

Summer Opportunities in Mathematics

Summer 2024



Many students are interested in spending part of their summer learning new mathematics or exploring some career paths related to mathematics. Here are some links to help you research some of these opportunities. This is not a comprehensive list. Please let the department know if you know of other programs that might be of interest to Bowdoin students.

Summer Research Programs in Pure and Applied Mathematics

1. National Science Foundation Research Experience for Undergraduate Programs

Located throughout the US, REUs are eight-to-ten week programs which admit 10-12 students for an intensive experience working on mathematics research closely with a professor. The stipend for the summer is between \$3000 and \$4000, and all travel and living expenses are covered.

The programs are highly competitive, targeting mainly students for the summer after their junior year who are exploring the possibility of attending graduate school. Required background usually consists of at least a course in linear algebra and mathematical proof. When researching individual programs, do not be discouraged by intimidating project titles. The programs are designed for students just like you, and you will be taught the background necessary to participate. This is a great opportunity to learn something not ordinarily seen in any class at Bowdoin!

The application deadlines vary, but cluster around February and March. For more information, visit:

- http://www.nsf.gov/crssprgm/reu/list_result.cfm?unitid=5044
- <http://www.ams.org/employment/reu.html>

2. Park City Mathematics Institute

This is a 3 week residential program in Park City, Utah, which focuses on one topic per year. There are classes and problem sessions on this topic at a variety of levels, from undergraduate through research level mathematics. There are concurrent programs for teachers at all levels. The program offers a smaller stipend, and its short length allows students to do some mathematics and spend some of the summer at home or elsewhere. This year's topic is *Motivic Homotopy Theory*.

- <https://www.ias.edu/pcmi/pcmi-2024-undergraduate-summer-school>

3. Research in Industrial Projects/ Sites in UCLA and Singapore

“The Research in Industrial Projects (RIPS) Program provides an opportunity for high-achieving undergraduate students to work in teams on a real-world research project proposed by a sponsor from industry or a national lab.

“Projects are selected to have a major mathematical component and to be something that will pose an interesting challenge to talented undergraduates. Recent projects have included how to do a physics-based animation of a lava lamp, how to stitch together two images, how to analyze cancer data using microarrays, statistical data assimilation methods for weather data, modeling particle transport phenomena in reactors, and designing missions to the moons of Jupiter. This is just a sampling of the types of projects assigned to RIPS teams. New industrial sponsors join the RIPS Program each year and the same projects are never repeated.” **Graduating seniors are eligible to apply!**

- <http://www.ipam.ucla.edu/programs/student-research-programs/>

4. Summer@ICERM – A special institute at Brown University

ICERM is designed for a select group of 14-16 undergraduate scholars. Students work in groups of two to four, supervised by faculty advisors and aided by teaching assistants. This year’s projects include: Ordinary Differential Equation Models of Disease Transmission and Control in Long-Term Care Facilities, Agent-Based Models to Evaluate Precision Nutrition Interventions through a Socioeconomic Lens, and Predictive Modeling and Analysis of Sports Using Linear-Algebra-Based Models.

- <https://icerm.brown.edu/summerug/2024/>

5. **MSRI-UP – A summer program at the Mathematical Sciences Research Institute in Berkeley, CA**

The MSRI Undergraduate Program (MSRI--UP) is a comprehensive summer program designed for undergraduate students who have completed two years of university-level mathematics courses and would like to conduct research in the mathematical sciences. The main objective of the MSRI-UP is to identify talented students, especially those from underrepresented groups, who are interested in mathematics and make available to them meaningful research opportunities, the necessary skills and knowledge to participate in successful collaborations, and a community of academic peers and mentors who can advise, encourage and support them through a successful graduate program.

The theme of the 2023 MSRI-UP is “Mathematical Endocrinology” and the research leader is Dr. Erica J. Graham, Associate Professor in the Department of Mathematics at Bryn Mawr College.

- <https://www.msri.org/up>

6. **SIAM and AMS Databases**

The Society for Industrial and Applied Mathematics and the American Mathematical Society also maintain long lists of summer research and other opportunities on their student webpages

- <https://www.siam.org/students-education/resources/for-undergraduate-students>
- <https://www.ams.org/opportunities>

7. **Summer Undergraduate Mathematics and Statistics Accelerator**

The Summer Undergraduate Mathematics and Statistics Accelerator (SUMSA) is an eight week mathematics and statistics summer bootcamp for undergraduates at U.S. colleges and universities which will be hosted by IMSI on the campus of the University of Chicago. The aim of the program is to help prepare students for the rigors of graduate school in a mathematical science with lecture series and problems sessions taught by experienced postdocs and advanced graduate students from the University of Chicago. The primary focus of this bootcamp is basic coursework; in particular, the program is not an REU, which tends to be more project-oriented.

- <https://www.imsi.institute/activities/sumsa-2023/>

Special Programs for Women Interested in Mathematics

The Edge Program

<https://www.edgeforwomen.org/summer-session/>

This program is intended to enhance the diversity of women in mathematics graduate programs. It is intended for women planning to apply to graduate school in mathematics and provides a solid introduction to topics you will see during your first year in graduate school.

National Security Agency Programs

The NSA offers several programs for rising seniors (and exceptional younger students). Students applying to these programs should have taken either abstract algebra or number theory. These programs will accept small numbers of exceptionally strong students. Applications are always due around October 15 for the following summer, so this is something you might consider for next summer.

The full list of programs offered for undergraduates at the NSA can be found through the following link:

<https://www.intelligencecareers.gov/nsa/students-and-internships>

NASA Internships

NASA Internships are educational hands-on opportunities that provide unique NASA-related research and operational experiences for high school, undergraduate, and graduate students as well as educators. These internships integrate participants with career professionals emphasizing mentor-directed, degree-related, real-time world task completion. During the internship participants engage in scientific or engineering research, development, and operations activities. In addition, there are non-technical internship opportunities to engage in professional activities which support NASA business and administrative processes. Through these internships, participants leverage NASA's unique mission activities and mentorship to enhance and increase their professional capabilities and clarify their long-term career goals.

<https://intern.nasa.gov/>

DEVELOP and LARSS are popular programs. The location that accepts the most applicants is Langley in Virginia, and some of the more coveted locations are Goddard, Ames, and JPL in D.C. and California. Coding experience is helpful, but not required, for instance experience with one of GIS, Matlab or Python.

Statistics Programs

1. Joint Program in Survey Methodology, Junior Fellow Program

These are paid summer internships sponsored by the Federal Statistical Agencies in Washington, DC. This is a great opportunity to learn about how statistics is used within our government. A minimum GPA of 3.5 is required, although no statistics is required!

Dates: Not yet available

Salary: \$6,000

<https://jpsm.umd.edu/>

2. **The US Census Bureau** summer internship program seeks students interested in statistics. For more information, see:

<https://www.census.gov/about/census-careers/jobs/internships-fellowships.html>

3. **Summer Institute for Training in Biostatistics**

“SIBS was designed to provide undergraduate and beginning graduate students with intensive training in applied biostatistical methods and to expose them to graduate school and career options in the fields of biostatistics, statistics, and public health. SIBS is an immersive four-week experience hosted on at a number of institutions. Students take a two-credit hour graduate-level course in introductory applied biostatistical methods, they attend seminars and panel discussions featuring faculty, staff and alumni, and participate in field trips to local public health institutions as well as in numerous social activities.”

<https://www.nhlbi.nih.gov/grants-and-training/summer-institute-biostatistics>

4. **Mayo Clinic**

<https://www.mayoclinic.org/jobs/internships/biomedical-statistics-informatics/overview>

“The Biomedical Statistics and Informatics Internship provides a learning experience for both undergraduate and graduate students interested in participating in the analysis of ongoing research projects conducted at Mayo Clinic. This annual summer program begins in late May or early June (depending on candidate availability) and lasts a minimum of 10 weeks. During the Biomedical Statistics and Informatics Internship, you have an opportunity to enhance your computer and statistical skills while working under the direction of a lead statistician or lead bioinformatician.”

5. **Travelers Insurance Internships**

<https://www.travelers.com/about-us/careers/students-new-graduates/internships.aspx#>

“Our internships provide meaningful work assignments that allow interns to interact with experts and gain insight into the real working world. As an intern, you'll have the opportunity to network with senior leaders, participate in a variety of training and development activities, and meet other interns from across the country.”

More complete databases of statistics internships can be found at:

<https://stattrak.amstat.org/2022/12/01/2023-internships/>

Mathematical Biology Programs

1. Quantitative Research in the Life and Social Sciences Program:

The Quantitative Research in the Life and Social Sciences Program (QRLSSP) is an intensive summer research experience that prepares undergraduate students for the rigors of graduate level research at the interface of mathematics, statistics, and the natural and social sciences. Select students are invited to Arizona State University for eight weeks, where their time is split between classroom instruction on research methods and hands-on research projects.

<https://mcmasc.asu.edu/institutes/qlssp>

Mathematics Teaching Opportunities

1. Working as a counselor in a summer math program

There are a number of summer math programs for high school and junior high school students who accept undergraduates as counselors or teaching assistants. You can find a comprehensive link at

<http://www.ams.org/employment/mathcamps.html>

Follow up to see whether there is an application for a counselor position. This can be a fun way to do a little teaching of mathematics and encourage younger students who are interested in math.

One particular such program is PROMYS, based in Boston which does use undergraduates from a variety of schools to help teach number theory to high school students. You should not apply to this program unless you have had some number theory. Prof. King works with this program – please see him if you are interested in applying.

<http://www.promys.org/home>

Another program is the Epsilon Camp. “Epsilon Camp is a camp serving exceptional young mathematicians and their families through an intensive student program and parent workshop. This program is for children who are highly gifted and passionate about math.

Our mission is to connect highly gifted children with professional mathematics and build a supportive community of peers and families.” They have counselor and staff assistant positions:

[Epsilon Camp Positions](#)

2. Teaching and Residential Assistants at Summer Academic Programs are available at many of the large New England boarding schools. Openings for these positions are posted on eBear – many have deadlines in December to early January. Schools include Loomis Chaffee, Exeter Academy, and Northfield Mount Hermon.
3. Gifted and Talented Summer Programs hire college students as teaching and residential assistants. These positions are usually posted in December to January. These include:
 - The Center for Talented Youth (Johns Hopkins University) <https://cty.jhu.edu/programs/on-campus/jobs> ;
 - Summer Institute for the Gifted <http://www.giftedstudy.org/employment>

Actuarial, Accounting and Financial Analyst Internships

Many of these opportunities are posted on eBear and LACN (Liberal Arts Career Network) – both of which have links on the CPC webpage. Do a “Job Search” and click “Internships”. Then use keywords: mathematics, accounting, analyst etc.

Summer Research Opportunities at Bowdoin

Students can sometimes do summer research with a professor at Bowdoin College. If you are interested in this you should contact your professors early in the spring semester, and check out the

[Bowdoin Student Research Awards](#)

page. The deadlines for application for summer research awards tend to be in late February and early March.

Other Sources of Information on Mathematics Careers and Opportunities

1. The American Mathematical Society

<https://www.ams.org/programs/students/undergrad-highschool>

2. Career Cornerstone Center – <http://www.careercornerstone.org/>– A site with resources for students exploring paths in mathematics, engineering, computer science, technology, health care and science.