

Undergraduate Research

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Undergraduate research

- Why is it important
- Things to consider when looking for a position
- Where to look in Boulder
- Where to look outside Boulder
- Applying
- Q&A with UG researchers



Who are UG researchers?

- They are diverse
- They are mainly juniors and seniors
- They are more likely to have been interested in STEM since they were kids
- They have more realistic (and more ambitious) expectations for STEM careers
- They are more likely to pursue a STEM career

Source: National Science Foundation



How are UG researchers seen?

- Mature (intellectually and otherwise)
- Adventurous
- Creative
- Determined
- Confident
- Self-directed and motivated
- Active learners

Actualization of Scientific Potential....



Why is UG research important?

- Gives you a credible sense of the research process
- Offers a 'hands-on' experience
- Allows you to explore different fields at relatively little cost
- Allows you to experience research programs and models outside of your home institutions
- Arms you with additional skills and experience
- Allows you to experience the 'culture of science', including professional meetings, etc.
- Can result in specific scientific products



Why is UG research important?

- Helps you decide if you a research career may be right for you
- Helps you decide what fields you are and are not interested in
- Unofficial requirement for grad school admission
 - Letters of recommendation



Things to consider

- What kind of work? Instrumentation, experimental, data analysis, modeling...
 - Consider your skills
- What kind of science?
 - Try several fields
- Do you need to get paid?
 - Volunteering can be good to get your feet wet



Things to consider

- Home Institution or Away?
 - Away is ideal for summers
 - Diversity of letters of recommendation (you'll need 3-4)
- Continuous work over school year or shorter more intensive experience?
 - Feel free to end a project
 - Think letters of recommendation
- How many different projects
 - Diversity vs. depth of letters
 - Opportunities for conferences, publications



Where to find in Boulder

- Ask faculty
 - Find out what group you're interested in
 - Office hours, colloquia, seminars, websites
 - APS faculty research: Mondays 3:00-3:45 pm, Duane E126
 - Physics faculty research: Mondays 12-12:50 pm, 11th floor Gamow Tower
 - Contact professor
 - Do your homework
 - List of skills, courses taken, transcript, CV
 - Paid positions vs. volunteer



Where to find in Boulder

- UROP (<http://www.colorado.edu/UROP/>)
 - Money for undergrad research projects – work w/ a professor to make a proposal
 - Deadline for spring December 1 (September for teams)
 - Deadline for summer March
- CU-connect (www.CUConnect.Colorado.edu)
- LASP website lists UG research positions



Where to find in Boulder

- Colorado Space Grant Consortium
- <http://spacegrant.colorado.edu/>
 - Projects building instruments
 - Students usually join a project at the beginning of semester, but it is possible to join mid-semester



Where to find in Boulder

- Local Federal Labs
 - NIST, NOAA, NCAR
- Local companies
 - Lockheed Martin, Ball Aerospace, Southwest Research Institute



Where to find outside Boulder

- NASA's Undergraduate Student Research Programs (USRP)
- <http://www.epo.usra.edu/usrp/>
 - 10 (summer, \$6000) and 15 (spring, \$9000) week opportunities at NASA centers across U.S. for sophomores/juniors/seniors
 - Spring 2011 deadline October 31, 2010
 - Summer 2011 deadline January 2011



Where to find outside Boulder

- National Science Foundation's Research Experience for Undergrads (NSF's REU) programs
- <http://www.nsf.gov/crssprgm/reu/>
 - Administered by individual sites and requirements vary
 - Search by field and/or state
 - Deadlines vary, October through February



Where to find outside Boulder

- Pathways to Science
- <http://www.pathwaystoscience.org/Summerresearch.asp>
 - Searchable database of REUs and other undergraduate research opportunities throughout U.S.
- Other services
 - Professional Newsletters (CEDAR, AGU SPA)
 - Professional Societies (GSA, AGU, AAS, AMS, AAAS)
 - These also have info on meetings and student travel grants to attend them



Some alternatives

- CU Career Services
- Denver Museum of Nature and Science
- Fiske Planetarium
- Sommers-Bausch Observatory

Applying

- Letters of recommendation
 - Think carefully!
 - Allow time for deadlines, remind as necessary
- Essay
 - Avoid common clichés
 - Use the Writing Center
- Transcript
 - Required for apps, useful to show profs
- CV (more on next slide...)
 - Sometimes required for apps, useful for emailing to profs
- What skills do you have?
 - Computing, electronics, mathematics



CV

- All of your academic career
 - Courses taken, major GPA
 - Awards, honors
 - Societies, memberships
 - Leadership positions
 - Jobs and research experience
 - Paid and volunteer
 - Conferences/talks/posters/publications
 - Skills
 - Programming languages, lab or observational skills, foreign languages, etc.
- Related to your field
- Complete – can be pared down for other purposes



Deadlines are approaching

- Investigate **now** – deadlines for summer programs are October through February
- BB session on how to put together a strong application
- BB hands-on workshop for polishing applications



Beyond Boulder website

<http://beyondboulder.pbworks.com>