ASTRONOMY...NOW WHAT?

Check out the American Astronomical Society and the American Institute of Physics for more information on careers in astronomy.

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A Ph.D. in physics, astronomy, or a related field is needed for most jobs, especially those in basic research or in independent research in industry. A typical Ph.D. program takes about five to seven years to complete. After receiving a Ph.D. in physics or astronomy, many begin their careers in a temporary postdoctoral research position, which typically lasts 2 to 3 years.

WHAT ELSE CAN YOU DO WITH AN ASTRONOMY OR PHYSICS BACHELORS DEGREE?

- **Continue to an Advanced Degree**: The UMass Amherst Astronomy department offers an extensive program in astrophysics to prepare students who want to become professional astronomers. This includes a thorough background in physics, and advanced courses in astronomical observations and astrophysical theory.
- **Careers in the Space Sciences**: Many astronomy majors go directly into positions at NASA research centers and industry, after strong technical preparation in research, computing, and laboratory skills.
- **Science Teaching and other Careers**: Astronomy incorporates elements of all the sciences, providing an excellent basis for science education, science writing, and work at museums and planetariums. The skills of scientific deduction developed in astronomy even make it an interesting alternative to prepare for medical or law school.
- **Technician or research assistant in fields of astronomy, engineering, and computer science**
- **Support personnel at observatories** (for example NASA centers such as the Space Telescope Science Institute)
- **Medical doctor** (the science you take anyway make it fairly simple to fulfill pre-med requirements)
- **Lawyer** (astronomy majors understand complicated arguments from principle)
- **Business** (an astronomy background will make the quantitative parts of business school curriculum pretty straightforward)
WHAT DOES AN ASTRONOMER DO?

Astronomers typically do the following:

- Develop scientific theories and models to explain the properties of the natural world, such as atom formation
- Plan and conduct scientific experiments and studies to test theories and discover properties of matter and energy
- Write proposals and apply for research grants
- Do complex mathematical calculations to analyze physical and astronomical data, such as finding new planets in distant solar systems
- Design scientific equipment, such as telescopes and lasers
- Develop computer software to analyze and model data
- Write scientific papers that may be published in scholarly journals
- Present research findings at scientific conferences and lectures

Astronomers study the motions, compositions, origins, and other properties of planets, stars, galaxies and other celestial bodies. They use ground-based equipment, such as radio and optical telescopes, and space-based equipment, such as the Hubble Space Telescope, to make observations and collect data. Some astronomers focus their research on objects in our own solar system, such as the sun or planets, while others study distant stars, galaxies, and phenomena such as neutron stars and black holes.

If you are considering graduate school, be sure to find research opportunities as part of your undergraduate work.

Career Planning Resources & Websites
UMass Amherst CNS Career Center www.cns.umass.edu/careers
UMass Handshake Database of Internships & Jobs https://umass.joinhandshake.com/
FOCUS2 Career and Education Planning www.umass.edu/careers/planning for sign-in button
CNS Completed Research/Internships database https://secure.cns.umass.edu/webforms/internships
What Can I Do With This Major? https://www.umass.edu/careers/planning

(Click on “What Can I do with this Major” icon on the right-hand column.)

Careers in astronomy (AAS) https://aas.org/careers/career-in-astronomy
Career Profiles in astronomy (AAS) https://aas.org/careers/career-profiles
Being an Astronomer http://www.noao.edu/education/being-an-astronomer.php

Astronomy Internship Resources
Five-College Astronomy Undergraduate Internship Program https://www.astro.umass.edu/academics/five-college-astronomy-undergraduate-internship-program/

Physics Department Undergraduate Research Opportunities https://www.physics.umass.edu/undergraduate/research/opportunities

* Internship Advice and Opportunities (AstroBetter) https://www.astrobetter.com/wiki/Summer+Internships
AAS Internships/Scholarships (both REU and non-REU’s) https://aas.org/learn/internships-scholarships

NASA Internships and Fellowships https://intern.nasa.gov/

NASA/JPL Internship Programs https://www.jpl.nasa.gov/edu/intern/apply/

Space Telescope Science Institute Summer Program https://www.stsci.edu/opportunities/space-astronomy-summer-program

Department of Energy Science Undergraduate Laboratory Internship (SULI) Program https://science.osti.gov/wdts/suli

Caltech Summer Undergraduate Research (SURF) Program https://sfp.caltech.edu/programs/surf

MIT/Lincoln Lab Undergraduate Research Program and Internships https://www.ll.mit.edu/careers/student-opportunities/summer-research-program

UTRIP: The University of Tokyo Research Internship Program https://www.s.u-tokyo.ac.jp/en/utrip/overview/

ASIAA Summer Student Program https://www.asiaa.sinica.edu.tw/outreach/summerstudent.php

**Astronomy Job Search Resources**

UMass Handshake Database https://umass.joinhandshake.com/

National Science Foundation Research Experiences for Undergraduates https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=5045

Internships & Summer Jobs https://aas.org/careers/internships-summer-jobs

Careers in Astronomy https://aas.org/learn/careers-astronomy

AAS Astronomy Jobs https://aas.org/careers


Space Jobs in Europe https://www.hespace.com/vacancies

Astronomy/Astrophysics Jobs https://jobs.sciencecareers.org/jobs/astronomy-astrophysics/#browsing

Jobs in Optics and Photonics https://spiecareercenter.org/

Top 50 Consulting Firms http://www.stormscape.com/inspiration/website-lists/consulting-firms/


**For Graduate Students Only**

European Space Agency http://www.esa.int/About_Us/Careers_at_ESA

Eur Astro Society Non-academic Jobs http://eas.unige.ch/jobs.jsp


European Federation of Organisations for Medical Physics http://www.efomp.org/index.php/component/content/article/83-staticcontent/123-job-opportunities
IMPORTANT TRANSFERABLE QUALITIES TO INCLUDE ON YOUR RESUME (WHETHER YOU’RE PURSUING A JOB IN ASTRONOMY OR NOT

Advanced mathematical skills. Astronomers perform complex calculations involving calculus, geometry, algebra, and other areas of mathematics. They must be able to express their research in mathematical terms.

Analytical skills. Astronomers need to be able to carry out scientific experiments and studies. They must be precise and accurate in their analysis because errors could invalidate their research.

Critical-thinking skills. Astronomers must carefully evaluate their own work and the work of others. They must determine whether results and conclusions are based on sound science.

Interpersonal skills. Astronomers must collaborate extensively with others—in both academic and industrial research contexts. They need to be able to work well with others towards a common goal.

Problem-solving skills. Astronomers use scientific observation and analysis to solve complex scientific questions.

Speaking skills. Astronomers present their research at scientific conferences, to the public, or to company management and other employees.

Writing skills. Astronomers write reports that may be published in scientific journals. They also write proposals for research funding.

Some information taken from Occupational Outlook Handbook and Dartmouth College Department of Physics and Astronomy

What Do Employers Look For? (NACE 2020 Job Outlook for Students)