

Goals

Our astronomy minor is geared toward developing astronomy as a lifelong hobby. Therefore, much of the course work is non-technical and uses a minimum of mathematics. Our aim is to provide students with all the background knowledge they need to read popular astronomy articles, to purchase and use their own telescope, to understand their relation to the Universe around them, and to teach these subjects to others. Students majoring in science education may find a minor in astronomy to be a useful asset in their careers.

Some students have used our astronomy minor in conjunction with a major in physics (or math, chemistry, or geology) as a jumping off point for a career in astronomy or a related field. Some jobs — for example technicians at observatories or at NASA — are available to astronomy minors with a B.S. degree. However, the "classical" career in astronomy — a professor or researcher — usually requires a Ph.D. in astronomy. An astronomy minor with a major in physics provides a solid start down that challenging but rewarding career path. If you would like to know more about career options and planning a career in astronomy, please contact us for more details.

Facilities

BGSU has a large, 114-seat planetarium that we use to simulate the nighttime sky. The room also features new advanced audiovisual equipment including two digital projectors and computers that we use to bring the digital presentations and the internet into the classroom. Many of our astronomy courses are taught in this room, and professional shows are run for the public each year in the Planetarium.

The BGSU Observatory includes a visual observation deck where students learn to identify the constellations and navigate their way around the night sky. Five 8-inch telescopes provide students with hands-on experience operating amateur-level equipment similar to that which they may buy themselves one day. The centerpiece of the Observatory is the computer-controlled 20-inch reflecting telescope — one of the largest available to undergraduates in Ohio. It is equipped with eyepieces for visual observing, photography equipment, and a state-of-the-art digital camera.

Activities

All of our astronomy minors can become involved beyond course work. Some work in the Stargaze Program teaching astronomy to other BGSU students at the Observatory. Some learn to operate the Planetarium and help present shows to the public. Others work at the Observatory obtaining research data with the 20-inch telescope — an exciting, early start to a career in astronomy.

Courses

The two "core courses," Astr 2010 and Astr 2120, provide a broad-ranging overview of astronomy, and we recommend they be taken first. The 3000-level courses focus on particular topics raised in the core courses. Students may study in-depth topics of particular interest by taking Independent Study courses. We recommend that students interested in a career in astronomy take the last three courses in the list.

Astr 2010 – Modern Astronomy: We investigate the birth and death of stars, including exotic phenomena like supernovas, pulsars, black holes, and x-ray stars. We describe the "Island Universes" called galaxies, and how they formed and change over time. We consider scientific theories of the origin of the Universe, including the evidence that supports them. Along the way, we highlight recent astronomical discoveries like the discovery of planets outside our solar system and the nature of dark matter. [A section of this course is available to students enrolled in the Honors Program.]

Astr 2120 – The Solar System: This course provides a descriptive overview of the Sun, the planets, and the small bodies of the solar system (asteroids, comets, etc.). We emphasize the processes governing the formation of the solar system and its change over time, and highlight how crewed and robot spacecraft have revolutionized our understanding of the solar system. We also discuss the history of astronomy, techniques for observing the sky with the unaided eye, the difference between astronomy and astrology, and the definition of science. [A section of this course is available to students in the Honors Program.]

Astr 2700 – Independent Study: This course allows a student to investigate astronomical topics of personal interest, usually one-on-one with a professor. At this level, the topics are non-technical and often involve library research. Some students choose to write term papers.

Astr 3050 – Life in the Universe: We investigate the possibility that life may exist on other planets in our solar system or on planets orbiting other stars. We discuss the methods being used to search for such life, and how we might communicate with other intelligent life. We also discuss the past and future movement of human life into space.

Astr 3070 – Understanding the Cosmos: This course focuses on the nature of the Universe. Black holes provide a vehicle for understanding how gravity is related to the structure of space and time. Observed properties like the universal redshift of galaxies, the clustering of galaxies into large scale structures, and the three-degree background radiation guide us toward theories of the formation of the Universe such as the Big Bang and steady-state models. Other observations allow us to predict the future and ultimate fate of the Universe.

Astr 3090 – Observational Astronomy: Students learn how to identify constellations, find their way around the sky using celestial coordinates, operate amateur-class telescopes, and run the Observatory's research-class 20-inch telescope. The hands-on approach includes obtaining photographic and digital images of astronomical objects. Students learn how to develop and print their photos, and how to process and display their digital images.

Astr 3210 – Recent Progress in Astronomy: This course covers recent astronomical discoveries in more technical detail than lower level courses. Physics, mathematical, and computing skills may be used to investigate topics like how planets around nearby stars are discovered, how we determine the ages and chemical make-ups of stars, and how our Galaxy formed.

Astr 4030 – Stellar Structure and Evolution: We describe the properties of stars from a technical standpoint, using physics to understand how stars shine, what they are like inside, and how they change over time. We investigate the end-states of stars, including red giants, white dwarfs, neutron stars, supernovas, and black holes.

Astr 4700 – Independent Study in Astronomy: This course serves as an introduction to technical research in astronomy. The student chooses a project in consultation with a faculty member. The project may involve observing with the 20-inch telescope, computer modeling, or analysis of laboratory data. Some projects result in a paper published in an astronomy research journal.

Contact

You can find more information at our department website — <http://physics.bgsu.edu>. Try the links including General Information, Planetarium, Research/Astrophysics, and more. If you have other questions, please contact us any time.

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