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# Mathematics Opportunities

## NSF Integrative Graduate Education and Research Training

The Integrative Graduate Education and Research Training (IGERT) program was initiated by the National Science Foundation (NSF) to meet the challenges of educating Ph.D. scientists and engineers with the interdisciplinary backgrounds and the technical, professional, and personal skills needed for the career demands of the future. The program is intended to catalyze a cultural change in graduate education for students, faculty, and universities by establishing innovative models for graduate education in a fertile environment for collaborative research that transcends traditional disciplinary boundaries. It is also intended to facilitate greater diversity in student participation and to contribute to the development of a diverse, globally aware science and engineering workforce. Supported projects must be based on a multidisciplinary research theme and administered by a diverse group of investigators from U.S. Ph.D.-granting institutions with appropriate research and teaching interests and expertise.

The preproposal deadline for the 2005 IGERT competition is **February 4, 2005**. Further information may be found at the website <http://www.nsf.gov/pubs/2005/nsf05517/nsf05517.htm>.

—From an NSF announcement

## Call for Proposals for 2006 NSF-CBMS Regional Conferences

To stimulate interest and activity in mathematical research, the National Science Foundation (NSF) intends to support up to seven NSF-CBMS Regional Research Conferences in 2006. A panel chosen by the Conference Board of the Mathematical Sciences will make the selections from among the submitted proposals.

Each five-day conference features a distinguished lecturer who delivers ten lectures on a topic of important current research in one sharply focused area of the mathematical sciences. The lecturer subsequently prepares an expository monograph based on these lectures, which is normally published as a part of a regional conference series. Depending on the conference topic, the monograph

will be published by the American Mathematical Society, by the Society for Industrial and Applied Mathematics, or jointly by the American Statistical Association and the Institute of Mathematical Statistics.

Support is provided for about thirty participants at each conference, and the conference organizer invites both established researchers and interested newcomers, including postdoctoral fellows and graduate students, to attend.

The proposal due date is **April 8, 2005**. For further information on submitting a proposal, consult the CBMS website, <http://www.cbms.org>, or contact: Conference Board of the Mathematical Sciences, 1529 Eighteenth Street, NW, Washington, DC 20036; telephone: 202-293-1170; fax: 202-293-3412; email: [kolbe@math.georgetown.edu](mailto:kolbe@math.georgetown.edu) or [rosier@math.georgetown.edu](mailto:rosier@math.georgetown.edu).

—From a CBMS announcement

## National Academies Research Associateship Programs

The Policy and Global Affairs Division of the National Academies is sponsoring the 2005 Postdoctoral and Senior Research Associateship Programs. The programs are meant to provide opportunities for Ph.D., Sc.D., or M.D. scientists and engineers of unusual promise and ability to perform research at more than 100 research laboratories throughout the United States and overseas.

Full-time associateships will be awarded for research in the fields of mathematics, chemistry, earth and atmospheric sciences, engineering, applied sciences, life sciences, space sciences, and physics. Most of the laboratories are open to both U.S. and non-U.S. nationals and to both recent doctoral recipients and senior investigators.

Awards are made for one or two years, renewable for a maximum of three years. Annual stipends for recent Ph.D. recipients range from \$30,000 to \$50,000, depending on the sponsoring laboratory; the awards for senior recipients will be higher. Support is also provided for allowable relocation expenses and for limited professional travel during the period of the award.

Awards will be made four times during the year, in February, May, August, and November. The deadline for application materials to be postmarked or for electronic submissions for the February 2005 review is **February 1, 2005**.

For further information and application materials, see the National Academies website at <http://www4.nas.edu/pga/rap.nsf/WebDocuments/Home+Page>, or contact Research Associateship Programs, Keck Center of the National Academies, 500 Fifth Street, NW, GR322A, Washington, DC 20001; telephone 202-334-2760; fax 202-334-2759; email: rap@nas.edu.

—From an NRC announcement

## National Academies Graduate Fellowship Program

The Christine Mirzayan Science and Technology Policy Graduate Fellowship Program of the National Academies is designed to engage graduate science, engineering, medical, veterinary, business, and law students in the analysis and creation of science and technology policy and to familiarize them with the interactions of science, technology, and government. As a result, students develop essential skills different from those attained in academia and make the transition from graduate student to professional. In 2005 programs will be held in the summer from June 6 through August 12, and in the fall from September 12 through November 18.

Applications for the fellowships are invited from scholars from graduate through postdoctoral levels in any physical, biological, or social science field or any field of engineering, medicine and health, or veterinary medicine, as well as business, law, education, and other graduate and professional programs. Postdoctoral scholars should have received their Ph.D.'s within the past five years.

The stipend for both 10-week programs is \$4,800. The fellowship stipend is intended to cover all living expenses for the period. In addition, a travel stipend of up to \$500 will be provided.

Deadlines for receipt of materials for the summer program is **March 1, 2005**, and for the fall program, **June 1, 2005**. More information and application forms and instructions can be found on the website <http://www7.nationalacademies.org/policyfellows> or by contacting National Academies Christine Mirzayan Science and Technology Policy Graduate Fellowship Program, 500 5th Street, NW, Room 508, Washington, DC 20001; telephone: 202-334-2455; fax: 202-334-1667.

—From a National Academies announcement

## Clay Mathematics Institute 2005 Summer School

The Clay Mathematics Institute (CMI) Summer School on Ricci Flow, 3-Manifolds, and Geometry will be held at the Mathematical Sciences Research Institute (MSRI) in Berkeley, California, June 20–July 15, 2005.

Designed for graduate students and mathematicians within five years of receipt of the Ph.D., the program is organized around Ricci flow and the geometrization of 3-manifolds, particularly the recent work of Grisha Perelman. Topics covered will include an introduction to geometrization, Ricci flow (both geometric and analytic aspects), minimal surfaces, and various fundamental results in topology and differential geometry. Courses will be dedicated to Perelman's work on general Ricci flow, as well as some results and applications in 3 dimensions. There will be three weeks of foundational courses and one week of minicourses focusing on more advanced topics. Lecturers include Jeff Cheeger, Bennett Chow, Tobias Colding, Richard Hamilton, Bruce Kleiner, John Lott, John Morgan, Gang Tian, and others. The organizing committee for the summer school consists of Gang Tian, John Lott, John Morgan, Bennett Chow, Tobias Colding, Jim Carlson, David Ellwood, and Hugo Rossi.

Funding is available to graduate students and postdoctoral fellows who are within five years of receipt of the Ph.D. Standard support amounts will include funds for local expenses and accommodations plus economy travel.

The deadline for application is **February 28, 2005**. Application forms are available at <http://www.claymath.org/summerschool>. For more information, see the website <http://www.claymath.org/summerschool>; telephone: 617-995-2600; email: [summerschool@claymath.org](mailto:summerschool@claymath.org).

—From a CMI announcement

## NSF-CBMS Regional Conferences, 2005

With funding from the National Science Foundation (NSF), the Conference Board of the Mathematical Sciences (CBMS) will hold three NSF-CBMS Regional Research Conferences during the spring and summer of 2005.

These conferences are intended to stimulate interest and activity in mathematical research. Each five-day conference features a distinguished lecturer who will deliver ten lectures on a topic of important current research in one sharply focused area of the mathematical sciences. The lecturer subsequently prepares an expository monograph based on these lectures. Depending on the conference topic, the monograph will be published by the American Mathematical Society, by the Society for Industrial and Applied Mathematics, or jointly by the American Statistical Association and the Institute of Mathematical Statistics.

Support for about thirty participants will be provided for each conference. Established researchers and interested newcomers, including postdoctoral fellows and graduate students, are invited to attend.

Information about an individual conference may be obtained by contacting the conference organizer. The three conferences to be held in 2005 are listed below.

*New Perspectives for Boundary Value Problems and Their Asymptotics*, Athanassios Fokas, lecturer. May 16–20, University of Texas-Pan American. Organizers: Lokenath Debnath, telephone 956-381-3459, email: [debnathl@utpa.edu](mailto:debnathl@utpa.edu); and Andras Balogh, telephone 956-381-2119, email: [abalogh@utpa.edu](mailto:abalogh@utpa.edu); website: <http://www.math.panam.edu/cbms2005.htm>.

*Nonlinear Dispersive and Wave Equations*, Terence Tao, lecturer. June 13–18, New Mexico State University. Organizers: Joseph Lakey, telephone 505-646-2417, email: [jlakey@nmsu.edu](mailto:jlakey@nmsu.edu); Tiziana Giorgi, telephone 505-646-2323, email: [tgiorgi@nmsu.edu](mailto:tgiorgi@nmsu.edu); Cristina Pereyra, telephone 505-277-4147, email: [crisp@math.unm.edu](mailto:crisp@math.unm.edu); Adam Sikora, telephone 505-646-6269, email: [asikora@nmsu.edu](mailto:asikora@nmsu.edu); and Robert Smits, telephone 505-646-2884, email: [rsmits@nmsu.edu](mailto:rsmits@nmsu.edu); website: <http://www.math.nmsu.edu/~jlakey.cbms.html>.

*Algebraic and Topological Combinatorics of Ordered Sets*, Anders Björner, lecturer. August 8–12, San Francisco State University. Organizers: Joseph Gubeladze, telephone 415-338-7722, email: [soso@math.sfsu.edu](mailto:soso@math.sfsu.edu); and Serkan Hosten, telephone 415-338-7723, email: [serkan@math.sfsu.edu](mailto:serkan@math.sfsu.edu); website <http://www.sfsu.edu/gubeladze/cbms.html>.

—From a CBMS announcement

## News from SAMSI

The Statistical and Applied Mathematical Sciences Institute (SAMSI) has entered its third year of operation. SAMSI is a national NSF institute in the mathematical sciences whose mission is to forge a new synthesis of the statistical sciences with the applied mathematical sciences and disciplinary science to confront the very hardest and most important data- and model-driven scientific challenges. SAMSI is housed in the NISS building in Research Triangle Park, North Carolina.

After a very successful second year, with well over 700 participants in SAMSI activities, the current year has an exciting slate of programs, on *Computational Biology of Infectious Diseases*, *Latent Variable Models in the Social Sciences*, and *Data Assimilation for Geophysical Systems*. Some opportunities for participation in these programs still remain, especially in the latter program, which begins January 2005. See the SAMSI website (<http://www.samsi.info>) for further information about these programs.

Plans are well under way for SAMSI's 2006–07 programs (discussed below), and numerous opportunities exist for participation by AMS members. Visiting young and senior researchers will be resident at SAMSI for periods of one month to one year. Several postdoctoral positions will be funded for each SAMSI program. Special programs exist for graduate and upper-level undergraduate students to initiate their involvement in cross-disciplinary and team research. New researchers will have special opportunities, from both the SAMSI environment and from financial support. Senior researchers will have the chance for serious broadening of their interests and skill sets.

Workshops will enable many others to join in the effort. Every SAMSI program will have at least an opening and a closing workshop, allowing for broad participation of individuals who cannot spend part of the year at SAMSI. New researchers and members of underrepresented groups are especially encouraged to participate in SAMSI workshops and programs.

SAMSI is very interested in obtaining proposals for future research programs. Anyone with an idea for a future program should contact Jim Berger ([berger@samsi.info](mailto:berger@samsi.info)). Such ideas can also be communicated to the other members of the SAMSI directorate—Tom Banks ([htbanks@eos.ncsu.edu](mailto:htbanks@eos.ncsu.edu)), Alan Karr ([karr@niss.org](mailto:karr@niss.org)), and Young Truong ([truong@bios.unc.edu](mailto:truong@bios.unc.edu))—or to the SAMSI National Advisory Committee, chaired by Peter Bickel and Margaret Wright.

Brief descriptions of the upcoming Fourth Year SAMSI programs follow. A program on **Financial Mathematics, Statistics and Econometrics** will run from September 2005 through December 2005. This program, being led by Jean-Pierre Fouque and Eric Ghysels, has the goal of bringing together the three disciplines of mathematics, statistics, and econometrics to focus on the major challenges in the three essential tasks: modeling, data analysis, and computation in applications ranging from financial and energy derivatives to real options and defaultable securities.

A program on **National Defense and Homeland Security** will run from September 2005 through May 2006. This program, being led by Lawrence Cox and Nell Sedransk, will emphasize *biointelligence*, which intersects the planned development of a CDC Biointelligence Center; *real time inference*, involving data streams; *anomaly detection*, with particular attention to high-dimensional data, extremely rare events, and false positives; *data integration*, including integration of new forms of data such as images or biometric identification; and *dynamics of massive databases*, which is in part a fundamental issue of data quality.

The third program is **Astrostatistics**, to be conducted from January to June 2006. This program, being led by Jogesh Babu, will address a range of statistical and mathematical problems that arise in modern astronomical and space sciences research, particularly due to the flood of data produced by space-based astronomical surveys at many wave-bands. The program will especially emphasize collaborations involving astronomers, mathematicians, and statisticians on novel problems facing upcoming astronomy missions.

In addition to these three major programs, SAMSI will conduct planning or hot topics workshops, undergraduate and graduate outreach workshops, summer schools (as part of programs), and several interdisciplinary courses associated with ongoing programs. For more information about any of the SAMSI activities and the possibilities for participating in them, go to the SAMSI website, <http://www.samsi.info>.

—James Berger, SAMSI director