

# ASTRONOMY

## Program Information

The Astronomy Department offers graduate programs leading to the M.S., M.S.T. or Ph.D. degrees in astronomy. Requirements for these degrees are given in the Graduate Degrees (<http://gradcatalog.ufl.edu/graduate/degrees/>) section of this catalog.

**Planetary Systems:** Observational and theoretical studies concentrate in the areas of planet formation, the dynamical evolution of planetary systems and the detection and characterization of extrasolar planets. Members of the department are active in Kepler Mission and ground-based Dopple surveys to identify extrasolar planets. Researchers are also active in studying the origins and orbital evolution of interplanetary dust and small bodies in the solar system and around nearby stars.

**Stellar populations:** Observational studies concentrate on resolved stars in the Milky Way and nearby galaxies. Studies of particular classes of stars include various types of binary stars and blue stragglers. The goal of these studies is to apply our theoretical understanding of stellar structure and evolution to the properties of stars in a variety of environments.

**Origins of stars and planets:** Observational studies focus on the properties of giant molecular clouds, the collapse of molecular cloud cores, the formation of stars in clusters and in isolation, and the formation and evolution of circumstellar and protoplanetary disks. The department is active in several star formation surveys, involving many international ground- and space-based facilities. Theoretical studies emphasize the development of analytic models and numerical simulations, as well as their testing against observational constraints.

**Structure and evolution of galaxies:** Observational programs use multi-wavelength photometry of stars and star clusters in galaxies throughout the Local Group and in nearby groups, including the Milky Way, to study galaxy evolution. Other observations focus on the structure and dynamics of galaxies and their interstellar medium using neutral hydrogen (HI) and molecules such as carbon monoxide.

**Extragalactic astronomy and cosmology:** Observational programs investigate the nature of ultra-luminous galaxies, active galactic nuclei (AGNs), and the formation and chemical evolution of distant galaxies and clusters of galaxies. Theoretical investigations focus on the emission/absorption features in AGN spectra, the star-formation and chemical-evolution properties of galaxies, and applications of general relativity and particle physics to conditions in the very early universe.

**Instrumentation programs:** The UF Infrared Astrophysics Laboratory is a world leader in designing and constructing advanced near-infrared and mid-infrared instrumentation for major telescopes around the world, including the 8m Gemini North and South Telescopes and the 10m Gran Telescopio Canarias. Instrumentation is also developed in the area of high precision Doppler techniques for planet searches and the development of high contrast imaging techniques for direct imaging of extrasolar planets.

**Computing facilities:** The Astronomy Department maintains a network of high-performance computers running Linux and OS-X. The local network is maintained by a full-time systems manager. Astronomy students have access to supercomputing facilities maintained by the UF High

Performance Computing Center, including thousands of CPU cores with high-performance networking.

## Degrees Offered

### Degrees Offered with a Major in Astronomy

- Doctor of Philosophy
- Master of Science
- Master of Science in Teaching

Requirements for these degrees are given in the Graduate Degrees (<http://gradcatalog.ufl.edu/graduate/degrees/>) section of this catalog.

## Courses

### Astronomy Courses

Code	Title	Credits
AST 6112	Solar System Astrophysics	3
AST 6215	Stars and the Galaxy	3
AST 6245	Stellar Atmospheres and Radiative Processes	3
AST 6309	Galaxies and Cosmology	3
AST 6336	Astrophysics of the Interstellar Medium	3
AST 6725C	Fundamentals of Observational Astronomy	3
AST 6905	Individual Work	1-6
AST 6925	Departmental Colloquium	1
AST 6935	Frontiers in Astronomy	1
AST 6936	Astronomy Journal Club	1
AST 7939	Special Topics	2-4
AST 7979	Advanced Research	1-12
AST 7980	Research for Doctoral Dissertation	1-15

### Astronomy Departmental Courses

Code	Title	Credits
AST 6112	Solar System Astrophysics	3
AST 6215	Stars and the Galaxy	3
AST 6245	Stellar Atmospheres and Radiative Processes	3
AST 6309	Galaxies and Cosmology	3
AST 6336	Astrophysics of the Interstellar Medium	3
AST 6725C	Fundamentals of Observational Astronomy	3
AST 6905	Individual Work	1-6
AST 6925	Departmental Colloquium	1
AST 6935	Frontiers in Astronomy	1
AST 6936	Astronomy Journal Club	1
AST 7939	Special Topics	2-4
AST 7979	Advanced Research	1-12
AST 7980	Research for Doctoral Dissertation	1-15

## Student Learning Outcomes

### Astronomy (PHD)

**SLO 1 Knowledge**  
Students identify, define and describe the fundamental astrophysics covered by the core curriculum in astronomy

**SLO 2 Skills**  
Students will conduct original, independent research in astrophysics

**SLO 3 Professional Behavior**

Students will write scholarly research that conforms to academic publishing conventions

Astronomy (MS)

SLO 1 Knowledge

Students will identify, define and describe the fundamental astrophysics covered by the core curriculum

SLO 2 Skills

Students will conduct supervised research in astrophysics

SLO 3 Professional Behavior

Students will communicate their research in oral presentations in a style appropriate for conferences

SLO 4 Professional Behavior

Students will write articles at the level of a conference proceeding based upon their research

## **Astronomy (MST)**

SLO 1 Knowledge

Students will identify, define and describe the fundamental astrophysics covered by the core curriculum

SLO 2 Skills

Students will effectively teach astronomy

SLO 3 Professional Behavior

Students will effectively communicate with their peers in a professional environment