Analytical and Environmental Chemistry: The design of instruments and analytical methods, guided by sophisticated software, unifies this diverse program. Projects include the development and characterization of remote sensors, separation science, mass spectrometry, atomic spectroscopy, forensic science, and environmental analyses.

Graduate Program: All accepted students in good standing are fully supported for up to five years by a combination of departmental and research grant funds. The total 12-month stipend for students entering in fall 2011 is $22,000. We emphasize an early start on research experience, and all of the formal course work can be completed in the first year for many students. Thesis research is conducted in research groups averaging six to seven students. This group size is large enough to encourage dynamic interactions and collaborations, but small enough to ensure strong student-faculty interaction. The National Science Foundation ranked USC chemistry No. 30 in the nation in total spending for chemical R&D in 2008, and in 2009 the Department of Chemistry and Biochemistry at the University of South Carolina was No. 26 in the nation in the National Research Council’s Faculty Research Activity Ranking and No. 4 among public universities in the South.

State-of-the-Art Facilities: Research facilities for NMR, CCD X-ray, mass spec and electron microscopy are available on a hands-on basis. A full-time staff assists and trains students. Additional support staff members operate the machine shop, electronics shop, computer clusters and analytical facilities. The Department of Chemistry and Biochemistry occupies a 158,000-square-foot research facility constructed in 2000, with additional space in the Horizon Center in Columbia’s new Innovista research district.

The University of South Carolina, one of the oldest public universities in the United States, was established in 1801 and currently enrolls almost 30,000 students on the Columbia campus. During the 2010-2011 fiscal year, a record $226.9 million was received in grants and contracts to support research, training and outreach. The University of South Carolina is ranked No. 54 in the nation among public universities, according to the 2012 rankings from U.S. News & World Report. Among the criteria in the ranking of universities are acceptance and graduation rates, retention, class size, faculty resources, SAT scores, and alumni giving. The Carnegie Foundation for the Advancement of Teaching has designated the University of South Carolina as an institution of “very high research activity.” Carolina is one of 73 public and 35 private research institutions — and the only university in South Carolina — to earn this distinction.

Location: The University of South Carolina is located in Columbia, the state capital. Its central location in the state provides easy access to the well-known S.C. beaches, as well as the Smoky Mountains and Appalachian resorts. Metropolitan Columbia has more than 700,000 residents and offers the many amenities of a progressive city that serves as a center for cultural activities in South Carolina. In 2007, Columbia was ranked as one of America’s most livable cities by Partners for Livable Communities, and it was named one of Relocate-America’s “Top 100 Best Places to Live” in 2008.

For additional information, please contact:
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S. Michael Angel
“"My group is exploring spectroscopic techniques and sensors for environmental, marine, earth and space science applications with emphasis on remote measurements.”

John Ferry
“My group studies how natural and technological processes can work to remove trace organic chemicals from the environment. The role of sunlight and surfaces is particularly important in our research.”

A laser-induced plasma probe is used for remote elemental analysis.

There are a wide variety of chemical reactions that can process chemicals in the environment.
Stephen L. Morgan

“We’ve been involved in basic research in forensic analytical chemistry to develop analytical methods for forensic trace evidence such as textile fibers (spectroscopy and capillary electrophoresis), drugs of abuse (GC, LC and MS) and polymers (pyrolysis GC/MS). Recent work in fiber analysis has the objective of understanding the scientific basis and establishing the validity of forensic fiber examinations.”

Timothy J. Shaw

“The analytical/ environmental chemistry laboratory combines analytical method development with environmental applications such as transport and cycling of trace elements associated with icebergs, seawater and submarine ground waters.”

Michael L. Myrick

“We’re working to understand how nutrient conditions affect fluorescence properties of phytoplankton. This knowledge is being used to test phytoplankton as sensors for ocean composition. It is also being used to help identify phytoplankton by their pigmentation regardless of ocean composition.”

Scott R. Goode

“Laser volatilization and excitation provide a unique opportunity for chemical analyses of samples while avoiding the problems inherent in dissolving a sample. These techniques have practical application in diverse areas such as environmental analyses and managing high-level radioactive waste.”

The Graduate Science Research Center provides 158,000 square feet of space for chemistry research.