Annual research funding exceeds $4 million.
More than 130 graduate students.
Base assistantship stipend for Fall 2015 Ph.D. students is $24,080.
29 full-time faculty members including 8 new in the past 5 years.
More than 20 scholarships available.
State-of-the art NMR, Polymer Characterization and Mass Spectrometry Facilities.
Strong ties to nearby Oak Ridge National Laboratory, nation’s largest energy research facility.
Knoxville is only 30 minutes away from the Great Smoky Mountains with a cost of living 22% below the national average.
The Department of Chemistry has a long-standing tradition of excellence in chemical research and education beginning in 1947 when the department graduated the University of Tennessee’s first Ph.D. degree. Currently, with more than 30 faculty whose research interests cover the traditional areas of chemistry and encompass new interdisciplinary fields such as soft and hard materials chemistry, neutron spectroscopy, and bioorganic chemistry, we have one of the strongest programs in the southeastern United States.

The research and teaching achievements of the UTK chemistry faculty have been recognized nationally and internationally. Our faculty include six Fellows of the American Association for the Advancement of Science and many recipients of the prestigious NSF CAREER award and its predecessor the National Young Investigator award. The research accomplishments and innovation of our faculty have been recognized by the Dreyfus Foundation, the Guggenheim Foundation, the American Chemical Society, the American Physical Society and the Department of Energy.

The department is well equipped for research in all manner of investigations into synthetic chemistry, spectroscopy, materials characterization and analytical chemistry. Detailed information about our NMR, Mass Spectrometry, X-ray diffraction (powder and single crystal), and Raman Spectroscopy facilities, as well as the Polymer Characterization Laboratory can be found in the pages that follow. The department also maintains electronic, glass, and machine shops to assist in the research programs of the faculty.

The Department of Chemistry enjoys a close relationship with scientists at nearby Oak Ridge National Laboratory (ORNL), the Department of Energy’s largest science and energy research facility operated jointly by the University of Tennessee and Battelle Memorial Institute. Many of our faculty collaborate with research groups at ORNL and several notable ORNL researchers are joint faculty members in the Department of Chemistry.

This brochure and its companion, “Faculty and Research in the Department of Chemistry,” describe our graduate program and the current research interests of our faculty. For more detailed descriptions of faculty research projects, visit the department’s Web site, www.chem.utk.edu, where you can investigate other aspects of our graduate program and apply online. For a more in-depth look at the department, visit us in person and learn about our program firsthand from the faculty and current graduate students.

We are proud of the Department’s tradition of excellence and invite you to become a part of it!

Charles Feigerle
Professor and Department Head

www.chem.utk.edu
WHY UT?

If it is true that a number of graduate schools offer a valuable experience, you may be asking “Why UT?” We hope that this booklet, supplemented with details from our research booklets and our web site (http://www.chem.utk.edu), will answer that question persuasively. Let’s first look at why other students chose to join UT Chemistry Department and how they have enjoyed the program.

UT gave me the opportunity to fulfill my dream of becoming a synthetic organic chemist under the great mentorship of an expert in the field. The facilities were up-to-date, and the personnel are always happy to help. Outside of the school, Knoxville is an affordable town with lots of entertainment opportunities nearby. My experience at UT has been a great one, which I would not trade for anything.

— Irene Abia

“People here are really nice and they helped me a lot in my first year here! I like this place. The department is like a big family.”

— Zhenqian Zhu

Collaborative efforts with ORNL is an extremely motivating feature.

— James Patton

To me, graduate school has attested Thomas Edison quote that “Genius is 1% inspiration and 99% perspiration”. Along this journey, I have truly found the workplace camaraderie as well as social companionship I experienced for five years at UT to be the best years of my life.

— Dias Linton

Despite this being such a large University, I still get the one on one that I need. I have a name instead of a number.

— Stephaine Rickett

The University of Tennessee Knoxville campus was founded in 1974 and is the flagship institution in the state with a current enrollment of 26,000 students. The Chemistry Department has one of the largest graduate programs within the university, and we are steadily growing. At the same time, our department offers excellent opportunities for our graduate students to work closely with their mentors as our faculty has 30 research active members with a range of scientific interests. We have added 11 of these faculty members in the last six years, and our research funding has increased by 25% since 2006.

Many members of our faculty have been nationally and internationally recognized for their accomplishments and have received a number of honors, such as induction into the American Association for the Advancement of Science (AAAS) and National Science Foundation CAREER awards for young faculty. All of these factors help to make the Chemistry Department at UTK a dynamic and vibrant program that we believe will offer you an excellent opportunity to further your career.
One of the most prominent strengths of UT’s Chemistry Department is its network of collaborations. On national and international levels, the department’s Principal Investigators collaborate with universities, industry, federal research institutions and national labs. Two collaborating institutions within a short driving distance of the Department are the UT Memorial Research Hospital and the Oak Ridge National Lab (ORNL). Both offer research opportunities which go well beyond those found at peer chemistry departments.

Research with the UT Research Hospital is based on the interface between medicine and organic chemistry with a world class radiopharmaceutical program with an emphasis on short-lived positron emitting isotopes for use in Nuclear Medicine imaging. Currently, a member of the Chemistry Department serves as Director of Research in the Department of Radiology.

Collaborations with ORNL are as multi-faceted as chemistry itself and range from nanoscience (Center for Nanophase Materials, CNMS), computational chemistry utilizing supercomputers (Joint Institute of Computational Sciences), environmental research, material sciences (Joint Institute of Material Science) and the world-leading Neutron Spallation Source. Being the DOE’s largest science and energy laboratory, with annual funding exceeds $1.65 billion, ORNL is managed by the University of Tennessee and Battelle Memorial Institute. Currently, six Chemistry faculty members are serving as joint faculty members between UT and ORNL. This provides incomparable opportunities for graduate students inside the Department in terms of research experience, funding and career development.

Because the state of Tennessee is interested in keeping East Tennessee a vital center of inquiry and discovery, it funds the Science Alliance—a “center of excellence” designed to maximize the research resources of the university and ORNL. The Science Alliance facilitates cooperation among research groups, provides stipends and research awards, offers summer research programs for new graduate students, and opens access to sophisticated instrumentation. Consequently, the area draws post-doctoral researchers and visiting scientists from around the world, which helps create and maintain a broad-based international atmosphere of investigation.

As for information resources, the university’s library system stands out for its excellent chemistry collection housed in the main library building. The library supports campus scholarship through digital publishing, digitization of unique local content, and the creation of digital collections to support research and teaching. In addition to the easily accessible digital collections, 179 library staff make themselves readily available for any questions students might have. A specific chemistry subject librarian is appointed to help chemistry grad students with their research.

ACGS, the Association of Chemistry Graduate Students, was founded to promote and maintain an environment optimal to the graduate learning experience of its members. It also represents its members in matters concerning the Chemistry Department by providing recommendations to appropriate decision making officials and organizations. Membership is open to all Chemistry graduate students. The ACGS frequently invites renowned chemists to give seminar talks and career workshops. The ACGS also organizes social events each year for its members such as a welcoming cook out, a fall social, and holiday gatherings to provide an opportunity for students to get to know each other. In addition, ACGS offers community service allowing its members to be involved with the local community.
The Mass Spectrometry Center is equipped with four mass spectrometers:

- The JEOL AccuTOF(tm) Mass Spectrometer is a LC-TOFMS (Liquid Chromatography Time-of-Flight Mass Spectrometer) using an orthogonal acceleration and a single stage reflectron. Our AccuTOF(tm) is equipped with a highly durable, orthogonal electrospray (ESI) source, and a contamination resistant, extremely versatile direct-analysis-in-real-time (DART) source.
- The Applied Biosystems QSTAR(r) XL Hybrid LC/MS/MS System is a hybrid quadrupole time of flight mass spectrometer (QTOF) using an orthogonal acceleration and a single stage reflectron. Our QSTAR(r) XL is equipped with an IonSpray, a TurboIonSpray, a NanolonSpray, an atmospheric pressure photoionization (APPI), and an oMALDI ion sources. It is integrated with a LC Packings UltiMate(tm) fully integrated micro-, capillary-, and nano-HPLC system.
- The Applied Biosystems Voyager-DE(tm) PRO Biospectrometry Workstation is a bench top matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) mass spectrometer. It can be operated in linear and reflectron modes.
- The Waters Quattro II is a triple quadrupole mass spectrometer. Our Quattro II is equipped with an electrospray (ESI) source and an atmospheric pressure chemical ionization (APCI) source. It is integrated with an Agilent 1050 HPLC system.

The Chemistry Department also owns several Hewlett-Packard GC/MS instruments. Individual faculty members in the Department have customized MS instruments in their laboratories.

The department has six FT-NMRs in the department that are accessible 24 hours a day, 7 days a week. The schedules of all are organized electronically via web based signup. Students are trained to use the instruments they need soon after they arrive and then given full access to them to do their research.

The instruments that we have are:
- a 600 MHz with cryoprobe
- 500 MHz multinuclear
- 400 widebore multinuclear with microimaging capabilities
- 300 plus 250 MHz instruments for routine measurements
- a dedicated solids instrument at 400 MHz field strength

NUCLEAR MAGNETIC RESONANCE (NMR)

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- a dedicated solids instrument at 400 MHz field strength
The department has well-staffed shops to support chemistry research, including a machine shop, an electronics shop and a glass-blowing shop. The machine shop includes a state-of-the-art numeric control (CNC) milling machine which accepts CAD designs and automatically machines as many exact replicas of custom parts as needed. A machinist is staffed there with over 25 years experience in fabricating a wide range of cells and other objects required by researchers. The electronics shop is staffed by four experienced technicians, who maintain and repair research instruments, design and construct novel electronic devices, perform computer support and administer departmental servers. Our professional glass-blower has over 35 years experience in repairing and producing scientific glass items.

The department has both single crystal and powder diffractometers. Our Bruker single crystal instrument has an APEX II CCD detector which can collect full data sets within hours, from which structures can be obtained within minutes. Our powder diffractometer is a brand new PanAnalitics.

The Department recently acquired a new multi-purpose research diffractometer, Empyrean. It is unique in its ability to measure all sample types on a single instrument, without compromising data quality. Samples it can measure include powders, thin films, nanomaterials, and solid objects.
Nathan I. Hammer  
Class of 2003  
Assistant Professor  
Department of Chemistry & Biochemistry  
The University of Mississippi

I would say that my time at UT was very instrumental in my development as a scientist and as an individual. The chemistry program prepared me well for my career and I try to make it back as often as I can to visit.

Laurel Morton  
Class of 2005  
Assistant Professor  
Department of Chemistry  
Eastern Kentucky University

“I had a great experience at UT. I could not have asked for a better advisor… He was instrumental in helping me obtain my post doc position and is still helping me any way he can through mentoring and facilitating contacts in the field. Through my studies and research experience at UT, I was able to lay the foundation of research skills that I needed to be successful in beginning my own research program here at EKU…”

Nathan I. Hammer  
Class of 2003  
Assistant Professor  
Department of Chemistry & Biochemistry  
The University of Mississippi

The UTK Chemistry Department has very good environment and facilities to conduct research. During my five years of graduate studies here, I had nine journal articles published with four of them as first author. Until May 2010, those articles have been cited over three hundred times by other scientists. On top of that, as a Teaching Assistant for General Chemistry Courses, I had a great opportunity to communicate with students and other faculty members, which not only strengthened my communication skills, but also solidified my fundamental chemistry knowledge. These are key factors for me to be successful in the industry. After joining the plastics industry for only one year, I have been elected into a leadership role of the Society of Plastics Engineers (SPE). I truly appreciate that the University of Tennessee offered me great training and assured my successful future.

Dejin Li  
Class of 2008  
Process Chemist  
SABIC Innovative Plastics Technology Center  
Washington, WV

“I had very good environment and facilities to conduct research. During my five years of graduate studies here, I had nine journal articles published with four of them as first author. Until May 2010, those articles have been cited over three hundred times by other scientists. On top of that, as a Teaching Assistant for General Chemistry Courses, I had a great opportunity to communicate with students and other faculty members, which not only strengthened my communication skills, but also solidified my fundamental chemistry knowledge. These are key factors for me to be successful in the industry. After joining the plastics industry for only one year, I have been elected into a leadership role of the Society of Plastics Engineers (SPE). I truly appreciate that the University of Tennessee offered me great training and assured my successful future.”
Jonathan Morrell  
Class of 2000  
Technology Development Division  
Compatibility and Surveillance Section Manager  
Y-12 National Security  
Oak Ridge, TN

I selected the Chemistry Department at the University of Tennessee (UT) for my graduate studies due to their close ties with Oak Ridge National Laboratory (ORNL). The opportunity to do research both at UT and ORNL allowed for valuable experience in both scientific and government collaborative areas and networking with top scientists in their fields of study.

Jessica White  
Class of 2009  
Research Associate,  
Oak Ridge National Laboratory, Global Nuclear Security Technology Division  
Oak Ridge, TN

The Chemical Physics program at the University of Tennessee allowed me to take a diverse curriculum. The size of the university offered a variety of research areas, but the small research groups allowed for much one-on-one time with my advisor. Further, the university’s national lab affiliation (ORNL) allowed me to carry out parts of my research at a world-class facility.

Elizabeth M. Zippi  
Class of 1991  
Professor of Chemistry  
Department of Chemistry and Physics  
Louisiana State University in Shreveport

At UTK, I learned how to work independently in a laboratory setting and how to design the flow of a research project. My training at UTK afforded me the experience needed to secure two post-doctoral positions at Lawrence Berkeley Laboratories where many unique opportunities were available to me... I enjoyed many of my classes at UTK, especially those covering spectroscopy and mechanisms. The Smokey Mountains with its beautiful scenery, shops at Pigeon Forge, and Dollywood all provided places for well needed and deserved breaks from my studies.
Tennessee Recreational Center for Students (TRECS)

Opened in August of 2003, TRECS boasts four basketball courts and a 1/7th mile indoor circular track. The main fitness area includes over 80 pieces of cardiovascular and over 100 strength training stations. As part of the cardiovascular selection, there are 18 treadmills and 33 elliptical machines along with an in-house entertainment system that allows participants to watch and listen to their favorite TV stations or XM radio as they workout.

Student Aquatic Center (SAC)

The facility features two Olympic-size swimming pools. The indoor pool includes a separate diving well with four 1-meter and 3-meter springboards and a 10-meter platform. The outdoor pool features 5-, 7.5-, and 10-meter platforms as well as two 1-meter and two 3-meter springboards.

The Bubble

The Bubble provides 24,000-square feet of additional recreational and instructional space. It includes three multipurpose areas for activities such as basketball, fencing, indoor soccer and volleyball. The Bubble also now houses a portable dasher board system to accommodate indoor soccer and floor hockey.

HPER

The Health and Physical Education Building, or HPER provides 4 multipurpose courts, 10 racquetball courts, 2 wallyball courts, 2 squash courts, outdoor tennis courts, a small indoor pool and a free weight room with a choice of cardio equipment. Included at HPER as well is the Rock Climbing Wall for people who enjoy this challenging sport.
CITY OF KNOXVILLE

Population (2010)
Knoxville: 178,874
Knox County: 432,226
Metro: 698,030

Weather
Annual Average Temperature: 58°F
Annual Average Rainfall: 47.17 inches
Annual Average Snowfall: 11.40 inches

Cost of Living
July 10, 2006 - ERI Economic Research Institute has announced that Knoxville ranks as the best place in the United States for recent college graduates.

Location
One-third of the U.S. population lives within 500 miles of Knoxville. Here are a few cities within a day’s drive on an Interstate highway:

Major Cities around Knoxville
Atlanta, GA 213 miles, 3.5-hour drive
Baltimore, MD 525 miles, 8.5-hour drive
Charlotte, NC 244 miles, 4-hour drive
Chapel Hill, NC 322 miles, 5.5-hour drive
Cincinnati, OH 260 miles, 4-hour drive
Memphis, TN 392 miles, 6-hour drive
Nashville, TN 180 miles, 3-hour drive
Washington D.C. 486 miles, 8-hour drive

Taxes
There are no state or local personal income taxes in Tennessee.

Housing
Housing is easily affordable in Knoxville. The price is usually under $500 for a one bedroom apartment.

Sports
Knoxville is a sports fan’s mecca with the “Go Vols” tradition at the University of Tennessee and champion hockey team, the Knoxville Ice Bears. Every fall, football season brings tens of thousands of fans to the nation’s fourth-largest stadium – Neyland Stadium – on UT campus, which seats a total of 102,037 people (2006). Tennessee has posted 78 winning seasons in 88 years of games played on the current site of the stadium.

Arts & Culture
Downtown Knoxville is abuzz with many cultural opportunities. The Knoxville Museum of Art is a dynamic center for the exhibition and exploration of the visual arts. Beck Cultural Center displays many types of African art. The Tennessee Theatre, also known as “Knoxville’s Grand Entertainment Palace” offers something for everyone: classical music from Knoxville Symphony Orchestra, vintage films, dance, theatre and stellar performances such as “Mama Mia” and “Blue Man Group”.

Clarence Brown Theater on campus offers a varied repertoire of plays and musicals featuring nationally renowned guest artists. Student tickets are offered at a discounted rate of only 5 dollars. Besides traditional theaters, Knoxville also hosts more than 10 movie theaters offering you the ultimate movie experience.

Recreation
Knoxville and Knox County have 5,596 acres of park and recreation space, including 27 recreation centers, 144 playgrounds and parks, 103 tennis courts, 20 public golf courses, and 14 greenways and walking trails.

The nearby Great Smoky Mountains National Park is the country’s most visited national park. Visitors are drawn by the beauty of the mountain landscape, the hiking trails, and activities such as swimming, boating, kayaking, and fishing that can be found there and at a number of other state parks, lakes, and resorts that dot the area. Norris Lake, which is a 30-min drive from Knoxville downtown area, hosts more than 20 marinas. It serves as a great destination for water-sports-loving people all year round.

www.chem.utk.edu
HOW TO APPLY:

Application Deadline
- The department accepts applications on a rolling admissions basis until the incoming class is full.
- Early applicants will be considered for fellowships and scholarships which can substantially raise the stipend.

Program Application Requirement
- General GRE required
- Chemistry subject test recommended
- TOEFL or iBT required for international students
- 3 Letters of Recommendations required
- Official Transcript(s) required
- Resume required
- Personal statement recommended

Department contact information
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552 Buehler Hall  
University of Tennessee  
Knoxville, TN 37996-1600  
(865) 974-3141  
Fax: (865) 974-3454  
E-mail: chemistry@utk.edu  
http://www.chem.utk.edu

For more information, please visit  
http://www.chem.utk.edu/applynow

Or scan the QR code on the left.