ASTRONOMY

In the Department of Physics and Astronomy

Assistant Professors Dale Kocevski and Elizabeth McGrath; Faculty Fellow Matthew Bayliss

Astronomy is one of the oldest sciences and deals primarily with developing an understanding of our origins on a cosmic scale. Students interested in graduate study in astronomy should complete the physics honors major, Astronomy 231, Astronomy 342, and one or more research projects in astronomy. The physics major is the most important part of graduate preparation for astronomy. Colby students with these credentials have always been admitted into graduate programs in astronomy or astrophysics.

Course Offerings

AS151s    Stars, Stellar Systems, and Cosmology  An introductory survey of modern astronomy, covering the solar system, stars and stellar evolution, galaxies, and cosmology, for students of both science and non-science backgrounds. The physical processes at work in the universe and the methods we use to learn about the universe will be emphasized. The use of mathematics at the level of first-year algebra is required. Fulfills the non-lab science requirement unless optional (one-credit) lab selected.  

Three credit hours.  

N. BAYLISS

AS172s    Extraterrestrial Life  Is Earth home to the only living organisms in the universe or should we expect life elsewhere? If extraterrestrial civilizations do exist, can we expect to make contact with them? We will focus on the clues to understanding the origins of life on Earth and its possible distribution throughout the cosmos. By the end of the course, you should be able to answer the following questions: How did Earth and the solar system form? Why is Earth habitable, but Venus and Mars are not? Are there other worlds that might support life? How many advanced civilizations might exist in our galaxy?  

Three credit hours.  

N. KOCEVSKI

AS231f    Introduction to Astrophysics  A general introduction based on topics needed for astrophysical research, accessible to all who are comfortable with calculus and computer analysis of data. Theoretical topics include celestial mechanics, continuous and line spectra, radiative transfer, star formation, nucleosynthesis, galaxy structure, and cosmology. Weekly labs alternate between afternoon and night. Students must be available Monday through Thursday evenings for five required observing labs held on clear nights to be selected by the instructor. Lecture and laboratory.  

Prerequisite: A working knowledge of introductory college-level physics and calculus, or concurrent enrollment in Physics 141 or 143.  

Four credit hours.  

N, Lb. BAYLISS


Four credit hours.

BAYLISS

AS342s    Galaxies and Cosmology  How did the universe as we observe it today come into existence? The physics behind the birth of the universe and its evolution over cosmic time, and an introduction to modern extragalactic astronomy and cosmology, i.e., the part of astrophysics that deals with the structure and evolution of the universe as a whole and its major constituents: dark matter, dark energy, galaxies, black holes, and large-scale structures. Topics include the Big Bang theory, composition of the universe, dark matter and dark energy, cosmic nucleosynthesis, and the formation and evolution of galaxies.  

Prerequisite: Physics 141 (or 143) and 145.  

Four credit hours.  

KOCEVSKI

AS491f, 492s    Independent Study  Individual topics or research in areas where the student has demonstrated the interest and competence necessary for independent work.  

Prerequisite: Permission of the Instructor.  

One to four credit hours.  

FACULTY