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 work force. 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 next IGERT competition is anticipated to be in January 2004. Further information may be found at the website http://www.nsf.gov/home/crssprgm/igert/start.htm.

—From an NSF announcement

NRC Research Associateship Programs

The Policy and Global Affairs Division of the National Research Council (NRC) is sponsoring the 2004 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 one of 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 and computer science, life and medical sciences, space and planetary 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 three times during the year, and applications will be accepted on a continuous basis. The deadlines for application materials to be postmarked, or for electronic submissions, are **February 1, May 1,** and **August 1, 2004**. For further information and application materials, see the NRC website at http://www4.nationalacademies.org/pga/rap.nsf, 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 Defense Science and Engineering Graduate Fellowships

As a means of increasing the number of U.S. citizens trained in disciplines of military importance in science and engineering, the Department of Defense (DoD) awards

National Defense Science and Engineering Graduate (NDSEG) Fellowships each year to individuals who have demonstrated ability and special aptitude for advanced training in science and engineering. The fellowships are awarded for a period of three years for study and research leading to doctoral degrees in mathematical, physical, biological, ocean, and engineering sciences. The number of fellowships awarded depends on available funding.

The NDSEG Fellowship Program is open only to applicants who are citizens or nationals of the United States. NDSEG Fellowships are intended for students at or near the beginning of their graduate studies in science or engineering. Applicants must have received or be on track to receive their bachelor's degrees by fall of 2004. Applications are encouraged from women, persons with disabilities, and minorities, including members of ethnic minority groups such as African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, Hispanic, or Latino.

The deadline for submitting a complete application is **January 9, 2004**. Application materials are available from, and completed applications should be returned to, the American Society for Engineering Education (ASEE) at NDSEG Fellowship Program, c/o American Society for Engineering Education, 1818 N Street, N.W. #600, Washington, DC 20036; telephone 202-331-3516; fax 202-265-8504; email: `ndseg@asee.org`. For further information, see the website `http://www.asee.org/ndseg/preface.cfm`.

—From an NDSEG announcement

NRC-Ford Foundation Fellowships for Minorities

The National Research Council (NRC) administers the Ford Foundation Fellowships for Minorities program. This program offers predoctoral fellowships, dissertation fellowships, and postdoctoral fellowships. Eligible applicants must be U.S. citizens or nationals who are members of one of the following groups: Black/African American, Alaskan Native (Eskimo or Aleut), Mexican American/Chicano/Chicana, Native American, Native Pacific Islander (Polynesian, Micronesian), or Puerto Rican.

The Predoctoral Fellowship Program offers support for three years in research-based programs in social and behavioral sciences, humanities, physical and biological sciences, engineering, and mathematics, or for interdisciplinary programs comprising two or more eligible disciplines leading to the Ph.D. or Sc.D. The annual stipend is $17,000, and there is an additional cost-of-education allowance of $6,000. The deadline to apply is **November 19, 2003**.

The Dissertation Fellowship is intended for the final year of dissertation writing. The stipend is $21,000. The application deadline is **December 3, 2003**.

The Postdoctoral Fellowship offers one year of postdoctoral support for individuals who have received their Ph.D.'s no earlier than January 1996 and no later than

January 17, 2004. The stipend is $40,000, with an employing institution allowance of $1,500. The application deadline is **December 17, 2003**.

Applicants are encouraged to apply online at `http://www7.nationalacademies.org/fellowships/applyonline.html`. The postal address is: Fellowship Office, GR 346A, National Research Council of the National Academies, 550 Fifth Street, NW, Washington, DC 20001. The telephone number is 202-334-2872. The email address is `infofell@nas.edu`.

—From an NRC announcement

EDGE Summer Program

Funded by the National Science Foundation and the Andrew W. Mellon Foundation, the Enhancing Diversity in Graduate Education (EDGE) Program, a postbaccalaureate summer enrichment program, is designed to strengthen the ability of women and minority students to successfully complete graduate programs in the mathematical sciences.

The summer program consists of two core courses in analysis and algebra/linear algebra. There will also be minicourses in vital areas of mathematical research in pure and applied mathematics, short-term visitors from academia and industry, guest lectures, graduate student mentors, and problem sessions. In addition, a follow-up mentoring program and support network will be established with the participants' respective graduate programs.

Applicants to the program should be women who are (1) graduating seniors who have applied to graduate programs in the mathematical sciences, (2) recent recipients of undergraduate degrees who are now entering graduate programs, or (3) first-year graduate students. All applicants should have completed standard junior-senior level undergraduate courses in analysis and abstract algebra and have a desire to earn the doctorate degree. Women from minority groups who fit one of the above three categories are especially encouraged to apply. Final acceptance to the program is contingent on acceptance to a graduate program in the mathematical sciences.

In 2004, the program will be held at Spelman College in Atlanta, Georgia. The dates for the summer program are June 7–July 2, 2004. It will be codirected by Sylvia Bozeman (Spelman College), Rhonda Hughes (Bryn Mawr College), and local coordinator Yewande Olubummo (Spelman College). A stipend of $2,000 plus room and board will be awarded to participants. Names of applicants chosen to participate in the program will be announced by April 15, 2004.

The application deadline is **March 4, 2004**. Applications should be sent to: EDGE Program, Department of Mathematics, Bryn Mawr College, 101 North Merion Avenue, Bryn Mawr, PA 19010. For more information, visit the program's website at `http://www.edgeforwomen.org/index.html`.

—EDGE Program announcement

Call for Nominations for Waterman Award

Congress established the Alan T. Waterman Award in August 1975 to mark the twenty-fifth anniversary of the National Science Foundation (NSF) and to honor its first director. The annual award recognizes an outstanding young researcher in any field of science or engineering supported by the NSF. In addition to a medal, the awardee receives a grant of $500,000 over a three-year period for scientific research or advanced study in the mathematical, physical, medical, biological, engineering, social, or other sciences at the institution of the recipient's choice.

Candidates must be U.S. citizens or permanent residents and must be thirty-five years of age or younger or not more than seven years beyond receipt of the Ph.D. degree by December 31 of the year in which they are nominated. Candidates should have demonstrated exceptional individual achievements in scientific or engineering research of sufficient quality to place them at the forefront of their peers. Criteria include originality, innovation, and significant impact on the field. Nominations for the award and supporting references must be postmarked by **December 31, 2003**. For more detailed information concerning the nomination procedures, see the NSF website: `http://www.fastlane.nsf.gov/fastlane.jsp`.

—*From an NSF announcement*

News from the Fields Institute

The Fields Institute for Research in the Mathematical Sciences thematic program for 2003–2004 is on the topic of partial differential equations and focuses principally on problems that stem from questions in applied mathematics and in mathematical physics. The subject matter is chosen from active topics of research that are of particular current interest.

The winter 2004 semester will focus on Hamiltonian partial differential equations, in particular hyperbolic equations and nonlinear dispersive evolution equations that arise in mathematical physics and in continuum mechanics, and on the equations of kinetic theory that arise in the study of statistical mechanics and of wave turbulence. A list of activities and dates for the winter and spring programs follows.

September 2003–April 2004: Course on Partial Differential Equations (continuing). Instructor: W. Craig.

January–April 2004: Course on Asymptotic Methods for Partial Differential Equations. Instructor: V. Buslaev.

January–April 2004: Course on Inverse Problems. Instructor: A. Nachman.

March 15–19, 2004: Workshop on Nonlinear Wave Equations. Organizers: C. Bardos, J. Colliander, W. Craig (Chair), N. Ercolani, C. Sulem.

March 24–26, 2004: Short Course in Kinetic Theory. Lecturers: Y. Elskens, F. Golse, D. Levermore, T. Passot, H. Qin, P.-L. Sulem, W. M. Tang.

March 29–April 2, 2004: Workshop on Kinetic Theory. Organizers: D. Levermore, T. Passot, C. Sulem (Chair), P.-L. Sulem.

May 3–7, 2004: Coxeter Lecture Series. Lecturer: Sergei Kuksin.

May 10–15, 2004: Distinguished Lecture Series. Lecturer: Jean Bourgain.

May 10–15, 2004: Short Course on Hamiltonian Partial Differential Equations.

May 17–21, 2004: Workshop on Integrable and Near-Integrable Hamiltonian Partial Differential Equations (joint with the Centre de Recherche Mathématique (CRM)). Organizers: W. Craig (Chair), P. Deift, S. Kuksin, P. Olver, J. Toth, P. Winternitz.

May 24–28, 2004: Workshop on Hamiltonian Dynamical Systems. Organizers: D. Bambusi, W. Craig, S. Kuksin, C. E. Wayne (Chair), E. Zehnder.

June 1–11, 2004: Workshop on Semiclassical Analysis (joint with the CRM).

June 21–25, 2004: Conference on Surface Water Waves. Organizers: J. Carter, W. Craig, B. Deconinck, J. Hammack, D. Henderson, D. Nicholls, H. Segur, C. Sulem.

For more information, including funding opportunities from the Fields Institute and the National Science Foundation, see the website `http://www.fields.utoronto.ca/programs/scientific/03-04/pde/`.

The Fields Institute invites applications for postdoctoral fellowship positions at the institute for the 2004–2005 academic year, during the Thematic Program on the Geometry of String Theory. These fellowships provide an opportunity to spend at least one year engaged in research and participating in the research activities of the institute. Applications for the Program on String Theory should be received by **January 2, 2004**. Applicants seeking postdoctoral fellowships funded by other agencies (such as NSERC and international fellowships) should request the Fields Institute as their proposed location of tenure and should apply to the Fields Institute for a letter of invitation. For further information, see `http://www.fields.utoronto.ca/programs/scientific/04-05/string-theory/`.

—*From a Fields Institute announcement*

News from the Institut Mittag-Leffler

The Institut Mittag-Leffler, Djursholm, Sweden, has announced its program for the academic year 2004–2005. The fall term will be devoted to queuing theory and teletraffic theory. The organizing committee consists of S. Asmussen, Aarhus; I. Kaj (Chair), Uppsala; G. Karlsson, Stockholm; and J. Virtamo, Helsinki. The spring term will be devoted to algebraic combinatorics. The organizing committee consists of A. Björner (Chair), Stockholm, and R. Stanley, MIT.

The application deadline for postdoctoral fellowships is **January 31, 2004**. Applications should be sent to

Marie-Louise Koskull, Institut Mittag-Leffler, Auravägen 17, SE-182 60 Djursholm, Sweden; email: `koskull@ml.kva.se`. For further information see the institute's website, `http://www.ml.kva.se`.

—*Institut Mittag-Leffler announcement*

News from the IMA

The theme of the current academic year at the Institute for Mathematics and its Applications (IMA), in Minneapolis, Minnesota, is "Probability and Statistics in Complex Systems" (`http://www.ima.umn.edu/complex/`). The program addresses systems with a very large number of interacting parts in which the interactions are nonlinear in the sense that the behavior of the system cannot be predicted simply by understanding the behavior of the component parts. The mathematical and statistical foundations of this program include stochastic modeling and simulation and analysis of massive data sets, as well as dynamical systems, network and graph theory, optimization, control, design of computer and physical experiments, and statistical visualization.

The fall quarter has been devoted to genomics.

The winter quarter will be devoted to communications networks and related models for power systems. The problems associated with designing, engineering, and managing such rapidly evolving systems have shaped much of networking research in the past and are likely to play an even more important role in the future as the scale of the problems addressed extends well beyond what has previously been considered.

The winter program will begin with a short course on "The Internet for Mathematicians" (January 7–9, 2004). Steven H. Strogatz will open the program with a public lecture titled "Sync: The Emerging Science of Spontaneous Order". The course is immediately followed by a one-day tutorial "Measurement, Modeling and Analysis of the Internet" (January 11, 2004) and then by a workshop "Measurement, Modeling and Analysis of the Internet" (January 12–16, 2004). The winter quarter will include two other workshops, "Robustness in Complex Systems" (February 9–13, 2004) and "Control and Pricing in Communication and Power Networks" (March 8–13, 2004). Each workshop is preceded by a one-day tutorial.

The spring quarter is concerned with advanced mathematical, statistical, and computational methods in finance and econometrics. It contains three workshops: "Risk Management and Model Specifications Issues in Finance" (April 12–16, 2004), "Model Implementation, Algorithms and Software Issues" (May 3–7, 2004), and "Financial Data Analysis and Applications" (May 24–28, 2004). There will also be one "hot topics" workshop unrelated to the annual theme and entitled "Compatible Spatial Discretizations for Partial Differential Equations" (May 11–15, 2004).

To request an invitation for one of the workshops, tutorials, or short courses, point to `http://www.ima.umn.edu/docs/reg_form1.html`.

The theme of the 2004–2005 program is "Mathematics of Materials and Macromolecules: Multiple Scales, Disorder, and Singularities" (`http://www.ima.umn.edu/matter/`). Opportunities for participation include postdoctoral positions, long term visits by senior mathematicians, and the "New Directions" program. This latter program, recently funded by the National Science Foundation, is aimed at established, mid-career mathematicians interested in expanding their research programs in new, interdisciplinary directions. All of these opportunities are described at `http://www.ima.umn.edu/docs/membership.html`. Online application forms can be found there.

As another aspect of the new "New Directions" program, in June 2004 the IMA will host a two-week intensive short course to provide mathematicians with the basic knowledge prerequisite in computational topology. The lecturers are Herbert Edelsbrunner and John Harer, both of Duke University. For more information, see `http://www.ima.umn.edu/new-directions/2004NDcourse.html`.

For further information, write to `staff@ima.umn.edu`.

—*IMA Announcement*