School of Physical Sciences

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Overview

The School of Physical Sciences offers both professional training and general education in the Departments of Chemistry, Earth System Science, Mathematics, and Physics and Astronomy. The faculty, active in research and graduate education, are at the same time vitally concerned with undergraduate teaching. Curricula of the School are designed to meet the needs of a wide variety of students ranging from those with little technical background who seek insight into the activities and accomplishments of physical scientists to those seeking a comprehensive understanding that will prepare them for creative research in physical science.

Over the course of the past century and a half, physics, chemistry, and mathematics have evolved into interdependent but separate intellectual disciplines. This development is reflected in the departmental structure of the School of Physical Sciences. In the same period, these fundamental disciplines have moved into domains of abstraction unimagined by early scientists. This trend to abstraction with its concomitant increase in understanding of the physical universe provides the major challenge to the student of the physical sciences. Mathematics, physics, and chemistry, while providing the foundation of the technology that dominates contemporary civilization, underlie to an ever-increasing extent the new developments in the biological and social sciences. Earth system science is grounded in the traditional physical sciences while breaking new paths in the quantitative study of changes in the global environment.

Degrees

<table>
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<tr>
<th>Major</th>
<th>Degree(s)</th>
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<tbody>
<tr>
<td>Applied Physics</td>
<td>B.S.</td>
</tr>
<tr>
<td>Chemistry</td>
<td>B.S., M.S., Ph.D.</td>
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<tr>
<td>Earth System Science</td>
<td>B.S., M.S.¹, Ph.D.</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>B.A.</td>
</tr>
<tr>
<td>Mathematics</td>
<td>B.S., M.S., Ph.D.</td>
</tr>
<tr>
<td>Physics</td>
<td>B.S., M.S., Ph.D.</td>
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</tbody>
</table>

¹ Emphasis at the graduate level is on the Ph.D.; the master’s degree may be awarded to Ph.D. students after fulfillment of the requirements.

Honors

Criteria used by the School of Physical Sciences in selecting candidates for honors at graduation are as follows: Approximately 2 percent will be awarded summa cum laude, 4 percent magna cum laude, and 10 percent cum laude. Honors are awarded on the basis of a student’s performance in research, cumulative grade point average, and performance in upper-division courses in the major. Students considered for honors at graduation must have completed 72 units in residence at the University of California. The student’s cumulative record at the end of the final quarter is the basis for all decisions regarding honors at graduation. Other important factors are considered visit at Honors Recognition. The School of Physical Sciences also grants special honors to students who have distinguished themselves by their work in their major subject.

Undergraduate Programs

The following majors are offered:
Applied Physics, B.S.
Chemistry, B.S.
Earth System Science, B.S.
Environmental Science, B.A.
Mathematics, B.S.
Physics, B.S.

The following minors are offered:
Earth and Atmospheric Sciences
Mathematics
Mathematics for Biology

Each department offers courses that are of value to nonmajors and majors in the sciences. The programs for majors are designed to meet the needs of students planning careers in business, education, or industry; of students planning advanced professional study; and of students planning graduate work that continues their major interest. Students who wish to complete a coordinated set of courses beyond the introductory level in Mathematics and in Earth and Atmospheric Sciences may pursue minors in these areas. Students interested in mathematical and computational biology may complete the Mathematics for Biology minor which prepares them for interdisciplinary graduate studies in this area. Introductory courses in chemistry, mathematics, and physics meet the needs of students majoring in the sciences, mathematics, and engineering and are also appropriate for students in other disciplines who seek a rigorous introduction to the physical sciences. In addition, a number of courses within the School have few or no prerequisites and are directed particularly toward students majoring in areas remote from the sciences.

Planning a Program of Study

Students who choose a major in the School of Physical Sciences have a variety of academic advising and counseling resources available to them. In addition to faculty advisors, there is a Chief Academic Advisor in each department who is responsible for interpreting degree requirements, reviewing student petitions, and assisting with special advising problems. An academic advising and counseling staff, employed in the Associate Dean’s Office, is available to serve a broad range of student advising needs. In consultation with their faculty advisor or an academic counselor, students should plan a course of study leading to a major in one of the departments of the School. In carrying out this major, students may often concentrate very heavily in a second department within the School or in some other school. Occasionally students choose to pursue a double major. Permission to do so may be sought by an online application submitted to the Office of the Associate Dean of Physical Sciences.

All initial courses of study for majors include mathematics through calculus, and calculus is a prerequisite for much of the upper-division work in each major. A student interested in any of the physical sciences should continue mathematical training beyond these prerequisite courses. Furthermore, students interested in either physics or chemistry usually will include work in both of these subjects in their undergraduate careers.

Students in the physical sciences are urged to acquire a working knowledge of computer programming at an early stage of their University studies. This can be accomplished by taking one of the following:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHEM 5</td>
<td>Scientific Mathematical and Computing Skills</td>
</tr>
<tr>
<td>EECS 10</td>
<td>Computational Methods in Electrical and Computer Engineering</td>
</tr>
<tr>
<td>EECS 12</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>ENGRMAE 10</td>
<td>Introduction to Engineering Computations</td>
</tr>
<tr>
<td>I&amp;C SCI 31</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>PHYSICS 53</td>
<td>Introduction to C and Numerical Analysis</td>
</tr>
</tbody>
</table>

Career Opportunities

Many of the School of Physical Sciences graduates continue their education beyond the Bachelor’s degree level. Some pursue advanced academic degrees in preparation for careers in scientific or medical research, engineering, or postsecondary education. Other students will complete a secondary education credential in order to prepare for careers teaching high school mathematics and science. Some students enter professional school in areas such as medicine, dentistry, law, or business administration. Students who choose not to continue their studies beyond the baccalaureate level most frequently find employment in private business or industry. In addition to technical areas directly related to their major fields of study, students often enter careers in less obviously related fields such as computing, systems analysis, engineering, journalism, marketing, or sales.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

Preparation for Teaching Science and Mathematics

Option 1: Earn a Bachelor’s Degree, Education Concentration, and Teaching Credential

Physical Sciences students who are interested in pursuing a teaching career should consider the UCI Cal Teach Science and Mathematics Program. This program offers Chemistry, Earth System Science, Environmental Science, Mathematics, and Physics majors an option to earn their bachelor’s degree concurrently with a California Preliminary Single Subject Teaching Credential. Individuals who hold this credential are authorized to teach science (chemistry, geosciences, or physics) or math in a middle school or high school.

Students complete the degree requirements for their selected major, the requirements for an optional education concentration offered by the same department, and any additional teacher credentialing course requirements that are not included in the major or the concentration. The following courses are required for the Preliminary Single Subject Teaching Credential:

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<tr>
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<tr>
<td>EDUC 55</td>
<td>Knowing and Learning in Mathematics and Science</td>
</tr>
<tr>
<td>EDUC 109</td>
<td>Reading and Writing in Secondary Mathematics and Science Classrooms</td>
</tr>
<tr>
<td>EDUC 143AW</td>
<td>Classroom Interactions I</td>
</tr>
<tr>
<td>EDUC 143BW</td>
<td>Classroom Interactions II</td>
</tr>
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</table>
EDUC 148 | Complex Pedagogical Design
---|---
EDUC 158 | Student Teaching Mathematics and Science in Middle/High School (two quarters)
LPS 60 | The Making of Modern Science (for chemistry, geosciences, and physics credential candidates only)
MATH 8 | Explorations in Functions and Modeling (for mathematics credential candidates only)
PHY SCI 5 | California Teach 1: Introduction to Science and Mathematics Teaching
PHY SCI 105 | California Teach 2: Middle School Science and Mathematics Teaching
PHYSICS 193 | Research Methods
or CHEM 193 | Research Methods

Beyond course work, some additional requirements for teacher certification are described below.

With careful, early planning, it is possible for students to complete their bachelor’s degree and teacher certification in four years. This is a more time-efficient and cost-effective route than the traditional five-year teacher preparation model, which usually involves a full academic year of teacher education courses and clinical teaching experience after completion of a bachelor’s degree.

After the School of Physical Sciences verifies the completion of all requirements for the bachelor’s degree and education concentration, students are awarded their degree from UC Irvine. The Preliminary Single Subject Teaching Credential is awarded by the California Commission on Teacher Credentialing (CTC) upon completion of a bachelor’s degree and the state-approved UCI teacher education program, which combines course work, student teaching, and a teaching performance assessment. The UCI School of Education must verify completion of all requirements for the teaching credential and then recommend that the credential be awarded to a candidate by the CTC.

**Additional Requirements for Teacher Certification.** In addition to the required course work for a California Preliminary Single Subject Teaching Credential, the following additional requirements must be satisfied:

1. The School of Physical Sciences requires a cumulative GPA of 2.0 (C) to graduate with the bachelor’s degree. However, students must earn a grade of C or better in each of the following courses in order to be recommended for the Preliminary Single Subject Credential: PHY SCI 105, EDUC 55, EDUC 143AW, EDUC 143BW, EDUC 148, and EDUC 158.

2. The following must be completed and verified prior to the start of student teaching in EDUC 158:
   a. Pass the California Basic Education Skills Test (CBEST), a basic mathematics and literacy skills test. For more information, visit the CBEST exam website (http://www.ctcexams.nesinc.com).
   b. Pass the California Subject Exam for Teachers (CSET) in the discipline in which a candidate plans to earn a Preliminary Single Subject Credential (chemistry, geosciences, mathematics, or physics). Although secondary teachers are only required to pass the CSET exam in one discipline, those who pass the CSET exam in more than one disciplinary field (e.g., physics and mathematics) can be authorized to teach classes in each of those disciplines. For more information visit the CSET exam website (http://www.ctcexams.nesinc.com). Mathematics majors have an option to waive the CSET exam by completing prescribed course work, referred to as a subject-matter preparation program (SMPP). More information is available at the School of Education's Mathematics SMPP website (http://calteach.uci.edu/files/2017/02/UCI_Math_SMPP-Requirements_with_class_descr.pdf).
   c. Secondary school science teachers in California are expected to have a broad range of general science knowledge in additional to their discipline of specialization, because their Single Subject Teaching Credential in one of the sciences also authorizes them to teach classes in general or integrated science. The general science subtests of the CSET exam cover foundational topics in astronomy, geodynamics, Earth resources, ecology, genetics and evolution, molecular biology and biochemistry, cell and organismal biology, waves, forces and motion, electricity and magnetism, heat transfer and thermodynamics, and structure and properties of matter. Although students can prepare for the CSET exam’s general science subtests through independent study, Physical Sciences students can also prepare themselves by taking lower-division courses that cover this content. Some suggested courses include BIO SCI 1A or BIO SCI 93 and BIO SCI 94; CHEM 1A-CHEM 1B-CHEM 1C; EARTHSS 1 and EARTHSS 7 and PHYSICS 20A.
   d. Obtain a Certificate of Clearance from the State of California.
   e. Obtain a TB test with negative results.

3. The following must be completed and verified before the School of Education is able to recommend an individual for the Preliminary Single Subject Credential:
   a. Complete a college-level course or pass an examination on the U.S. Constitution. POL SCI 21A satisfies this requirement. Contact the UCI School of Education Student Affairs Office for information about the exam.
   b. Obtain a CPR certificate in adult, child, or infant training.

**Declaring Intention to Complete the Concentration and Teacher Certification.** Prospective teachers who want to complete their degree and a teaching credential in four years are encouraged to start planning early by reviewing the sample programs for the major and the education concentration that they have selected, and to consult with an academic counselor. Interested students are encouraged to get started on the suggested first- and second-year credentialing course work, including PHY SCI 5 and PHY SCI 105, and can do so without officially declaring their intention to complete...
the concentration or the credential. However, students must declare their intention to complete the optional education concentration and their intention to earn the Preliminary Single Subject Teaching Credential by the end of their second year at the latest, and prior to enrolling in EDUC 55, which they would typically take in fall of their third year. Forms for declaring a selected education concentration and for declaring an intention to complete the teaching credential are available in the Cal Teach Science and Mathematics Resource and Advising Center (137 Bison Modular).

Option 2: Earn a Bachelor’s Degree and Education Concentration or Specialization

A second option for students interested in teaching science and mathematics is to earn a teaching credential in a post-baccalaureate teacher preparation program after completing their bachelor’s degree. UCI and other universities offer such programs, which typically require one academic year of education course work and clinical teaching experience. The Departments of Chemistry, Mathematics, and Physics and Astronomy offer the concentration in Chemistry Education, the specialization in Mathematics for Education, and the concentration in Physics Education, respectively, which are well suited for undergraduates who plan to pursue a teaching credential after finishing their degree. These programs offer strong grounding in the fundamentals of one discipline, and at the same time, emphasize the breadth in natural sciences needed by secondary science teachers. Each department’s curriculum includes introductory courses on effective methods of science and mathematics teaching and provides opportunities for practical fieldwork experiences in a secondary school classroom. Detailed requirements for each program are provided in the departmental sections.

Special Programs

Campuswide Honors Program

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; 949-824-5461; honors@uci.edu; or visit the Campuswide Honors Program website (http://honors.uci.edu).

UC Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the University’s Education Abroad Program (EAP). UCEAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. Visit the Study Abroad Center website (http://www.studyabroad.uci.edu) for additional information.

Minor in Biomedical Engineering

The minor in Biomedical Engineering is an interdisciplinary curriculum that includes courses from the Schools of Engineering, Physical Sciences, and Biological Sciences. The minor is designed to provide a student in the physical sciences with the introductory skills needed in the quantitative biomedical arena. See The Henry Samueli School of Engineering section of the Catalogue for more information.

Minor in Conflict Resolution

The interdisciplinary minor in Conflict Resolution provides skills in conflict analysis and resolution and a useful understanding of integrative institutions at the local, regional, and international levels. See School of Social Sciences section of the Catalogue for more information.

Minor in Global Sustainability

The interdisciplinary minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet. See Interdisciplinary Studies section of the Catalogue for more information.

Requirements for the Bachelor’s Degree

All students must meet the University Requirements.

School Requirements: None.

Departmental Requirements: Refer to individual departments.

Graduate Programs

The School offers M.S. and Ph.D. programs in the Departments of Chemistry, Earth System Science, Mathematics, and Physics and Astronomy. See the department sections for detailed information.

Faculty

Kevork N. Abazajian, Ph.D. University of California, San Diego, Associate Professor of Physics and Astronomy

Takeo Akasaki, Ph.D. University of California, Los Angeles, Professor Emeritus of Mathematics (ring theory)

Jun F. Allard, Ph.D. University of British Columbia, Assistant Professor of Mathematics; Physics and Astronomy (mathematical and computational biology)

Steven D. Allison, Ph.D. Stanford University, Assistant Professor of Ecology and Evolutionary Biology; Earth System Science

Ioan Andricioaei, Ph.D. Boston University, Professor of Chemistry; Physics and Astronomy (chemical biology, physical chemistry and chemical physics, theoretical and computational)
Ara Apkarian, Ph.D. Northwestern University, **Professor of Chemistry** (physical chemistry and chemical physics)

Ramesh D. Arasasingham, Ph.D. University of California, Davis, **Senior Lecturer of Chemistry** (chemical education and inorganic chemistry)

Shane Ardo, Ph.D. Johns Hopkins University, **Assistant Professor of Chemistry; Chemical Engineering and Materials Science** (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Vladimir Baranovsky, Ph.D. University of Chicago, **Associate Professor of Mathematics** (algebra and number theory)

Aaron J. Barth, Ph.D. University of California, Berkeley, **Professor of Physics and Astronomy**

Steven W. Barwick, Ph.D. University of California, Berkeley, **Professor of Physics and Astronomy**

Gregory A. Benford, Ph.D. University of California, San Diego, **Professor Emeritus of Physics and Astronomy**

Donald R. Blake, Ph.D. University of California, Irvine, **UCI Distinguished Professor of Chemistry** (analytical, atmospheric, environmental)

Kent Blasie, Ph.D. University of Michigan, **Adjunct Professor of Chemistry**

Suzanne A. Blum, Ph.D. University of California, Berkeley, **Associate Professor of Chemistry; Chemistry** (inorganic and organometallic, organic and synthetic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Andrew Borovik, Ph.D. University of North Carolina at Chapel Hill, **Professor of Chemistry** (inorganic and organometallic, organic and synthetic)

David A. Brante, Ph.D. University of Wisconsin-Madison, **Professor Emeritus of Chemistry** (biophysical)

James S. Bullock, Ph.D. University of California, Santa Cruz, **Gary McCue Administrative Term Chair in Cosmology and Professor of Physics and Astronomy**

David A. Buote, Ph.D. Massachusetts Institute of Technology, **Professor of Physics and Astronomy**

Kieron Burke, Ph.D. University of California, Santa Barbara, **Professor of Chemistry; Physics and Astronomy** (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Frank B. Cannonito, Ph.D. Adelphi University, **Professor Emeritus of Mathematics** (group theory)

Ann Marie Carlton, Ph.D. Rutgers University, **Associate Professor of Chemistry** (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)

David W. Casper, Ph.D. University of Michigan, **Associate Professor of Physics and Astronomy**

A. Richard Chamberlin, Ph.D. University of California, San Diego, **Department Chair and Professor of Pharmaceutical Sciences; Chemistry; Pharmacology** (chemical biology, organic and synthetic)

Gary A. Chanan, Ph.D. University of California, Berkeley, **Professor Emeritus of Physics and Astronomy**

Liu Chen, Ph.D. University of California, Berkeley, **Research Professor and Professor Emeritus of Physics and Astronomy**

Long Chen, Ph.D. Pennsylvania State University, **Professor of Mathematics** (applied and computational mathematics)

Mu-Chun Chen, Ph.D. University of Colorado Boulder, **Associate Professor of Physics and Astronomy**

Alexander L. Chernyshev, Ph.D. Russian Academy of Sciences, **Professor of Physics and Astronomy**

Philip Collins, Ph.D. University of California, Berkeley, **Professor of Physics and Astronomy**

Michael Cooper, Ph.D. University of California, Berkeley, **Assistant Professor of Physics and Astronomy**

Asantha R. Cooray, Ph.D. University of Chicago, **Professor of Physics and Astronomy**

Robert Corn, Ph.D. University of California, Berkeley, **Professor of Chemistry; Biomedical Engineering** (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Michael C. Cranston, Ph.D. University of Minnesota, **Professor of Mathematics** (probability)

Anthony V. Daly, M.F.A. University of California, Irvine, **Lecturer of Physical Sciences**

Donald A. Darling, Ph.D. California Institute of Technology, **Professor Emeritus of Mathematics**
Christopher J. Davis, Ph.D. Massachusetts Institute of Technology, Lecturer with Potential Security of Employment of Mathematics (algebra and number theory)

Kristen A. Davis, Ph.D. Stanford University, Assistant Professor of Civil and Environmental Engineering; Earth System Science (coastal oceanography, fluid mechanics, turbulent flows)

Steven J. Davis, Ph.D. Stanford University, Department Vice Chair and Associate Professor of Earth System Science

Michael B. Dennin, Ph.D. University of California, Santa Barbara, Professor of Physics and Astronomy

Robert J. Doedens, Ph.D. University of Wisconsin-Madison, Professor Emeritus of Chemistry (inorganic and organometallic)

Franklin Dollar, Ph.D. University of Michigan, Assistant Professor of Physics and Astronomy (applied physics)

Vy M. Dong, Ph.D. California Institute of Technology, Professor of Chemistry (organic and synthetic)

Ellen R. Druffel, Ph.D. University of California, San Diego, Fred Kavli Chair in Earth System Science and Professor of Earth System Science

Igor E. Dzyaloshinskii, Ph.D. Moscow State University, Professor Emeritus of Physics and Astronomy

Kimberly D. Edwards, Ph.D. University of California, Irvine, Department Vice Chair and Senior Lecturer with Security of Employment of Chemistry (general chemistry)

Paul C. Eklof, Ph.D. Cornell University, Professor Emeritus of Mathematics (logic and algebra)

German A. Enciso Ruiz, Ph.D. Rutgers, the State University of New Jersey, Associate Professor of Mathematics; Developmental and Cell Biology (applied and computational mathematics, mathematical and computational biology)

Aaron P. Esser-Kahn, Ph.D. University of California, Berkeley, Associate Professor of Chemistry; Biomedical Engineering; Chemical Engineering and Materials Science (chemical biology, organic and synthetic, polymer, materials, nanoscience)

William J. Evans, Ph.D. University of California, Los Angeles, Professor of Chemistry (inorganic and organometallic)

Jonathan L. Feng, Ph.D. Stanford University, Professor of Physics and Astronomy

Julie E. Ferguson, Ph.D. Oxford University, Lecturer with Potential Security of Employment of Earth System Science

Aleksandr Figotin, Ph.D. Tashkent University of Information Technologies, Professor of Mathematics (applied and computational mathematics, mathematical physics)

Mark Finkelstein, Ph.D. Stanford University, Professor Emeritus of Mathematics; Center for Educational Partnerships (analysis)

Barbara J. Finlayson-Pitts, Ph.D. University of California, Riverside, Director of AirUCI and UCI Distinguished Professor of Chemistry; Chemistry (chemistry, analytical, atmospheric and environmental, physical chemistry and chemical physics)

Zachary Fisk, Ph.D. University of California, San Diego, UCI Distinguished Professor Emeritus of Physics and Astronomy

Matthew Foreman, Ph.D. University of California, Berkeley, Professor of Mathematics; Logic and Philosophy of Science (ergodic theory and dynamical systems, logic and foundations)

Fillmore Freeman, Ph.D. Michigan State University, Professor of Chemistry (organic and synthetic, theoretical and computational)

Michael D. Fried, Ph.D. University of Michigan, Professor Emeritus of Mathematics (arithmetic geometry and complex variables)

Filipp Furche, Ph.D. University of Karlsruhe, Professor of Chemistry (physical chemistry and chemical physics, theoretical and computational)

Nien-Hui Ge, Ph.D. University of California, Berkeley, Associate Professor of Chemistry (analytical, chemical biology, physical chemistry and chemical physics, polymer, materials, nanoscience)

Robert B. Gerber, Ph.D. Oxford University, Professor Emeritus of Chemistry (atmospheric and environmental, physical chemistry and chemical physics, theoretical and computational)

Isaac Goldbring, Ph.D. University of Illinois at Urbana-Champaign, Assistant Professor of Mathematics (logic and foundations)

Anton Gorodetski, Ph.D. Moscow State University, Professor of Mathematics (ergodic theory and dynamical systems)

Alon A. Gorodetsky, Ph.D. California Institute of Technology, Assistant Professor of Chemical Engineering and Materials Science; Chemistry (organic photovoltaics, electrical biosensors, nanotechnology, DNA, materials chemistry)
Michael L. Goulden, Ph.D. Stanford University, *Professor of Earth System Science; Ecology and Evolutionary Biology*

Enrico Gratton, Ph.D. University of Rome, *Professor of Biomedical Engineering; Developmental and Cell Biology; Physics and Astronomy* (design of new fluorescence instruments, protein dynamics, single molecule, fluorescence microscopy, photon migration in tissues)

Claudia I. Green, Ph.D. Max Planck Institute, *Associate Professor of Earth System Science*

Michael T. Green, Ph.D. University of Chicago, *Professor of Molecular Biology and Biochemistry; Chemistry* (chemical, biology, inorganic and organometallic, physical chemistry and chemical physics, theoretical and computational)

Steven P. Gross, Ph.D. University of Texas at Austin, *Professor of Developmental and Cell Biology; Biomedical Engineering; Physics and Astronomy* (force generation by molecular motors in living cells)

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Professor of Chemistry; Biomedical Engineering; Chemical Engineering and Materials Science* (chemical biology, organic and synthetic, polymer, materials, nanoscience)

Arnold Guerra, Ph.D. University of California, Irvine, *Lecturer of Physics and Astronomy*

Patrick Q. Guidotti, Ph.D. University of Zurich, *Professor of Mathematics* (analysis and partial differential equations, applied and computational mathematics)

Gultekin Gulsen, Ph.D. Bogazici University, *Associate Professor of Radiological Sciences; Biomedical Engineering; Electrical Engineering and Computer Science; Physics and Astronomy* (in vivo molecular imaging, diffuse optical tomography, fluorescence tomography, photo-magnetic imaging, multi-modality imaging)

Herbert W. Hamber, Ph.D. University of California, Santa Barbara, *Professor of Physics and Astronomy*

Stephen Hanessian, Ph.D. Ohio State University, *Director of Medicinal Chemistry and Pharmacology Graduate Program and Professor of Pharmaceutical Sciences; Chemistry; Pharmacology* (organic chemistry)

William W. Heidbrink, Ph.D. Princeton University, *Professor of Physics and Astronomy*

John C. Hemminger, Ph.D. Harvard University, *Professor of Chemistry* (analytical, atmospheric and environmental, physical chemistry and chemical physics, polymer, materials, nanoscience)

Alan F. Heyduk, Ph.D. Massachusetts Institute of Technology, *Department Vice Chair and Professor of Chemistry* (chemical biology, inorganic and organometallic)

Hamid Hezari, Ph.D. Johns Hopkins University, *Assistant Professor of Mathematics* (analysis and partial differential equations)

Wilson Ho, Ph.D. University of Pennsylvania, *Donald Bren Professor and Professor of Physics and Astronomy; Chemistry* (physical chemistry and chemical physics, polymer, materials, nanoscience)

Allon I. Hochbaum, Ph.D. University of California, Berkeley, *Assistant Professor of Chemical Engineering and Materials Science; Chemistry* (nanoscale materials and hybrid bio-inorganic devices for applications in clean energy)


Herbert J. Hopster, Ph.D. Aachen University, *Professor Emeritus of Physics and Astronomy*

Kenneth C. Janda, Ph.D. Harvard University, *Dean of the School of Physical Sciences and Professor of Chemistry* (physical chemistry and chemical physics)

Elizabeth R. Jarvo, Ph.D. Boston College, *Department Vice Chair and Associate Professor of Chemistry* (inorganic and organometallic, organic and synthetic)

Svetlana Jitomirskaya, Ph.D. Moscow State University, *Professor of Mathematics* (mathematical physics)

Kathleen Johnson, Ph.D. University of California, Berkeley, *Associate Professor of Earth System Science*

Nathan Kaplan, Ph.D. Harvard University, *Assistant Professor of Mathematics* (algebra and number theory)

Manoj Kaplinghat, Ph.D. Ohio State University, *Professor of Physics and Astronomy*

Saewung Kim, Ph.D. Georgia Institute of Technology, *Assistant Professor of Earth System Science*

Susan M. King, Ph.D. Massachusetts Institute of Technology, *Lecturer with Security of Employment of Chemistry* (organic chemistry)
Anne A. Kirkby, Ph.D. California Institute of Technology, Lecturer of Physics and Astronomy

David P. Kirkby, Ph.D. California Institute of Technology, Professor of Physics and Astronomy (observational cosmology, data science, embedded systems)

Abel Klein, Ph.D. Massachusetts Institute of Technology, Professor of Mathematics (mathematical physics)

Natalia Komarova, Ph.D. University of Arizona, Professor of Mathematics; Ecology and Evolutionary Biology (applied and computational mathematics, mathematical and computational biology, mathematics of complex and social phenomena)

Ilya N. Krivorotov, Ph.D. University of Minnesota, Associate Professor of Physics and Astronomy

Katsiaryna Krupchyk, Ph.D. Belarusian State University, Associate Professor of Mathematics (analysis and partial differential equations, inverse problems)

Andrew J. Lankford, Ph.D. Yale University, Professor of Physics and Astronomy

David T. Lawrence, Ph.D. University of California, Berkeley, Associate Professor of Chemistry; Chemical Engineering and Materials Science (inorganic and organometallic, physical chemistry and chemical physics, polymer, materials, nanoscience)

Jon M. Lawrence, Ph.D. University of Rochester, Professor Emeritus of Physics and Astronomy

Rachel Lehman, Ph.D. University of California, Irvine, Lecturer of Mathematics (mathematics education and probability)

Peter Li, Ph.D. University of California, Berkeley, Professor Emeritus of Mathematics (geometry and topology)

Song-Ying Li, Ph.D. University of Pittsburgh, Professor of Mathematics (analysis and partial differential equations)

Zhihong Lin, Ph.D. University of California, Berkeley, Professor of Physics and Astronomy

Renee Link, Ph.D. University of California, Irvine, Lecturer with Security of Employment of Chemistry (organic chemistry)

Chang C. Liu, Ph.D. Scripps Research Institute, Assistant Professor of Biomedical Engineering; Chemistry (genetic engineering, directed evolution, synthetic biology, chemical biology)

John S. Lowengrub, Ph.D. Courant Institute of Mathematical Sciences, UCI Chancellor's Professor of Mathematics; Biomedical Engineering; Chemical Engineering and Materials Science (applied and computational mathematics, mathematical and computational biology)

Zhiqin Lu, Ph.D. Courant Institute of Mathematical Sciences, Professor of Mathematics (geometry and topology)

Andrej Luptak, Ph.D. Yale University, Associate Professor of Pharmaceutical Sciences; Chemistry; Molecular Biology and Biochemistry (chemical biology)

Katherine Mackey, Ph.D. Stanford University, Clare Booth Luce Assistant Professor of Earth System Science

Penelope J. Maddy, Ph.D. Princeton University, UCI Distinguished Professor of Logic and Philosophy of Science; Mathematics; Philosophy (philosophy of mathematics and logic, meta-philosophy)

Gudrun Magnusdottir, Ph.D. Colorado State University, Department Chair and Professor of Earth System Science

Mark A. Mandelkern, Ph.D. University of California, Berkeley, Research Professor and Professor Emeritus of Physics and Astronomy

Vladimir A. Mandelshtam, Ph.D. Russian Academy of Sciences, Professor of Chemistry (physical chemistry and chemical physics, theoretical and computational)

Stephen Mang, Ph.D. University of California, Irvine, Lecturer with Potential Security of Employment of Chemistry (chemical education, advanced laboratories)

Alexei A. Maradudin, Ph.D. University of Bristol, Professor Emeritus of Physics and Astronomy

Craig C. Martens, Ph.D. Cornell University, Professor of Chemistry (physical chemistry and chemical physics, polymer, materials, nanoscience, theoretical and computational)

Rachel Martin, Ph.D. Yale University, Associate Professor of Chemistry; Molecular Biology and Biochemistry (analytical, chemical biology, physical chemistry and chemical physics)

Adam Martiny, Ph.D. Technical University of Denmark, Associate Professor of Earth System Science; Ecology and Evolutionary Biology

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