Defocusing Nonlinear Schrödinger Equation with Finite Density Initial Data: Leading Order Asymptotics via the Riemann-Hilbert Approach*.  
**Arthur H Vartanian**, Winthrop University (960-35-73)
- 4:30PM (76) *Elementary and direct proof of Painleve property for Painleve equations*.  
**Min Yan**, Hong Kong U of Sci and Tech (960-34-92)
- 5:10PM (77) *Commuting Differential Operators and Integrable Systems*.  
**Rudi Weikard**, University of Alabama at Birmingham (960-34-110)

**Special Session on Differential Operators and Function Spaces, I**

2:30 PM – 5:25 PM Room 135, Educational Building

Organizers: **R. C. Brown**, University of Alabama-Tuscaloosa  
**D. B. Hinton**, University of Tennessee, Knoxville

- 2:30PM (78) *Modeling evanescent waves: some theoretical and computational aspects*.  
**Rolando Magnanini**, Florence University, **Luca Sgheri**, Istituto Analisi Globale ed Applicazioni - Consiglio Nazionale delle Ricerche, Italy, and **Giorgio G Talenti\***, Florence University (960-35-32)
- 3:30PM (79) *The heat equation with generalized Wentzell boundary conditions*. Preliminary report.  
**Jerome A. Goldstein**, University of Memphis (960-35-123)
- 4:00PM (80) *Dirac Operators and Over-Chirped Optical Pulses*.  
**J. K Shaw**, Virginia Tech (960-35-17)
- 4:30PM (81) *A Twin Fixed Point Theorem and Twin Solutions of Boundary Value Problems*.  
**Richard I. Avery**, Dakota State University, **Chuan Jen Chyan**, Tamkang University, and **Johnny Henderson\***, Auburn University (960-34-09)
- 5:00PM (82) *Upper and Lower Solution Methods for Fully Nonlinear Boundary Value Problems*.  
**Jeffrey Ehme**, Spelman College, **Paul W Eloee\***, University of Dayton, and **Johnny Henderson**, Auburn University (960-34-132)

**UAB Department of Mathematics Reception**

7:00 PM – 9:00 PM Marshall Center, UAB Campus (next to the Best Western Hotel)

**Saturday, November 11**

**Meeting Registration**

7:30 AM – 5:00 PM First Floor, Educational Building

**AMS Exhibit and Book Sale**

7:30 AM – 5:00 PM First Floor, Educational Building

**Special Session on Billiards and Related Topics, II**

8:30 AM – 10:50 AM Room 148, Educational Building

Organizers: **Nikolai I. Chernov**, University of Alabama at Birmingham  
**Nandor Simanyi**, University of Alabama at Birmingham

- 8:30AM (83) *Singularities in Multi-dimensional (Semi-)Dispersing Billiards*. Preliminary report.  
**Peter Balint\***, Renyi Institute of the H.A.S., **Nikolai Chernov**, University of Alabama at Birmingham, **Domokos Szasz** and **Peter I Toth**, Technical University of Budapest (960-37-127)
- 9:00AM (84) *The fundamental theorem for algebraic semi-dispersing billiards*. Preliminary report.  
**Domokos Szasz\***, Technical University of Budapest, **Nikolai Chernov**, University of Alabama at Birmingham, **Peter I. Toth**, Technical University of Budapest, and **Peter Balint**, Renyi Institute of the H.A.S. (960-37-144)
- 9:30AM (85) *Billiards in truncated ellipses*.  
**Gianluigi Del Magno**, Georgia Institute of Technology (960-37-172)
- 10:00AM (86) *Subexponential estimate of local proliferation of singularities in 2D billiards*.  
**Leonid A Bunimovich**, Georgia Institute of Technology (960-37-100)

10:30AM (87) *Natural Asymptotic Measures on the Unstable, Stable and Invariant Manifolds of Open Billiard Systems in the Plane.*  
**Peter A Richardson**, Baylor College Of Medicine / VHA (960-37-212)

**Special Session on Operator Algebras and Their Representations, II**

8:30 AM – 10:50 AM Room 133, Educational Building

Organizers: **Alan Hopenwasser**, University of Alabama  
**Justin R. Peters**, Iowa State University

8:30AM (88) *Noncommutative M-structure.* Preliminary report.  
**David P Blecher\***, University of Houston, **Edward G Effros** and **Vrej Zarikian**, UCLA (960-46-125)

9:00AM (89) *The Structure of Free Semigroup Algebras.*  
**Kenneth R Davidson**, University of Waterloo, **Elias Katsoulis**, East Carolina University, and **David R Pitts\***, University of Nebraska-Lincoln (960-47-91)

9:30AM (90) *On Ternary Rings of Operators.*  
**Manmohan Kaur** and **Zhong-Jin Ruan\***, University of Illinois (960-46-130)

10:00AM (91) *Primitive Limit Algebras and  $C^*$ -envelopes.* Preliminary report.  
**Kenneth R Davidson**, University of Waterloo, and **Elias G Katsoulis\***, East Carolina University (960-47-45)

10:30AM (92) *Isomorphisms of CSL Algebras.* Preliminary report.  
**Robert L Moore**, University of Alabama (960-47-97)

**Special Session on Nonlinear Differential Equations and Applications, II**

8:30 AM – 10:50 AM Room 151, Educational Building

Organizers: **James R. Ward, Jr.**, University of Alabama at Birmingham  
**Wenzhang Huang**, University of Alabama at Huntsville

8:30AM (93) *Dispersal, Disease and Life-History Evolution.* Preliminary report.  
**Carlos Castillo-Chavez\***, Cornell University, and **Abdul-Aziz Yakubu**, Howard and Cornell University (960-92-264)

9:00AM (94) *An age-structured TB model with resistant strains.* Preliminary report.  
**Zhilan Feng\***, Purdue University, **Mimmo Iannelli**, Trento University, and **Fabio A Milner**, Purdue University (960-35-266)

9:30AM (95) *Global Asymptotic Behavior of a Chemostat Model with Two Perfectly Complementary Resources and Distributed Delay.*  
**Bingtuan Li\***, University of Utah, **Gail Wolkowicz**, McMaster University, and **Yang Kuang**, Arizona State University (960-92-236)

10:00AM (96) *Habitat edges and predator-prey interactions : effects on critical patch size.*  
**Robert S Cantrell\***, **George C Cosner**, University of Miami, and **William F Fagan**, Arizona State University (960-92-41)

10:30AM (97) *Systems of Partial Differential Equations Modeling the Spread of Infectious Disease Through Highly Heterogeneous Habitats.* Preliminary report.  
**William Fitzgibbon\***, University of Houston, **Michel Langlais**, Universite de Bordeaux 2, and **Jeffery J Morgan**, Texas A&M (960-35-48)

**Special Session on Nonlinear Partial Differential Equations and Applications, II**

8:30 AM – 10:50 AM Room 144, Educational Building

Organizers: **Dehua Wang**, University of Pittsburgh  
**Yanni Zeng**, University of Alabama at Birmingham

8:30AM (98) *Renormalization Group and Scaling Methods in Differential Equations.*  
**Gunduz Caginalp**, University of Pittsburgh (960-35-40)

9:00AM (99) *Large-Time Behavior of Entropy Solutions with Large Oscillation for Hyperbolic Conservation Laws.*  
**Gui-Qiang Chen**, Northwestern University (960-35-216)

9:30AM (100) *Critical threshold phenomena in Euler-Poisson equations.*  
**Eitan Tadmor**, UCLA (960-35-116)

10:00AM (101) *Recent results on the Chapman-Enskog expansion.*  
**Marshall Slemrod**, UW Madison (960-35-118)

10:30AM (102) *Cavitation in one-dimensional compressible Navier-Stokes flows.*  
**David C Hoff**, Indiana University (960-35-30)

**Special Session on Nonlinear Methods in Approximation, II**

8:30 AM – 10:50 AM Room 146, Educational Building

Organizer: **Vladimir N. Temlyakov**, University of South Carolina

8:30AM (103) *Worst case analysis of greedy algorithms in Banach spaces.*  
**Peter Oswald**, Bell Laboratories, Lucent Technologies (960-41-198)

9:00AM (104) *On Approximate  $\ell_1$  Systems in Banach Spaces.* Preliminary report.  
**Stephen J Dilworth**, University of South Carolina, **Denka N Kutzarova\***, Bulgarian Academy of Sciences, and **Przemyslaw Wojtaszczyk**, Warsaw University (960-41-105)

9:30AM (105) *Nonlinear ridge approximation and gridge algorithms.*  
**Konstantin I Oskolkov**, University of South Carolina (960-41-184)

10:00AM (106) *Approximate Weak Greedy Algorithms : numerical motivations and sufficient condition of convergence.*  
**Rémi Gribonval\*** and **Morten Nielsen**, University of South Carolina. (960-41-78)

10:30AM (107) *Approximate Weak Greedy Algorithms : detailed study of convergence.*  
**Morten Nielsen\*** and **Rémi Gribonval**, University of South Carolina. (960-41-79)

**Special Session on Wavelets, Frames, Sampling, and Time-Frequency Representations, II**

8:30 AM – 10:50 AM Room 237, Educational Building

Organizer: **Akram Aldroubi**, Vanderbilt University

8:30AM (108) *Sampling, Banach frames, and applications.* Preliminary report.  
**Akram Aldroubi**, Vanderbilt University (960-42-133)

9:00AM (109) *Computing eigenvalues in the presence of a continuous spectrum.*  
**Amin Boumenir**, Moravian college (960-41-94)

9:30AM (110) *Construction of wavelets by interpolation over families of wavelet sets.* Preliminary report.  
**David R Larson**, Texas A&M University (960-46-142)

## Program of the Sessions – Birmingham, AL, Saturday, November 11 (cont'd.)

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10:00AM *Sampling Expansions in Unitarily Translation Invariant Reproducing Kernel Hilbert Spaces.*  
(111) **M. Zuhair Nashed**, University of Delaware, Newark, Delaware 19716 (960-42-260)

10:30AM *Sampling on a String.*  
(112) **Ahmed I Zayed\***, University of Central Florida, and **Amin Boumenir**, Sultan Qaboos University (960-42-44)

### ***Special Session on Integrable Systems and Riemann-Hilbert Problems, II***

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8:30 AM – 11:00 AM Room 147, Educational Building

Organizers: **Xin Zhou**, Duke University  
**Kenneth McLaughlin**, University of Arizona

8:30AM *Statistical Mechanics and Algebraic Combinatorics.*  
▶ (113) Preliminary report.  
**Vladimir E Korepin**, YITP, SUNY at Stony Brook (960-82-47)

9:10AM *Symplectic structures of the Painlevé test.*  
▶ (114) Preliminary report.  
**Jishan Hu\*** and **Min Yan**, The Hong Kong University of Science and Technology (960-00-171)

9:50AM *The RH problem in a semiclassical continuum limit.*  
(115) **Stephen P Shipman**, Duke University (960-35-191)

10:30AM *Statistical properties of the Fourier spectrum of the nonlinear Schroedinger equation in the semi-classical limit.*  
(116) **David Cai**, University of North Carolina at Chapel Hill (960-35-265)

### ***Special Session on Differential Operators and Function Spaces, II***

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8:30 AM – 10:20 AM Room 135, Educational Building

Organizers: **R. C. Brown**, University of Alabama-Tuscaloosa  
**D. B. Hinton**, University of Tennessee, Knoxville

8:30AM *Nonlinear Boundary Value Problems with Multiple Positive Solutions.*  
(117) **John V Baxley\*** and **Lyndsey J Haywood**, Wake Forest University (960-34-242)

9:00AM *Sturm-Liouville problems with finite spectrum.*  
▶ (118) Preliminary report.  
**Qingkai Kong**, **Hongyou Wu** and **Anton Zettl\***, NIU (960-34-08)

9:30AM *Positive eigenvalues of second order boundary value problems and a theorem of M. G. Krein.*  
(119) **Steve Clark\***, University of Missouri-Rolla, and **Don Hinton**, University of Tennessee (960-34-211)

10:00AM *The BKS(N,M) Problem in Orthogonal Polynomials and Differential Equations.*  
(120) **Lance L Littlejohn**, Utah State University (960-34-263)

### ***Special Session on Inverse Problems, II***

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9:00 AM – 10:50 AM Room 134, Educational Building

Organizers: **Ian Walker Knowles**, University of Alabama at Birmingham  
**Rudi Weikard**, University of Alabama at Birmingham

9:00AM *Numerical Conformal Mapping.* Preliminary report.  
▶ (121) **John R. Cannon**, University of Central Florida, Orlando, Florida, 32816 (960-65-10)

9:30AM *Acoustic imaging in a shallow ocean with a thin ice-cap.*  
(122)

**Robert P Gilbert\***, University of Delaware, and **Yongzhi S Xu**, University of Tennessee (960-35-158)

10:00AM *Which PDE describes suspensions?* Preliminary report.  
(123) **Jerome A. Goldstein**, University of Memphis (960-35-119)

10:30AM *The Best Generalized Inverse.*  
(124) **Gisele R Goldstein\*** and **Jerome A Goldstein**, University of Memphis (960-47-239)

### ***Special Session on Spectral and Transport Problems in Solid State Physics, II***

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9:00 AM – 10:50 AM Room 129, Educational Building

Organizers: **Peter D. Hislop**, University of Kentucky  
**Yulia Karpeshina**, University of Alabama at Birmingham  
**Gunter H. Stolz**, University of Alabama at Birmingham

9:00AM Discussion.

9:30AM *Absolute Continuity of Periodic Schrodinger Operators with Potentials in the Kato Class.*  
(125) **Zhongwei Shen**, University of Kentucky (960-35-98)

10:00AM *General Perturbations Preserving the Absolutely Continuous Spectrum.*  
(126) **Rowan Killip**, University of Pennsylvania (960-81-193)

10:30AM *Enhanced Multiscale Analysis and Localization in Random Media.*  
(127) **Abel Klein**, University of California, Irvine (960-81-149)

### ***Special Session on Analytical Problems in Mathematical Physics, II***

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9:00 AM – 10:50 AM Room 130, Educational Building

Organizers: **Roger T. Lewis**, University of Alabama at Birmingham  
**Michael P. Loss**, Georgia Institute of Technology  
**Marcel Grieseemer**, University of Alabama at Birmingham

9:00AM *Droplet States in the XXZ Heisenberg Chain.*  
(128) **Bruno X Nachtergaele** and **Shannon L Starr\***, U.C. Davis (960-82-81)

9:30AM *Exponential rate of convergence to nonequilibrium stationary states in classical statistical mechanics.*  
(129) Preliminary report.  
**Luc Rey-Bellet\*** and **Lawrence E Thomas**, University of Virginia (960-82-71)

10:00AM *Decay of Correlations in a Class of Multidimensional Dissipative Probabilistic Cellular Automata (PCA).*  
(130) **Joseph Slawny**, Virginia Tech (960-60-217)

10:30AM *Kinetic Equilibration Rates for Granular Media.*  
(131) Preliminary report.  
**Robert J McCann**, University of Toronto and Georgia Institute of Technology (960-70-19)

**Special Session on Dynamics and Low-Dimensional Topology, II**

9:00 AM – 10:50 AM Room 131, Educational Building

Organizers: **Alexander M. Blokh**, University of Alabama at Birmingham  
**Lex G. Oversteegen**, University of Alabama at Birmingham  
**John C. Mayer**, University of Alabama at Birmingham

- 9:00AM *Finite group actions on the products of Menger compacta.* (132)  
**Krystyna M Kuperberg**, Auburn University (960-54-115)
- 9:30AM *Asymptotic composants in inverse limit spaces of tent maps.* Preliminary report. (133)  
**Marcy Barge**, Montana State University, and **Beverly Diamond\***, College of Charleston (960-54-224)
- 10:00AM *Essential Turnlinks in Graph-Chainable Continua.* (134)  
**Brian E Raines**, Mathematical Institute, University of Oxford (960-54-175)
- 10:30AM *Hereditarily Indecomposable Inverse Limits of Graphs.* (135)  
**K. Kawamura**, University of Tsukuba, Japan, **H. M. Tuncali\***, Nipissing University, North Bay, Ontario, and **E. D. Tymchatyn**, University of Saskatchewan, Canada (960-54-173)

**Special Session on Operators and Function Theory on Holomorphic Space, II**

9:00 AM – 10:50 AM Room 127, Educational Building

Organizers: **James L. Wang**, University of Alabama  
**Zhijian Wu**, University of Alabama

- 9:00AM *A New Estimate for the Vector-valued Corona Problem.* (136)  
**Tavan T Trent**, University of Alabama (960-47-83)
- 9:30AM *Hankel type operators on the upper half space.* (137)  
**Jie Miao**, Arkansas State University (960-46-72)
- 10:00AM *Multipliers and Carleson measures for  $D(\mu)$ .* (138)  
Preliminary report.  
**Rick Chartrand**, University of Illinois at Chicago (960-46-77)
- 10:30AM *Lax-Phillips scattering, conservative linear systems and Schur-class functions: a multidimensional setting.* Preliminary report. (139)  
**Joseph A Ball\***, Virginia Tech, and **Victor Vinnikov**, Ben Gurion University of the Negev (960-47-66)

**Session for Contributed Papers, I**

9:00 AM – 10:10 AM Room 225, Educational Building

- 9:00AM *New optimal control problems with non-local operators.* Preliminary report. (140)  
**S A Belbas**, University of Alabama (960-49-46)
- 9:15AM *Existence of Minimizers for a Class of Monge-Kantorovich Problem.* Preliminary report. (141)  
**Yewande Olubummo**, Spelman College (960-46-202)
- 9:30AM *Stability and Asymptotic Behavior of Nonlinear Operator Differential Equations.* Preliminary report. (142)  
**Reza R Ahangar**, University of Central Arkansas (960-34-249)
- 9:45AM *Cosubnormal Composition Operators with Complex Symbol on Weighted Bergman Spaces.* Preliminary report. (143)  
**Alexander E Richman**, Purdue University (960-47-218)

- 10:00AM *Monotone Maps, Hereditarily Weakly Confluent Maps,  $W$ -sets, and Continua in Class  $W$ .* (144)  
**Jonathan R Hatch**, Southeastern Louisiana University (960-54-231)

**Invited Address**

11:10 AM – NOON Auditorium, Hill University Center

- (145) *Double Hecke algebras,  $Q$ -Gauss integrals, and Gaussian sums.*  
**Ivan Cherednik**, University of North Carolina at Chapel Hill (960-22-05)

**Invited Address**

2:00 PM – 2:50 PM Auditorium, Hill University Center

- (146) *Geometric evolution problems.*  
**Nicholas D. Alikakos**, University of Athens (960-35-01)

**Special Session on Inverse Problems, III**

3:00 PM – 5:50 PM Room 134, Educational Building

Organizers: **Ian Walker Knowles**, University of Alabama at Birmingham  
**Rudi Weikard**, University of Alabama at Birmingham

- 3:00PM *The Role of Operator Symbols in Classical Elliptic Direct and Inverse Problems.* (147)  
**Louis Fishman**, University of New Orleans (960-35-99)
- 3:30PM *Generalized Dual Space Indicator Method for Inverse Scattering Problems in a Waveguide.* (148)  
**Yongzhi S Xu**, University of Tennessee at Chattanooga (960-35-36)
- 4:00PM break (149)  
*A Paley-Wiener theorem with applications to inverse spectral theory.*  
**Christher Bennewitz**, Lund University (960-34-131)
- 5:00PM *Computing the eigenvalues and eigenfunctions of the one dimensional  $p$ -Laplacian.* (150)  
**Malcolm Brown\***, Cardiff University UK, and **Wolfgang Reichel**, University of Basel (960-34-61)
- 5:30PM *Recovery of Analytic Potentials.* (151)  
**Amin Boumenir**, Moravian College (960-34-137)

**Special Session on Billiards and Related Topics, III**

3:00 PM – 5:50 PM Room 148, Educational Building

Organizers: **Nikolai I. Chernov**, University of Alabama at Birmingham  
**Nandor Simanyi**, University of Alabama at Birmingham

- 3:00PM *Rigidity of Connected limit sets of conformal iterated function systems.* Preliminary report. (152)  
**R. Daniel Mauldin\*** and **Mariusz Urbanski**, University of North Texas (960-37-103)
- 3:30PM *On the Ergodicity of Geodesic Flow.* (153)  
**Robert M Kauffman**, University of Alabama at Birmingham (960-37-195)
- 4:00PM *Orbits of unbounded energy in geodesic flows and time dependent potential and in other mechanical systems.* (154)  
**Amadeu Delshams**, Univ Polit. Catalunya, **Rafael de la Llave\***, Univ of Texas, Austin, and **Tere Seara**, Univ.Polit. Catalunya (960-37-58)

- 4:30PM *Embedded Surfaces with Anosov Geodesic Flow.*  
 ► (155) **Victor J Donnay\***, Bryn Mawr College, and **Charles Pugh**, University of California at Berkeley (960-37-160)
- 5:00PM *Reflective properties of orientation reversing homeomorphisms of the plane.*  
 (156) **Krystyna M Kuperberg**, Auburn University (960-58-114)
- 5:30PM *Chromos and Covering Residue Classes.* Preliminary report.  
 ► (157) **Pantelimon Stanica**, Auburn University Montgomery (960-05-12)

**Special Session on Spectral and Transport Problems in Solid State Physics, III**

3:00 PM – 5:50 PM Room 129, Educational Building

- Organizers: **Peter D. Hislop**, University of Kentucky  
**Yulia Karpeshina**, University of Alabama at Birmingham  
**Gunter H. Stolz**, University of Alabama at Birmingham
- 3:00PM *Lower bound on phase-averaged transport exponents for self-dual quasiperiodic Hamiltonians.*  
 (158) **Hermann Schulz-Baldes**, University of California at Irvine (960-81-62)
- 3:30PM *Oscillatory Integrals in Nonlinear Wave Propagation.*  
 (159) **Alexander Figotin**, University of California at Irvine (960-78-65)
- 4:00PM *An optimal  $L^p$ -bound on the Krein spectral shift function.*  
 (160) **Dirk Hundertmark\*** and **Barry Simon**, Caltech (960-81-190)
- 4:30PM Break.
- 5:00PM *Log-dimensional properties of spectral measures.* Preliminary report.  
 (161) **Michael Landrigan**, UC Irvine (960-81-143)
- 5:30PM *Geometry and Statistics of quantum pumps.*  
 (162) **Lorenzo A Sadun**, U. of Texas at Austin (960-81-95)

**Special Session on Analytical Problems in Mathematical Physics, III**

3:00 PM – 5:50 PM Room 130, Educational Building

- Organizers: **Roger T. Lewis**, University of Alabama at Birmingham  
**Michael P. Loss**, Georgia Institute of Technology  
**Marcel Griesemer**, University of Alabama at Birmingham
- 3:00PM *Pauli operator and Aharonov-Casher theorem for measure-valued magnetic field.*  
 (163) **Laszlo Erdos\***, GeorgiaTech, and **Vitali Vougalter**, University of British Columbia (960-81-227)
- 3:30PM *Ground States in Non-relativistic Quantum Electrodynamics.*  
 (164) **Marcel Griesemer\***, University of Alabama at Birmingham, **Elliott H Lieb**, Princeton University, and **Michael Loss**, Georgia Tech (960-81-246)
- 4:00PM Break.
- 4:30PM *Lorentz Electrodynamics.*  
 (165) **Michael K-H Kiessling**, Rutgers University (960-83-163)
- 5:00PM *Realizing holonomic constraints.*  
 (166) **Richard G Froese\***, University of British Columbia, and **Ira w Herbst**, University of Virginia (960-70-197)
- 5:30PM Discussion.

**Special Session on Operator Algebras and Their Representations, III**

3:00 PM – 6:20 PM Room 133, Educational Building

- Organizers: **Alan Hopenwasser**, University of Alabama  
**Justin R. Peters**, Iowa State University
- 3:00PM *Approximation Properties for Crossed Products by Actions and Coactions.*  
 (167) **May M Nilsen** and **Roger R Smith\***, Texas A&M University (960-46-113)
- 3:30PM *Hopf  $C^*$ -algebras.*  
 (168) **May M Nilsen**, Texas A&M (960-46-177)
- 4:00PM *Analytic algebras with large extended asymptotic range.* Preliminary report.  
 (169) **Belisario A Ventura**, California State University San Bernardino (960-46-219)
- 4:30PM *A continuous analogue of Cuntz-Krieger algebras.* Preliminary report.  
 (170) **Igor Fulman**, Arizona State University (960-47-252)
- 5:00PM *Z-Analytic TAF Algebras and Partial Dynamical Systems.*  
 (171) **Justin R Peters** and **Yiu T Poon\***, Iowa State University (960-37-39)
- 5:30PM *Positivity of two by two operator matrices.* Preliminary report.  
 (172) **William L Green**, Georgia Institute of Technology (960-47-76)
- 6:00PM *Algebraic Isomorphisms and Spectra of Triangular Limit Algebras.*  
 (173) **Allan P Donsig\***, **David R Pitts**, University of Nebraska-Lincoln, and **Stephen C Power**, Lancaster University (960-47-29)

**Special Session on Dynamics and Low-Dimensional Topology, III**

3:00 PM – 5:50 PM Room 131, Educational Building

- Organizers: **Alexander M. Blokh**, University of Alabama at Birmingham  
**Lex G. Oversteegen**, University of Alabama at Birmingham  
**John C. Mayer**, University of Alabama at Birmingham
- 3:00PM *On light mappings of manifolds.* Preliminary report.  
 (174) **E D Tymchatyn\***, U. of Saskatchewan, and **Lex Oversteegen**, UAB (960-54-176)
- 3:30PM *Semiconjugacies to toral automorphisms.* Preliminary report.  
 (175) **Philip L Boyland**, University of Florida (960-37-52)
- 4:00PM *Inverse limits of simplicial maps and the fixed point property problem in the plane.*  
 (176) **Piotr Minc**, Auburn University (960-54-181)
- 4:30PM *Invariant Sets and Inverse Limits.*  
 (177) **W. T. Ingram**, University of Missouri - Rolla (960-54-128)
- 5:00PM *Existence of Knaster-like continua for unstable exponentials.* Preliminary report.  
 (178) **Monica Moreno-Rocha**, Boston University (960-37-57)
- 5:30PM *Classifying embeddings of nonseparating planar continua.* Preliminary report.  
 (179) **Andrew P Fabel**, Mississippi State University (960-58-187)

**Special Session on Nonlinear Differential Equations and Applications, III**

3:00 PM – 5:50 PM Room 151, Educational Building

Organizers: **James R. Ward, Jr.**, University of Alabama at Birmingham

**Wenzhang Huang**, University of Alabama at Huntsville

3:00PM *Some results on linear and nonlinear Tricomi problems.* (180)

**Daniela Lupo\***, Politecnico di Milano, and **Kevin R Payne**, Università di Milano (960-35-168)

3:30PM *Continuous dependence on modeling and nonexistence results for a Ginzburg-Landau equation.* (181)

**Karen A Ames**, University of Alabama in Huntsville (960-35-122)

4:00PM *Linearized Stability in Functional Differential Equations with State-Dependent Delays.* (182)

**Janos Turi**, The University of Texas at Dallas (960-34-221)

4:30PM *On a Class of Asymptotically Linear Elliptic Problems in  $R^N$ .* (183)

**David G Costa\*** and **Hossein Tehrani**, University of Nevada - Las Vegas (960-35-96)

5:00PM *Analytical and Numerical Results for Stationary Flows of Viscous, Incompressible, Electrically and Thermally Conducting Fluids.* (184)

**Paul G Schmidt\*** and **Amnon J Meir**, Auburn University (960-35-54)

5:30PM *Existence of Positive Periodic Solutions of Delay Differential Equations.* Preliminary report. (185)

**Daqing Jiang**, **Junjie Wei**, Northeast Normal University, and **Bo Zhang\***, Fayetteville State University (960-34-121)

**Special Session on Nonlinear Partial Differential Equations and Applications, III**

3:00 PM – 5:50 PM Room 144, Educational Building

Organizers: **Dehua Wang**, University of Pittsburgh  
**Yanni Zeng**, University of Alabama at Birmingham

3:00PM *Waves in ferromagnetic materials.* Preliminary report. (186)

**Hans G Kaper**, Argonne National Laboratory, Argonne, Illinois, USA (960-35-124)

3:30PM *Asymptotic Analysis of Fluid Mixing Equations in the Incompressible Limit.* (187)

**James G Glimm\***, **Hyeonseong Jin** and **Marc Laforest**, State University of New York at Stony Brook (960-35-16)

4:00PM *Extensions and Amplifications of a Traffic Model of Aw and Rascle.* (188)

**James M Greenberg**, Carnegie Mellon University (960-35-49)

4:30PM *On Approximate Solutions to Some Transonic Flow Problems.* (189)

**Gui Qiang Chen**, Northwestern University, and **Pui Tak Kan\***, IUPUI and Northwestern U. (960-35-235)

5:00PM *On the structure of the equations of elastodynamics.* (190)

**Athanasios E Tzavaras**, Univ. of Wisconsin-Madison (960-35-201)

5:30PM *Fundamental Solutions and Nonlinear Stability of Shock Profiles.* (191)

**Yanni Zeng**, University of Alabama at Birmingham (960-35-234)

**Special Session on Nonlinear Methods in Approximation, III**

3:00 PM – 5:20 PM Room 146, Educational Building

Organizer: **Vladimir N. Temlyakov**, University of South Carolina

3:00PM *Symmetric framelets.* (192)  
**Alexander Petukhov**, University of South Carolina (960-41-82)

3:30PM *Compression using wavelet frames.* Preliminary report. (193)

**H. Narfi Stefansson**, University of Wisconsin-Madison (960-42-230)

4:00PM *Spectral and approximation problems in potential theory.* (194)

**Irina Mitrea**, Institute for Advanced Study, Princeton (960-35-188)

4:30PM *Weakly Non-Oscillatory Schemes for Scalar Conservation Laws.* Preliminary report. (195)

**Bojan D Popov**, Vanderbilt University (960-65-112)

5:00PM *On Best Meromorphic Approximation in the Space  $L_p$ .* (196)

**Vasiliy A Prokhorov**, University of South Alabama (960-41-165)

**Special Session on Wavelets, Frames, Sampling, and Time-Frequency Representations, III**

3:00 PM – 6:20 PM Room 237, Educational Building

Organizer: **Akram Aldroubi**, Vanderbilt University

3:00PM *Orthogonal lifting: constructing new (symmetric) orthogonal scaling functions.* Preliminary report. (197)

**Eugene Belogay**, Florida Atlantic University, Honors College (960-42-24)

3:30PM *Developments on the Riesz-Fejer lemma for positive trigonometric polynomials in two variables.* (198)

**Jeff Geronimo**, Georgia Tech (960-42-152)

4:00PM *Bits and Pieces: The H-D Problem for Refinable Functions.* (199)

**Douglas P Hardin\***, Vanderbilt University, and **Thomas A Hogan**, Ohio University (960-41-42)

4:30PM *Smoothness of Refinable Function Vectors.* Preliminary report. (200)

**Denise A Jacobs**, Georgia Tech (960-42-18)

5:00PM *Infinite dimensional groups in wavelet theory.* (201)

**Palle E.T. Jorgensen**, The University of Iowa (960-46-07)

5:30PM *Three Ways of Raising Multiwavelet Approximation Order.* (202)

**Fritz – Keinert**, Iowa State University (960-42-34)

6:00PM *Analysis of Wavelet Bases in Numerical Resolution of Differential Equations.* (203)

**Jianzhong Wang**, Sam Houston State University (960-41-156)

**Special Session on Operators and Function Theory on Holomorphic Space, III**

3:00 PM – 5:20 PM Room 127, Educational Building

Organizers: **James L. Wang**, University of Alabama  
**Zhijian Wu**, University of Alabama

3:00PM *Hardy spaces and boundary value problems on spheres and hyperbolas via Clifford analysis.* Preliminary report. (204)

**John Ryan**, University of Arkansas (960-44-203)

- 3:30PM *The Decomposition Theorem for  $Q_p$  Spaces.*  
 ▶ (205) Preliminary report.  
**Zhijian Wu**, The University of Alabama, and  
**Chunping Xie\***, The university of Alabama  
 (960-32-56)
- 4:00PM *Alexandrov operators and smoothness.*  
 (206) **Alec L Matheson**, Lamar University (960-46-15)
- 4:30PM *Best constants for some inequalities involving the  
 Riesz projection.*  
 (207) **Brian Hollenbeck\***, University of  
 Missouri-Columbia, and **Igor E Verbitsky**,  
 University of Missouri (960-42-80)
- 5:00PM *On the norm of the Riesz projection in weighted  $L^p$   
 spaces.* Preliminary report.  
 (208) **Igor Verbitsky**, University of Missouri-Columbia  
 (960-46-155)

**Special Session on Integrable Systems and  
 Riemann-Hilbert Problems, III**

3:00 PM – 5:30 PM Room 147, Educational Building

- Organizers: **Xin Zhou**, Duke University  
**Kenneth McLaughlin**, University of  
 Arizona
- 3:00PM *Semiclassical Distributions of Solitons: Complex  
 Turning Point Theory for the Nonselfadjoint  
 Zakharov-Shabat Eigenvalue Problem.*  
 (209) **Peter D Miller**, The University of Michigan  
 (960-41-213)
- 3:40PM *Limiting distributions for a polynuclear growth  
 model with external sources.*  
 (210) **Jinho Baik\***, Princeton Univ. and IAS, and **Eric M  
 Rains**, AT&T Research (960-60-225)
- 4:20PM *The Eigenvalue Problem for the Focusing Nonlinear  
 Schroedinger Equation: New Solvable Cases.*  
 (211) **Alexander Tovbis\***, University of Central Florida,  
 and **Stephanos Venakides**, Duke University  
 (960-35-232)
- 5:00PM *On the semi-classical limit of the focusing nonlinear  
 Schroedinger equation.*  
 (212) **Spyros Kamvissis**, Univ. of Patras, Greece, **Ken D  
 McLaughlin\***, UNC-Chapel Hill and Univ. of AZ., and  
**Peter D Miller**, Univ. of Michigan (960-35-256)

**Special Session on Differential Operators and  
 Function Spaces, III**

3:00 PM – 5:50 PM Room 135, Educational Building

- Organizers: **R. C. Brown**, University of  
 Alabama-Tuscaloosa  
**D. B. Hinton**, University of Tennessee,  
 Knoxville
- 3:00PM *Laplace Transform for Time Scales.* Preliminary  
 ▶ (213) report.  
**Martin J Bohner\***, University of Missouri-Rolla, and  
**Allan C Peterson**, University of Lincoln-Nebraska  
 (960-39-261)
- 3:30PM *Relative Boundedness-Compactness Inequalities for  
 a Second Order Differential Operator.*  
 (214) **Don B Hinton**, University of Tennessee, and  
**Suzanne C Melescu\***, Arkansas State University  
 (960-34-244)
- 4:00PM *Universal Eigenvalue Inequalities for Domains in  
 Riemannian Manifolds.* Preliminary report.  
 (215) **Mark S. Ashbaugh**, University of Missouri-Columbia  
 (960-58-243)

- 4:30PM *Necessary conditions for Poincare domains.*  
 (216) Preliminary report.  
**David E Edmunds**, University of Sussex, and **Ritva  
 Hurri-Syrjanen\***, University of Helsinki, University  
 of Kentucky (960-46-194)
- 5:00PM *Approximation numbers for the Hardy operator and  
 the Sobolev embedding.* Preliminary report.  
 (217) **Jan Lang**, University of Missouri-Columbia  
 (960-46-166)
- 5:30PM *Sharp estimates for integrals over small intervals  
 for functions possessing some smoothness.*  
 (218) Preliminary report.  
**Victor C. Burenkov**, University of Wales, Cardiff  
 (960-46-267)

**Session for Contributed Papers, II**

3:00 PM – 4:10 PM Room 225, Educational Building

- 3:00PM *Closure spaces and an algorithm to generate  
 ▶ (219) frequent sets.*  
**Alan P. Sprague**, University of Alabama at  
 Birmingham (960-05-257)
- 3:15PM *The Basic Fraenkel Model.*  
 (220) **Henry A Gore**, Jackson State University  
 (960-03-245)
- 3:30PM *On a Polynomial Inequality of P. L. Chebyshev.*  
 (221) Preliminary report.  
**Mohammed A Qazi\***, Tuskegee University,  
 and **Qazi I Rahman**, Université de Montréal  
 (960-30-107)
- 3:45PM *Angular Ratio Transference.* Preliminary report.  
 ▶ (222) **James H Mulberry**, Houston, TX (960-49-38)
- 4:00PM *The counterfactual of Nelson Goodman*  
 ▶ (223) *cc:udel.edu/apa/J Sample.* Preliminary report.  
**G. W. Bill Lee**, Seoul National University (960-00-06)

**Sunday, November 12**

**Invited Address**

8:30 AM – 9:20 AM Room 133, Educational Building

- (224) *Greedy algorithms in nonlinear approximation.*  
**Vladimir N. Temlyakov**, University of South  
 Carolina (960-41-03)

**Special Session on Inverse Problems, IV**

9:30 AM – 11:20 AM Room 134, Educational Building

- Organizers: **Ian Walker Knowles**, University of  
 Alabama at Birmingham  
**Rudi Weikard**, University of Alabama  
 at Birmingham
- 9:30AM *Inverse problem for a semibounded crystal  
 (225) (three-dimensional case).*  
**Yulia Karpeshina**, UAB (960-35-136)
- 10:00AM *Sturm-Liouville problems with eigenvalue dependent  
 (226) and independent boundary conditions.*  
**Paul A Binding**, University of Calgary (960-34-117)
- 10:30AM *An efficient algorithm for approximate inversion of  
 (227) truncated spiral cone beam data.*  
**Alexander Katsevich**, University of Central Florida  
 (960-44-89)
- 11:00AM *An Efficient Implementation of Recursive Triangular  
 (228) Factorization for Cauchy-like Matrices.*  
**Zhao Chen**, Math Dept, CUNY (960-15-186)

**Special Session on Relations Between Spectral Theory and Analytic Number Theory, II**

9:30 AM – NOON Room 128, Educational Building

Organizers: **Robert M. Kauffman**, University of Alabama at Birmingham  
**Martin N. Huxley**, Cardiff University, Wales

- 9:30AM *L(1,  $\chi$ ) values.*  
 (229) **Andrew Granville\***, U of Georgia, and **K Soundararajan**, U. Michigan (960-11-262)
- 10:00AM Discussion.
- 10:30AM *A formula for the Dedekind  $\xi$ -function of an imaginary quadratic field.* Preliminary report.  
 (230) **Xian-Jin Li**, Brigham Young University (960-11-189)
- 11:00AM *Generalized eigenfunction expansions and number theory.* Preliminary report.  
 (231) **Robert M Kauffman** and **Mayumi Sakata\***, University of Alabama at Birmingham (960-47-209)
- 11:30AM Discussion.

**Special Session on Billiards and Related Topics, IV**

9:30 AM – 11:50 AM Room 148, Educational Building

Organizers: **Nikolai I. Chernov**, University of Alabama at Birmingham  
**Nandor Simanyi**, University of Alabama at Birmingham

- 9:30AM *Dynamical Systems and Statistical Mechanics.*  
 (232) **E. G. D. Cohen**, The Rockefeller University (960-82-50)
- 10:00AM *Kinetic Theory Methods for Lyapunov Exponents and KS Entropies.*  
 (233) **Robert J Dorfman**, The University of Maryland at College Park (960-37-161)
- 10:30AM *Infinite billiards and statistical mechanics.*  
 (234) **Carl P Dettmann**, University of Bristol (960-82-147)
- 11:00AM *Billiard gas dynamics in regions with moving boundaries.* Preliminary report.  
 (235) **Oliver R Knill**, Harvard University (960-37-159)
- 11:30AM *Billiards with a non-compact cusp.* Preliminary report.  
 (236) **Marco Lenci**, SUNY at Stony Brook (960-37-208)

**Special Session on Spectral and Transport Problems in Solid State Physics, IV**

9:30 AM – 10:30 AM Room 129, Educational Building

Organizers: **Peter D. Hislop**, University of Kentucky  
**Yulia Karpeshina**, University of Alabama at Birmingham  
**Gunter H. Stolz**, University of Alabama at Birmingham

- 9:30AM Discussion: Open problems in spectral study of random media.

**Special Session on Analytical Problems in Mathematical Physics, IV**

9:30 AM – 11:20 AM Room 130, Educational Building

Organizers: **Roger T. Lewis**, University of Alabama at Birmingham  
**Michael P. Loss**, Georgia Institute of Technology  
**Marcel Griesemer**, University of Alabama at Birmingham

- 9:30AM *The Dimension of the Attractor for the non-homogeneous Navier-Stokes equations in non-smooth domains.*  
 (237) **Russel M Brown**, **Peter A Perry\*** and **Zhongwei Shen**, University of Kentucky (960-76-207)
- 10:00AM *Rearrangement inequalities for multiple integrals and exit times.*  
 (238) **Almut Burchard**, University of Virginia (960-26-251)
- 10:30AM *A direct proof of a theorem of Blaschke and Lebesgue.*  
 (239) **Evans M Harrell**, Georgia Institute of Technology (960-52-55)
- 11:00AM *Capacity of Quantum Channels.*  
 (240) **Christopher King**, Northeastern University, and **Mary Beth Ruskai\***, University of Massachusetts Lowell (960-94-164)

**Special Session on Operator Algebras and Their Representations, IV**

9:30 AM – 11:50 AM Room 133, Educational Building

Organizers: **Alan Hopenwasser**, University of Alabama  
**Justin R. Peters**, Iowa State University

- 9:30AM *Flow of Weights and the AT Property for Product States of the Gauge Invariant and Rotation Invariant CAR Algebras.* Preliminary report.  
 (241) **Bennett M Baker\***, U.S. Naval Academy, and **Thierry Giordano**, University of Ottawa (960-46-104)
- 10:00AM *A groupoid approach to graph  $C^*$ -algebras.*  
 (242) **Alan L Paterson**, University of Mississippi (960-46-14)
- 10:30AM *Hecke  $C^*$ -Algebras.*  
 (243) **Rachel W Hall**, St. Joseph's University (960-16-129)
- 11:00AM *Hilbert bimodules with involution.*  
 (244) **Nik Weaver**, Washington University (960-46-60)
- 11:30AM *The Non-commutative Curvature Invariant.*  
 (245) **David W Kribs**, University of Iowa (960-47-22)

**Special Session on Dynamics and Low-Dimensional Topology, IV**

9:30 AM – 11:50 AM Room 131, Educational Building

Organizers: **Alexander M. Blokh**, University of Alabama at Birmingham  
**Lex G. Oversteegen**, University of Alabama at Birmingham  
**John C. Mayer**, University of Alabama at Birmingham

- 9:30AM *Minimal combinatorial models for maps of an interval with a given set of periods.* Preliminary report.  
 (246) **Louis Block\***, University of Florida, **Ethan M Coven**, Wesleyan University, **William Geller**, Indiana University-Purdue University, Indianapolis, and **Kristin Hubner**, Innosoft International Inc. (960-37-153)
- 10:00AM *New results and old results with new proofs concerning adding machines.* Preliminary report.  
 (247) **James Keesling\***, **Louis Block**, University of Florida, and **Jianhua Xie**, Southwest Jiaotong University, Chendu, P.R. China (960-37-200)
- 10:30AM *Entropy jumps for transitive interval maps.*  
 (248) **Michal Misiurewicz**, Indiana University - Purdue University Indianapolis (960-37-140)
- 11:00AM *A Classification of the Inverse Limit Spaces of Tent Maps with Periodic Critical Points.*  
 (249) **Lois P Kailhofer**, Alverno College (960-37-180)

- 11:30AM *Two unusual orientation reversing*  
(250) *homeomorphisms of the annulus onto itself.*  
**Harold Bell**, University of Cincinnati (960-57-258)

***Special Session on Nonlinear Partial Differential Equations and Applications, IV***

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9:30 AM – 11:20 AM                      **Room 144, Educational Building**

Organizers: **Dehua Wang**, University of Pittsburgh  
**Yanni Zeng**, University of Alabama at Birmingham

- 9:30AM *A Free Boundary Problem for a Quasilinear*  
(251) *Degenerate Elliptic Equation.*  
**Sunčica Čanić**, **Barbara L Keyfitz\*** and **Eun Heui Kim**, University of Houston (960-35-59)
- 10:00AM *Continuum Models of Granular Flow.* Preliminary  
(252) report.  
**Michael Shearer**, North Carolina State University (960-35-102)
- 10:30AM *The random projection method for hyperbolic*  
(253) *conservation laws with stiff reaction terms.*  
**Shi Jin**, University of Wisconsin-Madison (960-35-169)
- 11:00AM *'Thin Fluid Film' PDEs: Stability and Energy*  
(254) *Landscape of Steady States.*  
**Richard S. Laugesen\***, University of Illinois, Urbana-Champaign, and **Mary C. Pugh**, University of Pennsylvania (960-35-13)

***Special Session on Integrable Systems and Riemann-Hilbert Problems, IV***

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9:30 AM – NOON                              **Room 147, Educational Building**

Organizers: **Xin Zhou**, Duke University  
**Kenneth McLaughlin**, University of Arizona

- 9:30AM  *$L^p$  estimates for solutions of Riemann-Hilbert*  
(255) *Problems (RHP's) with coefficients depending on external parameters.*  
**Percy A Deift\***, University of Pennsylvania and Courant Institute, and **Xin Zhou**, Duke University (960-30-150)
- 10:10AM Discussion.
- 10:50AM Discussion.
- 11:30AM Discussion.

**John L. Bryant**  
Associate Secretary  
Tallahassee, Florida