ASTROCHEMISTRY

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Graduate Concentration: Astrochemistry
Participating Programs: Astronomy (PhD only) and Chemistry (PhD only)

Graduate Degree Programs

Astrochemistry is an interdisciplinary area of knowledge at the intersection between chemistry and astronomy. As a few examples, topics of active research in this area include identifying organic molecules in interstellar space, building models of the chemical reactions that occur in interstellar space, laboratory measurements of astronomically important molecules, searching for Earthlike planets using molecular signatures, and understanding the contributions of interstellar molecules to the chemical origin of life. In order to succeed in this field, students require training in both of the traditional disciplines of chemistry and astronomy.

The Astrochemistry graduate concentration (http://astrochemistry.illinois.edu) is intended for Ph.D. students in Chemistry or Astronomy who wish to gain the necessary background to perform original research in the emerging interdisciplinary field of astrochemistry. It is an addition to the Chemistry and Astronomy Ph.D. programs at Illinois and offers transcript recognition that will ensure that students are recognized as qualified by scientists in both traditional fields (chemistry and astronomy).

Admission

As the Astrochemistry graduate concentration (http://astrochemistry.uiuc.edu/concentration.php) is a part of the Chemistry and Astronomy Ph.D. programs, students should submit applications directly to either the Department of Chemistry (http://chemistry.uiuc.edu/graduates) or the Department of Astronomy.

Faculty Research Interests

A variety of faculty members in the departments of Chemistry, Astronomy, and Physics have research interests related to astrochemistry. A partial listing of research groups is available on the Astrochemistry concentration website (http://astrochemistry.illinois.edu/groups.php).

Facilities and Resources

Facilities that can be utilized by astrochemistry students in their thesis research include a wide variety of laboratory spectroscopy equipment in Chemistry, the Combined Array for Research in Millimeter-wave Astronomy, computing facilities in both Chemistry and Astronomy, and other national and international observational astronomy facilities.

Financial Aid

Financial aid in the form of teaching assistantships and/or research assistantships is generally provided for admitted students by the Departments of Chemistry and Astronomy.

The requirements for the Astrochemistry graduate concentration (http://astrochemistry.illinois.edu/concentration.php) are supplemental to the degree requirements of the Ph.D. in either Chemistry or Astronomy, and are summarized in the table below. For this concentration, at least 24 hours of graduate level coursework (at the 400- and 500- level) are required, of which at least 12 must be in chemistry courses and at least 12 in astronomy courses. A list of recommended courses is given on the Astrochemistry concentration website (http://astrochemistry.illinois.edu/concentration.php), but students may substitute other courses with consent of the Astrochemistry concentration steering committee.

All students in the concentration are required to take CHEM/ASTR 450, Astrochemistry, which may count toward either the astronomy or chemistry requirements. Students concentrating in astrochemistry should have at least one member from each department on their thesis committee.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate level Chemistry courses</td>
<td>12</td>
</tr>
<tr>
<td>Graduate level Astronomy courses</td>
<td>12</td>
</tr>
<tr>
<td>ASTR/CHEM 450 Astrochemistry (required, but may be taken to satisfy required Chemistry or Astronomy courses above)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

Other Requirements

Other requirements may overlap
At least one member of each department must serve on the PhD thesis committee.
Thesis research must be related to astrochemistry.
In addition to the graduate concentration requirements, students must also complete the requirements of their major degree.

1 For additional details and requirements refer to the department’s graduate concentration program (http://astrochemistry.illinois.edu/concentration.php) and the Graduate College Handbook (http://www.grad.illinois.edu/gradhandbook).