

## UCLA Engineering Faculty Garner 2007 National Science Foundation Early Career Development Awards

By Melissa Abraham



NSF CAREER Award recipients Jeff Eldredge (l) and Jacob Schmidt.

With prestigious awards from the National Science Foundation (NSF), two UCLA Engineering faculty members are tackling issues ranging from the creation of highly sensitive biomolecular sensors to using the physics behind aquatic movement to inspire human engineered systems.

The two researchers have earned NSF's 2007 Faculty Early Career Development (CAREER) award, the NSF's most prestigious junior faculty award, which recognizes a young researcher's dual commitment to scholarship and education. Bioengineering professor Jacob Schmidt will investigate "Membrane Platform Technologies for Channel Protein Science and Sensing." Mechanical and aerospace engineering professor Jeff Eldredge will look at "Numerical Investigations of Biological and Bio-inspired Locomotion." Together, the two UCLA Engineering researchers will garner more than \$800,000 in funding, to be awarded over the next five years.

"We are extraordinarily pleased to have our exceptional young faculty

recognized by the National Science Foundation," said Vijay K. Dhir, dean of the School. "We take great pride in having talented scholars who are conducting research in critical areas as part of our School."

Schmidt's work focuses on developing stable and long-lasting sensors based on measurements of single molecules of channel proteins. Channel proteins, in their natural form, inhabit cell membranes in living organisms. The proteins are so small that sensors employing them can detect the presence of single molecules bound to them.

But because the membranes housing them are nanometers in size, they can be fragile and difficult to produce in the laboratory. Schmidt's group is focusing on creating new platforms for the creation and stabilization of these membranes, enabling the sensor technology. His research may lead to the development of better ways to screen drugs, detect biomolecules, or rapidly sequence DNA.

Eldredge's research investigates how to observe and understand the fundamental physics of most forms of biological movement in fluids to construct human engineered systems that operate with similar functionality.

His work addresses the need for an accurate and efficient computational tool for simulating flows produced by

bodies with constantly moving and changing surfaces. This tool will be used to study the role of flexibility in natural forms of locomotion – such as insect flight and fish swimming. It is hoped that a better understanding of movement in nature will lead to energy-efficient vehicles with enhanced maneuvering capabilities.

The CAREER award also contains a strong education component. UCLA Engineering students will be able to broaden their field of study by participating in both of these cutting-edge interdisciplinary research projects.

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The two 2007 CAREER awards follow five awards garnered by faculty in 2006 – three from the computer science department, and one each from the chemical and biomolecular engineering and civil and environmental engineering departments.

To learn more about Jacob Schmidt, visit <http://www.bioeng.ucla.edu/facultyresearch/facultyprofiles/schmidt.html>.

For more on Jeff Eldredge, visit <http://www.mae.ucla.edu/academics/faculty/eldredge.htm>