



NEWSLETTER

AMS Programs to Help the Mathematics Pipeline — awards and recognition to departments with model programs, and AMS programs and resources to engage young mathematicians, lead them to advanced degrees in mathematics, and support professional success.

A PUBLICATION FROM THE
AMS PUBLIC AWARENESS
OFFICE TO INFORM MEMBERS
ABOUT SOCIETY ACTIVITIES
AND NEWS



Participants in the 2009 North Carolina State University REU in Mathematics.

Award for Exemplary Program or Achievement in a Mathematics Department

The 2010 Award for Exemplary Program or Achievement has been awarded by the AMS to the **Department of Mathematics, North Carolina State University**, which has distinguished itself through its many activities and programs.

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In the REU program, teams of students work with faculty and graduate students to solve real-world problems. This project was led by Dr. M. Olufsen and graduate student D. Valdez-Jasso and was one of the poster session prize winners at the 2009 JMM. In this 2008 photo are (from left to right) Kasey Crompton (University of South Carolina-Columbia), Gregory Morton (Morehouse College), Andrew Davis (Clarkson University), Satoru Ito (NC State University), and Amanda Olsen (LaGrange College). Photographs are courtesy of the NCSU mathematics department.

The NCSU mathematics department has a distinctive culture that successfully blends interdisciplinary and core mathematics, resulting in an exciting environment for research as well as an attractive setting in which students thrive. The department especially credits the leadership of department head Loek Helminck, who built several programs supported by external funding. Helminck in turn credits broad participation by the faculty as the key to the programs' success. One of the most visible of these is the Research Experiences for Undergraduates (REU) program, the largest of its kind in the nation. The faculty has a strong commitment to students, at both the undergraduate and graduate levels, and has put an emphasis in recent years on recruiting graduate students from groups traditionally underrepresented in mathematics. The department is home to two research centers, and its new building has modern and spacious visitor, teaching, conference, and seminar spaces that create an ideal working atmosphere.

Read more See the award citation, past awards, and the nomination process at www.ams.org/prizes/department-award.html, and visit the NCSU mathematics department website at www.math.ncsu.edu/ to read about its courses, people, events, programs, and outreach.



Recognizing Mathematics Programs That Make a Difference

The two programs recognized by the AMS in 2010 are the **Computational and Applied Mathematics Department, Rice University**, and the **Summer Program in Quantitative Sciences, Harvard School of Public Health**.



Richard Tapia with students. Photo courtesy of Rice Center for Excellence and Equity in Education.

The **Department of Computational and Applied Mathematics (CAAM)** at Rice University has been one of the most successful departments in the nation in mentoring and producing mathematical sciences doctorates drawn from underrepresented minority groups. In the past 25 years, the department has produced 34 PhDs from these groups, and some of the individuals were among the 43 women PhDs in the department.

The twelve members of the CAAM faculty are involved in cutting-edge research in inverse problems, discrete and continuous optimization, computational neuroscience, partial differential equations (PDE), PDE constrained optimization, and large scale numerical linear algebra. The interdisciplinary nature of the department has played a role in making CAAM attractive to groups traditionally underrepresented in mathematics. CAAM has two women professors, Liliana Borcea and Béatrice Rivière, who serve as role models for women students, and has been very successful in producing women PhDs, with 45.5 percent of its PhDs going to women in the years between 1995 and 2003.

Much of the department's success in the training of PhDs from underrepresented minority groups has come through the leadership of Richard Tapia, the recipient of the 2004 AMS Award for Distinguished Public Service to Mathematics. During his more than 30 years at Rice University, Tapia personally mentored dozens of students from underrepresented groups, many of whom have gone on to outstanding positions in academia and industry. Tapia's work on promoting diversity in mathematics, engineering, and the sciences has brought a national spotlight to the CAAM department.



The 2009 Summer Program in Quantitative Sciences student group, Harvard School of Public Health. Photo by Catherine Haskell, Diversity Program Coordinator, Department of Biostatistics, Harvard School of Public Health.

The **Summer Program in Quantitative Sciences at Harvard School of Public Health** attracts mathematically talented students from underrepresented minority groups to consider graduate school and careers in biostatistics and public health. Each year, between 6 and 12 minority students have participated in the program, and it is also open to students from other groups underrepresented in graduate education in public health, such as first-generation college students, low-income college students, and handicapped students.

An essential element of the program's success is its small size, which permits the development of personal connections with all of the students. Lasting four weeks, the program includes an introductory course in biostatistics and statistical computing; a lecture series on epidemiology, health and social behavior, environmental health, and current research in biostatistics; small group research projects; career development sessions; a practice GRE test; and field trips. Since 1994, when the program first began admitting students, 153 students have participated and 20 have enrolled in HSPH for graduate school. Of the 131 program participants known to have received their undergraduate degrees, at least 87 (66 percent) have completed graduate degrees or gone on to pursue graduate studies, at least 67 (51 percent) have pursued graduate study related to health or medical school, and 40 (31 percent) have gone on to pursue graduate training in statistics or biostatistics.

Read more The AMS highlights two programs each year that aim to bring more people from underrepresented minority backgrounds into some portion of the pipeline beginning at the undergraduate level and leading to an advanced degree in mathematics or to retain them in the pipeline; have achieved documentable success in doing so; and are replicable models. Read the full citations and program descriptions, and see other programs recognized since 2006, at www.ams.org/employment/makeadiff.html.

Fostering Undergraduate Mathematics Students



AMS programs that inform and encourage students to pursue graduate school and careers in mathematics include **Headlines & Deadlines for Students** (a free email service with news and deadlines for applications for fellowships and grants, meeting registrations, and more); **Early Career Profiles** (a growing network of nearly 170 recent bachelor's-level graduates in the mathematical sciences and how they use mathematics in their jobs); **Assistantships & Graduate Fellowships** (a centralized source of information on graduate programs in the U.S.); **Graduate School Fair** (co-sponsored at the Joint Mathematics Meetings); **Research Experience for Undergraduates** (a centralized list with links to approximately 75 REU summer programs); and the **Student Mathematical Library** and **AMS Pure and Applied Undergraduate Texts** book series. The Society also sponsors sessions and highlights the student poster presenters at the annual conference of the Society for the Advancement of Chicanos and Native Americans in Science.

Read more The **Undergraduate Mathematics Majors** page at www.ams.org/employment/undergrad.html includes many resources about graduate school programs, REUs and semester programs such as Math in Moscow, competitions, and online undergraduate mathematics journals.

Conferences on Undergraduate Mathematics Research Programs

Proceedings of the Conference on Promoting Undergraduate Research in Mathematics, edited by Joseph A. Gallian, is based on a conference organized by the AMS, with funding from the National Security Agency (NSA). The conference brought together a diverse group of people who are actively involving undergraduates in research programs of all types, in order that they might share their experiences and explore ways of creating more such opportunities, with the goal of bringing the most talented students into research-level mathematics.

[Read more](#) Download the pdf at www.ams.org/employment/REUproceedings.html.

Supporting the Graduate Student Experience

The AMS invites institutional members to nominate mathematics graduate students to become free AMS members (see how at www.ams.org/membership/nominees.html). These members receive discounts for AMS meeting registration and AMS books in the *Graduate Studies in Mathematics* series, among others, at www.ams.org/bookstore, and are entitled to receive *Notices of the AMS*. The *Notices* helps graduate students to become part of the wider network of mathematicians, find out about graduate and postdoctoral fellowships in universities and mathematics institutes, read up on professional matters such as job seeking and teaching, enjoy top-quality mathematics exposition, keep abreast of current research terms with the "What is...?" column, and learn of upcoming meetings.



In the AMS Membership booth at the 2010 Joint Mathematics Meetings: Students take part in the Graduate Student Challenge (left) and Baldur Hedinnsson, AMS-AAAS Mass Media Fellow, visits with Anita Benjamin, Assistant Director, AMS Washington, DC, Office

The AMS encourages graduate students to read and contribute comments on the Grad School Blog at mathgradblog.williams.edu/. Also, thanks to an anonymous donor, the AMS offers travel grants for graduate students to attend the Joint Mathematics Meetings. Information on how to apply for JMM 2011 Travel Grants is at www.ams.org/employment/student-JMM.html.

[Read more](#) Graduate students should verify their addresses at www.ams.org/cml/update-ams to ensure delivery of their free subscriptions to *Notices* and *Bulletin of the AMS*.

Programs for Early Career Mathematicians



To support the pipeline of mathematicians entering the field as professionals, the AMS offers employment and career services, reports and data on the profession, and a special introductory membership dues rate.

Also, inaugurated in 2008, the **Mathematics Research Communities** program nurtures early-career mathematicians—those who are close to finishing their doctorates or have recently finished—and provides them with opportunities to build social and collaborative networks to inspire and sustain each other in their work. The structured program is designed to engage and guide all participants as they start their careers. For each topic, the program includes a one-week summer conference at the Snowbird Resort in Utah, a Special Session at the national meeting, a discussion network, ongoing mentoring, and a longitudinal study of early career mathematicians.



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"For me, it was one of the most rewarding experiences I have had in my mathematical career. The vitality, enthusiasm, interest, and hard work of the participants were invigorating. I am going to try to be involved in more meetings using the MRC setup: workshops intended for and run by the young people in the field."

— **Gunther Uhlmann**, co-organizer, "Inverse Problems"

[Read more](#) See the program for the 2010 MRCs, the call for 2011 proposals, and photos and feedback from past MRCs at www.ams.org/amsmtgs/mrc.html.

For High school Students



Who Wants to Be a Mathematician winners with AMS Public Awareness Officer Mike Breen.



Student at the Epsilon-funded PROMYS (Program in Mathematics for Young Scientists), Boston University.

Recognizing that the future of mathematics depends on encouraging the most talented mathematics high school students, the AMS supports selected summer mathematics camps to receive Epsilon Fund grants, sponsors annual Arnold Ross Lectures, administers the Karl Menger Memorial Awards for outstanding mathematics projects at the Intel International Science and Engineering Fair, and runs the popular *Who Wants to Be a Mathematician* game across the country.

[Read more](#) Online resources for high school students and teachers are at www.ams.org/employment/highschool.html.

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AMS MEMBER NEWSLETTER

AMS Meetings



Mathematicians attend AMS national and sectional meetings throughout their careers. This year a record number of undergraduate and graduate students—33% of the scientific participants—attended the Joint Mathematics Meetings in San Francisco. They had an opportunity to attend and give talks, present posters, meet with mentors, enjoy the Student Network Center, visit the exhibits, learn about programs at the Grad School Fair, and use the Employment Center. JMM Travel Grant recipients had a chance to meet each other at a brunch.

Read more See highlights of JMM 2010 at www.ams.org/ams/jmm10-highlights.html and view the schedule of upcoming AMS meetings, conferences, and special lectures at www.ams.org/meetings.

At the 2010 Joint Mathematics Meetings. Photos by E. David Luria and Diane Boumenot.