

Two Researchers Receive prestigious national Science Foundation CAREER Awards

Two rising stars on the Florida State University faculty are recipients of highly competitive National Science Foundation research grants totaling nearly \$1.6 million.

M. Elizabeth Stroupe, an assistant professor in the Department of Biological Sciences, has won a five-year [NSF Faculty Early Career Development Award](#), also known as a CAREER Award, totaling \$997,000 to advance her research into what the “Structure and Function of Sulfite Reductase Teach About Fundamental Biology.”



M. Elizabeth "Beth" Stroupe

Kenneth L. Knappenberger Jr., an assistant professor in the Department of Chemistry and Biochemistry, has received the same award in the amount of \$600,000 to advance his research into “Structure-Specific Nanoscale Dynamics Studied by Nonlinear and Magneto-optical Spectroscopy.”

NSF CAREER Awards are designated for scientists who are still in the early stages of their academic careers and are intended to help them build upon previous accomplishments in their areas of research.

“I am excited to be the recipient of this award because it affords me the opportunity to do what I love the most about this job — teaching students about science from the point of view of research,” Stroupe said.



Kenneth L. Knappenberger Jr.

Knappenberger said it was an honor to be selected for an NSF CAREER award.

“Receiving this award reflects well on the high quality of work being done by the students studying in my laboratory,” Knappenberger said. “It is also an indication that the problems we are trying to solve are important to the scientific community and to the general public.”

Tom Roberts, chair of Florida State’s Department of Biological Science, called Stroupe’s NSF CAREER award a “tangible acknowledgment of the outstanding potential that we saw in her when we recruited.”

Stroupe conducts research into the relationship between the structure of molecules found in biology and their functions in the cell.

“Specifically, we are interested in a protein molecule called sulfite reductase, which is involved in transforming the element sulfur into the form that can be used by organisms to build molecules and create energy,” Stroupe said.

Using Florida State’s state-of-the-art Titan Krios electron microscope — one of about 20 in North America and Europe — Stroupe is able to take pictures of the components inside cells and reconstruct the shapes and structures in three dimensions to hypothesize about how they function.

Stroupe’s award has two components. The first supports her basic research. The second uses the results from her experiments to illustrate basic biological concepts in the classroom, such as which molecules in biology are responsible for which activities.

“Beth is a remarkably versatile scientist who is able to use her expertise in protein biochemistry, X-ray crystallography, and cryo-electron microscopy to explore biological problems in ways that few other investigators can match,” Roberts said.

Stroupe earned a doctorate in structural biology from the Scripps Research Institute in 2002 and held a postdoctoral fellowship at Brandeis University and Howard Hughes Medical Institute from 2003 to 2009.

Tim Logan, professor and chairman of Florida State’s Department of Chemistry and Biochemistry, praised Knappenberger’s research as among “the most meritorious science ideas submitted by young scientists from around the country.”

Knappenberger’s research uses sophisticated laser equipment to unravel the molecular processes following absorption of light by tiny clusters of gold atoms called nanoparticles, according to Logan.

Nanostructured materials offer great potential for novel ways to utilize, store and transport energy over much of the solar spectrum. These opportunities arise because nanomaterials often display unique properties that depend on particle shape, size and orientation. The award will allow Knappenberger and his research group to develop advanced measurement technologies to systematically investigate the interplay between nanoparticle structure and function. In particular, the group will work to develop an optical imaging and spectroscopy platform capable of extraordinarily high spatial resolution. This research has the potential to affect several technical areas: solar-energy conversion, national security, trace-level analysis and high-contrast biomedical imaging.

The award also recognizes a researcher’s commitment to teaching and the inclusion of others in the enterprise of science.

“Although Ken is a relatively new faculty member, he has already involved numerous undergraduates in his research, with one even leading the effort on a project that was published in the *Journal of Chemical Physics*,” Logan said. “It is this dedication to research and to teaching students about research in a laboratory that made Ken successful in his grant application.”

Knappenberger earned a doctorate in chemistry from Pennsylvania State University in 2005. He held a postdoctoral fellowship with the University of California, Berkeley, and Lawrence Berkeley National Laboratory from 2005 to 2008.

A video of the interview with Knappenberger can be viewed [here](#).