

APS Undergraduate Research Opportunities Symposium

Part 1: REU's, UROPS & Independent Study

All documents, recordings and
application form posted [here](#)

11 November 2025 | 5:00pm | Duane G1B20
John Keller, Nick Schneider & Zach Berta-Thompson
ASTR/PHYS Professional Development

UROP's, Independent Study, Courses and REU's

<u>Are you ready for research?</u>	Nick Schneider
<u>UROP and Independent Study</u> <u>ASTR 3400 Research Methods</u> <u>ASTR 3560 Instrumentation</u>	John Keller John Keller John Keller
<u>Research Experience for Undergraduates & the Boulder Solar Alliance REU</u> <u>REU listings</u>	Willow Reed Nick Schneider

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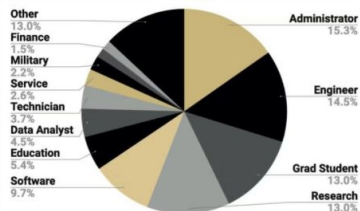
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Professional Development

Job Categories for APS Alums



Where APS Can Take You

Most Common Career Paths:

- **Research & Academia** (24%)
- **Aerospace & Engineering** (15%)
- **Administration** (15%)
- **Software & Data Science** (10%)
- **Education** (5% in K-12, outreach)

Click [here](#) to see the full brochure on career paths for APS grads!

APS/PHYS Professional Development is a resource for undergrads in fields related to physics and astronomy at CU Boulder. This website includes resources and information designed to help undergraduates in APS/Physics develop successful long term careers. Navigate with the following main sections:

Events for the 2025-2026 Academic Year:

21 October, Graduate School: slides, recording

5 November, Getting Involved in Physics Research: slides, recording

11 November, ASTR Undergraduate Research Opportunities Symposium: slides, recording

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Research Opportunities

Participating in scientific research can be a highly valuable and rewarding part of your undergraduate education here at CU. Many students develop their interests, skills and contacts by working on one or more projects during their time at university.

Working in a research program can also be a significant help in ensuring success in your post-graduation plans. Research experience is highly recommended for those who are considering post-graduate academic programs, and can help you decide whether this is the right path for you. For any career path, a research advisor can provide letters of reference and valuable contacts. Being able to describe your research accomplishments can make your résumé a standout when applying for nearly any type of job after graduation.

Are you Ready for Research?

Students typically start to acquire useful skills, solidify their understanding of foundational math and physics concepts, and hone their interests after at least a year in our major. Below is a list of things you should consider, and steps you can take to help you get started.

You should keep in mind that finding research work may be competitive, and that resources may be tight (time for supervising your work, as well as pay). You will likely have to be patient and persistent to find a good match to your skill set and interests.

1. **Is your academic record solid?** If your GPA (either cumulative or in your math and science classes) is less than about 2.7-3.0, we STRONGLY suggest that you postpone an extracurricular activity like research until you can improve your grades. We offer free homework help rooms and other tutoring and mentoring support. Please talk to your academic advisor AND your APS mentor about resources you can access to boost your academic performance.
2. **Do you have useful research skills?** Many research jobs require computer programming and data analysis skills, and so we highly recommend taking ASTR 2600 (Computational Techniques) or an equivalent programming class before you start looking for a research project. ASTR 3800 (Data Analysis and Computing) can also build relevant skills, as can ASTR 3510/20 (Observations and Instrumentation), engineering and writing classes. Pre-professional work can also take the form of being a Learning Assistant or participating in the wide range of outreach, teaching and tutoring opportunities here at CU. Beyond Boulder is a program to help you explore the many career paths you might make, and help you identify the skills you should master in college. The schedule for this weekly series is [here](#), and is also emailed to all majors.
3. **Polish your résumé.** A good résumé can serve as an introduction to a potential supervisor and you should have one handy when starting to look for a project. Make sure your skills (above) are highlighted, as well as the relevant classes you've completed and your grades in them. Here is a sample [résumé](#) for your reference.

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Are you ready for research?

Some Resources

<https://www.colorado.edu/aps/undergraduate-students/ready-research>

My Official Firstname (alternatename) LastName

My address in Colorado

Email: myofficial.cuaddress@colorado.edu

Education

Previous college-level education (CC, transfer, etc.)

Semesters or dates

Major in ASTR, whichever track, Other majors, minors

Expected graduation date:

GPA (mandatory!): overall and in major, if available

Experience (list all relevant)

Research Assistant, Institution or Dept.

Semesters or dates

what you did in three or four words

Supervisor:

Tutor, grader, LA, other teaching, Dept.

Semesters or dates

Topics, in a few words

Supervisor:

Other relevant volunteer or paid work,

Semesters or dates

incl. relevant extra-curriculars (CUAC, STARS, Fiske, SBO)

Topics and activities in a few words

Research Skills

Computer skills, computer courses taken (grade)

Data analysis skills including statistics, relevant courses taken (grade)

Experience with telescopes: which, what did you do, relevant courses (grade)

Laboratory or other useful skills, relevant courses taken (grade)

Awards and Recognition

Scholarships for CU or other colleges

Awards or other recognition at the college level

Other skills (if space): Something that makes you stand out

Bass player for heavy metal band

Chain-saw certification

Fluent in Serbo-Croatian

Reference: email@colorado.edu

Someone at CU who has agreed to be your reference. Can be mentor, instructor who knows you well



UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM

[COLORADO.EDU/UROP](https://colorado.edu/urop)

OVERVIEW

We offer funding options, or grants, for students and faculty to develop projects in all areas of study and professional practice. Most undergraduates and faculty members are eligible for UROP funding, and we encourage you to contact us with questions.

TIMELINE

We fund projects throughout the year in two "grant terms," but applications are awarded annually in the spring. Students can check for "Open Opportunities" on our website and explore more in the Curiosity Lab at any time.

STUDENT GRANTS

ASSISTANTSHIPS (\$1,000-2,000) provide funding to students to partner with a faculty mentor to help on an existing project.

INDIVIDUAL GRANTS (\$1,500-3,000) allow students to take ownership of part or all of a project with an original proposal.

Applications due 13 Feb, 2026.

Check the website for details!

Research Experience in Independent Study

- Earns academic credit but is not paid
- Usually 1-2 credits
- Research project jointly developed with a faculty* advisor
- Projects last one semester, with regular meetings through the semester
- Similar process to UROP, but less formal

* CU researchers serve as faculty research advisors

ASTR 3400: Research Methods

(Prof. Jason Dexter)

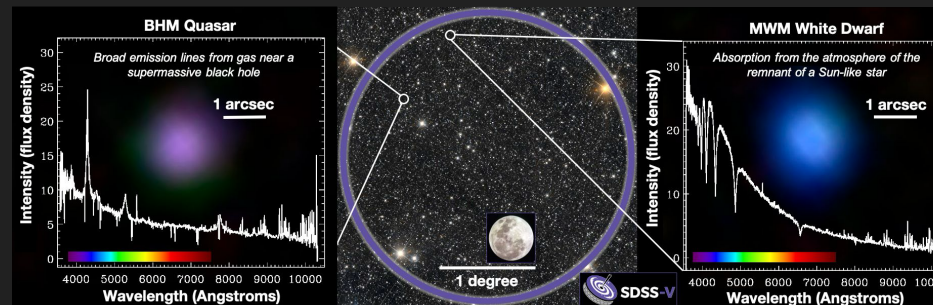
Purpose: Gain hands-on research experience in the classroom through guided project-based learning

Topics covered: Scientific computing, data processing and analysis, numerical modeling, back-of-the-envelope calculations, reading the scientific literature, peer review, science communication, *and more!*

Focus for Spring '26: Quasars and friends, using the Sloan Digital Sky Survey data

Previous terms have focused on: solar physics, black hole observations with EHT, asteroid occultation measurements, planetary remote sensing

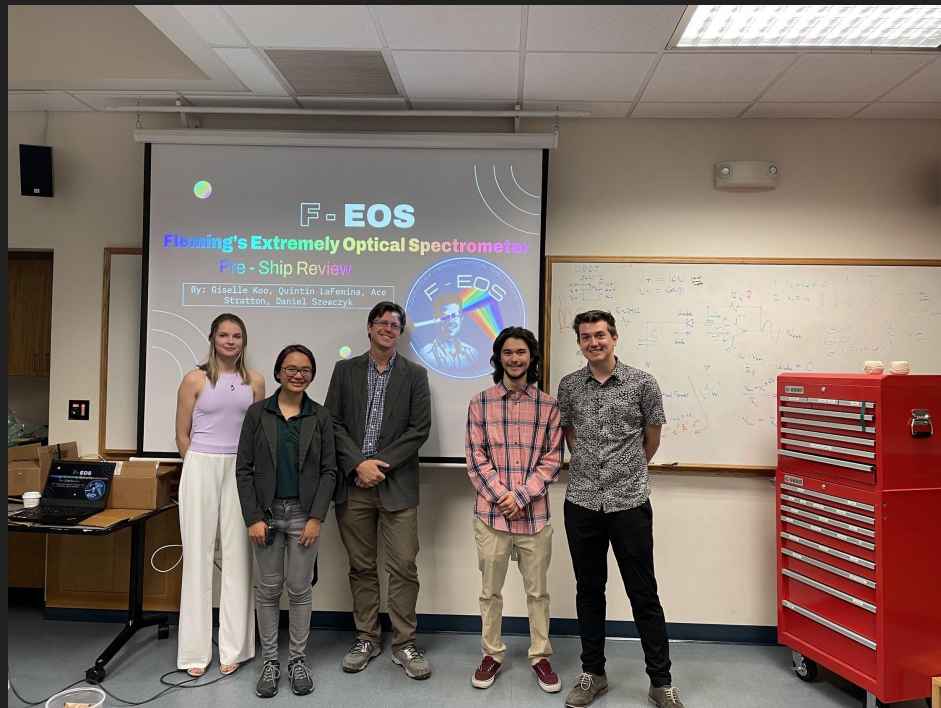
Prerequisites: ASTR 1040, PHYS 1125 or 1120, pre- or co-requisite of ASTR 2600 or PHYS 2600 (all minimum grade C-)



So you think this is a little cool but aren't sure you want to join a space mission and/or work at a big ground-based observatory?
(then take a class...)

ASTR 3560

- Learn about optics!
- Play with lasers!
- Build your own detector!
- Project-based class – minimal lectures, lots of doing!
- No experience necessary – we will teach you how to understand astronomical instruments!
- You will leave this class with experience with experimentation and testing and exclamation points!



The first team ever (plus Professor) to build a spectrometer to measure the solar spectrum – F-EOS 2022

Can you be the second?

Research Experience for Undergraduates (REU) Programs

- The Research Experiences for Undergraduates (REU) program **supports active research participation by undergraduate students (enrolled Fall 2025) in any of the areas of research** funded by the National Science Foundation.
- REU projects **involve students in meaningful ways** in ongoing research programs or in research projects specifically designed for the REU program.
- These are **paid** research opportunities and the **REU site may be at either a US or foreign locations.**
- Undergraduate students supported with NSF funds **must be citizens or permanent residents of the United States** or its possessions.
- **Astronomical Sciences**, Chemistry, Earth Sciences, Materials Research, **Physics**, STEM Education, and more!



NSF's REU Sites Search

ETAP



NSF Education and Training Application

- New application system from the NSF
- Common application - allows you to apply to multiple programs in one application.
- Most questions are standard for federally funded programs.
- Each program can add their own questions.
- **Not all REUs are on this system!**

My advice on applying to REUs (or anything really)

Make it clear why you want to be part of that specific program!

- You could be applying for a lot of great reasons - such as bettering your resume - but that can be achieved with any program. Why this one?
- CU Boulder offers a lot of research opportunities. Why are you applying for this REU over finding research at CU?

Start your applications early and give plenty of time to your references!

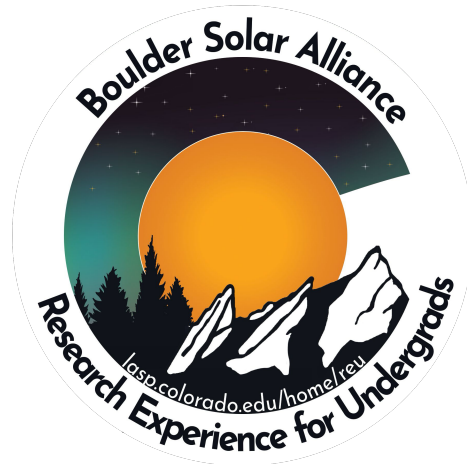
- Most applications are due between January - March, with references due around the same time. Don't wait until the last minute!

Don't be afraid to apply!

Boulder Solar Alliance REU Program

- A **10 week paid research summer program** where students get to work on a research project with a mentor.
- The topic areas span the **field of solar and space physics**; the Sun, the Sun-Earth system, the near-Earth environment, the heliosphere, and more.
- The **BSA REU works in partnership with several institutes around Boulder**, including LASP, NSO, HAO, NOAA, and more!
- Applicants **do not** need prior research or coding experience to apply.

Applications due January 21st!



BSA REU Website

Summer REU Opportunity Listings

NSF REU's:

Astronomy: https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=5045

Physics: https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=69

APS information:

<https://www.colorado.edu/aps/undergraduate-studies/research-opportunities/research-and-internship-opportunities>

American Astronomical Society (AAS) information

<https://aas.org/careers/internships-summer-jobs>

Division for Planetary Sciences (AAS/DPS) information

<https://dps.aas.org/education/reu-programs>

(most planetary programs are not NSF-funded and do not appear in other listings)

Deadlines are coming up! Competition is strong. But go for it!

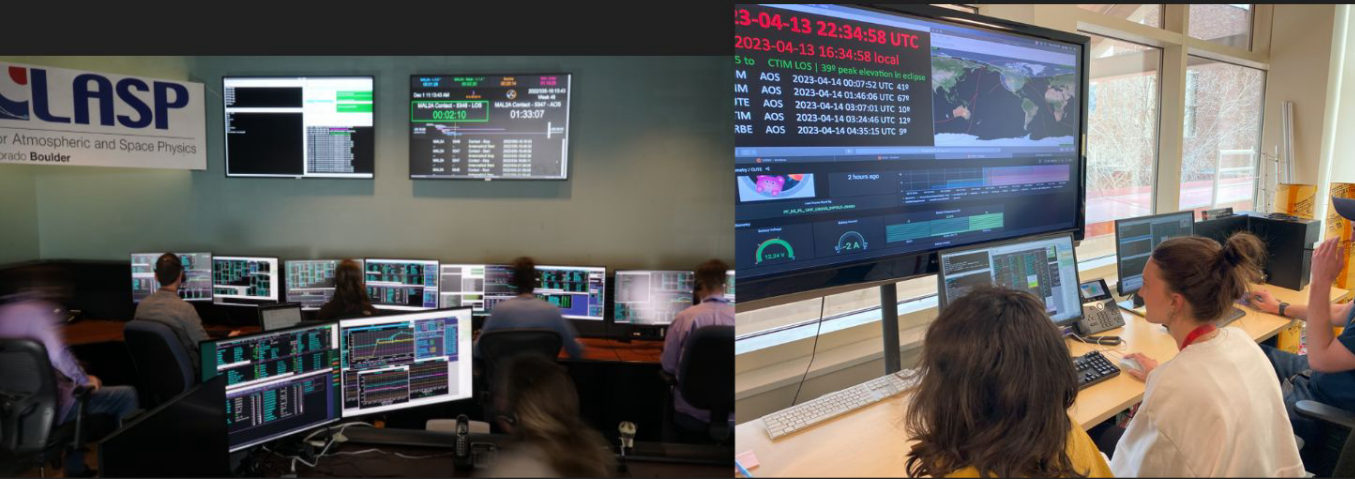
LASP Spacecraft Mission Operations: Command Controller

Do you want to operate spacecraft?

CU's Laboratory for Atmospheric and Space Physics is hiring students for its Space Flight Operations Team. LASP operates multiple NASA missions, several payloads and SmallSats, and new projects that are in development!

Job Responsibilities:

- Pre-launch environmental testing
- Real-time spacecraft operations
- Telemetry trending analysis
- Anomaly detection and resolution
- Process automation



The Program

- Rigorous summer training
- Assigned to missions/subsystems
- 20 hrs/wk school year, 40 hrs/wk summer

Requirements:

- Full-time CU student, 3.0+ GPA
- Any major!
- At least 4 *undergrad* semesters remaining to commit to working at LASP (long-term position)
- Time commitment
- US Citizen or Permanent Resident

Logistics:

- Paid position
- Starts May 2026
- Application: resume, cover letter, unofficial transcript

Applications will open in January 2026 with info at

<https://lasp.colorado.edu/careers/>



Contact Info:

Adrienne Pickerill, Flight Controller: adrienne.pickerill@lasp.colorado.edu

Robby Mendoza, Student Manager: raymond.mendoza@lasp.colorado.edu

Fiske Student Employment Opportunities

- Paid Student Positions at Fiske
 - Ushering
 - Ticketing
 - Navigating
 - Presenting
 - Producing
- To express interest in hiring opportunities
 - tinyurl.com/JoinFiske
 - Hiring typically in Jan, May, and Sept



APS Undergraduate Research Opportunities Symposium

Part 2: 1-on-1 research internship opportunities

All documents, recordings and
application form posted [here](#)

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1-on-1 Research Mentorship Positions: 20+ Opportunities!!

[Common Application](#) for all opportunities. All majors welcome. Deadlines may vary.

- Some of the projects are already grant-funded
- Most projects can be carried out for Independent Study credit
- Most projects are eligible for UROP support this coming summer, if you write a successful proposal in February. SwRI projects aren't included :-(
- Some additional projects will be supported by a \$3000 APS Department "Undergrad Research Stipend" (APS majors only, priority to first-time researchers)

When you are interviewed for the positions, you can discuss which is the best path forward

Common Application for APS/PHYS UROS research positions

Use this common application to apply for positions as advertised at the Undergraduate Research Opportunities Symposium.

nick@colorado.edu [Switch account](#)



The name, email, and photo associated with your Google account will be recorded when you upload files and submit this form

* Indicates required question

Email *

☐ Record nick@colorado.edu as the email to be included with my response

Name *

Your answer

Email (if different than account linked above)

Your answer

Student ID # (9 digits) *

[Apply at https://forms.gle/67eQFgXX4xWF9VKX6](https://forms.gle/67eQFgXX4xWF9VKX6)

Major(s) (include emphasis/track if applicable) *

Your answer

Please check all the positions you would like to be considered for: *

- ☐ John Keller (APS) - Studying Trojan Binarity through Stellar Occultations
- ☐ Dang Pham (APS) - Implementing gravitational structures in REBOUND
- ☐ Zach Berta-Thompson (CASA) - Slitless Spectroscopy of Exoplanets and Solar System Objects from SBO
- ☐ Olivia Cooper (CASA) - The evolution of dust properties in distant, massive galaxies with JWST + ALMA
- ☐ Stephen Majeski (JILA) - Modeling plasma micro-physics in galaxy clusters and around black holes
- ☐ Fran Bagenal (LASP) - Analysis of Data from Juno Mission in Jupiter's Magnetosphere
- ☐ Dave Brain (LASP) - MAVEN data analysis and/or Retention of Habitable Atmospheres
- ☐ Eryn Cangi (LASP) - Improving Mars and Venus atmospheric modeling with new chemistry and transport
- ☐ Chihoko Cullens (LASP) - Studying Atmospheric Coupling Process
- ☐ Yaxue Dong (LASP) - Studying Mars' pickup ion plume rotation based on multi-spacecraft observations
- ☐ Harish (LASP) - Unveiling the Composition of Asteroids through Near-Infrared Spectroscopy
- ☐ Kevin McGouldrick (LASP) - Improved Radiative Transfer to support studies of the