

*Ares J. Rosakis, Theodore von Kármán  
Professor of Aeronautics and Professor of  
Mechanical Engineering; Chair, Division of  
Engineering and Applied Science, standing  
in the recently renovated Von Kármán  
Conference Room.*



The “impact out of proportion to our size” theme continues to resonate at Caltech. We have been ranked as the number one Engineering and Technology university in the world by the Times Higher Education World University Ranking, despite our modest size (300 faculty at the Institute, with roughly 90 of those in the Division of Engineering and Applied Science). And our stellar faculty, students, and alumni continue to win praise and recognition from all quarters. The White House, as we go to press, just named Amnon Yariv, Martin and Eileen Summerfield Professor of Applied Physics and Professor of Electrical Engineering, a recipient of the National Medal of Science; John Dabiri (MS ’03, PhD ’05), Associate Professor of Aeronautics and Bioengineering, was awarded a MacArthur “Genius” grant; and Chiara Daraio, Assistant Professor of Aeronautics and Applied Physics, has been recognized by Popular Science magazine as one of the “Brilliant 10” in their annual compilation of America’s young science geniuses. These are but three of the hundreds of recognitions and awards that our faculty receive each year and attest to the broad spectrum of achievement that exists in the Division.

I became Chair in May of 2009 and, since then, have enjoyed working with this truly amazing group of faculty to reorganize the Division into seven Departments that collectively offer fourteen graduate and seven undergraduate degrees. What has been the impetus? To create a structure that allows larger groups of faculty, with related intellectual interests, to efficiently articulate their vision for engineering at Caltech in seven key areas: Aerospace; Applied Physics and Materials Science; Bioengineering; Computing and Mathematical Sciences; Electrical Engineering; Environmental Science and Engineering; and Mechanical and Civil Engineering. A clear vision for education and research in each of these areas is instrumental in continuing to attract donors and foundations to support our goals, retaining and attracting the best faculty, and attracting and recruiting the very best and brightest students—who of course become the best and brightest alumni!

Also during the past year, the Resnick Institute, founded with an initial \$20 million gift from Stewart and Lynda Resnick and a \$10 million gift from the Gordon and Betty Moore Foundation, has begun its mission to foster transformational advances in energy science and technology through research, education and communication. Vinod Khosla, co-founder of Sun Microsystems and “greentech” investor, gave the inaugural Resnick Institute lecture on

October 26. Plans to renovate the Jorgensen Laboratory as the new headquarters for this center have begun. Joining the Resnick Institute in the Jorgensen Lab is the Joint Center for Artificial Photosynthesis, a \$122 million DOE energy “hub” that aims to do no less than decisively move us away from a fossil fuel economy by developing revolutionary methods to generate fuels directly from sunlight.

Also established this year is the Terrestrial Hazard Observation and Reporting Center (THOR), whose research seeks to find ways to minimize the damage caused by natural hazards such as carbon emissions, earthquakes, floods, and wildfires. THOR has been endowed with \$6.7 million from Foster and Coco Stanback and with \$3.3 million from the Gordon and Betty Moore matching program and will provide a focal point to unify efforts and allow investigators to focus on critical societal issues. This interdivisional center is jointly managed by our Division and the Division of Geological and Planetary Sciences. Another related example of interdisciplinary research at Caltech is the newly established Community Seismic Network (CNS). By combining the algorithms and analysis from Computer Science with simple, cheap accelerometers employed on a massive scale, this project seeks to enhance our community’s capability to respond to major earthquake disasters.

Our focus in this issue of ENGenious is on the “electrifying century” of Electrical Engineering at Caltech, and I invite you to enjoy reading up on the history of the Department, the ground-breaking research that is currently engaging our faculty, and a profile of Carver Mead (BS ’56, MS ’57, PhD ’60), Gordon and Betty Moore Professor of Engineering and Applied Science, Emeritus, a long-time and much beloved member of the Caltech family. We have rounded out this issue with articles that span the spectrum of activities in the Division, from nanotechnology to quantum algorithms, and I invite you to send us feedback as we endeavor to continue to share with our growing family of alumni and friends the magnificent work that goes on daily in the Division of Engineering and Applied Science at Caltech.



Ares Rosakis  
Chair, Division of Engineering and Applied Science