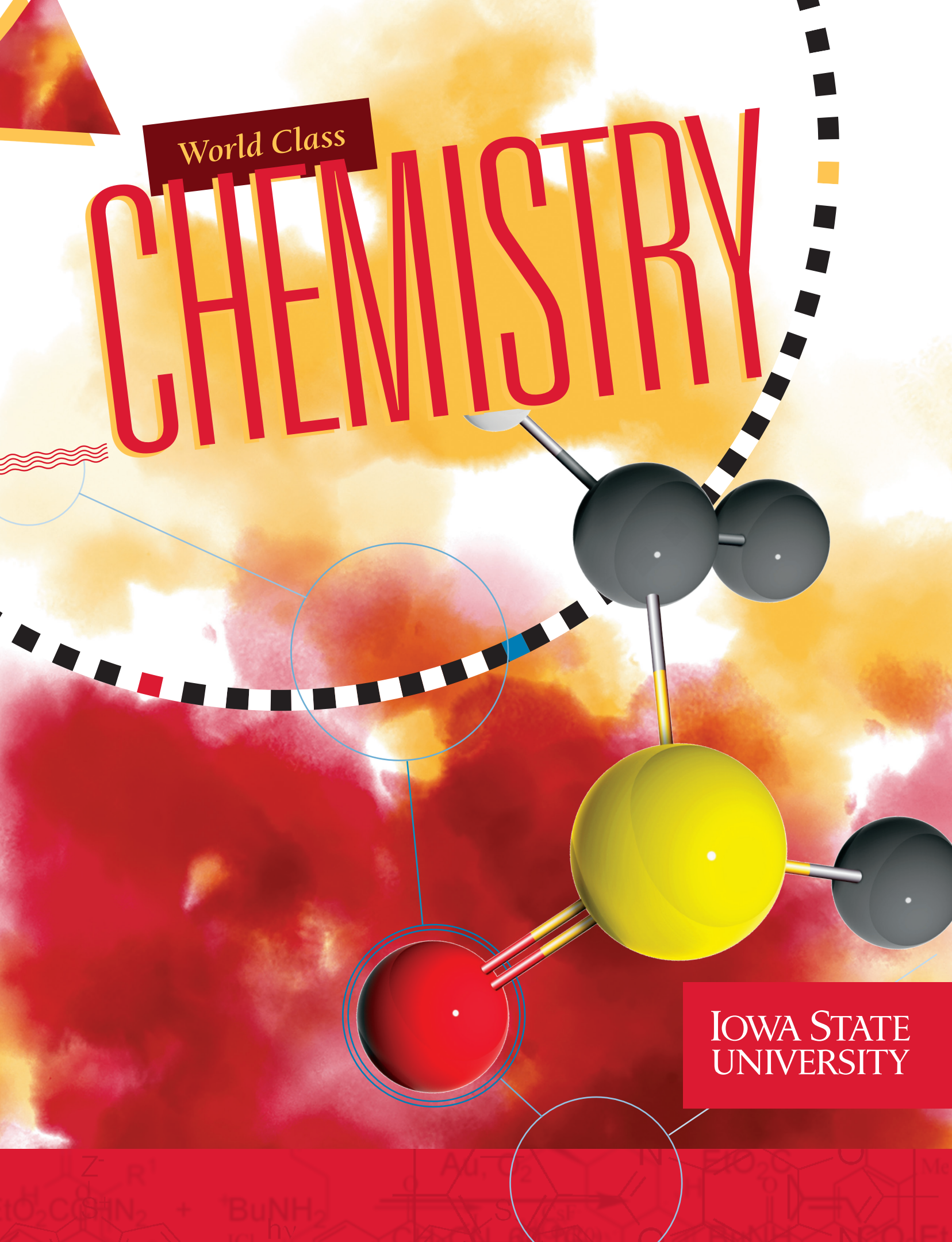
World Class

CHEMISTRY



IOWA STATE UNIVERSITY

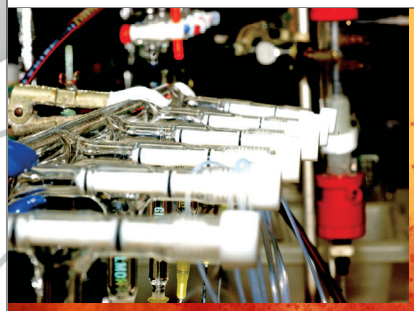
World Class Science Living Jobs

Welcome to the Iowa State University Chemistry family and thank you for your interest in our graduate program. Please use this brochure to find out about your opportunities in our department, to acquaint yourself with our faculty and their research interests, and to catch a glimpse of our university.

Feel free to contact any of our faculty to learn more about their research activities. You may also find us on the web at www.chem.iastate.edu. Our graduate admission team will gladly answer any questions about the admissions process or program details. They can be reached at (515) 294-7810 or by email at chemgrad@iastate.edu. On behalf of our entire department, we look forward to meeting you!

William Jenks

www.chem.iastate.edu



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The Ph.D. in Chemistry at Iowa State University

The Program

SELECTING A GRADUATE SCHOOL is one of the most important choices that you will make and the Chemistry program at Iowa State is among the best in the country. Research is the focus of our graduate program and our goal is to is to help you learn about the most modern research techniques and to think creatively about solutions to major scientific problems.

Our graduate program offers majors in the four traditional fields of analytical, inorganic, organic and physical chemistry plus a customizable interdisciplinary "chemistry" major in which a course sequence is designed by the student and advisor. Additionally, we offer specializations in Materials Chemistry, Industrial Chemistry, Biomolecular Science, Chemical Instrumentation, Forensic Chemistry and Chemical Education.

Pursuing a Ph.D. is a very exciting experience. In the first year students choose a research advisor, work as teaching assistants and take courses. Research begins in earnest in the summer following the first academic year. Usually coursework is completed and students are making good progress in research and preparing for the preliminary oral examination in the third year in residence. Most students present their work at national meetings during their career and virtually all publish their work in scientific journals. On average, it takes less than 5.5 years to complete the Ph.D.

Funding a graduate education at Iowa State is easy. All students receive paid tuition, health insurance and are supported on a teaching or research assistantship as long as they remain in good academic standing.

In the pages that follow, you'll find more information about our faculty, our campus, our facilities, and the City of Ames. Take a look at what the Department of Chemistry at Iowa State has to offer – we think you'll be glad you did.

World Class Facilities

Hach Hall

The Department of Chemistry at Iowa State University is home to world-class instrumentation, including high field NMR spectrometers, several classes of mass spectrometry, many optical spectroscopic tools, electron paramagnetic spectroscopy, X-ray crystallography, and much more. Beyond that, we have several research centers on campus that allow us to offer interdepartmental collaborations that are not found at other universities.

Hach Hall (pronounced "hock" hall), opened in 2010, and is the newest addition to the Department of Chemistry at Iowa State University. It joins Gilman, Wilhelm and Spedding Halls, along with the Roy J. Carver Co-Lab, to provide state-of-the-art facilities to support the continued excellence of the Chemistry program. The $74.5 million, 135,000 square-foot facility allows us to meet the distinct challenges of tomorrow's technological breakthroughs, while training the next generation of scientists. Some of the features of Hach Hall include:

- Flexible research laboratory spaces allowing the department to respond effectively to changes in research teams, research topics, equipment, and techniques. Special features include an isolated basement floor system for vibration suppression to accommodate ultrasensitive instrumentation.
- Technologically advanced teaching laboratories (organic and general chemistry) promote interactive, hands-on science exploration and learning. New student labs are designed with spaces for modern instrumentation. Larger labs facilitate group instruction and enhance student engagement.
- Centralized service facilities accommodate major research instrumentation for analytical support of ongoing research programs and student training.
- Classrooms and interaction spaces provide students with distinctive learning experiences. Several interaction areas throughout the building encourage planned and spontaneous discussions, brain-storming, and outreach sessions among students, faculty and staff.

Ames Laboratory **www.ameslab.gov**

Iowa State is the home of the Ames Laboratory, a national lab established and funded by the US Department of Energy. Its $30 million annual budget funds over 230 scientists. Many of the Iowa State Chemistry faculty are directly affiliated with the Ames Lab and enjoy the unique collaborative environment of the national laboratory system. Laboratory facilities directly adjoin the main chemistry building making collaboration as easy as walking down the hall. Research super-groups commonly consist of chemists, physicists and engineers coupled together to solve modern problems in materials, catalysis, environmental management, and computational science.

The Center for Biorenewable Chemicals (CBiRC)

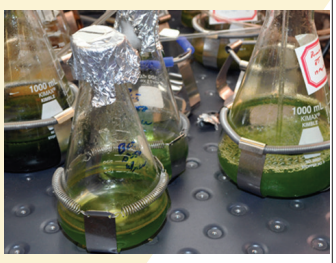
www.cbric.iastate.edu/

The Center for Biorenewable Chemicals (CBiRC) is developing the tools, components and materials needed to transform carbohydrate feedstocks into biobased chemicals. Core know-how and technologies include bioengineering of fatty acid and polyketide biochemistry in microorganisms, as well as an innovative and complementary portfolio of developments in chemical catalysis. By combining biocatalysis and chemical catalysis CBiRC creates new know-how and powerful systems that have the potential to nurture a sustainable biobased chemical industry. CBiRC believes it can enable the growth of the nascent biobased chemical industry with key biobased foundational intermediates that deliver an array of drop-in chemistry or similar functionality to existing fossil-carbon-based chemicals.

W. M. Keck Laboratory **www.microfab.chem.iastate.edu**

The W. M. Keck Laboratory for the Fabrication of Microminiaturized Analytical Instrumentation (Keck Lab), a part of Chemical Services, provides ISU with access to microfabrication technologies. With its approximately 1,000 square feet of class 10/100 clean rooms, the Keck Lab supports all phases of microfabrication and its use in the fields ranging from analytical chemistry to cell biology. Drawing from affiliates across camps and its resident support staff, expertise in micromechanics, microfluidics, microchip arrays, biology, chemistry, physics and microelectronics can be integrated in translating research ideas into experimental reality. Research capabilities in the lab include developing microanalysis systems, chip-scale chromatography, microelectrode assemblies, biochips and cell culture platforms. The laboratory currently houses equipment for optional lithography, surface metrology (stylus profilometry), wet chemical etching, and plasma etching. The facility will soon expand to include wire bounding, thin film deposition and chemical etching capabilities.

Center for Catalysis **www.ccat.las.iastate.edu**



The Center for Catalysis facilitates interdisciplinary collaborations between chemists, physicists, biologists, and engineers to address environmental, energy, and healthscience issues through catalysis. The work in the center encompasses basic research incatalysis, laboratory-scale applications to synthetic problems, and industrial-scale targetsfor impacting Iowa and national commercial interests. A main goal of the members ofthe Center for Catalysis is the development of new sustainable processes and improving sustainability of current processes through green chemistry and engineering and lifecycleanalysis. The Center for Catalysis also provides connections between scientists and engineers working on fundamental problems to groups seeking solutions to practical problems.

World Class Science

with World Class Faculty

SCIENCE AND RESEARCH ARE THE CENTER of every Ph.D. program in Chemistry. We have a renowned and well-funded faculty with a good mix of well-established researchers and emerging stars. We have a strong publishing record for both faculty and students and we typically receive over $10,000,000 in external funding per year.

Our faculty have been recognized as members or fellows of the National Academy of Sciences, the American Physical Society, the American Association for the Advancement of Science, as well as, the Royal Academy of Chemistry and the American Academy of Arts and Sciences. We have winners of such prestigious awards as the American Chemical Society Award for Distinguished Service in the Advancement of Inorganic Chemistry, The ACS F. Albert Cotton Award in Synthetic Inorganic Chemistry, American Chemical Society Pure Chemistry Award, Iota Sigma Pi Agnes Fay Morgan Research Award, the ACS Fisher Award, the Ralph N. Adams Award in Bioanalytical Chemistry, NSF CAREER Awards and several R & D 100 Awards. You can learn more about specific faculty research interests elsewhere in this brochure or at our web site, *www.chem.iastate.edu*.

World Class Job Placement

Graduates from the Iowa State University Department of Chemistry are highly sought after and accept offers from all types of different companies and academic institutions. Our graduates work at: Abbott Labs, Johnson and Johnson, 3M, Hewlett Packard, Dow, GlaxoSmithKline, Baxter International, Celanese, Pioneer Hi-Bred, Spectrumedix, Novartis, NIH, Mayo Clinic, Eli Lilly, Merck, Hoffman LaRoche, Molecular Dynamics, Proctor & Gamble, New York Police Department, Goodyear, General Electric, STMicroelectronics, IBM, Pfizer, Boehringer Ingelheim, Scripps Howard, NASA Ames Research Center, ConocoPhillips, Thermo Scientific, Varian, LECO, CETAC, Gilead Sciences and Bristol-Meyers Squibb.

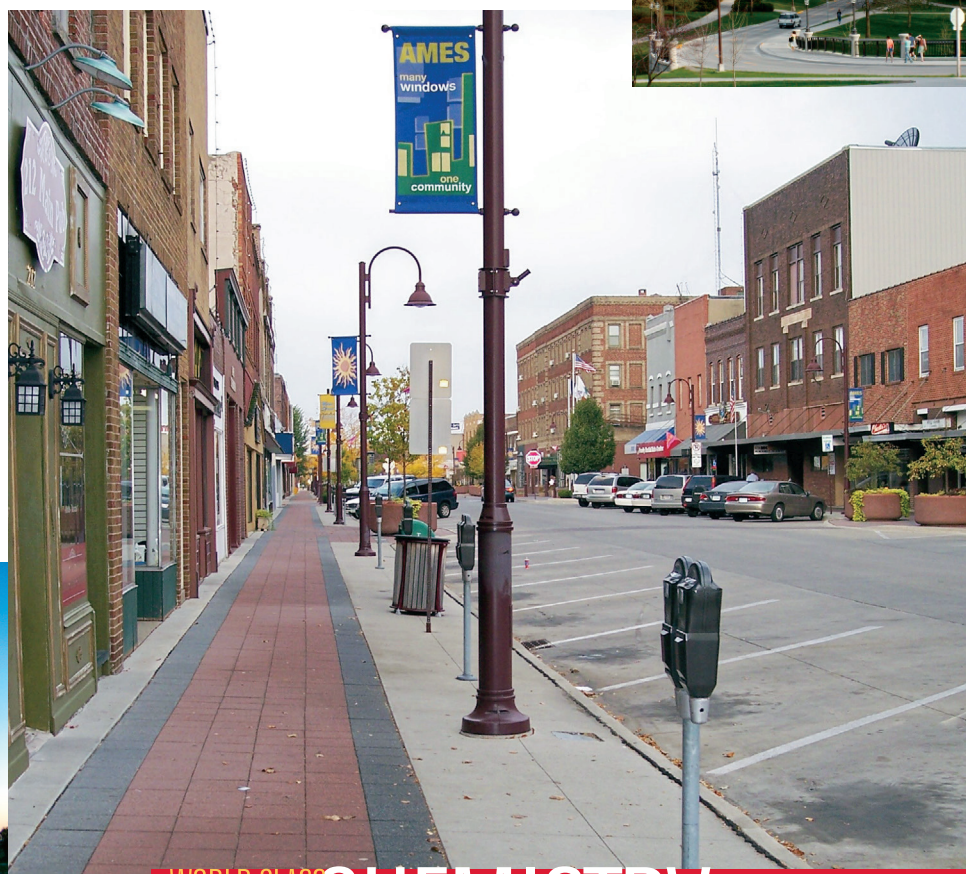
Our alumni who graduated over the last several years are now professors at UCLA, Coe College, St. Cloud State University (Minnesota), St. Norbert College, Purdue University, Wesleyan College, Truman State University, Long Island University, University of Wisconsin, Utah State University, and the University of Northern Iowa, among others.

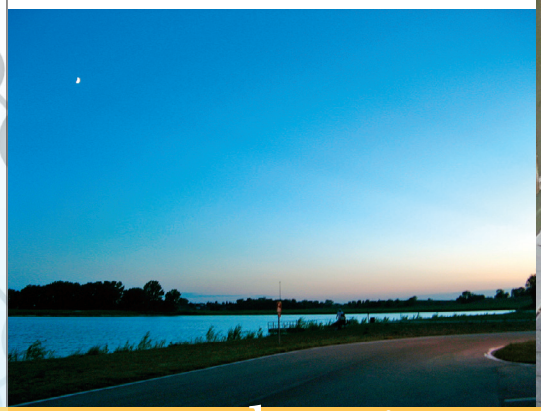
Answers That Matter.

World Class Small City Living

Iowa State University is located in Ames, a city of about 66,500 that has been ranked the second most liveable small city in the nation. The University plays a central role in shaping our entertainment and cultural life. We have benefits that befit a much larger city, while retaining the ambience, low crime, and modest cost of living of a smaller Midwestern town. Concerts of every sort stop in Ames. Touring theater is also complimented by an active local theater program. Recent events include *Criss Angel, Cirque, Newsboys United, Jersey Boys, The Color Purple,* and *The Diary of Anne Frank*. And, with the Iowa Events Center and the Des Moines Civic Center only a short drive away, you can see more great acts like *Hamilton, The Book of Mormon* and *Wicked*.

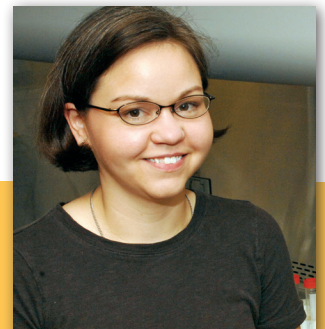
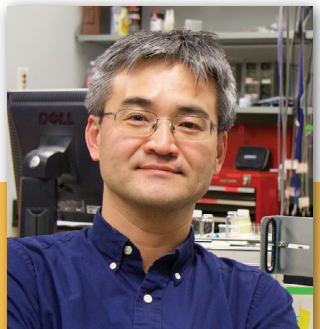
Housing and transportation are easy in Ames. Most of our students live in private apartments, but university housing is also available. Two bedroom apartments rent for about $750 per month, depending on size and proximity to campus. While most of our students own cars, Ames is a Bicycle Friendly Community and is proud to have an outstanding and inexpensive public transportation system, Cy-Ride, that is free for student use. The Des Moines International Airport is located less than an hour from campus with flights to and from most major cities in the U.S.





Meet Our World Class Faculty

Robbyn Anand:	Bioanalytical; Microfluidics; Electrochemistry; Separations
Jared Anderson:	Bioanalytical chemistry; chromatography and separations; ionic liquids; nucleic acid extraction and purification; green chemistry
Mark Gordon:	Development of Accurate Methods for Large Molecular Systems; Solvent Effects; Heterogeneous Catalysis; Fundamentals of Chemical Bonding.
Alexander: Gundlach-Graham	Analytical Chemistry, Atomic Mass Spectrometry, Nanomaterial Analysis, Mass Spectrometer Design
Thomas Holme:	Computational chemistry; Chemical Education; Measurement of student learning
Wenyu Huang:	Nanomaterials; Catalysis; Green chemistry; Renewable materials.
William Jenks:	Organic photochemistry; Organosulfur chemistry; Environmental photochemistry
Kirill Kovnir:	Novel Solid-State materials for energy and catalysis
George Kraus:	Synthetic organic chemistry; Biobased products; Green Chemistry
Young-Jin Lee:	Bioanalytical chemistry; Biological mass spectrometry
Junqi Li:	Molecular editing with transitional-metal catalysis and oganatalysis
Gordon Miller:	Atomic and electronic structure of complex solids using experiment and theory
Jacob Petrich:	Fundamental and Applied Uses of Light
Davit Potoyan:	Computational Biophysics; Statistical Mechanics; Systems Biology
Marek Pruski:	Solid state NMR methods; Heterogeneous catalysis; Materials chemistry; Hydrogen storage, Dynamic Nuclear Polarization
Aaron Rossini:	Solid-State NMR spectroscopy for characterization of materials and pharmaceuticals
Aaron Sadow:	Transition-metal, Rare Earth and Main Group Organometallic Chemistry and Catalysis for Green Chemistry
Igor Slowing:	Nanostructured materials; Catalysis; Green Chemistry; Biorenewables
Emily Smith:	Spectroscopy; Instrumentation; Imaging; Analytical Chemistry; Chemical Biology
Xueyu Song:	Statistical Mechanics and Biophysics
Levi Stanley:	Organic chemistry; Organometallic chemistry; Catalysis; Asymmetric synthesis; Artificial metalloenzymes
Pat Thiel:	Surface structure, growth and properties at the atomic scale
Brett VanVeller:	Organic, Bioorganic and Supramolecular Chemistry; Materials
Javier Vela:	Nanomaterials for biological imaging; Energy conversion; Catalysis
Vincenzo Venditti:	Regulatory mechanisms in enzymes and nanoparticle catalysts; NMR spectroscopy
Theresa Windus:	Environmental chemistry catalysis; Reaction Mechanisms; High Performance Computing
Arthur Winter:	Organic synthesis of chemical tools for biological applications
Julia Zaikina:	Unconventional synthesis of emerging inorganic and solid state materials
Yan Zhao:	Organic, supramolecular biomimetic materials; Catalysis; Nanochemistry


World Class Campus Services

Iowa State is an international, prestigious university with a friendly welcoming personality. More than 36,000 students choose from 100 majors, study with world-class scholars and hone their leadership skills in more than 800 student organizations. Iowa State offers a great environment where students can enjoy reaching their potential and discovering their passions. It's a culturally diverse student body with students from all 50 states and more than 110 countries.

Center for Excellence in Teaching and Learning

Our mission is to support, promote, and enhance teaching effectiveness and student learning; encourage scholarship of teaching and learning; communicate the importance of teaching and learning to both internal and external audiences; and serve as a catalyst for learning-centered education. The Center provides consultation, resources and programs to facilitate the professional and intellectual development of faculty, staff and graduate students as educators. Learn more at http://www.celt.iastate.edu/

Career Services

The Iowa State University Career Services is a coordinated network of career services offices offering a broad range of programs and services for undergraduate, professional, and graduate students, faculty, staff, alumni, and employers. These services include career exploration, career development, experiential learning, and professional career search assistance programs. The goal is to provide constituents with life-long skills to assist with career development and exploration.

Preparing Future Faculty

The PFF program supplements departmental graduate preparation by offering new teaching, mentoring, and learning possibilities, which give postdoctoral fellows, Ph.D. students, and master's students further credentialing for a competitive academic job market. PFF's goal is to better prepare graduates for faculty careers through a combination of seminars, mentoring, and practical classroom and departmental service experiences.

Graduate and Professional Student Senate

The Graduate and Professional Student Senate (GPSS) represents the graduate and professional students' perspective on campus issues and serves as a liaison between graduate/professional students and the university administration. Learn more at https://www.gpss.iastate.edu/

Student Services

More than 800 student clubs and organizations are active at Iowa State. These include many cultural groups to help international students make the transition to the Cyclone family. Participation in intramurals and sports clubs number in the thousands each year. Texas Hold'em. Hockey. Rugby. Broomball. Stampede Rodeo. Ski and Snowboard. Iowa State has it all. In addition, Recreation Services, with new and renovated facilities, provides group fitness classes, the Rec Milers club, personal trainers and state-of-the exercise equipment.

Notes:

Apply Now for Fall!

www.chem.iastate.edu

How to Apply:

1. Complete our online application at www.chem.iastate.edu
2. Upload copies of transcripts from all universities attended
3. Select three people to complete Letter of Recommendation
4. A current CV/resume and a statement of purpose can be uploaded
5. GRE and TOEFL scores (if required) can be uploaded with your application

Questions? Please email chemgrad@iastate.edu

Chemistry Graduate Admissions
Iowa State University
1605 Gilman Hall
2415 Osborn Drive
Ames, Iowa 50011-1021

IOWA STATE UNIVERSITY™