Guidelines for Proposals
Mathematics Research Communities
Summer 2017

The review of proposals will continue until March of 2016 or until the 2017 schedule is filled. Expressions of interest for submitting a proposal for subsequent years are welcomed. The 2017 MRC program is contingent on the renewal of a grant from the National Science Foundation.

Inquiries should be sent to:

Mathematics Research Communities
American Mathematical Society

Email: mrc2017@ams.org
Mail: 201 Charles Street, Providence, RI 02906
Fax: 401-455-4004

Proposal submission:

Please submit a 2017 MRC proposal by emailing it to the Associate Executive Director for Meetings and Professional Services at aed-mps@ams.org.

Information can also be found at the web site:

http://www.ams.org/programs/research-communities/mrc-proposals-17

Background on the 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. In 2008, the Mathematics Research Communities (MRC) became the first national program to initiate them into a research community, guiding them to form working relationships with other researchers as they as they begin life as research mathematicians. The American Mathematical Society (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 aims to achieve this goal through:

- One-week conferences in each topic area in summer 2017.
- AMS Special Sessions at the Joint Mathematics Meetings in January 2018.
- Discussion networks.
- Funding for additional collaborations.
- Longitudinal study.

An introductory article giving background information about the MRC program appeared in the February 2008 *Notices*, and can 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 one to two years before or one to three 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. Women and underrepresented minorities are especially encouraged to apply.

Most participants in the MRC program are expected to be U.S. citizens or affiliated with U.S. institutions. A few international participants may be accepted. However, no qualified U.S. applicant should be turned away to make room for non-U.S. participants. It should be noted that all MRC participants are expected to be active in the follow-up activities such as Special Sessions at the Joint Mathematics Meetings. Travel funds to the summer MRC conference and the subsequent JMM are limited; international participants in 2017 cannot expect to be reimbursed for more than approximately US$740 in travel expenses to the summer conference site. See below for the coverage of on-site room and board costs at Snowbird.

For each conference, there will be a small group of senior organizers: four to five organizers for a conference of forty participants; two to three organizers for a conference of twenty 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 2017, the tentative dates, including arrival and departure days, are: June 4 – 10, June 11 – 17, and June 18 – 24. Participants arrive at Snowbird on the first date and depart early on the last date of each week. The focus of these conferences will be on the young mathematicians. These one-week conferences will be either a large conference with approximately forty young mathematicians, or two small conferences run simultaneously that will each include approximately twenty young mathematicians. A

conference coordinator from the AMS serves before and on site at the conference to take care of the logistical details. A mathematician from the AMS staff serves as the MRC coordinator, and will also be on site.

Each senior organizer can receive an honorarium. Additionally, each organizing committee has the option of choosing a graduate student to assist with work before and during the conference. It would also be possible to choose more than one assistant (up to three). Each assistant will also receive an honorarium. Any assistant who attends the summer conference is counted as a participant in the program. The program pays room and board during the stay at Snowbird for all organizers and participants. The MRC program fully covers the transportation costs of the senior organizers. The budget of the grant includes US$740 for ground and air transportation, including baggage charges, for participants in 2017, although we are usually able to cover the full cost of domestic travel. Note that it may not be possible to fully reimburse the transportation expenses of international participants. 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 Sunday (note that they are on their own for Sunday night dinner, although can be reimbursed for up to $40), and will depart on Saturday, after a breakfast provided in the package. All meals beginning with Monday breakfast and ending with Saturday breakfast are included. There will be a hospitality lounge open most evenings, with snacks and beverages available.

The primary goal of the MRC program is to foster engagement and interaction among the participants. Thus the amount of time spent passively listening to lectures—especially lectures by the organizers—should be minimized. Within this goal, program allows the organizers a great deal of flexibility in structuring the week of the conference at Snowbird. During the first day of the conference, you should plan some sessions that introduce the participants to each other. AMS staff members and the MRC Advisory Board will be able to assist you as you design the scientific program.

Below are descriptions of some successful small group structures from past MRC programs:

- At a conference of twenty, the participants broke into three small groups, each working on an unsolved problem. Impressively, one of the problems was completely solved during the conference; the other two groups obtained partial results.

- Another group of twenty participants broke into three working subgroups—two studied aspects of a paper, 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. 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.

- In two different conferences, the organizers used an ingenious way to help the participants interact despite their diverse backgrounds: The participants broke into small working groups and prepared grant proposals to be submitted to a fictitious granting agency. This allowed discussions about grant writing as well as creating connections across disciplines.

- A group of forty participants broke into five small groups to work on topics chosen in the spring by the organizers. All participants were expected to read several assigned papers before the conference began. During the first morning, there were survey talks by all the groups. Beginning that afternoon, the small groups began to work. The whole group reconvened at the end of the week, when each small group made a presentation.

- Some other ideas from past conferences:
    - Choose a topic that teaches fundamental tools.
    - Select senior postdocs to serve as junior mentors.
    - If special software is needed, prepare a DVD for participants to use to install the software when they arrive at Snowbird
    - Give participants reading assignments to complete before the conference.

Although the main emphasis of the summer conferences will be on the 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. At many of the past MRC conferences, there were two evening sessions. At one of the conferences, professional development topics were intermixed with the daily activities. During that conference, for example, all participants gave introductory talks of five to ten minutes during the first day. At the end of the day, the organizers critiqued the presentations, and included helpful comments about giving mathematics talks. An AMS staff member will schedule a half-hour session on the various aspects of the MRC program sometime on the second day of the conference.

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. Highlights of each summer's conferences can be found linked to the main MRC web site, http://www.ams.org/programs/research-communities/mrc.

After the Summer Conference

The other major events of the 2017 MRC program will be AMS Special Sessions at the Joint Mathematics Meetings (JMM) to be held in San Diego, California, January 10 - 13, 2018. 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 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 2018 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 several additional aspects of the MRC program. First, the AMS will help facilitate the use of electronic discussion groups for each group. Second, the MRC program will offer funding for the MRC participants to travel to continue the collaborations begun at the MRC summer conference. Third, 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, AMS staff will work with the organizers to determine the best way to ensure that all participants continue to be mentored after the summer conference.

Application Guidelines

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

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(s).
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. Dates: Please indicate any weeks that are not possible for your organizers, and choose your preferred week.
7. Other: Feel free to include other relevant information that 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 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?

Instructions on how to submit applications can be found at the web site:

http://www.ams.org/programs/research-communities/mrc-proposals-17