How to get an REU
Reseach Experience for Undergraduates

Presented by The University of Houston's Pi Mu Epsilon Chapter

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Did you know that someone would PAY you to

- pad out your resume/CV (Curriculum Vitae),
- go out of state,
- meet like-minded peers,
- learn about cutting edge research?

Introduction

- What is an REU?
- How to apply to one.
- Some experiences.
- Future.

What is an REU?

- REU Stands for - Research experience for undergraduates.
- It is a program with funding from the NSF (National Science Foundation) that encourages undergraduates with research opportunities in science fields.
- REU's can be found in your home institution as well as institutions across the country.
- Intended expand student's knowledge of emerging technologies and fields that will prepare them for graduate school.

Why and Who?

Why do an REU

- Work interesting problems.
- Gain higher knowledge of advanced mathematics (or sciences).
- Insight to academic career track.
- One more item to add to your CV, or resume.

Who is an REU for?

- Any level of undergraduate may apply.
- People interested in working on problems that may save or destroy mankind.

Timeline

Materials need to start being assembled at least a month before the deadline.

It is best if you ask for a letter of recommendation at least a month in advance, with weekly reminders.

Be sure to know the deadline for each REU. They are different for different schools.

How to apply

- Pick a program(s) that suits you
- Fill out an application
- Resume/ CV
- Statement of purpose (Essay)
- Letters of Recommendation

Picking a program

Each program is different.

- Some are structured (highly supervised), other unstructured (more self -motivated).
- Some are large (high student to faculty), some are small (low student to faculty) .
- Some focus on novel research projects, others are intended to give a through education on advanced mathematics.

You can chose from programs is many different disciplines: Math (pure and applied), theoretical neuroscience, chemistry, physics, engineering, molecular bio-engineering, etc.

You can chose from programs across the country, there's even an REU in Antarctica!

You must find the right fit in a field that you find interesting.

Curriculum Vitae

Idea: "Look good on paper item" and brevity
It is a one page summary of things that you have done, don't worry if it's too short.

What you should include:

- Education
- Research interest
- Course work
- Computer skills, i.e.Programming languages/software/operating systems
- Outreach activities, what you have done to promote field
- Extracurricular activities.
- Experience, talks given, projects done (can be a class project), seminars attended (you may list this seminar).

What you should not include

- Things that do not apply to the field you are applying to. Ex: Answering phones for Papa John's.

Some examples CV's

- Undergraduate CV
- Undergraduate CV
- Graduate CV
- Professor's CV

Statement of purpose

This is your time to go indepth with your passion.

If you are already working on a project

Write about

- your project,
- what you have done
- why is it important
- where you hope that take it (future work)
- how the REU will aid you to success

If you want to start working on a project

Write about

- why you find that field interesting
- problems worth investigating
- what skills you can bring this this project
- what skills you hope pick up from this project

Sample Statements

- Undergraduate Essay
  - Essay
  - Future Plans
  - Reasons for Research
- Graduate Essay
  - Careeer Goals
  - Project Description

Letters of Recommendation

Who should you ask?

- A professor that you have worked closely with (school work, school activities, etc.).
- Someone you know well, professionally, and will be able to write good things about you.

What do they need to know

- Information on the program, the due date of the letter, and who they are writing to.
- Your application materials.
- Transcripts, career goals, things that make you look good.

Time line

- Ask at least three weeks in advance, a month is preferable.
- Ask them to notify you when they send an email.
- If it is one week before the deadline, send a friendly reminder.

List of some REU'S

- List of REU sites:

  American Mathematical Society's AMS list of summer REUs

  NSF's list by disciple

- Some opportunities at UH
  - Summer Undergraduate Research Fellowship (SURF-UH) program
  - The Provost's Undergraduate Research Scholarship Program (PURS)
  - REU Supplements to NSF grants
- University of Texas at Tyler
- Out of state opportunities
  - Nebraska IMMERSE
  - Carleton College Summer Mathematics Program for Women
  - Enhancing Diversity in Graduate Education (EDGE)
  - George Washington University Summer Program for Women in Mathematics (SPWM)

Summer Undergraduate Research Fellowship (SURF-UH) program

- Awards $3500 stipends to students interested in conducting a full-time, 10 week summer research project in any field under the mentorship of a UH faculty mentor.
- Student first secures the research project with the faculty member, and then the student and faculty member apply for the program collaboratively online.
- Requirements: 3.0 GPA, not graduating in spring 2011 or summer 2011, not participated in SURF-UH before.
- Deadline for this year has passed . . . but there's always next year.

The Provost's Undergraduate Research Scholarship Program (PURS)

- Provides talented UH juniors and seniors with the opportunity to paticipate in a research project under the direction of a UH faculty mentor.
- Recipients will receive a $1,000 scholarship to conduct one semester of research
- Scholarship is open to students of all disciplines, including those with research proposals in the social sciences, humanities, business, engineering, technology, education, architecture, hotel and restaurant management, and natural sciences
- Deadline: Wednesday, April 27 by 5 p.m.

Requirements for PURS

- Junior or senior who has completed 12 hours in residence at UH
- A cumulative GPA of 3.0 OR who has completed fewer than 12 hours in residence at UH but has a 3.5 cumulative GPA on all college-level course work taken at UH or elsewhere,
- Current sophomores who will be a juniors in fall 2011 are eligible to apply for the scholarship.
- Applicants must have earned at least 60 credits by the beginning of the mentorship period and must enroll in and maintain a minimum of 12 hours in the semester of the award unless they are undergraduate students graduating that semester.
- Students who have participated in the PURS program at UH in a prior semester are ineligible to reapply.

REU Supplements to NSF grants

You do not need to go out of state, or do this over the summer

- Any UH professor with an NSF grant can request additional funds to supervise an undergraduate research project
- This can be either throughout the semester or during the summer

This means that you can work with a professor while you are working on your undergraduate degree. You can also get funding from said professor, and as always... it looks good on your resume.

University of Texas at Tyler

- Students will work in groups of three with faculty advisors in the areas of knot theory, tiling theory, and graph theory.
- The eight week program will run from June 20 to August 12.
- Participants will receive a $4000 stipend to pay for housing, food, and entertainment while staying in Tyler.
- Students must be U.S. citizens or permanent residents to participate, with a target on American Indian and first generation college students.
- We will begin reviewing applications on April 10 and will likely make offers by May 1.
- Flyer

Nebraska IMMERSE

- Six-week summer program, June 13–July 22, to help students make the transition from undergraduate to graduate work.
- Students will receive room, board, a travel allowance, and a $3,400 stipend.
- The main component of IMMERSE consists of two intensive courses in algebra and analysis at the advanced-undergraduate/beginning-graduate level.
- The courses are structured around the reading of research papers.
- Additional components, such as guest speakers.
- Deadline for this year has passed. But there is always next year.

Senior Research Project

Angelynn will tell us about her senior research project that she is working on with Gordon Heier on algebraic geometry.

Angelynn's Presentation

REU at UH

Neil will tell us about his REU at UH with the AGEP program. He worked with Dr. Ott doing algebraic topology

Neil's Poster

Come on back

Please let us know about your experience! And you success with the application process, and your program. We would love to invite you to speak about this for future graduates.

Email to Dr. Tomforde, or Rebecca Chen

ΠME is looking for officers for next year, please contact Dr. Tomforde if you are interested.

We need volunteers for High School recruitment outreach, April 23^{rd}, 9am - 1pm. Please contact Dr. Tomforde or Rebecca Chen if you are interested.

Link - Application Help

- University of Houston Writing Center (210 Agnes Arnold Hall)
- Seth Sullivant's guide to applying for graduate school (process is similar)
- Dr. Tomforde's website for math majors

Links - Interesting programs to apply to

- UH's Discovery Program
- UH Mathematical biology program
- Cellular bioengineering at University of Maryland
- Theoretical and comutational neuroscience wtih GCC (Partnership of Rice, UH, Baylor College of Medicine, UT Health Science, and UTMB)
- Combinatorics
- American Astronomical Society (AAS)'s REU programs

Link - Testimonials

- A Physics student's Experience
- Brandon & Seth's REU at ERWiN, experimental research in wireless networking
- American Physics' Society's (APS) article about REU experiences