
Mathematics Opportunities

NSF Postdoctoral Research Fellowships

The National Science Foundation (NSF) awards Mathematical Sciences Postdoctoral Research Fellowships (MSPRF) for appropriate research in areas of the mathematical sciences, including applications to other disciplines. Awardees are permitted to choose research environments that will have maximal impact on their future scientific development. Awards are made in the form of either Research Fellowships or Research Instructorships. The Research Fellowship option provides full-time support for any eighteen academic-year months in a three-year period in intervals not shorter than three consecutive months. The Research Instructorship option provides a combination of full-time and half-time support over a period of three academic years, usually one academic year full time and two academic years half time. Under both options, the award includes six summer months; however, no more than two summer months of support may be received in any calendar year. Under both options, the stipend support for twenty-four months (eighteen academic-year months plus six summer months) will be provided within a forty-eight-month period.

The deadline for proposals is **October 15, 2008**. See http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5301&org=DMS.

—From an NSF announcement

NSF-CBMS Regional Conferences, 2008

With funding from the National Science Foundation (NSF), the Conference Board of the Mathematical Sciences (CBMS) will hold nine NSF-CBMS Regional Research Conferences during the summer of 2008.

These conferences are intended to stimulate interest and activity in mathematical research. 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.

Support for about thirty participants will be provided for each conference. Both 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 conferences to be held in 2008 are as follows.

May 12–16, 2008: Imaging in Random Media. George Papanicolaou, lecturer. Rice University. Organizers: Liliana Borcea, 713-348-5723, email: borcea@caam.rice.edu; Danny C. Sorensen, 713-348-5193, email: sorensen@caam.rice.edu; William W. Symes, 713-348-5997, email: symes@caam.rice.edu; conference website: <http://www.caam.rice.edu/~CBMS2008/>.

May 13–18, 2008: Water Waves: Theory and Experiment. Harvey Segur, lecturer. Howard University. Organizer: Mohammad F. Mahmood, 202-806-6295, email: mahmood@howard.edu; conference website: <http://www.coas.howard.edu/mathematics/CBMS-Mahmood.html>.

May 27–31, 2008: Inverse Scattering for Radar Imaging. Margaret Cheney, lecturer. University of Texas, Arlington. Organizer: Tuncay Aktosun, 817-272-1545, email: aktosun@uta.edu; conference website: <http://omega.uta.edu/~aktosun/cbms2008>.

June 2–6, 2008: Topology, C^ -Algebras, and String Duality.* Jonathan Rosenberg, lecturer. Texas Christian University. Organizers: Greg Friedman, 817-257-6343, email: g.friedman@tcu.edu; Robert Doran, 817-257-7335, email: r.doran@tcu.edu; conference website: <http://www.math.tcu.edu>.

June 22–27, 2008: Convex Duality Method in Mathematical Finance. Marco Frittelli, lecturer. University of California, Santa Barbara. Organizers: Jean-Pierre Fouque, 805-893-5637, email: fouque@pstat.ucsb.edu; Guillaume Bonnet, 805-893-4188, email: bonnet@pstat.ucsb.edu; Raya Feldman, 805-893-2826, email: feldman@pstat.ucsb.edu; conference website: <http://www.pstat.ucsb.edu/projects/cbms/>.

June 22–28, 2008: Ergodic Ramsey Theory: A Dynamical Approach to Static Theorems. Vitaly Bergelson, lecturer. Eastern Illinois University. Organizer: Patrick R. Coulton, 217-581-6276, email: prcoulton@eiu.edu; conference website: <http://www.ux1.eiu.edu/~prcoulton/cbms07/>.

July 9–13, 2008: Knots and Topological Quantum Computing. Zhenghan Wang, lecturer; Ara Basmajian, Short Course on Knots. University of Central Oklahoma. Organizers: Charlotte Simmons, 405-974-5294, email: cksimmons@ucok.edu; Jesse Byrne, 405-974-5575, email: jbyrne@ucok.edu; conference website: <http://www.math.ucok.edu/cbms/cbms.html>.

August 7–12, 2008: Malliavin Calculus and Its Applications. David Nualart, lecturer. Kent State University. Organizers: Oana Mocioalca, 330-672-9083, email: oana@math.kent.edu; Kazim M. Khan, 330-672-9110, email: kazim@math.kent.edu; conference website: <http://www.math.kent.edu/math/CBMS2008.cfm>.

December 13–17, 2008: Tropical Geometry and Mirror Symmetry. Mark Gross, lecturer. Kansas State University. Organizers: Ricardo Castano-Bernard, 785-532-0585, email:

rcastano@math.ksu.edu; Yan Soibelman, 785-532-0584, email: soibel@math.ksu.edu; Iliia Zharkov, 617-495-8797, email: zharkov@math.harvard.edu; conference website: <http://www.math.ksu.edu/~rcastano/CBMS.html>.

—From a CBMS announcement

Call for Proposals for 2009 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 2009. 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 both established researchers and interested newcomers, including postdoctoral fellows and graduate students, are invited to attend.

The proposal due date is **April 21, 2008**. For further information on submitting a proposal, consult the CBMS website, http://www.cbmsweb.org/NSF/2009_call.htm, or contact: Conference Board of the Mathematical Sciences, 1529 Eighteenth Street, NW, Washington, DC 20036; telephone: 202-293-1170; fax: 202-293-3412; email: lko1be@maa.org or rosier@georgetown.edu.

—From a CBMS announcement

International Mathematics Competition for University Students

The fifteenth International Mathematics Competition (IMC) for University Students will be held July 25–31, 2008, at the American University in Blagoevgrad, Bulgaria. Participating universities are invited to send several students and one teacher; individual students are welcome. Students completing their first, second, third, or fourth years of university education are eligible. The competition will consist of two sessions of five hours each. Problems will come from the fields of algebra, analysis (real and complex), and combinatorics. The working language will be English.

The deadline for registration is **May 31, 2008**. For details, see the website <http://www.imc-math.org.uk/> or contact John Jayne, University College London, Gower Street, London WC1E 6BT, United Kingdom; telephone: +44-20-7679-7322; email: j.jayne@ucl.ac.uk.

—John Jayne, University College London

News from the IMA

The 2008–2009 thematic program at the Institute for Mathematics and its Applications (IMA) at the University of Minnesota will be on “Mathematics and Chemistry”. Computational chemistry has reached a stage of development where many chemical properties of both simple and complex systems may now be computed more accurately, more economically, or more speedily than they can be measured. Further advances in accuracy and practicality will depend on the development of both new theory and new algorithms, and mathematical techniques will play an important role in both of these areas. The advances in chemical theory and computations have built on interfaces with a number of areas of mathematics, including differential equations, linear and nonlinear algebra, optimization theory, probability theory, stochastic analysis, sampling theory, complex analysis, geometry, group theory, and numerical analysis. Further progress in computational chemistry will require that the ties between chemistry and mathematics be strengthened. This IMA program will provide a setting for the chemistry and mathematics communities to examine some of these problems together. The year will focus on issues in electronic structure, dynamics, and statistical mechanics, including both the mathematical underpinnings of modern molecular modeling and simulation and practical issues in state-of-the-art applications. Applications areas will include organic and inorganic chemistry, biochemistry, solid-state chemistry, nanochemistry, advanced materials, photochemistry, catalysis, and environmental chemistry. Emphasis will be placed on mingling applied mathematicians with theoretical and computational chemists in each workshop. Limited financial support is available for the workshops. Detailed information about this program can be found at <http://www.ima.umn.edu/2008-2009>.

The 2009–2010 IMA thematic program will be on “Complex Fluids and Complex Flows”. This program is broadly concerned with fundamental challenges of modeling, analysis, and computation for (mostly) incompressible fluid dynamics. Much attention will be focused on non-Newtonian fluids in which complex material constitutions produce nonlinear and/or nonlocal relationships between stresses and rates-of-strain (and sometimes strains) leading to unique and often unforeseen flow phenomena. Complex fluids are ubiquitous in engineering applications and the applied sciences from biology to geology. They serve as the focus of active areas of research within the larger fluid dynamics community. Complex flows include those of both simple and complex fluids in simple and complex domains, in the presence of moving

boundaries, and turbulent flows. Key questions for such flows include transport and mixing properties, and flow-structure interactions generating motions including swimming, flying, sliding, and crawling. Recent research has revealed new connections between fluid characteristics, flow complexity, and transport properties that will in part serve as a unifying theme throughout the program. The mathematical scope of this program will be very broad, ranging from fundamental modeling questions through issues of computation, simulation, approximation and analysis. Program participants will include researchers from the engineering and applied sciences—including both theorists and experimentalists—numerical analysis, and scientific computation, and both applied and abstract analysts. A central goal of the program will be to bring these interdisciplinary perspectives together and facilitate productive engagement. Opportunities for participation in the 2009–2010 program include New Directions research professorships for established mathematicians seeking to branch into new interdisciplinary research directions, regular and industrial postdoctoral fellowships (application deadline is **January 5, 2009**), and general memberships (visits of a month or more, no application deadline).

The IMA actively solicits proposals for programs from members of the mathematical sciences community. Possibilities include annual programs (running September–June), summer programs (typically running two to four weeks and involving between 60 and 120 participants), and Hot Topics workshops (typically lasting a few days and treating a topic of exceptional contemporary interest and potential impact). Submission timelines: Preproposals for annual programs, at least four years in advance of the proposed start date; summer program proposals, roughly two to three years in advance; Hot Topics workshop proposals, a year in advance, cosponsorship by an industrial partner or institute is preferred. Additional information is available at <http://www.ima.umn.edu/solicit>.

—From an IMA announcement

News from IPAM

The Institute for Pure and Applied Mathematics (IPAM), located at the University of California, Los Angeles, holds long- and short-term research programs and workshops throughout the academic year for junior and senior mathematicians and scientists who work in academia, the national laboratories, and industry. IPAM sponsors two summer programs as well. IPAM's programs for 2008–2009 are listed below. Please go to <http://www.ipam.ucla.edu> for detailed information and online application and registration forms.

IPAM's Science Advisory Board meets in November, when it considers program proposals. Proposals from the community are encouraged; instructions are available at our website.

IPAM is seeking a second associate director, to begin July 2008. Information about the position and how to apply is available on our website.

Optimal Transport. March 10–June 13, 2008. Applications for the long program are closed, but individuals may still register for the three remaining workshops:

Workshop III: Transport Systems in Geography, Geosciences, and Networks: May 5–9, 2008.

Workshop IV: Optimal Transport in the Human Body: Lungs and Blood: May 19–23, 2008.

Mini-Workshop: Entropies and Optimal Transport in Quantum Mechanics: June 5–6, 2008.

Summer School. Mathematics in Brain Imaging, July 14–25, 2008. Individuals may register online.

Internet Multi-Resolution Analysis. September 8–December 12, 2008. This long program includes the following workshops that are also open for participation. Individuals may apply online for support to be core participants for the entire program or to attend individual workshops.

Tutorials: September 9–12, 2008.

Workshop I: Multiscale Representation, Analysis and Modeling of Internet Data and Measurements: September 22–26, 2008.

Workshop II: Applications of Internet MRA to Cyber-Security: October 13–17, 2008.

Workshop III: Beyond Internet MRA: Networks of Networks: November 3–7, 2008.

Workshop IV: New Mathematical Frontiers in Network Multi-Resolution Analysis: November 17–21, 2008.

Winter 2009 Short Programs. Individuals may apply online for support to attend each workshop.

Quantitative and Computational Aspects of Metric Geometry: January 12–16, 2009.

Numerical Approaches to Quantum Many-Body Systems: January 22–30, 2009.

Laplacian Eigenvalues and Eigenfunctions: Theory, Computation, Application: February 9–13, 2009.

Rare Events in High-Dimensional Systems: February 23–27, 2009.

Quantum and Kinetic Transport Equations: Analysis, Computations, and New Applications. March 9–June 12, 2009. This long program includes the following workshops that are also open for participation. Individuals may apply online for support to be core participants for the entire program or to attend individual workshops.

Tutorials: March 10–13, 2009.

Workshop I: Computational Kinetic Transport and Hybrid Methods: March 30–April 3, 2009.

Workshop II: The Boltzmann Equation: DiPerna-Lions Plus 20 Years: April 15–17, 2009.

Workshop III: Flows and Networks in Complex Media: April 27–May 1, 2009.

Workshop IV: Asymptotic Methods for Dissipative Particle Systems: May 18–22, 2009.

—IPAM announcement