
Mathematics Opportunities

Workshop for Women Students and Postdocs

Over the past seven years, the Association for Women in Mathematics (AWM) has held a series of workshops for women graduate students and recent Ph.D.s (referred to as “postdocs” below) in conjunction with major mathematics meetings. With support from the Office of Naval Research the AWM will hold the next workshop in conjunction with the annual AMS-MAA Joint Mathematics Meetings in Orlando, Florida, January 10–13, 1996. The workshop will be held on Saturday, January 13, 1996.

Each participating graduate student is invited to present a poster on her thesis problem and each postdoc to present a talk on her research. AWM will offer funding for travel and two days subsistence for up to twenty participants. Participants will have the opportunity to present and discuss their research and to meet with other women mathematicians at all stages of their careers. Each workshop will also include a panel discussion on issues of career development, a luncheon, and a dinner banquet. All mathematicians (female and male) are invited to attend the entire program, even though funding is provided only for twenty women graduate students and postdocs. Departments are urged to help graduate students and postdocs obtain some institutional support to attend the workshop and the associated meetings.

To be eligible for funding, graduate students must have begun work on a thesis problem. The word “postdoc” refers to any mathematician who has received her Ph.D. within approximately the last five years, whether or not she currently holds a postdoctoral or other academic posi-

tion. All non-U.S. citizens must have a current U.S. address. All applications should include a curriculum vitae and a concise description of research; letters of support are encouraged. Graduate students should include a letter of recommendation from their thesis advisors. Nominations by other mathematicians (along with the information described above) are also welcome.

Send *five* complete copies of the application materials (including the cover letter) to: Workshop Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, Maryland 20742-2461. For further information contact the AWM by telephone at 301-405-7892, or by e-mail at awm@math.umd.edu. (Applications via e-mail or fax are not acceptable.) The application deadline is **October 1, 1995**.

—AWM Announcement

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

The 1995–96 program at the IMA will be on the topic, **Mathematical Methods in Materials Science**. One goal of this year is to bring together materials scientists and mathematicians to talk to each other and to transfer problems, ideas and methods from one community to another, so as to enhance further progress in the understanding of ma-

materials. New mathematical ideas will be sought to help in improving modeling of materials, in deriving innovative and efficient numerical methods, and in developing approximate models which are amenable to mathematical analysis. The mathematical disciplines involved in the program will include partial differential equations, numerical analysis, homogenization and stochastic techniques, and geometric and topological methods for polymers.

A parallel goal of the IMA year is the enhancement and stimulation of the mathematics itself. In recent years, problems arising from certain areas of materials science have motivated mathematicians to pursue new mathematical topics in response to unexpected and unexplained materials phenomena. According to Richard James, one of the organizers, "there will be a huge variety of visitors at the IMA this coming year, representing many of the most prominent people in mathematics, physics, and materials science. I believe that, with such a group assembled, entirely new mathematical fields may be born, that will have a real impact on the practice of materials science. There are some rumblings of this possibility leading up to several of the workshops, particularly the first workshop on the direct passage of atomic to continuum theory. In short, I believe that this is a once-in-a-lifetime opportunity."

The year's program will focus on topics such as phase transitions, optimal materials, the passage from atomistic to continuum theory, disordered materials, materials for nonlinear optics, and polymers, each area of materials science being coupled with relevant areas of mathematical research.

The fall term will focus on **Phase Transitions, Optimal Microstructures and Disordered Materials**.

Fall will begin with a September 5-8 tutorial on **Microstructure, Weak Convergence and Atomic Forces**. The following two weeks will feature workshops on **Mechanical Response of Materials from Angstroms to Meters** (September 11-15) and on **Phase Transformations, Composite Materials and Microstructure** (September 18-22). One focus of the first workshop will be on mathematical methods appropriate to the passage from one scale to another. In cases in which properties exhibit large spatial fluctuations on one scale governed by a certain set of partial differential equations, it is now becoming better understood how to derive equations appropriate to a larger scale. In these calculations weak-convergence methods, homogenization, Young measures and various notions of convergence of operators play a central role. The time appears ripe to exploit such methods in problems of change of scale, e.g. from quantum mechanics to density functional theory, from density functional theory to atomic forces, and from atomic forces to continuum response. The same body of mathematical techniques will be seen, in the September 18-22 workshop, to be important in three more specific areas of materials science with a strong commonality of themes.

October 23-27 will see a period of concentration on **Microstructure and Turbulence**, which will bring together two communities that are involved in small-scale computations: materials scientists and computational fluid dynamicists. These two groups do not ordinarily talk to each

other and could greatly benefit by getting together.

The IMA will hold a workshop on **Disordered Materials** during the week November 13-17. The materials of interest range from polycrystalline metals and foams to sea ice. The overall themes which will be addressed include recent mathematical developments in percolation theory, including conformal invariance, and transport processes in disordered systems. Of special interest is the behavior of materials close to criticality, i.e., close to the percolation threshold. While most other analysis of random systems is related to perturbations about a dilute volume-fraction limit, or about a nearly homogeneous system, the results of analysis near the critical point are valid in the opposite regime of moderately large volume fractions and high-contrast materials. The predictions of renormalization-group theory suggest that some quantities such as exponents or amplitude ratios may have a universal value in the vicinity of the critical point.

The winter term will emphasize **Thin Films, Particulate Flows and Nonlinear Optical Materials**, while the spring will be devoted to **Numerical Methods and Topological/Geometric Properties in Polymers**. More detailed descriptions of the winter and spring terms will appear in future issues of the *Notices*.

For more information about IMA activities, see the Meetings and Conferences section of this issue or contact the IMA (at staff@ima.umn.edu). Also, weekly IMA seminar schedules are available by fingering seminar@ima.umn.edu. \TeX files and \.dvi files for the Newsletter and the quarterly Update are available via anonymous ftp (at [ftp.ima.umn.edu](ftp://ftp.ima.umn.edu)) or through the World Wide Web (<http://www.ima.umn.edu>).

—IMA Announcement

News from the Mathematical Sciences Research Institute, Berkeley

In 1997-1998 there will be a year-long program in Stochastic Analysis at the Mathematical Sciences Research Institute (MSRI), Berkeley, California.

The last ten to fifteen years have seen explosive development in the theory of continuous-time stochastic processes which, loosely speaking, are highly singular. For example, the state space might be infinite dimensional or "fractal", or the evolution dynamics of the process might not be sufficiently smooth to permit study using classical tools such as partial differential equations. Probabilists have been led to study such processes by the requirements of physics, chemistry, biology, and engineering; by the desire to develop probabilistic tools for the solution of "non-stochastic" problems in analysis and geometry; and by the intrinsic mathematical interest of the subject. The modern theory of such processes and of related analytical tools has come to be called stochastic analysis.

The MSRI year will cover a substantial cross-section of the work being done in stochastic analysis and will encompass a diversity of approaches.

The following topics are to be covered in the year (it is expected that there will be substantial overlap between some of these topics).

1. Stochastic partial differential equations and related topics.
2. Infinite dimensional analysis: Malliavin calculus.
3. Dirichlet form techniques in stochastic analysis on finite and infinite dimensional state spaces.
4. Geometric stochastic analysis.
5. Euclidean stochastic geometry.
6. Fine properties of stochastic processes.

An organizing committee consisting of R. Banuelos, S. Evans, P. Fitzsimmons, E. Pardoux, D. Stroock, and R. Williams will oversee the year's program. Cochairs of this committee are S. Evans and R. Williams.

This is a preliminary announcement to enable researchers who may be interested in attending the MSRI year in Stochastic Analysis to take this into account in planning sabbaticals and other leaves. A formal announcement of the program, together with applications for Postdoctoral Fellowships, Research Professorships, and General Memberships, will be issued in the spring of 1996.

—from MSRI

NSA Mathematical Sciences Program

The Mathematical Sciences Program (MSP) at the National Security Agency (NSA) continues its efforts to fund high quality mathematical research in the areas of algebra, number theory, discrete mathematics, probability, statistics, and cryptology. The program, which began in its present form in 1987, is currently being vigorously supported by the NSA.

The program provides for summer salary, professional travel, graduate student support, postdoctoral support, and conference support. Grant proposals submitted to the program are reviewed by the NSA Mathematics Review Panel, which is appointed and administered by the AMS. Under the guidance of this panel, the program has been particularly interested in supporting promising young investigators with summer salary grants. The program has also directed funds to senior investigators for support of their graduate students and to university departments for support of special conferences and workshops.

In an attempt to formalize these objectives, the MSP now offers funding in four distinct categories: the Young Investigators Grant, the Standard Grant, the Senior Investigators Grant, and the Conferences, Workshops, and Special Situations Grant. *Grant holders and graduate students should be U.S. citizens or permanent residents.*

There is a firm deadline of **October 15, 1995**, for all proposals (except those for conferences). Funding will commence as soon as possible after October 15, 1996. Con-

ference proposals are accepted at any time. Allow eight months for the review, negotiations, and funding.

The NSA has another related program, the Sabbatical Program, whereby mathematics and computer science professors can spend a sabbatical year at the NSA, learning how mathematics can be applied to solving problems of national significance. Applicants and their immediate families must be U.S. citizens, and a full security clearance is required.

For further information about these programs, contact: Charles F. Osgood, NSA Mathematical Sciences Program, National Security Agency, ATTN: R51A, Ft. George G. Meade, MD 20755-6000; telephone 301-688-0400; msp@math13.math.umbc.edu. For information on sabbaticals for the 1996-1997 year, contact Osgood as soon as possible at the above address.

—NSA

NSF Early Career Development Program

The Division of Mathematical Sciences (DMS) of the National Science Foundation announces that this year's deadline for proposals to the Faculty Early Career Development (CAREER) Program will be **October 17, 1995**.

The CAREER program is intended for the support of excellent proposals from junior faculty who combine strong research activity with a genuine and substantive involvement in education. Proposals will be evaluated on the basis of *both* research and education. The total award, including administrative costs, will not be less than \$200,000 for a four-year award or less than \$250,000 for a five-year award.

It is expected that DMS will make a small number of CAREER awards. It is appropriate for the budget request and proposal plan to reflect both the research and education components of the principal investigator's activity. The proposed activity and budget allocation will be considered in determining the merit of proposals. As always the total impact and added value of an award will weigh heavily in the evaluation process.

The CAREER program announcement (NSF-95118) is available on the NSF electronic information system STIS, which can be accessed through the World-Wide Web at <http://www.nsf.gov>, or via the STIS Gopher at stis.nsf.gov. Those considering submitting a proposal should read the program announcement carefully.

The Division's disciplinary programs continue to encourage proposals that integrate research and education activity or that have significant education components, at all levels. Applicants may contact disciplinary program directors if they have any questions.

—DMS Announcement