

Mathematics Research Communities

Summer 2010

Letter of intent due date: **March 2, 2009**

Proposal due date: **April 1, 2009**

Inquiries and proposals should be sent to:

Mathematics Research Communities
American Mathematical Society

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Background on MRC program

Young mathematicians are often overwhelmed when beginning their research careers. Some receive little guidance about initiating their research programs, either before or after earning their doctorates. Others end up in positions at colleges or universities where research is not a top priority, and so are isolated from other active researchers in their own fields or from any researchers at all. Programs exist at individual institutions and at the national level to assist young mathematicians with teaching and juggling the many demands on their time. But there has been no national program that initiates them into a research community, guiding them as they begin life as research mathematicians and form working relationships with other researchers. The AMS has created such a program, with the support of the National Science Foundation.

The goal of the MRC program is to create research cohorts of young mathematicians that will sustain themselves over time, fostering joint research and coherent research programs that will, eventually, reach all research areas of mathematics. Of course, young mathematicians will be supported in other aspects of their professional careers, through interactions with senior researchers and their peers, gaining advice in subjects ranging from gaining tenure to writing grants. However, it is the formation of research cohorts that sets this program apart from any other (national) professional development programs for mathematicians that currently exist.

The Mathematics Research Communities program aim to achieve this goal through:

- One-week conferences in each topic area in summer 2010.
- AMS Special Sessions at the Joint Mathematics Meetings (JMM) in January 2011.
- Discussion networks.
- A mentoring program.
- Longitudinal study.

An introductory article giving background information about the MRC program appeared in the February 2008 *Notices*, and may be found at <http://www.ams.org/notices/200802/tx080200247p.pdf>

Participants and Organizers

The participants in the MRC program will be “peridoctoral” mathematicians—those who are within 1-2 years before or 1-3 years after the PhD at the time of the summer conference. Ideally, the mix will not be weighted too heavily in either direction. Organizers should be prepared to encourage qualified young mathematicians to apply. The MRC program is open to individuals who are U.S. citizens as well as to those who are affiliated with U.S. institutions. Women and underrepresented minorities are especially encouraged to apply.

For each conference, there will be a small group of senior organizers: 4-5 organizers for a conference of 40 participants; 2-3 organizers for a conference of 20 participants. The organizers will choose participants from among the applicants to each program. The senior participants may each give a lecture, but will otherwise attend the conference in a mentoring capacity.

Summer Conference at Snowbird

There will be a one-week conference in each topic area chosen, held at Snowbird, Utah. During the summer of 2010, the tentative dates are: June 12-18, 2010, June 19-25, 2010 and June 26-July 2, 2010. The focus of these conferences will be on the young mathematicians. These one-week conferences will alternate between a large conference with approximately 40 young mathematicians, and two small conferences run simultaneously that will each include approximately 20 young mathematicians. A conference coordinator from the AMS serves before and on site at the conference to take care of the logistical details.

Each senior organizer receives a stipend of \$3,000. Additionally, each organizing committee has the option of hiring a graduate student to assist with work before and during the conference, for a stipend of \$3,000. The program pays for air transportation for all participants and organizers, as well as room and board for the stay at Snowbird. Senior organizers stay in single rooms, and the young mathematicians share doubles. As part of the Snowbird package, participants are provided with transportation by van from the Salt Lake City airport to the resort and back. Participants will arrive at some time on Saturday (note that they are on their own for Saturday night dinner), and will depart on Friday, after a breakfast provided in the package. All meals beginning with Sunday breakfast and ending with Friday breakfast are included. There will be a hospitality lounge open most evenings, with snacks and beverages available for a small charge.

The MRC program allows the organizers a great deal of flexibility in structuring the week of the conference at Snowbird. Although the main emphasis of the summer conferences will be on scientific program, it will be important to spend time discussing some professional development topics, such as the job search, writing grant proposals, giving talks or other activities. These topics can be covered in several evening sessions, or incorporated into the scientific program. An AMS staff member will schedule a short session on the various aspects of the MRC program.

The MRC Advisory Board encourages each set of organizers to create a program that works well for the topic and the particular group of participants. In the summer of 2008, the three

different conference organizers planned very different structures to accomplish their goals, yet each conference was highly successful. During the first week, the 40 participants spent most of the time together, listening to talks given by each other. Two senior postdocs gave several hour-long expository talks on the two topics of the conference, Teichmüller Theory and Low-Dimensional Topology. Everyone gave short talks on his or her research: new PhDs gave 15-minute talks and graduate students gave 5-minute talks. After lunch, the group had an informal period when organizers answered questions from the young mathematicians.

During the second week of the MRC program, two groups of 20 participants each shared the conference site. One group, on the topic of Computational Algebra & Convexity, broke into three working subgroups—two studied aspects of a paper on the Boij-Soderberg conjecture, with their participants giving explanatory talks about the paper at the end of the week, and the other subgroup worked on a problem using several software packages, including the program Macaulay2. Each participant gave a short (one overhead) talk on the first day to introduce himself or herself. In the evenings, informal “Basic Notions” sessions were given by participants. The participants in the conference on Scientific Computing and Advanced Computation began their week giving short talks on their research that were critiqued by the organizers. The senior organizers gave hour-long talks on several topics, including some new programming languages, parallel computing and multiscale analysis. The organizers then devised an ingenious way to help the participants interact despite their diverse backgrounds. The participants then broke into small working groups and prepared grant proposals to be submitted to the fictitious “Department of Computational Sciences”. This allowed discussions about grant-writing as well as creating connections across disciplines.

An article about the 2008 MRC program was published in the February 2009 *Notices* and can be found at the site <http://www.ams.org/notices/200902/rtx090200224p.pdf>. A collection of photos and quotes from summer 2008 appears at <http://www.ams.org/ams/mrc-2008.html>.

After the Summer Conference

The other major events of the 2010 MRC program will be AMS Special Sessions at the Joint Mathematics Meetings (JMM) to be held in New Orleans, January 5 – 8, 2011. Each group will have a day-long Special Session organized by young mathematicians who are chosen from among the MRC participants. The speakers at the Special Session do not need to be chosen from among the MRC participants. Rather, the Special Session at the JMM is an opportunity for the group to gather again to hear outstanding researchers in the area. There will also be a reunion event at the 2011 JMM for all MRC participants. Partial funding for travel, rooms and meals will be available to participants, Special Session organizers and senior organizers.

There are three additional aspects of the MRC program. First, the AMS will help facilitate the use of electronic discussion groups for each group. Second, the AMS staff will be conducting a longitudinal study on the MRC participants, to determine the long-term impact of the program and also to gather information on career trajectories of young mathematicians in the 21st century. As part of their acceptance into the MRC program, the young mathematicians agree to participate in this survey. Finally, during the 2008-09 academic year, some of the 2008 MRC participants are serving on a task force to devise a mentoring program for the MRC participants, which will be implemented in the fall of 2009.

Application Guidelines

The MRC Advisory Board solicits proposals from the entire spectrum of the mathematical sciences.

Letter of Intent

Letter of intent should include: Organizing committee members, with names, institutions and contact information, and the topic of conference.

*Intent to submit proposal: **March 2, 2009***

Proposal

The proposal should be no more than six pages, and should address the following topics:

1. Personnel: The proposal should include a list of organizers, with institutions and contact information. Also, the organizers should indicate if they plan to hire a graduate assistant.
2. Scientific content: This section should discuss both the scientific background and topic(s) of the proposal, as well as the timeliness (for example, has there been a recent breakthrough in the field).
3. Objective: What will the participants take away from the conference?
4. Nuts and bolts: This section should be a rough outline of the actual structure of the conference. This need not account for every hour of every day, but should give an outline of how the time will be spent. This is a good place to highlight any novel ideas you have for making the conference a success.
5. Professional development activities: The organizers should indicate how they intend to address issues of professional development (such as grant-writing or the job search) during the week.
6. Other: Feel free to include other relevant information which you don't feel fits into the categories above. Also welcome are plans for post-conference mentoring of and contact between the junior participants.

The Advisory Board will evaluate the proposals considering the following questions:

- How will the goals of the MRC program be achieved?
- Is the topic is appropriate for such a program (sufficiently broad enough to attract a good diversity of participants, yet not generic)?
- Will there be a sufficient number of participants of sufficient caliber?
- Will appropriate mentorship and follow-up be provided?

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