THE UNIVERSITY OF CHICAGO
Preliminary announcement of the
2016 Summer Program for Undergraduates

This announcement describes an eight-week summer program of study and research for undergraduates, most of whom are from the University of Chicago. Its web page is

http://www.math.uchicago.edu/∼may/REU2016.

Its first year of operation was 2000, and details from past years may be found at
http://www.math.uchicago.edu/∼may/VIGRE/index.html
http://math.uchicago.edu/∼may/REU2012/
http://math.uchicago.edu/∼may/REU2013/
http://math.uchicago.edu/∼may/REU2014/
http://math.uchicago.edu/∼may/REU2015/

In this program, students have the opportunity for intensive study and research in mathematics. Students participate in at least one of several courses taught by Department of Mathematics faculty members and are mentored by Department of Mathematics graduate students.

The purpose of the program is to provide an opportunity for students to be involved in a deeper experience in mathematics than is usually available during the academic quarters. This program is especially beneficial for undergraduates who are considering graduate study and research in mathematics.

The program has limited federal support, but not nearly enough to fund all deserving applicants, hence the level of individual support will typically be lower than at other REUs. As in the past, people accepted to the program but for whom funding is not available are welcome as full participants in all REU activities.

DATES: June 20–August 12, 2016; June 20–July 22 for the Apprentice Program. Participants in the full program are required to be in residence for all eight weeks. Apprentices are required to be in residence for the first five weeks and are welcome to participate in the program for the full eight weeks.

STIPENDS: Stipend information is provisional. Acceptance letters will give firm offers of support. For University of Chicago students, stipends are likely to range from $1,000 in the apprentice program to probably at most $3,000 in the full program. Stipends will be paid at the end of July. Please note: taxes will be deducted from these paychecks. Paid participants are not permitted to hold a part-time job while participating in the REU without the approval of the program director.

ACCOMMODATIONS: University of Chicago students are expected to find their own accommodations. Graduate students and past participants will offer advice and assistance. Students from outside the University of Chicago will be offered assistance through the University of Chicago housing office.

Application information will be updated soon.
Applications are due Friday, February 19, 2016. University of Chicago students should return completed applications to Eckhardt 314; if nobody is in that office, applications should be slipped under the door. Outside applications must be sent by email to may@math.uchicago.edu or by mail, as indicated on the application. Applicants will be notified of acceptance or possible wait list status by e-mail no

later than February 29. We adhere to a general agreement among REUs that the deadline for responses to acceptances is March 8.

THE PROGRAM OF STUDY AND RESEARCH: Students attend courses taught by Department of Mathematics faculty. The courses consist of lectures and problem solving sessions; graduate student assistants run help and problem sessions. Some research problems and some problems aimed to aid understanding are introduced. No previous knowledge or study in the areas taught is required. In addition, opportunities for reading and research with graduate students and/or faculty are offered, and regular meetings with graduate student and/or faculty mentors are required.

The apprentice program is similar, but includes material aimed at those with less mathematical experience. It is closely tied to the apprentice course. It lasts five weeks. Its participants are typically freshmen or sophomores who have not been in advanced mathematics courses. Apprentices often participate in the full program the following summer.

All participants in the program are *required* to write a short mathematical paper on some problem or topic of their own choosing, in consultation with graduate students and faculty. The paper may be either expository or research, but it must be substantial. A first draft must be submitted to mentors by August 15 and the completed paper must be submitted by August 29, unless permission for a later date has been obtained from the program director.

The first few weeks have a larger proportion of lectures than the later weeks, setting up background in some areas, giving self-contained presentations in others, and offering many problems. However, there will be classes and study and problem sessions later in the program. Papers are strongly encouraged to be on topics related to the lectures, and apprentice papers not related to the lectures must be approved by the program director.

Graduate student and faculty counselors will be on hand ready and willing to offer help throughout the program. Moreover, each student will be paired with a graduate student or faculty mentor who will meet with the student on a regular basis and will be available to offer tutorials. All participants are *required* to meet with their mentors at least twice a week. Topics for papers *must* be discussed with the mentors, first drafts *must* be submitted to them for feedback, and final drafts *must* take their comments into account. This is an essential feature of the program.

There will be student presentations on evenings during the last week of the program. It is hoped that many participants will make presentations. These can be made by individuals or by groups working together.

The program offers a wide variety of material at various mathematical levels. Some is problem oriented, some introduces areas that are not ordinarily encountered in the undergraduate curriculum. There will be lots of problems, including research problems, that students can work on in groups or alone throughout the program — and later!! Students are encouraged to work together and to organize evening and weekend study sessions. Students are expected to spend substantial amounts of time working on projects or problems outside of classes.

The precise program for 2016 has not yet been established. As always, we plan to offer a variety of courses at various levels, arranged into several "sequences". The program will be frontloaded in intensity to maximize opportunities to get started on research problems and papers. Abstracts of all course offerings will be made available in March. At this writing (November, 2016), the list of faculty participants

has not yet been determined. The faculty participants will be announced as soon as possible, and updates will appear on the web site.
Abstracts of courses from the 2002-2015 REU's are on previous years' web pages. As in previous years, there will be courses in many areas of mathematics, including geometry, topology, number theory, probability, logic, and others.