

MAE Assistant Professors Jiang and Sodano Receive 2009 NSF CAREER Awards

The Mechanical and Aerospace Engineering Department congratulates Assistant Professors Hanqing Jiang and Henry Sodano on receiving 2009 National Science Foundation (NSF) CAREER Awards. CAREER funding represents NSF's most prestigious award in support of the early career-development activities of teacher-scholars who "most effectively integrate research and education within the context of the mission of their organization."

Prof. Jiang received the CAREER award for his proposal "Investigation of Mechanical Properties of Carbon Nanotube Macro-Films in Integrated Systems". Dr. Jiang's proposal addresses some of the major issues surrounding the lack of availability of a more appropriate technology to manipulate ultra-small individual carbon nanotubes (CNTs). The research goal of his CAREER proposal is to understand the mechanical properties of CNT macro-films in integrated systems.

Advances in Dr. Jiang's CAREER research could significantly impact the development of a design guideline for the assembly of macroscopic CNT networks with desired properties that can advance new applications. His research findings will facilitate our understanding of fundamentals in macro-structured CNTs in integrated systems and has great potential to lead to a range of transformative and innovative applications. The education component of his CAREER proposal focuses on increasing enrollment and retention of underrepresented students and engaging the public through unique outreach programs initiated by Dr. Jiang and in partnership with: (1) the Arizona Science Center, and (2) the Phoenix Elementary School District. Additionally, a new MAE undergraduate course will be developed based on his research.

Prof. Sodano received the CAREER award for his proposal "Nanowire Interfaces for Increased Strength and Multifunctionality". Dr. Sodano's CAREER plan revolves around the study of a novel ceramic interface that was recently identified in his laboratory. In the CAREER research plan, Dr. Sodano proposes to study the influence of the nanowire interphase on the mechanical and multifunctional properties of a fiber reinforced composite. The main objective of Dr. Sodano's research plan is to gain an understanding of how the properties of nanoscale features at the interface of fiber reinforced composites translate to those of the bulk material.

Dr. Sodano's research will have far-reaching impacts, beyond the immediate objectives of the CAREER plan. The results of the research will, for example, lead to further insight into a better understand of functionally graded interfaces. Interfaces of this form more closely represent those in biological systems which rarely exhibit a discrete boundary between two materials of vastly different mechanical properties. The biomimetic interfaces may allow the design of improved prosthetic and biological implants. The educational component of Dr. Sodano's plan will create an Engineering Science Night for middle school students and their parents. The program will initially be delivered in the Scottsdale Unified School District before being transitioned into a sustainable program delivered around the state. The program will educate both students and parents on the diversity of the opportunities that exist in the engineering field. The educational plan will also create a new course in the Mechanical and Aerospace department and start a hands on research based undergraduate internship program for Dr. Sodano Laboratory.