

Undergraduate Research

Opportunities to gain experience

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Undergraduate research

Design, Create, Discover

- Faculty and graduate student mentoring
- Looking at unique solutions to problems
- Conducted in a lab setting



Goes beyond the classroom

- Active learning
- Building on previous knowledge
- Attention to safety
- Results are shared with others



Not “mini” graduate students

- Undergraduate students work most effectively as researchers when they are not just part time versions of graduate students.
- Undergraduate researchers usually are given a focused set of tasks that complement what a graduate student is working on.



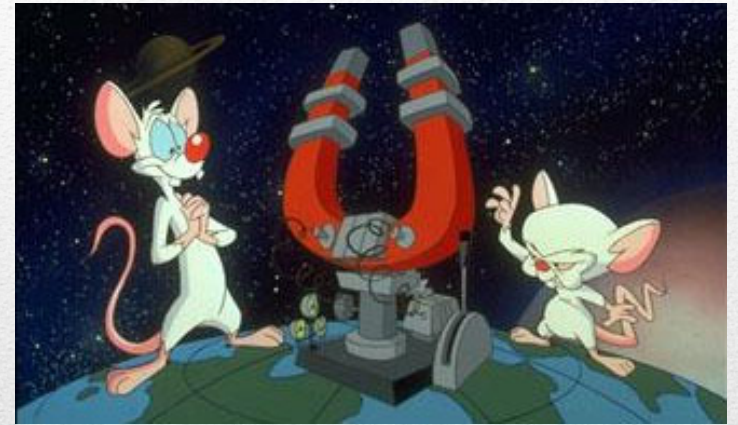


Why do faculty do this?

- Performing research really adds educational value
 - Our undergraduates help me get research done
 - Our undergraduates sometimes have better “hands on” skills compared to our graduate students
 - We use it for recruiting
 - Builds our program’s reputation
 - Encourages students to pursue graduate studies **OR** not to pursue graduate studies
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Why do students do this?

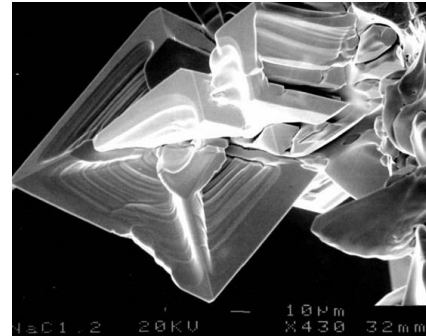
- Gain experience
 - Build a resume (potential presentations and publications)
 - Make a difference in the world
 - Looking for a challenge
 - Opens future career options
 - Interested in graduate school
 - A different kind of peer interaction (a member of a group or cohort)
 - Travel to conferences
 - Build confidence
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Research develops over time



**Marian
Kennedy**

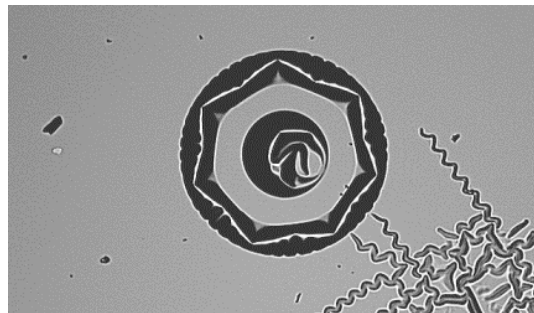


Freshman year:

Honors College, WSU REU program


Sophomore year: Study abroad in Wales,
REU at Dartmouth University

Junior year: Sandia National Lab intern



Currently:

Professor, Clemson University



Other options - Talk with faculty once you have done your homework! Some have summer and academic support available.

Tips for getting started

- Finding an advisor
 - Webpages, departments, centers, colleges, institutes, ask other students, clubs
 - What do you want?
 - Volunteer, academic credit, \$, Honors thesis, Emerging Scholars program ...
 - What does the advisor want?
 - Opportunities to secure funding with preliminary data, give graduate students opportunity to mentor, ...
 - It takes time, do you have it?
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2014 UA Study Abroad Program

Engineering in Pamplona, Spain

- May 22 – June 28, 2014
 - Cost \$3990 (does not include airfare)
 - Open to all students (freshmen to seniors)
 - Earn 6 credits of SP 104 and 3 credits of GES 225 (Society, Technology, and the Environment)
 - Emphasis on the course is on sustainable technologies and energy
 - Includes a variety of technical and cultural tours and excursions
 - See www.studyabroad.ua.edu
 - Applications due March 21, 2012.
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UA Summer Options



Research Experience for Undergraduates (REU) Sites in the College of Engineering (<http://reu.eng.ua.edu/>):

- National Academy of Engineering Grand Challenges (multi-disciplinary)
- Empirical Software Engineering
- Engineering Solutions for Clean Energy Generation
- Fluid Mechanics with Analysis Using Computations and Experiments

Summer Undergraduate Research Program (SURP) in Chemistry

Materials for Information Technology (MINT) Center REU

McNair Scholar's Program – Housed in Lloyd Hall



Finding REU programs off campus

- Over 100 schools have REU Sites in the summer usually around a common research theme
- Full-time positions for 10-12 students total
- Paid a \$4000-\$5000 (\$500/week) stipend
- Many include housing and a travel allowance
- Deadlines usually in February – March with decisions made in March-early April; typically 2 weeks given to accept an offer with a possibility for extension (Do not accept more than one offer)

http://www.nsf.gov/crssprgm/reu/reu_search.cfm



National Science Foundation
WHERE DISCOVERIES BEGIN



Requirements

Generally:

- Eligibility – US Citizen or Permanent Resident (NSF REU Sites)
 - GPA – 3.0/4.0
 - Preference for sophomore and juniors
 - An interest in the research topic and appropriate experience or appropriate course work
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Choosing a Program

Things to think about –

- Explore programs in research areas of interest
 - Explore schools/programs you might want to apply to in the future
 - Have you taken courses to support the research area?
 - Visit department websites in your field. Are there Professors conducting research that is interesting to you?
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Application Process

Generally:

- On-line forms submitted electronically
 - A personal statement and/or research statement
 - Two or three letters of recommendation
 - Transcripts
 - Summary of relevant experience
 - May have to provide proof of citizenship
 - Resume (accept professional advice)
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What should be in a personal/research statement?

- Why you want to do research in general
 - What are your academic and career goals?
 - Why these projects? What is interesting to you about the ones you have chosen?
 - How have your previous experiences shaped your goals?
 - How will the program help you to achieve your goals?
 - What will you bring to the research program?
 - **DO NOT** cut and paste from their website, or give generic statements about how wonderful they are or you are.
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Letters of recommendation

- Choose Faculty over TAs (someone who knows your academic work)
 - Ask your recommenders EARLY (2-4 weeks before due)!
 - Provide a list of where you are looking, and what is interesting at each place you are looking at
 - Discuss your long term goals with recommenders
 - Provide a resume or summary of highlights so they can comment on those aspects
 - Provide the details – should it be mailed or emailed? Where should it go? To whom should it be addressed? If mailed, provide an addressed envelope.
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Expectations

- You will be assigned a research mentor, usually a faculty member
 - You may be sent papers to read before you arrive to campus. Read them and be prepared to discuss on Day one!
 - In most cases you will be working with a graduate student on a day to day basis and will meet with your faculty mentor probably once a week
 - You are expected to become a full member of the lab; make sure you understand the working hours your advisor expects
 - Attend all REU program seminars and social functions
 - You will be required to prepare either an oral presentation or poster at the end of the summer and probably a final report
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How to be a stellar REU student

- Be prepared to work hard!
 - Put yourself on a schedule and follow it
 - Ask questions when needed but be prepared to work independently
 - Become part of the lab – help out where needed
 - Be enthusiastic about your work
 - Remember you are representing your entire university, act appropriately
 - Get to know your fellow REU students – they could be lifelong friends/colleagues
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After the REU or other research experience

- Keep in contact with your REU advisor, graduate/post doc mentor throughout the upcoming year; they are future recommenders hopefully
 - Send a formal thank you to your advisor and any other mentors
 - Present your work at your home institution
 - Use what you learned in your own undergraduate research
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NIST

You need to apply through your university research office

Locations: Boulder, CO (May 19-Aug. 1, 2014) or Gaithersburg, MD (May 27-Aug. 8, 2014)

S. Burkett – UA contact

Deadline Feb 14, 2014

<http://www.nist.gov/surfgaithersburg/>

OR

<http://www.nist.gov/surfboulder/>



NASA

Provides internships three times a year (spring, summer, fall)

See intern.nasa.gov



Department of Energy

Look at the labs:

- Oak Ridge National Laboratory
- Argonne National Laboratory
- Sandia National Laboratory
- Pacific Northwest National Laboratory
- Los Alamos National Laboratory

Search for summer internships



Department of Defense

<http://www.dsss.mil> OR


Look at Gov. labs:

- Air Force Research Laboratory
- Army Research Laboratory
- Naval Research Laboratory

OR

Department of Homeland Security

(www.orau.gov/dhsinternships/)



Present your research or come watch!
**UA's Annual Research and Creative Activity
Conference**

April 17, 2014
Bryant Conference Center
Judged with awards



Tips

- Apply to multiple programs because they are competitive but take time to choose the programs
 - Look at the research not only the location (most desirable locations probably the most competitive)
 - Use Career services for help with resume, personal/research statements
 - Ask advice about anything you are unsure of before proceeding
 - If you are successful, please let us know
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Make the most of it!



Lake Lurleen



Birmingham Civil Rights Institute



Bama
Lanes

UA REU 2011
Poster Session

