Abstract

The Chemical Physics Program is a program of study and research leading to Master of Science and Doctor of Philosophy degrees for students who wish to enter professional careers requiring an in-depth knowledge of both physics and chemistry. Students can choose research topics across many disciplines including biophysics, chemistry, physics, chemical engineering, electrical engineering, materials and nuclear engineering, mechanical engineering, and meteorology.

The Chemical Physics Program is designed for students with undergraduate degrees in physics, chemistry, or engineering who are sufficiently well prepared in mathematics and the physical sciences to undertake graduate training in physics and chemical physics. Formal course offerings in quantum mechanics, quantum chemistry, spectroscopy, thermodynamics, electricity and magnetism, statistical mechanics and biophysics prepare a student to explore the broad range of research topics at the University of Maryland. Research areas of the Chemical Physics faculty include: the study of single molecules as well as gases, surfaces, solids and polymers by means of laser-light, electron scattering, and nanomicroscopies; the study of dynamic phenomena from atom-molecule collisions to protein-folding and hydrodynamics; thermodynamics from phase transitions and critical phenomena to combustion; the statistical mechanical theory of phase transitions, fluid dynamics and non-equilibrium phenomena; the quantum mechanical theory of molecules and molecular dynamics; atmospheric physics and chemistry; and biophysics.

The Chemical Physics Program is sponsored by the Institute for Physical Science and Technology and seven academic departments: Chemistry and Biochemistry, Physics, Electrical and Computer Engineering, Chemical Engineering, Materials and Nuclear Engineering, Mechanical Engineering, and Meteorology. Formal arrangements with the National Institute of Standards and Technology (NIST) and the National Institute of Health (NIH) allow students to perform research off campus under the supervision of a government scientist associated with the program and a Chemical Physics faculty member. The Chemical Physics Committee oversees the program and is made up of representatives from the sponsoring units with the Program Director as chair. The Chemical Physics Program Office administers the program and is affiliated with the Institute for Physical Science and Technology. A booklet describing the University and Chemical Physics at Maryland, College Park, can be obtained from the Chemical Physics office upon request.

Financial Assistance

Teaching and research assistantships are available for qualified students. There are also University and Chemical Physics Fellowships and fellowships in Biophysics (in cooperation with the National Institutes of Health) and Atomic, Molecular and Optical Science (in cooperation with the National Institute of Standards and Technology).

Contact

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Email: gpapoian@umd.edu
Website: http://www.chemicalphysics.umd.edu

Courses: CPHPH

Admissions

The program is for students with undergraduate degrees in chemistry, physics or engineering. For those students with degrees in other disciplines, knowledge of calculus, differential equations, and vector algebra, as well as introductory mechanics, electricity and magnetism, and quantum mechanics is ordinarily expected.

General Requirements

- Statement of Purpose
- Transcript(s)
- TOEFL/IELTS/PTE (international graduate students)
- Graduate Record Examination (GRE)
- CV/Resume
- GRE Subject
- Description of Research/Work Experience

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

Application Deadlines

<table>
<thead>
<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</td>
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<td>Residents</td>
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<td>International Applicants</td>
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<tr>
<td>F (student) or J (exchange</td>
<td>3 Jan</td>
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<td>visitor) visas; A,E,G,H,I</td>
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<td>and L visas and immigrants</td>
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Other Deadlines: Please visit the program website at http://www.chemicalphysics.umd.edu

Requirements

- Chemical Physics, Doctor of Philosophy (Ph.D.)
- Chemical Physics, Master of Science (M.S.)

Facilities and Special Resources

Incoming students are provided with private desk space and up to date computer facilities. There is a wide array of advanced equipment.
associated with the various research groups in the Program including scanning probe microscopes, high-resolution spectrographs, ultra-short high-power lasers, multi-coincidence electron scattering spectrometers, and a fully equipped light-scattering laboratory.

## 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>Alexander</td>
<td>Millard H.</td>
<td>Full Member</td>
<td>B.A., Harvard University, 1964; Ph.D., University of Paris, 1967.</td>
<td>Distinguished University Professor, Applied Mathematics &amp; Statistics, and Scientific Computation Professor, Chemical Physics Distinguished University Professor, Chemistry Professor, Chemistry Professor, Chemical Engineering Professor, Chemical Physics Professor, Chemistry Professor, Chemical Physics Professor, Chemical Physics</td>
</tr>
<tr>
<td>Anisimov</td>
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<td>Ph.D., Moscow State University, 1968.</td>
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<td>Arif</td>
<td>Muhammad</td>
<td>Non-Member</td>
<td>Ph.D., University of Missouri-Columbia; 1986 NIST</td>
<td>University Affiliate, Chemical Physics</td>
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<tr>
<td>Bienfang</td>
<td>Joshua C.</td>
<td>Non-Member</td>
<td>Ph.D., University of Mexico; 2001 NIST</td>
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</tr>
<tr>
<td>Briber</td>
<td>Robert M.</td>
<td>Full Member</td>
<td>B.S., Cornell University, 1979; M.S., University of Massachusetts#Professor, Amherst, 1981; Ph.D., 1984.</td>
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<tr>
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<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>
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</tr>
<tr>
<td>Clark</td>
<td>Charles</td>
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<td>B.A., Western Washington University, 1974; Ph.D., University of Chicago, 1979.</td>
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</tr>
<tr>
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<td>John</td>
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<td>Ph.D. University of California, Berkeley 2002</td>
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<td>Mario</td>
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<td>B.S., Universite de Montreal, 1974 M.S., University of Rochester, 1976; Ph.D., 1978.</td>
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<td>Davis</td>
<td>Christopher C.</td>
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<td>B.A., Cambridge University, 1965; M.A., 1970; Ph.D., Manchester University, 1970.</td>
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<td>Dickerson</td>
<td>Russell R.</td>
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<td>B.A., University of Chicago, 1975; M.S., University of Michigan-Ann Arbor, 1978; Ph.D., 1980.</td>
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Kirkpatrick Theodore R.  Full Member  B.S., University of California, Berkeley, 1994

Kirkpatrick Theodore R.  Full Member  B.S., University of California, Berkeley, 1994

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Assistant Professor, Electrical and Computer Engineering Assistant Professor, Chemical Physics

Assistant Professor, Electrical and Computer Engineering Assistant Professor, Chemical Physics
<table>
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<tr>
<th>Name</th>
<th>Title</th>
<th>Member Type</th>
<th>Education</th>
<th>Position</th>
<th>Affiliations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murphy</td>
<td>Thomas E.</td>
<td>Full Member</td>
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<tr>
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<td>Zhihong</td>
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<td>William D.</td>
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<td>Rabin</td>
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Wang Yu-Huang Full Member Ph.D. Rice University, 2004 Assistant Professor, Chemical Physics
<table>
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<tr>
<th>Name</th>
<th>Title</th>
<th>Full Member</th>
<th>Education/Professional Background</th>
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</thead>
<tbody>
<tr>
<td>Weeks</td>
<td>John D.</td>
<td>Full Member</td>
<td>B.A., Harvard University, 1965; Ph.D., University of Chicago, 1969. Distinguished University Professor, Biophysics Distinguished University Professor, Chemical Physics Distinguished University Professor, Chemistry Affiliate Professor, Physics</td>
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<tr>
<td>White</td>
<td>Ian</td>
<td>Full Member</td>
<td>Ph.D., Stanford University 2002. Associate Chair, Bioengineering Associate Professor, Bioengineering Assistant Professor, Chemical Physics</td>
</tr>
<tr>
<td>Williams</td>
<td>Carl</td>
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</tr>
<tr>
<td>Williams</td>
<td>Ellen D.</td>
<td>Full Member</td>
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</tr>
<tr>
<td>Yu</td>
<td>Yihua Bruce</td>
<td>Full Member</td>
<td>Ph.D., Johns Hopkins University, 1996. Associate Professor, Chemical Physics</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>B.S., University of California, LA, 1979; M.S., University of California, LA, 1981; Ph.D., University of California, LA, 1986. Distinguished University Professor, Chemical Physics Distinguished University Professor, Chemistry Affiliate Professor, Materials Science and Engineering Professor, Chemical Physics</td>
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<td>Ph.D. Cornell University 1989 - NIST. University Affiliate, Chemical Physics</td>
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</table>