

Chemistry Faculty and their Research Interests

Our Department's faculty have a wide variety of research interests and hold joint appointments with ¹Biosciences, ²Bioengineering, ³Chemical & Biomolecular Engineering, ⁴Computer Science, ⁵Earth Science, ⁶Electrical & Computer Engineering, ⁷Material Science & NanoEngineering, ⁸Physics & Astronomy, and ⁹Civil & Environmental Engineering.

Pulickel Ajayan^{3,7}, PhD (Northwestern, 1989). Multi-functional nanostructures and hybrid platforms for energy storage, composites, sensors, electronics, and biomedicine.

Pedro Alvarez^{7,9}, PhD (U of Michigan, 1992). Bioremediation of contaminated aquifers, fate and transport of toxic chemicals, and environmental implication and application of nanotechnology.

Zachary Ball, PhD (Stanford, 2004). Chemical biology. Protein chemistry. Organic synthesis, bioinorganic, and medicinal chemistry.

Enrique Barrera⁷, PhD (UT Austin, 1987). Formation of hybrid nanotube materials and the development of fully integrated nanotube composites.

Andrew Barron⁷, PhD (Imperial College, U of London, 1986). Chemistry, nanoscale science and materials science of the Group 13 elements leading to the development of new materials and catalysts.

Philip R. Brooks, PhD (U of California, Berkeley, 1964). Physical Chemistry. Molecular-beam studies of chemical reaction dynamics.

Cecilia Clementi³, PhD (International School for Advanced Studies, 1998). Theoretical and computational investigation of protein folding, protein interactions and functions.

Michael Diehl², PhD (UCLA, 2002). Biomotor cooperativity, biomaterials, supramolecular biophysics and molecular bioengineering.

Paul Engel, PhD (Harvard, 1968). Free radical initiators, inhibitors of polymerization, free radical of single walled carbon nanotubes with organic free radicals.

Jason Hafner⁸, PhD (Rice, 1998). Application of nanometer-scale tools and materials to problems of biological and biomedical interest.

Naomi Halas^{2,6,7,8}, PhD (Bryn Mawr, 1987). Nanofabrication chemistry and nano-optics.

Jeffrey Hartgerink², PhD (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.

John Hutchinson, PhD (UT Austin, 1980). Chemical education

Matthew Jones, PhD (Northwestern, 2014). Nanoparticle synthesis, surface chemistry, supramolecular chemistry, soft matter assembly, and liquid-phase electron microscopy

Anatoly Kolomeisky³, PhD (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, PhD (Penn, 2006). Synthetic Organic Chemistry. Specializes in the development of new catalytic asymmetric transformations, modes of chirality transfer, methods for the synthesis of bioactive N- and O-heterocycles as well as novel aminating agents & transition metal-free amination reactions.

Christy Landes⁶, PhD (Georgia Tech, 2003). Experimental physical, biophysical, and nanomaterials physical chemistry; single molecule spectroscopy. Dynamic complexity and its role in biological and synthetic polymer functions.

Stephan Link⁶, PhD (Georgia Tech, 2000). Physical chemistry of nanomaterials, nanophotonics and plasmonics, spectroscopy of individual & coupled nanoparticles with applications in opto-electronics, energy, and medicine.

Jun Lou⁷, PhD (Princeton U, 2004). Nanomaterial synthesis, nanomechanical characterization and nanodevice fabrication for energy, environment and biomedical applications.

Angel Marti^{2,7}, PhD (U Puerto Rico, 2004). Development of molecules to diagnose and treat disorders that involve protein aggregates, e.g. Alzheimer's; development of supramolecular materials based on nanoscale building blocks.

Carrie Masiello⁵, PhD (U of California, Irvine, 1999). Fundamental mechanisms of the carbon cycle, carbon sequestration, climate change, black carbon, terrestrial-river-ocean biosphere interactions.

Seiichi Matsuda¹, PhD (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 Mikos^{3,7}, PhD (Purdue U, 1988). Synthetic biodegradable polymers as supportive scaffolds for cells, as conduits for guided tissue growth, as specific substrates for targeted cell adhesion, or as stimulants for a desired cellular response.

Emilia Morosan^{7,8}, PhD (Iowa State, 2005). Design and synthesis of novel magnetic and superconducting materials.

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

Jose Onuchic^{1,8}, PhD (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}, PhD (Minnesota, 1999). Interaction of flow and liquid micro- and nanostructure in complex fluids, with application to the manufacturing of engineered materials.

George Phillips¹, PhD (Rice, 1976). Three-dimensional structure and dynamics of proteins to their biological functions, computational biology.

Emilie Ringe⁷, PhD (Northwestern, 2012). Atomic resolution and three dimensional elemental mapping of alloy nanoparticles relevant for catalysis applications.

Peter Rossky³, PhD (Harvard, 1978). The elucidation of the fundamental molecular-level origins of chemical behavior in condensed phases and clusters.

Gustavo Scuseria^{7,8}, PhD (U Buenos Aires, 1983). Development of theoretical and computational quantum chemistry techniques (many in the Gaussian program). Application of quantum mechanics to predict the structure and properties of molecules.

Ned Thomas^{3,7}, PhD (Cornell, 1974). Polymer physics and engineering, photonics and phononics and mechanical and optical properties of block copolymers, liquid crystalline polymers, and hybrid organic-inorganic nanocomposites.

James Tour^{4,7}, PhD (Purdue, 1986). Organic chemistry, materials science, polymer chemistry, nanoscience, and nanotechnology.

R. Bruce Weisman⁷, PhD (U Chicago, 1977). Basic studies of carbon nanotube spectroscopy and photophysics and related analytical, mechanical engineering and biomedical applications.

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

Lon Wilson, PhD (U Washington, 1971). Nanoparticle development in biology and medicine. Nanotechnologically-enhanced medical imaging and therapeutic agents.

Peter Wolynes^{7,8}, PhD (Harvard, 1976). Theoretical chemical physics, theory of glasses, protein dynamics and folding. Stochastic cell biology.

Michael Wong^{3,7}, PhD (MIT, 2000). Chemical engineering, chemistry, and materials science, functional nanoparticle-based materials.

Han Xiao¹, PhD (Scripps Research Institute, 2015). Synthetic chemistry, chemical biology, molecular biology, cancer biology, and immunology.

Boris Yakobson⁷, PhD (Russian Acad. of Sciences, 1982). Theory and modeling of materials derived from macroscopic and fundamental molecular interactions.

Eugene Zubarev⁷, PhD (Russian Acad. of Sciences, 1998). Organic chemistry and polymer chemistry, synthesis and characterization of self-assembling molecules.