

Astrophysics, PhD

LAASTPHPHD

Work with world-class faculty, including theorists, observers and instrumentalists, on NASA- and NSF-funded projects to discover new planets, trace the evolution of stars and galaxies, explore the origin and development of the universe, build spaceflight hardware and design instruments for telescopes and satellites.

Program description

Degree awarded: PHD Astrophysics

The PhD program in astrophysics develops creative scholarship in students and prepares them for professional careers in astrophysics, astronomy or related fields.

Students in this program take graduate-level courses in stars and interstellar media, galaxies and cosmology; obtain quantitative skills through analysis and modelling; may have observing opportunities through regional and international telescope observatories; and conduct independent, fundamental astrophysical research. Graduate students work closely with a research advisor on a wide range of topics including theoretical physics, cosmology, galaxy dynamics, stellar evolution, exoplanets, and the development and building of instrumentation.

Graduate students in astrophysics become leaders in observational and theoretical research. They participate in NASA- and NSF-funded space missions and study topics such as how stars are born and die, how galaxies interact and evolve, and how the universe changed as it developed from its earliest beginnings.

The program's world-class faculty have research expertise across the full breadth of astrophysics including the solar system, stars and galaxies from the Milky Way and the most distant galaxies in the universe. Current ASU research applies both computational and observational approaches to the exploration of a range of topics such as fundamental cosmology and whether there is life on exoplanets.

At a glance

- **College/School:** [The College of Liberal Arts and Sciences](#)
- **Location:** [Tempe](#)

Degree requirements

84 credit hours, a written comprehensive exam, an oral comprehensive exam, a prospectus and a dissertation

Required Core (1 credit hour)

SES 502 Exploring SESE Research (1)

Electives or Research (53 credit hours)

Other Requirements: Astrophysics Sequence (9 credit hours)

AST 521 Stars and Interstellar Medium I (3)

AST 522 Stars and Interstellar Medium II (3)

AST 591 Seminar: Astrophysics (2)

SES 501 SESE Colloquium (1)

Other Requirements: Galaxies and Cosmology Sequence, pick one (3 credit hours)

AST 531 Galaxies and Cosmology I (3)

AST 532 Galaxies and Cosmology II (3)

AST 533 Galaxies and Cosmology III (3)

Other Requirements: Exoplanets and Planetary Science Sequence, pick one (3 credit hours)

AST 598 Topic: Origins of Solar Systems (3)

AST 598 Topic: Exploring Exoplanets (3)

SES 598 Topic: Water in the Solar System (3)

Other Requirements: Instrumentation and Techniques Sequence, pick one (3 credit hours)

AST 552 Astronomical Instrumentation and Data Analysis (3)

SES 598 Topic: An Introduction to Astro-statistics (3)

SES 598 Topic: Spectroscopy for Astrophysics (3)

SES 598 Topic: Introductory Radio Astronomy (3)

Culminating Experience (12 credit hours)

SES 799 Dissertation (12)

Additional Curriculum Information

When approved by the student's supervisory committee and the Graduate College, this program allows 30 credit hours from a previously awarded master's degree in a related field to be used for this degree.

Substitutions for Other Requirement courses may be made per department approval.

Admission requirements

Applicants must fulfill the requirements of both the Graduate College and The College of Liberal Arts and Sciences.

Applicants are eligible to apply to the program if they have earned a bachelor's or master's degree in any field from a regionally accredited institution.

Applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in the last 60 hours of their first bachelor's degree program, or they must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in an applicable master's degree program.

All applicants must submit:

1. graduate admissions application and application fee
2. official transcripts
3. statement of purpose
4. three letters of recommendation
5. proof of English proficiency

Additional Application Information

An applicant whose native language is not English must provide proof of [English proficiency](#) regardless of their current residency.

Tuition information

When it comes to paying for higher education, everyone's situation is different. Students can learn about [ASU tuition and financial aid](#) options to find out which will work best for them.

Application deadlines

Fall

Spring

[expand](#)

[expand](#)

Career opportunities

Professionals with expertise in astrophysics are in high demand across all sectors and industries, including remote sensing, data science, instrument building, computational science, defense industries and scientific research. Coding and numerical modeling skills translate across many domains, even beyond astrophysics. Skills in the measurement and analysis of data related to the physics, chemistry and structure of the universe and exoplanetary systems are valuable to businesses and institutions relying on data-driven strategies to explore beyond the Earth and solar system.

A doctoral degree in astrophysics is required for some careers in post-secondary education and research.

Career examples include:

- astrophysics professor
- data scientist
- instrument builder
- project manager
- research astronomer
- telescope operator

Contact information

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