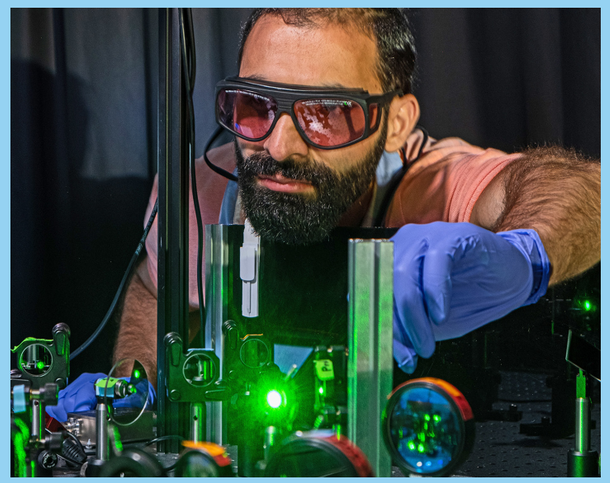
RICE NATURAL SCIENCES

Department of Chemistry

GRADUATE STUDIES AT RICE UNIVERSITY

Graduate students in the Rice University Department of Chemistry have established an extraordinary record of achievement. A 2013 study by the Max Planck Society ranked Rice Chemistry at No. 1 in the world, based on the citation records of student publications. Coupled with a prolific publication rate (seven publications and nearly three first authorships), a typical student in the program publishes multiple papers cited in the top 10% worldwide. Underlying the unusual development of Rice chemists is a strong, dynamic, interdisciplinary faculty that includes a Nobel Laureate, six members of the National Academy of Sciences, and two members of the National Academy of Engineering. The low student to faculty ratio (3:1) ensures that students have ample access to faculty time, instrumentation, and other resources.



The doctoral program at Rice is built around a close-knit community that promotes student achievement. This collaborative environment was critical to the development of nanotechnology, having facilitated the work of two Nobel laureates in the discovery of buckminsterfullerene. Rice's culture of collaboration has minimized barriers between research areas for decades. Chemistry faculty members hold appointments in four of the seven departments in natural sciences at Rice and in six of the nine engineering departments (most Chemistry faculty members also hold appointments in an engineering department). Rice chemists do not take a prescribed set of courses, but construct an individualized curriculum consisting of six courses in any area of science or engineering.

This flexibility to customize courses is ideal for chemists who want to branch out into other areas and for people who want to move into chemistry from another discipline.

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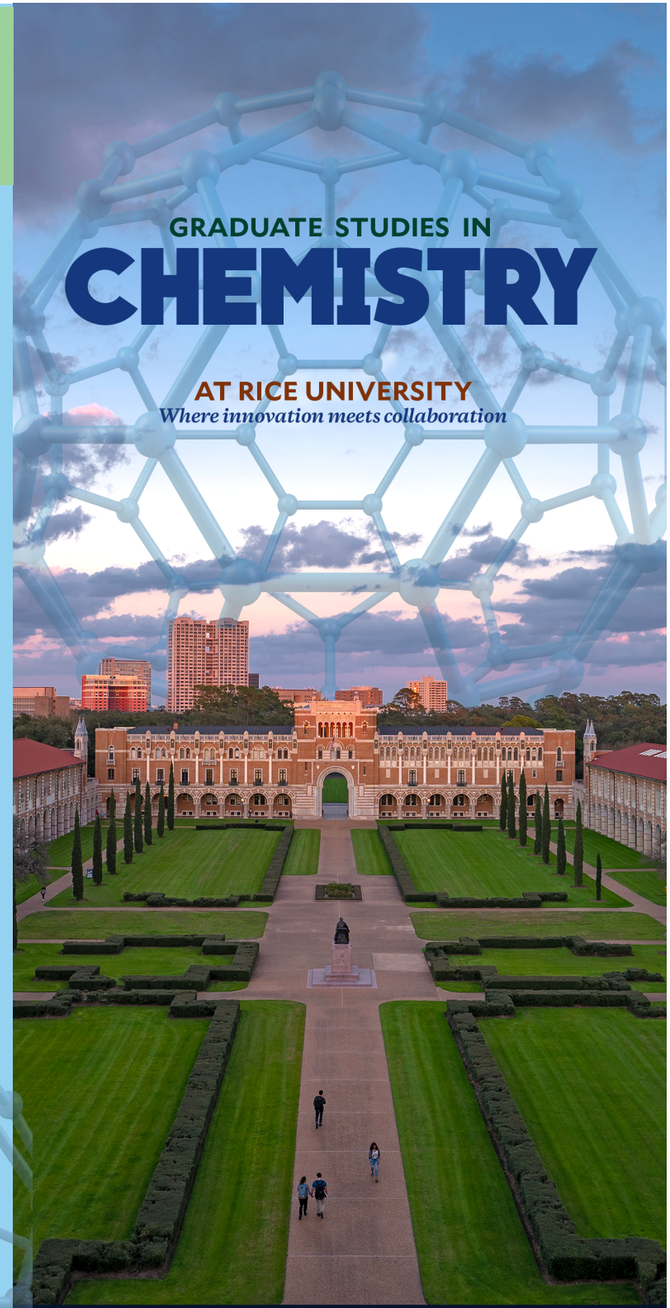
Graduate Recruiting email: gradchem@rice.edu



RICE UNIVERSITY DEPARTMENT OF CHEMISTRY FACULTY AND RESEARCH

Faculty holding joint appointments with (**1**) BioSciences, (**2**) Bioengineering, (**3**) Chemical & Biomolecular Engineering, (**4**) Computer Science, (**5**) Earth, Enviornmental and Planetary Sciences, (**6**) Electrical & Computer Engineering, (**7**) Material Science & Nanoengineering, (**8**) Physics & Astronomy, and (**9**) Civil & Environmental Engineering. Superscript corresponding numbers represent the joint appoinments.

Pulickel Ajayan[3, 7], Ph.D. (Northwestern, 1989)
Multifunctional nanostructures and hybrid platforms for energy storage, composites, sensors, electronics and biomedicine.

Pedro J. Alvarez[7, 9], Ph.D. (U of Michigan, 1992)
Bioremediation of contaminated aquifers, fate and transport of toxic chemicals, and environmental implication and application of nanotechnology.

Zachary T. Ball[1], Ph.D. (Stanford, 2004)
Reaction discovery, biomimetic catalysis, and organometallics for biology and medicine.

Bao, Gang[1], Ph.D. (Lehigh, 1987)
Nanomedicine, genome editing and molecular bioengineering.

Enrique Barrera[7], Ph.D. (UT Austin, 1987)
Formation of hybrid nanotube materials and the development of fully integrated nanotube composites.

Michael Diehl[2], Ph.D. (UCLA, 2002)
Biomotor cooperativity, biomaterials, supramolecular biophysics and molecular bioengineering.

Anna-Karin Gustavsson, Ph.D.
(U Gothenburg, 2015)
Development and application of 3D single-molecule, super-resolution microscopy with the goal of answering questions in physical chemistry, biophysics, and biomedicine related to cancer and other diseases.

Jason H. Hafner[8], Ph.D. (Rice, 1998)
Nanomaterials and enhanced spectroscopies for biomolecular structure.

Naomi J. Halas[2, 6, 7, 8], Ph.D. (Bryn Mawr, 1987)
Synthesis and characterization of nanoparticles that interact with light; earth-abundant metallic and dielectric nanoparticle synthesis and properties; plasmonic photocatalysis, environmental applications; and applications in bioimaging and biomedical therapies.

John S. Hutchinson*, Ph.D. (UT Austin, 1980)
Chemistry education research. Development and assessment of new teaching materials and approaches.

Jeffrey D. Hartgerink[2], Ph.D. (Scripps, 1999)
Self-assembly of nanostructured materials with a focus on molecular structures of proteins and peptide based biomaterials for tissue regeneration, drug delivery and other biomedical applications.

Oleg Igoshin[1, 2], Ph.D. (UC Berkeley 2004)
Theoretical biological physics, chemical kinetics and nonequilibrium statistical mechanics to chemical reactions systems. Modeling biochemical networks, gene regulation and enzymatic catalysis.

Matthew Jones[7], Ph.D. (Northwestern 2014)
Self-assembly of semiconductor and metallic nanocrystals for nanophotonics, complex systems and dynamic inorganic materials

Anatoly B. Kolomeisky[3], Ph.D. (Cornell, 1998)
Theoretical physical chemistry, biophysics and statistical mechanics. Modeling of biological transport systems and protein-DNA interactions and investigation of nanocars and other artificial nanoscale devices.

László Kürti, Ph.D. (U of Penn, 2006)
Synthetic organic chemistry specializing in the development of new catalytic asymmetric transformations, modes of chirality transfer, methods for the synthesis of bioactive N- and O-hetero cycles as well as novel aminating agents and transition metal-free amination reactions.

Christy F. Landes[3, 6], Ph.D. (Georgia Tech, 2003)
Experimental physical, biophysical and nano-materials physical chemistry and single molecule spectroscopy. Dynamic complexity and its role in biological and synthetic polymer functions.

Stephan Link[6], Ph.D. (Georgia Tech, 2000)
Physical chemistry of nanomaterials, nanophotonics and plasmonics, spectroscopy of individual and coupled nanoparticles with applications in opto-electronics, energy and medicine.

Jun Lou[7], Ph.D. (Princeton U, 2004)
Nanomaterial synthesis, nanomechanical characterization and nanodevice fabrication for energy, environmental and biomedical applications.

Fred MacKintosh[3, 8], Ph.D. (Princeton U, 1989)
Soft and biological matter, with particular emphasis on biopolymers and nonequilibrium aspects.

Angel Marti[2, 7], Ph.D. (U of Puerto Rico, 2004)
Development of molecules to diagnose and treat disorders like Alzheimer's that involve protein aggregates and development of supramolecular materials based on nanoscale building blocks.

Carrie Masiello[5], Ph.D. (U of California, Irvine, 1999)
Fundamental mechanisms of the carbon cycle, carbon sequestration, climate change, black carbon and terrestrial-river-ocean biosphere interactions.

Seiichi P. T. Matsuda[1, *], Ph.D. (Harvard, 1994)
Bioorganic and organic chemistry, terpenoid biosynthesis, enzyme evolution, redesign of enzymes to have new activities and genomic approaches to find biologically active molecules.

Antonios G. Mikos[2, 3, 7], Ph.D. (Purdue U, 1988)
Biomaterials for use as scaffolds for tissue engineering, as carriers for controlled drug delivery, as nonviral vectors for gene therapy and as platforms for disease modeling.

Emilia Morosan[7, 8], Ph.D. (Iowa State, 2005)
Design and synthesis of novel magnetic and superconducting materials.

K.C. Nicolaou*, Ph.D. (U London, 1972)
Specializing in organic chemistry with a focus on the synthesis of natural and designed molecules of biological and medical importance to cancer research.

Jose Onuchic[8], Ph.D. (Harvard, 1976)
Theoretical and computational methods for molecular biophysics and chemical reactions in condensed matter; protein folding funnels as a mechanism for the folding of proteins.

Matteo Pasquali[3, 7], Ph.D. (Minnesota, 1999)
Interaction of flow and liquid micro- and nanostructure in complex fluids, with application to the manufacturing of engineered materials.

George Phillips[1], Ph.D. (Rice, 1976)
Three-dimensional structure and dynamics of proteins to their biological functions, computational biology.

Peter Rossky*, Ph.D. (Harvard, 1978)
The elucidation of the fundamental molecular-level origins of chemical behavior in condensed phases and clusters using theory and computation.

Gustavo E. Scuseria[7, 8], Ph.D. (U Buenos Aires, 1983)
Development of theoretical and computational quantum chemistry techniques. Application of quantum mechanics to predict the structure and properties of molecules, materials and nanostructures

James M. Tour[4, 7], Ph.D. (Purdue, 1986)
Organic chemistry, materials science, polymer chemistry, nanoscience and nanotechnology.

R. Bruce Weisman[7], Ph.D. (U of Chicago, 1977)
Basic studies of carbon nanotube spectroscopy and photophysics and related analytical, mechanical engineering and biomedical applications.

Julian G. West, Ph.D. (Princeton U, 2017)
Design and development of new catalytic reactions for synthetic organic chemistry and cancer research.

Kenton H. Whitmire*, Ph.D. (Northwestern, 1982)
Inorganic and organometallic chemistry; precursor design for advanced nanomaterials; structural and mechanistic chemistry; catalysis; bioactivity of heavy main group elements.

Peter G. Wolynes[1, 8, 7], Ph.D. (Harvard, 1976)
Theoretical chemical physics; theory of glasses; protein dynamics and folding; Stochastic cell biology.

Michael S. Wong[3, 7, 9], Ph.D. (MIT, 2000)
Heterogeneous catalysis; clean water; clean energy; hydrocarbon upgrading; nanoparticle synthesis and assembly.

Han Xiao, Ph.D. (Scripps, 2015)
Development of chemical biology tools to study complex biology system as well as develop novel therapeutic strategies.

Boris I. Yakobson[7], Ph.D. (Russian Academy of Sciences, 1982). Theory and modeling of materials derived from macroscopic and fundamental molecular interactions.

Eugene R. Zubarev[7], Ph.D. (Russian Academy of Sciences, 1996). Organic chemistry and polymer chemistry, synthesis and characterization of self-assembling molecules.

*Currently not taking students