ATMOSPHERIC AND OCEANIC SCIENCE (AOSC)

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

Abstract
The Department of Atmospheric and Oceanic Science offers graduate study leading to the Master of Professional Studies, Master of Science, and Doctor of Philosophy degrees. Coursework in atmospheric and oceanic sciences is also offered at the upper division and graduate level as a service to other campus graduate programs. The educational program is broadly based and involves many applications of the mathematical, physical and applied sciences that characterize modern atmospheric sciences and physical oceanography, including climate and earth system science, and multidisciplinary studies of the interrelationship among the atmosphere, the oceans, the land, and the biota. The Department's advanced degree programs are designed to prepare students for participation in contemporary research in the atmospheric and oceanic science. Research specializations include: atmospheric dynamics; atmospheric chemistry; physical oceanography; air pollution; atmospheric radiative transfer; remote sensing of the atmosphere, ocean, and land; climate variability and change; data assimilation; numerical weather prediction; severe storms; surface-atmosphere, ocean-atmosphere and biosphere-atmosphere interactions; and earth system modeling. The curriculum includes a set of Core courses to provide a fundamental background in atmospheric and oceanic dynamics, physical meteorology and atmospheric chemistry, earth system science and climate, as well as advanced specialized courses. Supervised research using state-of-the-art facilities then prepares the students for future contributions in their chosen field.

The Department's close association with federal agencies in the Washington area provides graduate students with good training and opportunities in atmospheric and oceanic science. As a research assistant, the student has the opportunity to develop a close working relationship with one or more of the scientific agencies.

Financial Assistance
Graduate research and teaching assistantships are available to qualified graduate students. Research assistants carry out research in the areas of physical and dynamic meteorology, physical oceanography, data assimilation, remote sensing, atmospheric chemistry, air pollution, climate dynamics, atmospheric radiation, severe storms, global climate change, and ocean-atmosphere and atmosphere-biosphere interactions. Fellowships are also awarded by the Graduate School to the most qualified applicants. In addition, hourly employment is available in the Department and off campus. Stipends are maintained at a competitive level.

Contact
Tamara Hendershot
Department of Atmospheric and Oceanic Science
3405 Atlantic Building
4254 Stadium Drive
University of Maryland
College Park, MD 20742
Telephone: 301.405.5389
Fax: 301.314.9482

Email: tbarksda@umd.edu
Website: http://www.aosc.umd.edu

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)
- CV/Resume

In addition to the requirements of the Graduate School, the department requires a Bachelors or higher degree in meteorology, oceanography, physics, chemistry, mathematics, biology, engineering or other program with suitable emphasis in the sciences. We welcome applications from those with no background in atmospheric sciences. The Core courses offered in the first year of study present students with the necessary background in atmospheric and oceanic science for the more advanced courses. The minimum undergraduate background includes 3 semesters of calculus, differential equations, linear algebra, 3 semesters of calculus-based physics, and 2 semesters of chemistry. One semester of computer programming. Scores from the GRE General Examination are also required.


Note: Applicants must get approval from the AOSC Department to apply to the Spring semester.

The fall admission deadline for priority/funding is January 17 for both domestic and international students. The fall admission deadline for funding is February 1 for both domestic and international students. Final fall admission deadlines are May 17 for domestic students and March 15 for international students.

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

Requirements

- Atmospheric and Oceanic Science, Doctor of Philosophy (Ph.D.)
  (https://academiccatalog.umd.edu/graduate/programs/atmospheric-oceanic-science-aosc/atmospheric-oceanic-science-phd)
- Atmospheric and Oceanic Science, Master of Science (M.S.)
  (https://academiccatalog.umd.edu/graduate/programs/atmospheric-oceanic-science-aosc/atmospheric-oceanic-science-ms)

Facilities and Special Resources

The Department participates in the Earth System Science Interdisciplinary Center (ESSIC) and the Cooperative Institute for Climate Studies (CICS). These institutions conduct research, and offer opportunities for graduate research beyond those offered by the department faculty. In addition, the Department maintains close research and teaching associations with Departments of Mathematics and Chemistry, as well as the Institute for Physical Science and Technology (IPST), Center for Scientific Computation and Mathematical Modeling (CSCAMM), and nearby government agencies including NOAA, NASA, ONR, USDA, NIST, and Maryland's Department of the Environment and Department of Natural Resources. Special facilities that support the Department's teaching and research activities include sophisticated computing facilities allowing access to a variety of atmospheric and oceanographic datasets, a laboratory for atmospheric chemistry, a mobile air pollution laboratory, access to research aircraft, a variety of supercomputers, radar, windprofiler at Fort Meade, historical data. Most importantly the students are encouraged to exploit the resources of the nearby government laboratories: NASA Goddard Space Flight Center, NOAA National Centers for Environmental Prediction.

The Department maintains a specialized library with several hundred text and reference books in meteorology and allied sciences, specialized series of research reports, and many journals. The campus provides a main library as well as specialized libraries in chemistry, astronomy, and engineering. Several excellent government libraries in the area, including the Library of Congress, the NASA Goddard Space Flight Center, the National Archives, and the NOAA libraries provide unsurpassed resources.

The University of Maryland is located in an area of unparalleled professional resources. Because of its proximity to the nation's capital, The University of Maryland is able to interact closely with the many governmental groups interested in various aspects of the atmospheric, oceanic and earth system sciences. Scientists from government laboratories participate in many aspects of graduate education, such as giving lectures in classes, presenting research results in seminars, and serving on dissertation committees. Likewise, the Department faculty often attend and participate in the seminars, colloquia and scientific workshops being held at these neighboring institutions.

The Washington, D.C. chapter of the American Meteorological Society consists of about 400 members who hold professional meetings each month. The Washington, D.C. area is frequently the site of national and international conferences, most notably of the American Association for the Advancement of Science and the American geophysical Union. In addition to the various government and academic institutions, the Washington metropolitan area contains numerous well-known private contractors and consulting companies involved in meteorology and oceanography, which provide employment opportunities for students both before and after graduation.

As a member of the University Corporation for Atmospheric Research, the department enjoys the common facilities offered by the National Center for Atmospheric Research such as research aircraft and supercomputers.

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>
</tr>
</thead>
<tbody>
<tr>
<td>Allen</td>
<td>Dale</td>
<td>Adjunct Member</td>
<td>B.S., Iowa State University, 1984; M.S., Florida State University, 1987; Ph.D., University of Maryland, 1996.</td>
<td>Associate Research Scientist, Atmospheric and Oceanic Science</td>
</tr>
<tr>
<td>Berbery</td>
<td>Ernesto H</td>
<td>Adjunct Member</td>
<td>M.S., University of Buenos Aires, 1976; S.C.D., 1987.</td>
<td>Research Professor, Atmospheric and Oceanic Science</td>
</tr>
<tr>
<td>Canty</td>
<td>Timothy</td>
<td>Adjunct Member</td>
<td>B.A., Physics, Hdartwick College, 1994 MS, Physics, New Mexico Institute of Mining and Technology, 2000 PhD, Physics, New Mexico Institute of Mining and Technology, 2002</td>
<td>Director, Atmospheric and Oceanic Science</td>
</tr>
<tr>
<td>Carton</td>
<td>James A.</td>
<td>Full Member</td>
<td>B.S.E., Princeton University, 1976; M.S., University of Washington, 1979; M.A., Princeton University, 1980; Ph.D., 1983.</td>
<td>Chair, Atmospheric and Oceanic Science Professor, Applied Mathematics &amp; Statistics, and Scientific Computation Professor, Chemical Physics Assistant Research Scientist, Atmospheric and Oceanic Science</td>
</tr>
<tr>
<td>Chepurin</td>
<td>Gennady</td>
<td>Adjunct Member</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dickerson Russell R. Full Member B.A., University of Chicago, 1975; M.S., University of Michigan-Ann Arbor, 1978; Ph.D., 1980. Professor, Atmospheric and Oceanic Science

Kleist Daryl Full Member B.S., M.S., University of Wisconsin-Madison, 2001, 2003; Ph.D., University of Maryland, 2012. University Affiliate, Atmospheric and Oceanic Science

Farrell Sinead Adjunct Member Assistant Research Scientist, Atmospheric and Oceanic Science

Kousky Vernon Adjunct Member

Grodsy Semyon Adjunct Member M.S., Institute of Physics and Technology, 1981, Ph.D., Marine Hydrophysical Institute, Sevastopol, USSR, 1986

Lampkin Derrick Full Member M.A., Geography, The Ohio State University, June 2000 Ph.D., Philosophy-Geography, Minor: Remote Sensing and Spatial Analysis, University of Arizona

Hudson Robert D. Full Member B.S., University of Reading, 1956; Ph.D., 1959. Professor Emeritus, Atmospheric and Oceanic Science

Lau William Special Member

Ide Kayo Full Member B.S., Nagoya University, Japan; M.S., Ph.D., California Institute of Technology Associate Professor; Applied Mathematics & Statistics, and Scientific Computation Assistant Professor; Atmospheric and Oceanic Science

Li Zhanqing Full Member B.S., Nanjing Institute of Meteorology-China, 1983; M.Sc., Nanjing Institute of Meteorology-China, 1986; Ph.D., McGill University-Canada, 1991. Professor, Atmospheric and Oceanic Science

Kalnay Eugenia E Full Member B.A., Lenguas Vivas Buenos Aires, 1970; M.A., Licenciatura en Ciencias Meteorologicas, 1972; Ph.D., Massachusetts Institute of Technology, 1978. Distinguished University Professor, Applied Mathematics and Scientific Computation Distinguished University Professor, Atmospheric and Oceanic Science Affiliate Professor, Civil and Environmental Engineering

Liang Xin-Zhong Full Member B.S., Zhejiang University, 1983; Ph. D., Institute of Atmospheric Physics, Chinese Academy, 1987. Professor, Atmospheric and Oceanic Science
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miyoshi Takemasa</td>
<td>Full Member</td>
<td>Assistant Professor, Applied Mathematics &amp; Statistics, and Scientific Computation Assistant Professor, Atmospheric and Oceanic Science</td>
</tr>
<tr>
<td>Nigam Sumant</td>
<td>Full Member</td>
<td>Professor, Atmospheric and Oceanic Science Professor, Chemical Physics</td>
</tr>
<tr>
<td>Penny Stephen</td>
<td>Full Member</td>
<td>Assistant Research Professor, Applied Mathematics &amp; Statistics, and Scientific Computation Assistant Research Professor, Atmospheric and Oceanic Science</td>
</tr>
<tr>
<td>Pickering Kenneth E.</td>
<td>Adjunct Member</td>
<td>Adjunct Professor, Atmospheric and Oceanic Science</td>
</tr>
<tr>
<td>Pinker Rachel</td>
<td>Full Member</td>
<td>Professor, Atmospheric and Oceanic Science</td>
</tr>
</tbody>
</table>

** Ruiz-Barradas Alfredo **
Adjunct Member
B.S., Universidad Veracruzana, Xalapa, Veracruz, MEXICO, 1987; M.S., Universidad Nacional Autonoma de Mexico, 1991; M.S., University of Maryland, 1998; Ph.D., University of Maryland, 2001.

** Salawitch Ross J. **
Full Member

** Uccellini Louis **
Adjunct Member

** Vinnikov Konstantin **
Adjunct Member

** Zeng Ning **
Full Member
B.S., University of Science and Technology China, 1987: M.S., University of Arizona, 1991; Ph.D., University of Arizona, 1995.
Zhang Da-Lin  
Full Member  
Professor, Applied Mathematics & Statistics, and Scientific Computation  
Professor, Atmospheric and Oceanic Science

Zheng Quanan  
Adjunct Member  
B.S., Jilin University, China, 1966; Ph.D., Chinese Academy of Sciences, China, 1987.  
Senior Research Scientist, Atmospheric and Oceanic Science