



Astronomy

Astronomy is a research field oriented toward the study of the fundamental nature of the universe, its origin and evolution, and the physical processes that take place in it. The gathering of observations, the search for consistent patterns, and the application of mathematics, physics, and other bodies of scientific knowledge all fall within the domain of the astronomer/astrophysicist. Astronomers carry out research activities to accomplish their goals. These activities include making observations with

ground-based telescopes and spacecraft, designing and building instruments, programming and use of computers for data analysis and theoretical investigations, and pursuing laboratory simulations. Education beyond the bachelor's degree—usually the Ph.D.—is required for placement in professional astronomy positions, but holders of the astronomy bachelor's degree may be found in teaching, business, government, and many other areas of employment.

SKILLS & ABILITIES

Astronomy students are in a unique position to develop a wide range of abilities and interests which may be translated to a variety of work settings. In addition to research skills specific to astrophysical investigation, concentrators develop technical and communication skills. Students may wish to consider combining the study of astronomy with courses in allied areas such as design of optical in-

struments or particle physics. In addition to preparing for a research career, students may tailor their concentration program to provide training for such employment areas as museum guide, technical writer, or computer programmer. A sampling of representative skills and abilities follows.

Investigative

- Defining a research problem
- Developing a research model
- Establishing hypotheses
- Gathering/analyzing data
- Evaluating ideas
- Seeing relationships among factors
- Drawing meaningful conclusions

Communication

- Developing and writing research proposals
- Reviewing astronomy literature
- Summarizing research findings
- Informing/explaining/instructing
- Preparing technical reports

Computational/ Mathematical

- Measuring distances/sizes/relationships
- Performing calculations
- Mathematical modeling
- Maintaining records
- Utilizing mathematical formulas

Technical

- Designing equipment
- Identifying and classifying materials/specimens
- Observing data/things
- Establishing and controlling experimental designs
- Designing/using computer simulations
- Using instruments

OCCUPATIONAL OPPORTUNITIES

Astronomy majors are prepared to succeed in a number of occupational areas. This selected list of occupations was compiled from information on Michigan graduates and from national data. For some of the occupations listed

below, such as special effects artist, additional skills or related training are desirable. Additional graduate study is generally required for those occupations marked with a • on the following list.

Research/Technical

- Telescope operator
- Instrument maker
- Photographer
- Research scientist
- Computer programmer
- Optical design specialist
- Mathematical technician
- Particle physicist

Government/Educational

- Professor
- Planetarium guide/lecturer
- Special librarian
- Museum exhibits planner
- Cartographer
- Military officer

Communication

- Technical writer
- Educational television advisor
- System support representative
- Information specialist
- Newspaper science writer
- Web site designer
- Web site administrator

Business

- Navigation equipment specialist
- Flight management analyst
- Special effects artist
- Sales, technical equipment
- Database analyst

CURRICULUM REQUIREMENTS

Prerequisites

Mathematics through Mathematics 216 (or equivalent)
Physics 140/141, 240/241, 242
Astronomy 221/222

General Requirements

Astronomy 361, 399, 421, 422, and 429
Mathematics 450 or 451; one of the following: 404, 454, 455, 554, or physics 451
Physics 401 405, 453; one of the following: 402, 406, 438, or 455

FOR MORE INFORMATION

For information about choosing a career, about graduate/professional school, internships, or job descriptions; and for library resources:

The Career Center
3200 Student Activities Building
764-7460
www.careercenter.umich.edu

For information about the concentration and degree requirements:

Department of Astronomy
830 Dennison Building
764-3440
www.astro.lsa.umich.edu

LS&A Academic Advising Center
1255 Angell Hall
764-0332