

# Astronomy and Astrophysics

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Department Website: <http://astro.uchicago.edu>

Astrophysics deals with some of the most majestic themes known to science. Among these are the evolution of the universe from the Big Bang to the present day; the origin and evolution of planets, stars, galaxies, and the elements themselves; the unity of basic physical law; and the connection between the subatomic properties of nature and the observed macroscopic universe.

## Program of Study

The Department of Astronomy and Astrophysics offers several courses that satisfy the general education requirement in the physical sciences. The six courses numbered in the 12000s present many options for choosing coherent two- or three-quarter sequences across a range of foundational topics, from the grand principles governing the universe and understanding its beginning, to the formation and evolution of stars and galaxies, and the search for habitable extrasolar planets. The courses include labs for engaging in astronomical inquiry through classical experiments, opportunities for telescope observing, and data analysis. Quantitative analysis will be an important part of these courses; however, any tools needed beyond pre-calculus algebra will be taught as needed.

For students seeking a more in-depth examination of selected astrophysical topics, astronomy courses numbered in the 18000s are offered, usually to be taken in the student's second year or later. These courses are intended for students from throughout the College.

## Minor in Astronomy and Astrophysics

Non-science majors may pursue extended exploration of astronomical phenomena to complete the minor in Astronomy and Astrophysics. Students are allowed flexibility in selecting five courses to compose a rigorous program of study according to individual interest, with the requirement that their selection include at least two courses numbered in the 12000s and at least one in the 18000s. It is possible for a student pursuing the minor to substitute ASTR 29700 Participation in Research for one course numbered in the 18000s, if the student is able to make a suitable arrangement with a faculty member who agrees to supervise this effort.

There are no physics or math prerequisites for the minor. Students must meet with the academic affairs administrator before the end of Spring Quarter of their third year to declare their intention to complete the minor and fill out the College's Consent to Complete a Minor ([http://college.uchicago.edu/sites/college.uchicago.edu/files/Consent\\_Minor\\_Program.pdf](http://college.uchicago.edu/sites/college.uchicago.edu/files/Consent_Minor_Program.pdf)) form. Courses taken to satisfy the general education requirement in the physical sciences may not be counted towards the minor.

Courses counted toward the minor must be taken for quality grades (no P/F grading).

## Sample Program for the Minor

|             |  |     |
|-------------|--|-----|
| ASTR 12700  | Stars                                    | 100 |
| ASTR 12710  | Galaxies                                 | 100 |
| ASTR 12720  | Exoplanets                               | 100 |
| ASTR 18100  | The Milky Way                            | 100 |
| ASTR 18200  | The Origin and Evolution of the Universe | 100 |
| Total Units |  | 500 |

Students who satisfy their general education requirement in the physical sciences in Astronomy and Astrophysics may pursue the minor through completing the remaining courses numbered in the 12000s and at least one in the 18000s.

## Sample Program

**(when general education requirement in the physical sciences is taken in Astronomy and Astrophysics)**

|             |  |     |
|-------------|--|-----|
| ASTR 12600  | Matter, Energy, Space, and Time          | 100 |
| ASTR 12620  | The Big Bang                             | 100 |
| ASTR 12700  | Stars                                    | 100 |
| ASTR 12610  | Black Holes                              | 100 |
| ASTR 18200  | The Origin and Evolution of the Universe | 100 |
| Total Units |  | 500 |

## Study Abroad Program

Every Spring Quarter a three-course Astronomy program is offered in Paris, composed from the courses numbered in the 12000s that are offered on campus. This sequence is designed for non-science majors but may also be of interest to science majors who want to supplement their work in physics and chemistry with a quarter devoted to the cosmos.

The Astronomy program in Paris satisfies the general education requirement in the physical sciences. Students who have already completed their general education requirement in the physical sciences may count the three courses taken in

Paris toward the five required to satisfy the minor in Astronomy and Astrophysics. For details, see the Study Abroad (<https://study-abroad.uchicago.edu>) page for Paris: Astronomy (<http://study-abroad.uchicago.edu/programs/paris-astronomy>).

### Specialization in Astrophysics

The program leading to a BA in physics with a specialization in astrophysics is a variant of the BA in physics. The degree is in physics, with the designation "with specialization in astrophysics" included on the final transcript. Candidates are required to complete all requirements for the BA degree in physics, plus three courses in astrophysics (selected from ASTR 23900 The Physics of Galaxies, ASTR 24100 The Physics of Stars, ASTR 24300 Cosmological Physics, ASTR 25400 Radiation Processes in Astrophysics, ASTR 28200 Current Topics in Astrophysics), or two courses in astrophysics plus a senior thesis project in physics (PHYS 29100-29200-29300 Bachelor's Thesis) on a topic in astrophysics. If the latter option is chosen, the thesis topic must be approved by the program chair. (This thesis may simultaneously fulfill part of the requirements for honors in physics.) A grade of at least C- must be obtained in each course.

For details on the specialization in astrophysics, see the Physics section of this catalog.





#### Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Trajan.

Times was used instead of Palatino.

The editor may contact Leepfrog for a draft with the correct fonts in place.