
Mathematics Opportunities

American Mathematical Society Centennial Fellowships

Invitation for Applications for Awards for 1998–99

Deadline: December 1, 1997

The AMS Centennial Research Fellowship Program makes awards annually to outstanding mathematicians to help further their careers in research. Recently the AMS Council approved changes in the rules for the fellowships. From 1984–96, the fellowship program was aimed at midcareer mathematicians. The changes adopted two years ago redirected the fellowship program toward recent Ph.D.s. The eligibility rules are as follows.

Applicants must: (1) be citizens or permanent residents of a country in North America, (2) have held their doctoral degrees for at least two years at the time of the award, (3) not have permanent tenure, and (4) have held less than two years of research support at the time of the award. (Each year of a full-time teaching appointment with teaching load less than four (respectively, five) courses per year on the semester (respectively, quarter) system will count in this respect as one-half year of research support.) Recipients may not hold the Centennial Fellowship concurrently with other research fellowships (e.g., Sloan Foundation Fellowships or National Science Foundation Postdoctoral Fellowships), they may not use the stipend solely to reduce teaching at the home institution, and they are expected to spend some of the fellowship period at another institution that has a stimulating research environment suited to the candidate's research development.

The stipend for fellowships awarded for 1998–99 is expected to be approximately \$36,000, with an additional expense allowance of about \$1,500. Acceptance of the fellowship cannot be postponed. Fellowship holders may use their stipend as full support for a year or may combine it

with half-time teaching and use it as half support over a two-year period.

The number of fellowships to be awarded is small and depends on the amount of money contributed to the program. The Trustees have arranged a matching program from general funds in such a way that funds for at least one fellowship are guaranteed. Because of the generosity of the AMS membership, it has been possible to award two to five fellowships a year for the past ten years.

Applications should include a short research plan describing both an outline of the research to be pursued and a program for using the fellowship, including institutions at which it will be used and reasons for the choices. The selection committee will base its decision on both the research potential of the applicant, based upon track record and letters of recommendation, and on the quality and feasibility of the research plan.

The deadline for receipt of applications is **December 1, 1997**. Awards will be announced in February 1998 or earlier if possible.

For application forms write to the Executive Director, American Mathematical Society, P.O. Box 6248, Providence, RI 02940-6248, or send electronic mail to ams@ams.org, or call 401-455-4103. Application forms are also available via the Internet at URL <http://www.ams.org/committee/profession/>. **Please note that completed application and reference forms should not be sent to the AMS, but to the address given on the forms.**

—AMS Announcement

Grants for Integrated Research and Education

The Division of Mathematical Sciences (DMS) of the National Science Foundation (NSF) has developed a new program entitled Grants for Vertically Integrated Research and Edu-

cation (VIGRE). These grants will provide support to Ph.D.-granting mathematics departments for the development of innovative educational programs that are integrated with research activities. The intent is to provide meaningful educational experiences for undergraduate and graduate students and encourage professional development at the post-doctoral level and beyond.

Every VIGRE proposal should have as its core a coherent plan for the vertical integration of an undergraduate research experience program, a graduate traineeship program, a postdoctoral fellowship program, and an undergraduate and graduate curriculum review. Proposals must indicate the interactions among these four components and discuss efforts for enhancing the participation of women and members of underrepresented groups. The DMS is also strongly suggesting that proposers include components for curricular or instructional materials development and for outreach to other communities, such as K-12 teachers, industry, and government laboratories.

Proposals should request five years of funding. Awards will be made in amounts up to \$500,000 per year (including direct and indirect costs). The curriculum development and outreach components could receive an additional amount, up to \$100,000 per year. While the number and size of the awards will depend upon the advice of reviewers and the availability of funds, the DMS anticipates making up to ten awards in each of the first two years of the program.

The deadline is **February 11, 1998**, for the first round of proposals and **September 1, 1998**, for the second. The program announcement for VIGRE can be found on the DMS Web site, <http://www.nsf.gov/mps/dms/>. Or contact: Division of Mathematical Sciences, National Science Foundation, 4201 Wilson Boulevard, Room 1025, Arlington, VA 22230; telephone 703-306-1870.

—from DMS Announcement

News from DIMACS

DIMACS, the Center for Discrete Mathematics and Theoretical Computer Science, has laid plans for a number of upcoming activities. All programs offer opportunities for participation in workshops and for visiting the DIMACS sites in New Jersey.

Massive Data Sets. During 1997–98, DIMACS will hold a special year on massive data sets. The focus will be on mathematical and computational problems arising from the rapidly increasing data sets collected in science, engineering, and commerce. Among the application areas are astrophysical models, genetic sequencing, geographic information systems, ecological models, weather prediction, telecommunications, commercial digital video and audio, digital libraries, government information systems, and biological models in medicine. The aims are to relate core problems in diverse applications to computer science and discrete mathematics, discover limitations on performance, develop and analyze new practical algorithms, and estab-

lish partnerships with researchers in other areas. Upcoming events include workshops on massive data sets in telecommunications, on dimensionality, on biological databases, and on commercial applications. DIMACS also plans to hold an implementation challenge, to begin in late 1997 and culminate in a workshop in 1998.

Networks. DIMACS will continue into the 1997–98 academic year its special focus program on networks. This program brings together researchers and practitioners in a variety of fields to address questions ranging from infrastructure to applications. Emphasis is placed on Internet-related topics, as this is a young area where theoretical computer science and discrete mathematics have a chance to make an impact. Four overlapping areas will be addressed: network security, network applications, network control, and network design. Topics of upcoming workshops include trust management in networks, architecture and algorithmic aspects of communication networks, network design, networks in distributed computing, and traffic and network modeling and analysis.

DNA Computing. This special focus follows two DIMACS workshops in 1995 and 1996 on the theme of DNA computing. This area presents great challenges to both computer science and molecular biology for using parallelism, designing new algorithms, and dealing with errors in molecular processes. Molecular biology is an area that is increasingly dependent on discrete mathematics and theoretical computer science. Among the workshops will be one on nucleic acid selection and computing.

Mathematical Support for Molecular Biology. This is the third of a series of three special focus years in this area. Among the aims are to expose the community of discrete mathematicians and theoretical computer scientists to problems of molecular biology and to introduce molecular biologists to a community of computer and mathematical scientists who are interested in helping them solve their problems. The topics covered include mapping and sequencing, sequence alignment, DNA topology and structure, phylogeny, protein structure, DNA computing, gene-finding and gene structure prediction, and the mathematics of drug discovery.

General Workshops. DIMACS will hold three general workshops during spring 1998 in the following areas: discrete mathematical chemistry, large-scale discrete optimization, and applications of the probabilistic method.

For further information on any of these programs, consult the DIMACS Web site at <http://dimacs.rutgers.edu/>, or send e-mail to center@dimacs.rutgers.edu. The mailing address is DIMACS, Rutgers University, P.O. Box 1179, Piscataway, NJ 08855-1179. The telephone number is 732-445-5928, and the fax number is 732-445-5932.

—from DIMACS Announcements

News from the Institute for Mathematics and its Applications, University of Minnesota

The 1997–98 program at the IMA is on the topic Emerging Applications of Dynamical Systems. Geometric and analytic study of simple examples has led to tremendous insight into universal aspects of nonlinear dynamics. Experimental studies in diverse areas, including fluid flows, chemical reactions, laser dynamics, cardiac rhythms and neural output, have confirmed the ubiquity of these dynamical patterns. Harnessing theoretical advances in mathematics for the solution of larger, more complex practical problems requires further effort in understanding algorithmic and computational issues related to dynamical systems, extensions of the theory to important classes of systems that arise in applications, and attention to the modeling of complex systems that are accessible to only limited measurements of their components. Application of the theory to “real-world” problems is a thoroughly interdisciplinary effort; many of the workshops will bring together researchers in areas of application with mathematicians involved with the appropriate theory.

The fall of 1997 will be devoted to the topic Numerical Analysis of Dynamical Systems. The IMA will host the following workshops.

Large-Scale Dynamical Systems, September 29–October 3. This workshop will address development and application of special iterative methods for large-scale systems that exploit local stability properties of the linearized system. It will also consider global model reduction schemes for PDEs, such as approximate inertial manifolds and lattice dynamics. Applications are drawn from fluid flow and nucleation in alloys, among other areas.

Multiple-Time-Scale Dynamical Systems, October 27–31. Examples of physical problems that occur on widely varying time scales come from biology, chemistry, and mechanics. The resulting model is a system that has a singular perturbation character. The phenomena that appear are subtle, often involving expansions in terms of quantities that are exponentially small in terms of a small parameter in the problem. The singular structure of these equations can also pose formidable numerical challenges. The workshop will be preceded by a tutorial, October 23–24.

Dynamics of Algorithms, November 17–21. On the one hand, the transformations of data affected by an algorithm can be considered as a dynamical system, and the techniques of dynamical systems can be used to analyze properties such as global convergence, asymptotic rates, etc., and eventually lead to better numerical algorithms. On the other hand, computations in dynamical systems present special challenges: what is known a priori of the solutions affects the design of algorithms.

The winter term will emphasize Dynamics in Physiology and Chemistry, while the spring will be devoted to Symmetry and Pattern Formation. More detailed descriptions

of the winter and spring terms will appear in future issues of the *Notices*.

For more information about IMA activities and how to register, contact the IMA at staff@ima.umn.edu or through the World Wide Web (<http://www.ima.umn.edu/>).

—IMA Announcement

Grants for Mathematicians from Eastern Europe to Attend ICM98

Mathematicians who reside in Eastern European countries and the independent states of the former Soviet Union may apply to receive financial support for attending the International Congress of Mathematicians 1998 (ICM98), to be held August 18–27, 1998, in Berlin, Germany.

The ICM98 Organizing Committee has set up the Committee for Support of Mathematicians from Eastern Europe (CSMEE) to handle applications for funds. To secure the participation of as many persons as possible from limited funds, support will be available only for local costs in Berlin. Travel grants are not available. Those applying for a grant from CSMEE are expected to cover travel expenses from other sources.

The deadline for the submission of applications is **January 1, 1998**. Applicants will be notified immediately after May 1, 1998.

For further information and application forms, contact the CSMEE by e-mail at icm-csmee@mathematik.hu-berlin.de; by fax at 49-30-2093-1866; or by mail at Humboldt-Universität, Institut für Mathematik, ICM-CSMEE, Unter den Linden 6, D-10099 Berlin, Germany. Application forms are also available at the ICM98 Web site <http://elib.zib.de/ICM98/>.

—from ICM98 Announcement