Conferences

Joint Summer Research Conferences in the Mathematical Sciences

Snowbird Resort
Snowbird, Utah
June 6–July 23, 2004

The 2004 Joint Summer Research Conferences will be held at the Snowbird Resort (http://summer.snowbird.com/pages/home/default.php) from June 6 to July 23, 2004. The topics and organizers for the conferences were selected by a committee representing the AMS, the Institute of Mathematical Sciences (IMS), and the Society for Industrial and Applied Mathematics (SIAM). Committee members at the time were David Brydges, Tom Di Ciccio, Charles Doering, Ron Donagi, Michael Fried, William Mark Goldman, Barbara Keyfitz, Steven Lalley, Mark Gordon Low, Hema Srinivasan, Kenneth Stephenson, and Olof B. Widlund.

It is anticipated that the conferences will be partially funded by a grant from the National Science Foundation and perhaps others. Special encouragement is extended to junior scientists to apply. A special pool of funds expected from grant agencies has been earmarked for this group. Other participants who wish to apply for support funds should so indicate; however, available funds are limited, and individuals who can obtain support from other sources are encouraged to do so.

All persons who are interested in participating in one of the conferences should request an invitation by sending the following information to the Summer Research Conferences Coordinator, AMS, P. O. Box 6887, Providence, RI 02940; or by email to wsd@ams.org no later than **March 3, 2004**.

Please type or print the following:

1. Title and dates of conference.
2. Full name.
3. Mailing address.
4. Phone numbers (including area code) for office, home, and fax.
5. Email address.
6. Your anticipated arrival/departure dates.
7. Scientific background relevant to the conference topics; please indicate if you are a student or if you received your Ph.D. on or after 7/1/96.
8. The amount of financial assistance requested (or indicate if no support is required).

All requests will be forwarded to the appropriate organizing committee for consideration. In late April applicants selected by the organizers for each conference will receive formal invitations (including specific offers of support if applicable), a brochure of conference information, program information known to date, along with information on travel and local housing.

Questions concerning the scientific program should be addressed to the organizers. Questions of a nonscientific nature should be directed to the Summer Research Conferences coordinator at the address provided above. Please watch http://www.ams.org/meetings/ for future developments about these conferences.

Lectures begin on Sunday morning and run through Thursday. Check-in for housing begins on Saturday. No lectures are held on Saturday. Please note: Lectures for the conference on Gaussian Measure and Geometric Convexity end on Friday, July 23.

String Geometry

Sunday, June 6–Thursday, June 10

Organizing Committee:
Katrin Becker, Department of Physics, University of Utah
Melanie Becker, Physics Department, University of Maryland
Aaron Bertram, Mathematics Department, University of Utah
Paul Green, Physics Department, University of Maryland
Benjamin McKay, Mathematics Department, University of Utah

The purpose of the workshop is to bring mathematicians and physicists together to talk to each other about string theory. String theory has borrowed from and revolutionized differential and algebraic geometry, and yet despite extraordinary efforts the communication between mathematicians and physicists could be much improved. The goal of this conference is to bring mathematicians and physicists into the same room and make them try to speak to each other about recent research and open problems from both perspectives, especially in the areas of exceptional holonomy manifolds and calibrated cycles.

Confirmed participants include: Robert Bryant, Mathematics Department, Duke University; Andrew Strominger, Physics Department, Harvard University; Paul Aspinwall, Mathematics and Physics Departments and Center for Geometry and Theoretical Physics, Duke University; Michael Douglas, Institut des Hautes Études Scientifiques and Department of Physics and Astronomy, Rutgers University;

S. James Gates Jr., Physics Department, University of Maryland; Brian Greene, Department of Physics, Columbia University; Mark Gross, Mathematics Department, University of California San Diego; Jeffrey A. Harvey, Enrico Fermi Institute and Department of Physics, University of Chicago; Paul Horja, Mathematics Department, University of Michigan; Sheldon Katz, Mathematics and Physics Departments, University of Illinois at Urbana–Champaign; and David Morrison, Mathematics and Physics Departments and Center for Geometry and Theoretical Physics, Duke University.

Further information about the conference is available at the website maintained by the organizers: `http://www.physics.utah.edu/%7Ekatrin/snowbird.html`.

Complex Dynamics: Twenty-Five Years after the Appearance of the Mandelbrot Set
Sunday, June 13–Thursday, June 17

Organizing Committee:
Eric Bedford, Indiana University
Bodil Branner, Technical University of Denmark
Robert L. Devaney, Boston University (Cochair)
Linda Keen, CUNY (Cochair)
Mikhail Lyubich, SUNY, Stony Brook

In 1979 mathematicians received their first computer-generated glimpses of the incredibly complicated objects in dynamical systems known as the Julia and Mandelbrot sets. Given the intricacy of these objects, together with the fact that they arise from the simple quadratic expression $Q_c(z) = z^2 + c$ (where z and c are complex), it is little wonder that the field of complex dynamics exploded in the early 1980s, with many major breakthroughs occurring during the ensuing twenty-five years.

At this time the field of complex dynamics extends well beyond the original confines of quadratic dynamics. Current research topics include the investigation of the dynamics of rational and entire functions, numerical methods such as Newton's method, higher-dimensional complex systems, and many other areas. The goal of the conference will be to bring together researchers in all of these areas of complex dynamics.

The conference will provide a forum for researchers to explain recent findings, develop new areas of inquiry, and initiate future collaborations. The morning lectures will include overviews of particular areas of complex dynamics by established researchers, while the afternoon sessions will be devoted to research reports by the younger generation of complex dynamicists.

Participation of recent Ph.D.'s as well as advanced graduate students is encouraged, as is the participation of minorities and women. Further information about the conference is available at the website maintained by the organizers: `http://math.bu.edu/snowbird`.

A tentative list of speakers includes: J.-Y. Briend, X. Buff, R. Chamanara, A. Cheritat, L. DeMarco, A. Douady, R. Dujardin, N. Fagella, E. Ghys, S. Hruska, J. Kahn, B. Karpinska, N. Lakic, K. Pilgrim, and J. Smillie.

Algebraic Geometry: Presentations by Young Researchers
Sunday, July 4–Thursday, July 8

Organizing Committee:
Herb Clemens, Ohio State University
Rob Lazarsfeld, University of Michigan
Ravi Vakil, Stanford University

Even at its modern inception, algebraic geometry was technically quite demanding. Today the field is broad and deep enough that most new Ph.D.'s narrowly focus on a small part of it in order to produce original research. Thus the postdoctoral years are the best time to broaden their knowledge and to build the connections, both personal and intellectual, that will nourish a lifelong research career.

The goal of this conference is to bring together young researchers in all areas of algebraic geometry (broadly defined) in order to provide a showcase for important new ideas and to encourage collaboration among participants. All research talks will be given by mathematically young researchers, likely those no more than two or three years beyond their Ph.D., and graduate students in their final year of study. There will be ample time and emphasis on small group discussions and networking. In particular, there will be structured time in the late afternoons and evenings for participants to work in small groups on the problems and ideas brought up in that day's lectures. Each of these sessions will be conducted by one of the senior organizers, who might open the session with a few mathematical remarks. We expect that the most important benefit of this meeting will be the future collaborations among the participants.

In order to ensure ample time for information discussions and mathematical interaction, there will be no contributed talks. It is expected that some support will be available for those wishing to attend talks and participate in the informal discussions. Further information about the conference is available at the website maintained by the organizers: `http://math.stanford.edu/~vakil/snowbird/`.

Representations of Algebraic Groups, Quantum Groups, and Lie Algebras
Sunday, July 11–Thursday, July 15

Organizing Committee:
Georgia Benkart, University of Wisconsin, Madison
Jens C. Jantzen, Aarhus University, Denmark
Zongzhu Lin, Kansas State University
Daniel K. Nakano, University of Georgia
Brian J. Parshall, University of Virginia (Chair)

The main theme of the conference will focus on canonical bases from these different points of view. The talks will

provide various interpretations and applications of canonical bases. These subjects are very closely related to finite-dimensional representations of affine Hecke algebras, affine quantum groups, Nakajima's quiver varieties, and the structure of Hall algebras. Knowledge about these algebras can lead to new results about the representations of Schur algebras and finite-dimensional Hecke algebras.

In addition, the conference will feature talks on the K-theoretic and geometric approaches towards the understanding of the (nonrestricted) modular representations of Lie algebras and of algebraic groups in positive characteristics.

The main topics the conference will concentrate on are:

1. Representations of algebraic groups in characteristics $p > 0$

2. Modular representations of Lie algebras in positive characteristics

3. Representations of affine Kac-Moody Lie algebras, their quantum analogs, and Hecke algebras

4. Representations of the Ringel-Hall double algebras of quivers

5. Representations of quantum groups at roots of unity and quantum affine algebras

List of principal speakers: Henning H. Andersen, Aarhus University, Denmark; Jie Du, University of New South Wales, Sydney, Australia; Seok-Jin Kang, Korea Institute for Advanced Study, Seoul, South Korea; Alexander Kleshchev, University of Oregon, USA; George Lusztig, MIT, USA; Ivan Mirkovic, University of Massachusetts, USA; Hiraku Nakajima, Kyoto University, Japan; Alexander Premet, University of Manchester, UK; Eric Vasserot, Université de Cergy-Pontoise, France; Jie Xiao, Tsinghua University, Beijing, China.

Further information about the conference is available at the website maintained by the organizers: `http://www.math.ksu.edu/~zlin/ams2004.html`.

Gaussian Measure and Geometric Convexity

Sunday, July 18–Friday, July 23

Sessions start on Sunday and end on Friday. Housing checkout is Saturday.

Organizing Committee:
K. Ball, University College London
V. Milman, Tel Aviv University
A. Pajor, University of Marne-la-Vallée
R. Schneider, University of Freiburg
R. A. Vitale (Chair), University of Connecticut
W. Weil, University of Karlsruhe

Remarkable advances have been made in several areas that involve aspects of Gaussian measure and the theory of convex bodies. The conference will bring together researchers in convex geometry, probability, statistics, and the local/asymptotic theories of Banach spaces to discuss recent results and directions for future research.

It is anticipated that this unusual mix of specialties will lead to a useful exchange of ideas.

Major themes will be (i) the role of probabilistic methods in understanding properties of convex bodies, especially in high dimensions; and (ii) the application of convex-geometric methods to the study of Gaussian processes. Among the topics will be central limit theorems, concentration of measure, Dvoretzky-type results, isoperimetry and Gaussian inequalities, intrinsic volumes and Gaussian processes, and flag-coefficient renormalization.

A preliminary list of participants includes: S. Artstein, Z. Artstein, K. Ball, F. Barthe, Y. Baryshnikov, S. Bobkov, D. Cordero, S. Efromovich, F. Gao, A. Giannopoulos, Y. Gordon, O. Guedon, D. Klain, A. Koldobsky, J. Kuelbs, R. Latala, M. Ledoux, W. V. Li, M. Lifshits, J. Lindenstrauss, A. Litvak, M. Meyer, V. Milman, K. Oleszkiewicz, A. Pajor, G. Pisier, M. Rudelson, G. Schechtman, R. Schneider, S. Szarek, M. Talagrand, N. Tomczak-Jaegermann, R. Vershynin, R. A. Vitale, W. Weil, E. Werner, and A. Zvavitch.

Further information is available from Rick Vitale at `r.vitale@uconn.edu`.