DEPARTMENT OF CHEMISTRY

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More Information: https://chemistry.case.edu

The Department of Chemistry is the largest department representing the chemical sciences at Case Western Reserve University. It consists of 23 faculty members, 16 associated faculty, 7 postdoctoral associates, approximately 58 graduate students, and over 100 undergraduate students majoring in chemistry. The department offers undergraduate and graduate degree programs leading to the Bachelor of Arts, Bachelor of Science, Master of Science, and Doctor of Philosophy.

The general focus of chemistry is on understanding the basic properties of matter, employing this knowledge in the design, synthesis, and characterization of materials with novel and useful properties, and using chemical perspectives and state-of-the-art instrumentation and computational methods to better understand biological systems and materials. The various degree programs strive to develop all aspects of the student's chemical knowledge through a broad range of lecture and laboratory courses.

Chemical research is an integral part of the department's activities: over $3 million of federal, state, industry, and private research support flows into the department each year. State-of-the-art research facilities are available to both graduate and undergraduate students. Undergraduates are encouraged and expected to participate in research projects with individual faculty members to expand their hands-on training, problem-solving skills, and understanding of the scientific method as applied in chemical research. These research projects typically involve interchange and collaboration across all levels of experience and may also involve scientists from other departments and institutions.

Chemistry is often referred to as "the central science" because of its key role in interdisciplinary studies. Correspondingly, a degree in chemistry affords a broad range of employment opportunities. Chemists can direct their talents to specialized problems of applied research, or they can choose to delve into fundamental investigations. A degree in chemistry can cover the spectrum of chemical specialties, from biochemistry to interstellar chemistry. The degree also provides valuable preparation for other professions, such as medicine, dentistry, and law.

The American Chemical Society, with more than 200,000 members, is the major professional society in the United States for practicing chemists. Both undergraduate and graduate students may join the society.

Facilities

The department's facilities for experimental and theoretical research are modern and extensive. They include diverse analytical instrumentation for use by faculty and students, as well as specialized equipment serving individual research groups. Shared instrumentation includes 400- to 900-MHz state-of-the-art NMR, high resolution mass spectrometers, and ultrafast laser systems in both the Center for Chemical Dynamics and the newly established Ultrafast Laser Facility, which support the department's research thrusts in the areas of Chemical Biology and Materials and Energy.

Other departmental instrumentation includes equipment for laser Raman spectroscopy, GC-MS and LC-MS/MS mass spectrometers, calorimeters, stopped-flow kinetics instrumentation, analytical ultracentrifuges, UV-vis-NIR absorbance spectrophotometers, FTIR spectrophotometers, HPLC, AAS, equipment for electrochemical measurements, and a Departmental Cell Culture Facility for biomedical research.

The chemistry department's computers are part of the campus-wide fiber optic communications network operated by Information Technology Services, and the entire University Circle area offers wireless access. In addition to the full complement of the University's software, Internet, and library database services, connections to off-site databases, such as SciFinder and Ohio Supercomputer Center, are available to departmental users.

Primary Faculty

Anna C. Samia, PhD
(Georgia Institute of Technology)
Rudolph and Susan Rense Professor of Chemistry and Chair
https://chemistry.case.edu/faculty/anna-samia/
Analytical chemistry, inorganic chemistry, materials and energy, bioinorganic chemistry, functional nanomaterials, nanotheranostics

Thomas G. Gray, PhD
(Harvard University)
Professor and Associate Chair
https://chemistry.case.edu/faculty/thomas-gray/
Inorganic chemistry, organometallic chemistry, materials, and computational chemistry

Matthew Bertin, PhD
(The Medical University of South Carolina)
Gilles and Malvina Klopman Assistant Professor of Chemistry
https://chemistry.case.edu/faculty/matthew-bertin/
Medicinal chemistry, organic chemistry, natural products, chemical ecology, analytical chemistry, mass spectrometry

Clemens Burda, PhD
(University of Basel, Switzerland)
Chemical Professor
https://chemistry.case.edu/faculty/clemens-burda/
Photochemistry, materials, physical chemistry, nanochemistry, bio- and energy applications, biophysical and biomedical science and engineering, spectroscopy

Carlos E. Crespo-Hernández, PhD
(University of Puerto Rico, Río Piedras Campus)
Professor; Associate Dean for Research
https://chemistry.case.edu/faculty/carlos-crespo-hernandez/
Photochemistry, physical chemistry, computational chemistry, biophysical chemistry, analytical chemistry, organic synthesis, environmental chemistry, chemical dynamics and kinetics, time-resolved spectroscopy, photodrugs, photodynamic therapy, energy conversion

Metin Karayilan, PhD
(University of Arizona)
Assistant Professor
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Organic chemistry, polymers, biomaterials, synthesis, materials characterization, 3-D printing, photochemistry, data science, green chemistry, chemical education

Irene Lee, PhD
(Pennsylvania State University)
Professor
https://chemistry.case.edu/faculty/irene-lee/
Biochemistry, medicinal chemistry, bioorganic chemistry

Fu-Sen Liang, PhD
(The Scripps Research Institute)
Professor
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Bioorganic chemistry

Divita Mathur, PhD
(Iowa State University)
Assistant Professor
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Biochemistry, medicinal, structural DNA nanotechnology, spectroscopy, nanotechnology, inorganic nanomaterials, nucleic acids, gene delivery

Drew A. Meyer, PhD
(Stanford University)
John Teagle Professorial Fellow in Chemistry; Senior Instructor
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Physical chemistry, inorganic chemistry, X-ray spectroscopy, chemical education

Shane M. Parker, PhD
(Northwestern University)
Frank Hovorka Assistant Professor of Chemistry
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Computational and theoretical chemistry

John D. Protasiewicz, PhD
(Cornell University)
Hurlbut Professor of Chemistry
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Inorganic chemistry, materials and energy, organometallic chemistry, photochemistry, catalysis, computational chemistry, crystallography, electrochemistry, green chemistry, main group chemistry, molecular electronics, nanotechnology, OLEDs, optoelectronics, physical organic chemistry, polymers, solar energy, solid-state chemistry, spectroscopy, supramolecular chemistry, synthesis

Robert G. Salomon, PhD
(University of Wisconsin, Madison)
Charles Frederic Mabery Professor of Research in Chemistry
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Biochemistry, chemical biology, medicinal chemistry, organic chemistry, bioorganic chemistry, cellular biology, molecular biology, natural products, pharmacology, synthesis

Geneviève Sauvé, PhD
(California Institute of Technology)
Professor
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Materials and energy, organic chemistry, physical chemistry, functional polymers, nanoscale morphology, organic electronics, solar energy conversion, structure-property relationships

Daniel A. Scherson, PhD
(University of California, Davis)
Frank Hovorka Professor of Chemistry
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Analytical chemistry, materials, physical chemistry, photochemistry, electrochemistry

Rekha R. Srinivasan, PhD
(Case Western Reserve University)
James Stephen Swinehart Professorial Teaching Fellow in Chemistry; Senior Instructor
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Analytical chemistry, biophysical chemistry, organic chemistry, chemical education

Benjamin Sturtz, PhD
(Case Western Reserve University)
Instructor
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Inorganic chemistry, organosilicon chemistry, macrocycle chemistry, dyes and pigments, chemistry education

Gregory P. Tochtrop, PhD
(Washington University Medical School)
Professor
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Biochemistry, biophysical chemistry, chemical biology, medicinal chemistry, organic chemistry, bioorganic chemistry, synthesis

Lecturers

Badru-Deen Barry, PhD
(Michigan State University)
Full-Time Lecturer
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Payel Datta, PhD
(Kent State University)
Full-Time Lecturer
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Brian Fitch, PhD
(The Ohio State University)
Full-Time Lecturer
https://chemistry.case.edu/faculty/brian-fitch/

Yusuf Nur, PhD
(Middle East Technical University)
Full-Time Lecturer
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Research Faculty

Mikhail D. Linetsky, PhD
(Academy of Science of Ukraine)
Research Professor
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Biochemistry, chemical biology, protein chemistry, post-translational protein modification, proteomics

Secondary Faculty

Drew Adams, PhD
(Harvard University)
Associate Professor
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Genetics and Genome Sciences

Laura Bruckman, PhD
(University of South Carolina-Columbia)
Associate Professor
https://engineering.case.edu/about/school-directory/laura-bruckman
Lifetime and Degradation Science, Quantitative Spectroscopic Characterization of Materials, Statistical Analytics and Data Science, Predictive Modeling

Paul Carey, PhD
(University of Sussex, UK)
Professor, Department of Biochemistry
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Biochemistry, biophysical chemistry, microscopy/imaging, spectroscopy

Thomas Gerken, PhD
(Case Western Reserve University)
Professor, Division of Pediatric Pulmonology
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Biochemistry, biophysical chemistry, chemical biology, glycosylation, protein chemistry, protein structure

Burcu Gurkan, PhD
(University of Notre Dame)
Assistant Professor, Chemical Engineering
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Chemical Engineering

Thomas Kelley, PhD
(University of Notre Dame)
Associate Professor, Division of Pediatric Pulmonology
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Biochemistry, medicinal chemistry, cellular biology, pharmacology

Lydia Kisley, PhD
(Rice University)
Assistant Professor, Department of Physics
https://physics.case.edu/faculty/lydia-kisley/
Experimental biophysics, soft condensed matter physics, microscopy, interfacial/surface science, nanoscience, physical chemistry/chemical physics, signal processing, image analysis

Witold K. Surewicz, PhD
(University of Lodz, Poland)
Professor, Department of Physiology and Biophysics
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Biochemistry, biophysical chemistry, neurochemistry, spectroscopy

Yanming Wang, PhD
(Federal Institute of Technology, Zürich, Switzerland)
Associate Professor, Department of Radiology
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Organic synthesis, molecular probes for in vivo imaging

Gary E. Wnek, PhD
(University of Massachusetts, Amherst)
The Joseph F. Toot, Jr., Professor of Engineering Professor, Department of Macromolecular Science & Engineering
https://engineering.case.edu/about/school-directory/gary-wnek
Polymeric biomaterials for drug delivery and regenerative medicine; nano- and micro-fiber fabrication; bio-mimicking approaches for polymer flammability mitigation; polymer packaging systems design; polyelectrolyte gels and elastomers; physiologically-mimicking macromolecular constructs with attention to primitive motile and irritable systems

Lei Zhu, PhD
(University of Akron)
Associate Professor, Department of Macromolecular Science & Engineering
https://case.edu/engineering/groups/leizhu/
Polymer structure and morphology, polymers for energy storage, nanocomposites, polymers for drug delivery

Adjunct Faculty

Michael Jirousek, PhD
(Case Western Reserve University)
Adjunct Instructor
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Michael J. Kenney, PhD
(Iowa State University)
Adjunct Associate Professor
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Emily B. Pentzer, PhD
(Northwestern University)
Adjunct Associate Professor
https://www.chem.tamu.edu/faculty/emily-pentzer/
Energy, Materials, Nanoscience, Organic Chemistry, Polymer Chemistry, Supramolecular Chemistry, Surface Chemistry, Sustainability & Green, Synthesis

M. Cather Simpson, PhD
(University of New Mexico)
Adjunct Professor
https://profiles.auckland.ac.nz/c-simpson
Biophysical chemistry; spectroscopic studies of biologically significant processes

Blanton S. Tolbert, PhD
(University of Rochester)
Adjunct Professor
https://www.med.upenn.edu/apps/faculty/index.php/g275/p9724013
Biochemistry, Biophysical Chemistry

Emeritus Faculty

Alfred B. Anderson, PhD
(Johns Hopkins University)
Emeritus Professor
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Materials, physical chemistry, electrocatalysis, interfacial phenomena, catalysis, theoretical chemistry

Mary D. Barkley, PhD
(University of California, San Diego)
Emeritus Professor and M. Roger Clapp University Professor of Arts and Sciences
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Analytical chemistry, biochemistry, biophysical chemistry, medicinal chemistry, photochemistry, physical chemistry, theoretical chemistry

Barry Miller, PhD
(Massachusetts Institute of Technology)
Frank Hovorka Professor Emeritus of Chemistry
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Physical chemistry, electrochemistry

Anthony J. Pearson, PhD
(University of Aston, Birmingham, England)
Rudolph and Susan Rense Professor Emeritus of Chemistry
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Organic chemistry, organometallic chemistry, catalysis, natural products, synthesis

Terry Swift, PhD
Professor Emeritus of Chemistry
Analytical chemistry

Fred L. Urbach, PhD
(Michigan State University)
Professor Emeritus of Chemistry
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Analytical chemistry, biochemistry, inorganic chemistry, bioinorganic chemistry, catalysis

Michael G. Zagorski, PhD
(Case Western Reserve University)
Professor Emeritus of Chemistry
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Biochemistry, biophysical chemistry, chemical biology, organic chemistry, beer brewing, bioorganic chemistry, drug delivery, NMR, structural biology

Programs

- Chemical Biology, BA
- Chemistry, BA
- Chemistry, BS
- Chemistry, Minor
- Chemistry, MS
- Chemistry, PhD

Dual Degrees

- Programs Toward Graduate or Professional Degrees