SUMMER UNDERGRADUATE RESEARCH PROGRAM IN CHEMISTRY at the University of Utah

The Department of Chemistry at the University of Utah is soliciting applications for a summer research program for outstanding undergraduates majoring in chemistry. This program provides the opportunity for an undergraduate to join an active research group and participate in a research project directed by a member of the faculty. In addition to the research experience, participants will have the opportunity to learn about new developments in a variety of areas of chemistry through direct contact with several faculty members. A SPECIAL OPPORTUNITY TO DO RESEARCH IN THE NETHERLANDS EXISTS FOR STUDENTS INTERESTED IN JOINING PROFESSOR ARMENTROUT'S GROUP.

The program is open to undergraduate chemistry majors who will graduate in 2010 and plan on attending graduate school in chemistry. An application is available by writing Dr. Richard Steiner (Steiner@chem.utah.edu). In addition to completing the application form, a transcript of your undergraduate academic record must be submitted and two letters of recommendation should be sent on your behalf from faculty members who are familiar with your recent progress as a chemistry major. Prompt application is encouraged, since only a few openings are available and applications are considered at frequent intervals.

The summer program begins May 27 and runs for 10 weeks through August 5. You should plan to arrive Tuesday, May 26. Participants will receive a $4200 stipend, plus housing and up to $500 for travel.

In addition to academic pursuits, a variety of weekend diversions are available, including back-packing, camping, river-running with the Outdoor Program, hiking in the nearby canyons of the Wasatch Front, mountain biking, and visits to the nine national parks in and around Utah.

Participating Chemistry faculty at Utah and their research interests are listed on the back of this flyer. If you desire more detailed information about specific research projects or have questions regarding the summer undergraduate program, do not hesitate to call or write. Address all inquiries and applications to:

Dr. Richard P. Steiner
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Chemistry Department
315 South 1400 East Rm 2020
Salt Lake City UT 84112-0850
Phone: 801-581-5325
Email: steiner@chemistry.utah.edu

The Faculty and Their Research Interests

SCOTT L. ANDERSON, Physical Chemistry: Reaction dynamics by laser, ion, and molecular beam techniques; Size selected nanocluster catalysts; Surface science; Catalysts for combustion/propulsion applications; direct dynamics theory of vibrational effects on reactions.

PETER B. ARMENTROUT, Physical Analytical & Organometallic Chemistry:. Chemistry, thermodynamics, and kinetics of the reactions of metal ions, metal-ligand complexes, and clusters using tandem mass spectrometry. Applications in biological chemistry, catalysis, solvation phenomena, environmental chemistry, semiconductor processing
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MICHAEL H. BARTL, Physical & Materials Chemistry: Micro- and nanophotonics: design and study of non-classical optical phenomena in photonic band gap crystals, semiconductor nanocrystal quantum dots, biophotonics; magneto-optical effects; self-assembly; single chromophore spectroscopy; micro-spectroscopy.

CYNTHIA J. BURROWS, Organic & Bioinorganic Chemistry: Organic and biological chemistry of DNA oxidation and cross-linking; RNA chemistry; mechanisms of purine modification.

JOHN C. CONBOY, Analytical Chemistry: Nonlinear laser spectroscopy studies of protein structure at surfaces, and spectroscopic imaging of cell membrane structures.

RICHARD D. ERNST, Inorganic Chemistry: Synthesis, characterization and reaction studies of organometallic compounds, especially those containing pentadienyl ligands; coordination chemistry of metal carbonyl and hydride complexes.

EDWARD M. EYRING, Physical & Analytical Chemistry: Synthesis and characterization of heterogeneous catalysts to produce Fischer-Tropsch diesel fuel. Preparation and characterization of palladium doped ceria aerogels to produce hydrogen in a water-gas-shift reaction. Development of pressure swing adsorption experiments to separate gases such as argon and xenon from gas mixtures.

CHARLES B. GRISSOM, Bioorganic Chemistry: Chemistry of diradical enzyme intermediates; magnetic field effects on enzymes; magnetic isotope effects; mechanism of antitumor antibiotics; enzyme mechanisms and kinetics.

JOEL M. HARRIS, Analytical Chemistry: Application of lasers to chemical analysis; time-resolved fluorescence and Raman spectroscopy; single-molecule detection. Spectroscopy of liquid/solid interfaces. Raman microscopy of optically-trapped particles.

GARY E. KECK, Organic Chemistry: Total synthesis of natural products; development of new synthetic methods; free radical reactions; organotin chemistry; stereochemistry of organic reactions.

RYAN E. LOOPER, Organic Chemistry: Synthesis of complex molecules to probe biological processes, in particular post-translational arginine modifications, prokaryotic protein synthesis and metalloproteinase mediated cell signaling.

JANIS LOUIE, Organic & Organometallic Chemistry: Design and discovery of new catalytic reactions, synthesis and study of reactive transition metal complexes, cycloaddition and rearrangement reactions, activation of carbon dioxide.

JOEL S. MILLER, Inorganic, Inorganic, Organic, Physical & Materials Chemistry: Synthesis and characterization of new materials based on moelcular chemistry (organic, organometallic, and inorganic coordination synthesis); molecule-based magnetic materials; interdisciplinary studies of the physical properties of new materials.

VALERIA MOLINERO, Physical Chemistry: Computer simulations and statistical mechanics methods to investigate disordered materials, from monatomic liquids to biomolecules and nanostructured polyelectrolyte membranes. Multiscale modeling of materials. Structure and dynamics of liquids and glasses. State of water in complex materials. Mechanisms of ice nucleation and crystallization. Molecular transport in batteries and fuel cell membranes.

MICHAEL D. MORSE, Physical Chemistry: Laser spectroscopy of cold, isolated reactive species in the gas phase, including bare metal and semiconductor clusters, atom-ligand complexes, radicals, and ions.

JENNIFER SHUMAKER-PARRY, Analytical Chemistry: Development and application of surface plasmon resonance (SPR)-based sensing methods for studying molecular recognition between biomolecules

C. DALE POULTER, Bioorganic Chemistry: Biosynthesis of terpenes; synthesis of substrate analogues, mechanisms of enzyme-catalyzed reactions; structure of nucleic acids; $^{1}H^{15}N$ NMR of biopolymers; construction of recombinant plasmids containing genes for enzymes and tRNAs.

JON D. RAINIER, Organic Chemistry: Chemical synthesis emphasizing the interplay between structure (biological activity), total synthesis, and reaction development.

THOMAS G. RICHMOND, Inorganic Chemistry: Synthesis and characterization of inorganic and organometallic complexes. Oxidation chemistry, electrochemistry and coordination chemistry. Study of mechanisms of inorganic transformations.

MATTHEW S. SIGMAN, Organic Chemistry: Discovery and development of catalysts for synthetically versatile reactions, combinatorial approaches for catalyst development, organometallic chemistry, synthesis.

JACK SIMONS, Physical Chemistry: Quantum mechanics, electronic spectra and chemical bonding of negative molecular ions; electron damage to DNA, electron-induced fragmentation of peptide ions, solvation of anions.

PETER J. STANG, Organic Chemistry: Reaction mechanisms; reactive intermediates; unsaturated cations and carbenes; molecules of medicinal and biological interest; organometallic chemistry.

THANH N. TRUONG, Theoretical & Computational Chemistry: Reactive dynamics of chemical reactions in gas-phase, in microsolvated states, and in solution; dynamics and mechanism of heterogenerous catalysis reactions; protein dynamics; computer-aided molecular modeling and molecular design.

GREGORY A. VOTH, Theoretical & Computational Chemistry: Theoretical studies of complex condensed matter systems, ranging from solution phase chemistry to materials science to biophysical chemistry. Development and application of novel theoretical methodologies in a high performance computing environment.

HENRY S. WHITE, Analytical Chemistry: Electrochemistry; scanning tunneling microscopy and tunneling spectroscopy of electroactive molecules; scanning electrochemical microscopy; organic electrosynthesis; iontophoretic transdermal drug delivery.

CHARLES A. WIGHT, Physical Chemistry: Solid-state kinetics, reactions of explosives and propellants, high-performance computer simulations of explosions, reactions of free radicals in low-temperature solids.

KENNETH J. WOYCECHOSKY, Biological Chemistry: chemical biology of proteins; protein folding; enzymology; use of protein engineering and biophysical methods to study self-assembly of virus-like capsids and amyloid fibrils; application of directed evolution to generate novel enzymes and receptors.

ILYA ZHAROV, Organic Chemistry: Organic, Inorganic and Materials Chemistry: Nanoporous materials, functional organic and hybrid organic/inorganic materials, surface chemistry, dendrimers, anti-cancer agents, self-assembly, molecular recognition.