Astronomy (ASTR)

Graduate Degree Program
College: Computer, Mathematical, and Natural Sciences

Abstract
The Department of Astronomy offers programs of study leading to the Master of Science and Doctor of Philosophy degrees. A full schedule of courses covering most fields of astronomy is offered. Some areas in which the faculty focus their research efforts are comets, interplanetary dust, planetary dynamics, extrasolar planets, star and planet formation, mm wavelength astronomy, the interstellar medium, black holes, active galaxies, time-domain astronomy, galaxy formation and evolution, plasma astrophysics, high energy astrophysics, theoretical and computational astrophysics, and cosmology.

Financial Assistance
The Department of Astronomy offers both teaching and research assistantships. Essentially all full-time graduate students receive full financial support. Most students receive research assistantships to cover the summer period. These are either with faculty in the Department or with staff members at the NASA/Goddard Space Flight Center. Some summer teaching assistantships are also available.

Contact
Graduate Entrance Committee
Department of Astronomy
1127 Physical Sciences Complex
4296 Stadium Drive
University of Maryland
College Park, MD 20742
Telephone: 301.405.3001
Fax: 301.314.9067
Email: astr-grad@deans.umd.edu
Website: http://www.astro.umd.edu

Courses: ASTR
Relationships: Physics (PHYS) (https://academiccatalog.umd.edu/graduate/programs/physics-phys)

Admissions
General Requirements
• Statement of Purpose
• Transcript(s)
• TOEFL/IELTS/PTE (international graduate students (https://gradschool.umd.edu/admissions/english-language-proficiency-requirements))

Program-Specific Requirements
• Letters of Recommendation (3)
• Graduate Record Examination (GRE): Please contact astr-grad@deans.umd.edu to discuss exceptions. (The University of Maryland’s institution code is 5814.)

• Supplementary Application (https://gradschool.umd.edu/sites/gradschool.umd.edu/files/uploads/admissionsforms/umdsupplementaryapplicationastr.pdf)
• Description of Research: 1-2 page description of research and relevant work experience. It should include the topic of research, where it took place and who supervised it, the description of the actual activity (for example, “data reduction for a ground-based optical FTS instrument, wrote reduction software in Python”), whether there were resulting publications, what you learned from pursuing this activity, and what motivated you to pursue it. Note: Please do not upload documents for the Writing Samples. (The admissions committee will not read these.)
• Publications/Presentations
• Faculty of Interest: applicants are asked to select a minimum of 3 tenured/tenure-track faculty members (http://www.astro.umd.edu/people/directory.html#Tenured/Tenure-Track%20Faculty).
• GRE Subject

Because of the large number of qualified applicants, the Department of Astronomy has had to restrict formal admission to the Graduate School to those who have shown particularly outstanding work in their undergraduate records. Students who enter the graduate program are normally expected to have strong backgrounds in astronomy, physics, and mathematics. A student with deficiencies in one of these areas may be admitted but will be expected to remedy such deficiencies as soon as possible.

Note that the Department of Astronomy accepts applications for the Ph.D. program only. (Admitted students typically receive an M.S. degree after their second year in the program.) For full details, see http://www.astro.umd.edu/graduate/admissions.html

For more admissions information or to apply to the program, please visit our Graduate School website: www.gradschool.umd.edu/admissions

Application Deadlines

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<th>Type of Applicant</th>
<th>Fall Deadline</th>
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<tr>
<td>Domestic Applicants</td>
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<td>US Citizens and Permanent Residents</td>
<td>Priority Consideration: 15 Dec / Final: 17 Jan</td>
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<td>International Applicants</td>
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<td>F (student) or J (exchange visitor), visas; A,E,G,H,I and L visas and immigrants</td>
<td>Priority Consideration: 15 Dec / Final: 17 Jan</td>
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Other Deadlines: Please visit the program website at http://www.astro.umd.edu

Requirements

• Astronomy, Doctor of Philosophy (Ph.D.) (https://academiccatalog.umd.edu/graduate/programs/astronomy-astr/astronomy-phd)
• Astronomy, Master of Science (M.S.) (https://academiccatalog.umd.edu/graduate/programs/astronomy-astr/astronomy-ms)

Facilities and Special Resources
The Department has guaranteed observing time on the new 4.3-meter Discovery Channel Telescope through a partnership with Lowell
Observatory. We have strong interactions with other major observatories, where many students and faculty maintain observing programs, and with neighboring scientific institutes, including the Naval Observatory, the Naval Research Lab, and other government agencies. We have joined with Caltech and other partners in the Zwicky Transient Facility, a time-domain survey for studying rare and exotic transient phenomena which will see first light at Palomar Observatory in 2017. Our planetary science team is heavily involved with space missions visiting solar system bodies, such as NASA’s Deep Impact, EPOXI, and Rosetta missions to study comets.

The Center for Research and Exploration in Space Science & Technology (CRESST) is the most visible of our many interactions with NASA’s Goddard Space Flight Center, located only 5 miles away. UMD researchers work together with Goddard scientists on many topics, ranging from the study of neutron stars, black holes, and extremely hot gas throughout the universe to the study of planets in our Solar System. This partnership offers an exciting array of opportunities for graduate students to work with Goddard scientists and facilities on their Ph.D. theses.

In 2010, U. Maryland and NASA’s Goddard Space Flight Center signed an agreement launching the Joint Space-Science Institute (JSI), a close collaboration between the Departments of Astronomy and Physics and NASA/Goddard. JSI’s areas of investigation include black hole physics, high-energy astrophysics, and cosmology.

The Department has also established a partnership with Pontificia Universidad Catolica de Chile (PUC). PUC, one of the top two institutions for astronomy in Chile, signed an agreement with UMD in 2010 that enables astronomy graduate students at both institutions to participate in a joint Ph.D. program starting in their third year. These students split their time between both locations and conduct their thesis research under the supervision of UMD and PUC co-advisors. UMD students gain improved access to Chilean observatories, which include many of the best telescopes in the world.

The Center for Theory and Computation (CTC), a strong group of theoretical astrophysicists within the department, built and maintains a Beowulf cluster to perform computational analyses and simulations across a range of research areas. We also have access to three larger university clusters, including the world-class “DeepThought2” and “MARCC/Bluecrab”, which have been invaluable to our students in completing computationally-intensive thesis projects.

In 2014, much of the Department moved to the new Physical Sciences Complex (PSC). Highlights of the building include beautiful architecture, windowed office space for grad students, a grad student lounge, and a state-of-the-art visualization lab for state-of-the-art simulations and displays of large datasets.

This Department is associated with the following research units and facilities:

- Center for Research and Exploration in Space Science and Technology (CRESST) (http://cresst.umd.edu): Partnership between UMCP, UMBC, USRA, and NASA/Goddard, with an emphasis on high-energy astrophysics.
- Laboratory for Millimeter Wave Astronomy (LMA) (http://www.astro.umd.edu/rareas/lma)
- Discovery Channel Telescope (DCT) (http://www.astro.umd.edu/facilities/dct.html)
- Zwicky Transient Facility (ZTF) (https://www.ptf.caltech.edu/ztf)

### Faculty

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First/Middle Name</th>
<th>Graduate Faculty Status</th>
<th>Academic Credentials</th>
<th>Positions</th>
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<tbody>
<tr>
<td>Deming</td>
<td>Leo Drake</td>
<td>Full Member</td>
<td>B.A., University of Chicago, 1970; Ph.D., University of Illinois, 1976.</td>
<td>Professor, Astronomy</td>
</tr>
<tr>
<td>Earl</td>
<td>James A.</td>
<td>Full Member</td>
<td>B.S., Massachusetts; Emeritus, Institute of Technology, 1953; Ph.D., 1957.</td>
<td>Professor, Astronomy</td>
</tr>
<tr>
<td>Hamilton</td>
<td>Douglas P.</td>
<td>Full Member</td>
<td>B.S., Stanford University, 1988; M.S., Cornell University, 1990; Ph.D., 1994.</td>
<td>Professor, Astronomy</td>
</tr>
<tr>
<td>Harrington</td>
<td>J. Patrick</td>
<td>Full Member</td>
<td>B.S., University of Chicago, 1961; M.S., Ohio State University-Columbus, 1964; Ph.D., 1967.</td>
<td>Professor, Astronomy</td>
</tr>
<tr>
<td>Harris</td>
<td>Andrew I.</td>
<td>Full Member</td>
<td>B.S., City College of New York, 1958; PhD, Brown University, 1964.</td>
<td>Chair, Astronomy Professor, Astronomy Affiliate Professor, Electrical and Computer Engineering Professor, Astronomy</td>
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<tr>
<td>Last Name</td>
<td>First Name</td>
<td>Membership Status</td>
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<td>Mundy</td>
<td>Lee G.</td>
<td>Full Member</td>
<td>B.S., California Institute of Technology, 1977; Ph.D., University of Texas-Austin, 1984.</td>
<td>Professor, Astronomy</td>
</tr>
<tr>
<td>Papadopoulos Konstantinos Dennis</td>
<td>Konstantinos Dennis</td>
<td>Full Member</td>
<td>B.Sc., University of Athens-Greece, 1960; M.Sc, Massachusetts Institute of Technology, 1965; Ph.D., University of Maryland-College Park, 1968.</td>
<td>Professor, Physics Professor, Astronomy</td>
</tr>
<tr>
<td>Richardson</td>
<td>Derek C.</td>
<td>Full Member</td>
<td>B.S., University of British Columbia, 1990; Ph.D., University of Cambridge, 1993.</td>
<td>Professor, Astronomy</td>
</tr>
<tr>
<td>Ricotti</td>
<td>Massimo</td>
<td>Full Member</td>
<td>B.S./M.S., University of Florence, 1996; M.S., University of Colorado-Boulder, 1999; Ph.D., University of Colorado-Boulder, 2001.</td>
<td>Associate Professor, Astronomy</td>
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<tr>
<td>Stock</td>
<td>Suvi Gezari</td>
<td>Full Member</td>
<td>B.S., Brown University; M.S., University of California-Los Angeles; Ph.D., Columbia University, 2005.</td>
<td>Assistant Professor, Astronomy</td>
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