Building a Research Career: Mathematics Research Communities

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With the expectation of funding from the National Science Foundation, the AMS is launching a new program designed to nurture budding researchers and help them build collaborative communities centered on research. Called Mathematics Research Communities (MRC), the program is geared toward mathematicians at the "peridoctoral" stage, meaning those who are close to finishing the doctorate or have recently finished. The program will bring together peridoctoral mathematicians with a passion for research and provide them with structured activities aimed at building social and collaborative networks through which they can inspire and sustain each other in their work. "The aim of MRC is to encourage young mathematicians when they are establishing their research careers by building communities in which the camaraderie comes from sharing research activities," said Ellen Maycock, the Society staff member overseeing the MRC. "It's a way of laying foundations, and individuals could end up being influenced for the rest of their lives."

MRC is inspired by several existing programs but is not quite like any of them. One inspiration is Project NExT, which has been highly successful in preparing the next generation of mathematics professors through a rich program of professional development. MRC differs from Project NExT by putting less emphasis on teaching and also by focusing on specific research topics. Another inspiration is the GAEL conferences, which have been held in Luminy, France. GAEL stands for "Géométrie Algébrique En Liberté", which suggests a bit of naughtiness but also refers to the need for young mathematicians to have time and space to develop free of the constraints of the older generation. At the GAEL conferences, peridoctoral mathematicians give talks and discuss their research with others in the same area. A small number of senior researchers are invited by the younger researchers in order to give a few lectures and provide guidance, but the conference is mainly conducted by and for the young mathematicians.

In 2003 and 2004, while he was AMS president, David Eisenbud of the University of California, Berkeley, initiated two experimental AMS summer conferences along the lines of GAEL. The 2003 conference was on commutative algebra and consisted mainly of lectures by recent Ph.D.'s and graduate students who were just finishing up their theses. In 2004 the topic was algebraic geometry, and the conference had a different structure: In the mornings young researchers gave Bourbaki-style expository talks, and in the afternoons the participants broke up into small working groups, each led by a senior mathematician who would give a brief lecture and then get participants working on problems that had come up during the conference. (A webpage for the 2004 conference is available at `http://math.stanford.edu/~vakil/snowbird/`.) The response to the conferences was enthusiastic. The young participants found it rewarding and encouraging to exchange ideas with and give support to others at the same career stage. Many came away with new contacts and felt motivated and revitalized to continue in research.

The response to these two conferences persuaded the AMS that there is a real need for a program focused on nurturing the research careers of young mathematicians and sowing the seeds for building future groups of research collaborators. In the summer of 2007 the Society submitted a proposal for the MRC to the National Science Foundation and by December of that year received word that the proposal would be funded for three years. The first MRC activities will begin in the summer of 2008 under the guidance of an advisory board chaired by Eisenbud.

MRC has five main components. The first is a set of one-week summer conferences: three will be held in 2008, and four will be held each summer thereafter. They will alternate between a large conference in a broad research area with approximately forty young mathematicians and four to five senior research mathematicians and two

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smaller conferences on more focused areas run simultaneously, that will include approximately twenty young mathematicians and two to three senior researchers. Careful choices of conference topics over the years will ensure that a wide range of mathematical areas is covered. The emphasis of all the conferences will be on the young mathematicians, but the exact structure is not set in stone so that organizers will have flexibility tailoring the conferences as they see fit. The conferences will also include activities focused on professional development topics, such as how to write a research paper, how to give an effective research talk, how to prepare a grant proposal, and the like.

    One of the main professional development activities comes in the second component of MRC, which consists of Special Sessions at the Joint Mathematics Meetings in the winter following the conferences. All MRC participants will attend the JMM, allowing them to reestablish contacts made during the summer conferences and possibly providing venues to speak on their own work. Each MRC conference topic will have a full-day Special Session. For each topic the primary responsibilities for the Special Session will be placed in the hands of a group of several young MRC participants. Organizing the Special Sessions will provide the young researchers with valuable experience in an important activity of the professional lives of mathematicians.

    The third component will be a private online discussion network to help MRC participants keep in touch outside the formal MRC events. The AMS is currently investigating what kind of software would be best to use. The fourth component focuses on mentoring of MRC participants by senior mathematicians. The goal is to develop a mentoring program that for each summer conference would be active for at least two years following the conference. Several options for carrying out this part of the program are under consideration. The savvy and experience that young people often have in using electronic communication will be tapped: Groups of MRC participants will be given resources to study and recommend the best means for the discussion and mentoring networks.

    The final component of the MRC is evaluation, for which the AMS will launch an eight-year longitudinal study. Individuals accepted into MRC will agree to remain in touch with the AMS for the following five years, and the AMS will track for five years the career paths of all of the young mathematicians who attend the summer conferences in 2008, 2009, and 2010. Through the Annual Survey of the Mathematical Sciences, the AMS has built up a great deal of experience in gathering data of this sort. The Annual Survey does not track new doctorates after their first employment, so the study of the MRC participants will enrich the Annual Survey data by providing new information about the peridoctoral career stage.

    The main criterion for participation in MRC is enthusiasm for research. Such enthusiasm is not dependent on where one got a Ph.D. or where one found a first job, so it is expected that the MRC will bring together a diverse group of young researchers from a variety of institutions and backgrounds. The MRC will have an emphasis on attracting young women mathematicians and helping them remain on the research track and will make similar efforts to reach out to minority groups underrepresented in mathematics. "The goal is to help create vibrant, active, and exciting research communities that will benefit everyone by forging closer connections and promoting collaborations," said Eisenbud. "We also want to provide examples and mentoring that will help make young mathematicians better and more productive citizens of the large research community in which we live."