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## Developing Better Tsunami Prediction Tools

**Costas Synolakis**, professor of civil engineering and director of the USC Tsunami Research Center (TRC), has made many important engineering contributions to forecasting and detecting of potentially devastating tsunamis over the last few years. From inundation field surveys to numerical and analytical modeling to hazard assessment, mitigating and planning, Synolakis and his team have conducted a wide range of tsunami studies, many of which aim to proactively reevaluate certain elements of tsunami preparedness.

TRC engineers use hydrodynamic computer modeling to evaluate tsunami currents. They draw upon data from previous tsunamis, such as those caused by the 2004 Sumatra and 2011 Japan earthquakes, to refine prediction models. The National Oceanic and Atmospheric Association uses these models operationally to forecast tsunamis in the Pacific from main warning stations in Alaska, Hawaii and Australia.

“Thanks to these improved forecasting tools,” says Synolakis, “countries at risk of tsunamis can carry out more targeted evacuations, potentially saving hundreds of lives.”

In addition to his roles at USC, Synolakis is a professor of natural disasters and coastal engineering at the Technical University of Crete (TUC) in Chania, Greece, and the director of TUC’s Natural Disasters and Coastal Engineering Laboratory. He is also the chairman of the United Nations Educational, Scientific and Cultural Organization’s (UNESCO’s) Intergovernmental Oceanographic Commission Review Board on the Pacific Tsunami Warning Center, and he formerly served as president of the Hellenic Center for Marine Research, the equivalent of NOAA in the Mediterranean. Synolakis received the 2015 Moffatt and Nichol Coastal Engineering Award from the American Society of Civil Engineers, the 2014 Sergey Soloviev Medal of the European Geosciences Union for mitigation of natural hazards and the 2001 County of Los Angeles Award on Leadership in Emergency Preparedness. Synolakis was also recently elected as the 45th member of the Academy of Athens, which is the only national academy of Greece. He is the 4th academician in the 90-year history of the Academy of Athens to hold the chair of earth sciences position. ■



Costas Synolakis, professor of civil engineering and director of the USC Tsunami Research Center.

*“Thanks to improved forecasting tools, countries at risk of tsunamis can carry out more targeted evacuations, potentially saving hundreds of lives.”*

## FACULTY NEWS



Daniel McCurry

### CEE WELCOMES NEW ASSISTANT PROFESSOR

**Daniel McCurry** will join the USC Sonny Astani Department of Civil and Environmental Engineering as an assistant professor of civil and environmental engineering in January and will teach courses in environmental chemistry,

including an aquatic chemistry course and a new graduate course on environmental organic chemistry.

McCurry's research focuses on protecting public health by improving the long-term safety of engineered water sources. He applies environmental organic chemistry to analyze water quality problems arising from chemical and ultraviolet disinfection of wastewater and drinking water. At USC, he plans to explore the direct potable reuse of wastewater, collaborating closely with water reuse utilities in Southern California and colleagues in the Astani Department.

McCurry completed his PhD in civil and environmental engineering at Stanford University in 2016. He also has a master's degree in environmental engineering from Yale University, a BS in civil engineering from the University of Cincinnati, and he worked as a research assistant at the U.S. Environmental Protection Agency Office of Research and Development. ■



### CELEBRATING AN INFLUENTIAL PROFESSOR'S CAREER

CEE celebrated **James Anderson** (second from right) at the close of the 2015–16 school year with a retirement party at Lawry's The Prime Rib in Beverly Hills. The event brought together many successful engineering leaders who were mentored by Anderson, including TJ Eimani, president of NIC Structural Engineering Consultants, and Vida Tarassoly, president of Rubicon Engineering Corporation. Those who could not attend, such as Sung Woo Lee, past president of Kookmin University in Seoul, South Korea, sent gifts to honor their beloved advisor. ■

University of Southern California



Kaprielian Hall basement

## Introducing Our New Structures Lab

The Brandow & Johnston Structures and Materials Research Laboratory (SMRL) is currently undergoing \$2.5 million worth of renovations with support from Viterbi School of Engineering and Sonny Astani Alumni. Once completed, the laboratory will be equipped to conduct cutting-edge research to improve the safety, sustainability and serviceability of built infrastructure. The laboratory will consist of over 5,500 square feet of test space and associated fabrication facilities. The major renovations include a large reaction frame with approximately 600 square feet of strong floor space and an L-shaped reaction wall 15 feet (length) by 15 feet (length) by 14 feet (height), an upgrade of the hydraulic power supply to a maximum flow rate of 160 gallons per minute, a 100-foot-long hydraulic distribution system, a new outdoor fabrication space with a retractable roof and five tons of overhead crane, and a new concrete materials preparation room. Additionally, the laboratory will include several pieces of equipment, such as actuators with capacities ranging from 11 kips to 400 kips, load frames ranging from 1 kip to 1,000 kips, environmental chambers for durability testing of materials, state-of-the-art data acquisition and control systems for existing twin shake tables and other testing equipment, and high-resolution cameras for non-contact measurements. ■



Hank Koffman (center)

## Taking Our Construction Management Program to the Middle East

This summer, USC brought its Master of Construction Management program to Aramco employees in Saudi Arabia to help meet international demands for construction management education.

The purpose of the Master of Construction Management program is to educate and train multidisciplinary professionals to understand and execute the broad array of technical and non-technical activities associated with construction management.

Aramco, the most commonly used name for the Saudi Arabian Oil Company, is a national petroleum and natural gas company recognized as the world's most valuable company.

**Professor Hank Koffman**, director of the Construction Engineering and Management program, announced the contract with Aramco, which extends through summer 2018, at the Aramco compound in Dammam, Saudi Arabia.

The first class of cohorts includes 17 of Aramco's highly qualified senior project managers, who passed USC CEE's strict admissions process.

Koffman says this is the first program of its kind and may lead to more opportunities in the Middle East and other international locations. ■



Kelly Sanders

### ASSISTANT PROFESSOR RECOGNIZED AS TOP INNOVATOR

*The MIT Technology Review has recognized **Kelly Sanders** as one of the world's top "35 Innovators Under 35." According to the magazine, the "latest group of 35 young innovators features people whose contributions in energy, medicine, computing and materials will influence the direction of human affairs." Sanders is the third USC Sonny Astani Department of Civil and Environmental Engineering faculty member to receive this recognition in the last four years. Past honorees include Burcin Becerik-Gerber and George Ban-Weiss. ■*



## GRADUATE STUDENT NEWS



Mohammad Motie

### PhD Student Helps Secure National Science Foundation Funding

**Mohammad Motie**, a fourth-year PhD student in the USC Sonny Astani Department of Civil and Environmental Engineering who simultaneously obtained a master's degree from USC's computer science department, performs research on the impacts of emerging capabilities in driverless cars and inter-vehicle communication on transportation systems.

Advised by **Ketan Savla** and supported by a grant from the National Science Foundation, Motie captures vehicle-level congestion effects and relates them to system-level measures for transportation systems. Through a novel queuing theoretic framework, which uses the construct of horizontal traffic queues, he analytically characterizes system-level performance measures, such as capacity and travel time, under different vehicle-scale configurations. This framework is useful for the next generation of transportation systems for which vehicle-level interaction rules can be designed to improve system-level performance. ■



Evangelos Pantazis



Ruda Zhang

### Featured Research Assistants of 2016

Since 2014, the Astani Department has recognized research assistants who have shown excellence in their field through a monthly news article, "Featured Research Assistant of the Month." CEE takes pride in its research assistants and their accomplishments.

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| ■ January 2016: Arsalan Heydarian | ■ June 2016: Evangelos Pantazis    |
| ■ February 2016: Arash Mohegh     | ■ July 2016: Measrainsey Meng      |
| ■ March 2016: Adam Keen           | ■ August 2016: Jiachen Zhang       |
| ■ April 2016: Ruda Zhang          | ■ September 2016: Pedram Oskouie   |
| ■ May 2016: Ali Kazemian          | ■ October 2016: Vassilios Skanavis |

# STUDENT AWARDS

## Recognizing Our Stellar Graduate Students



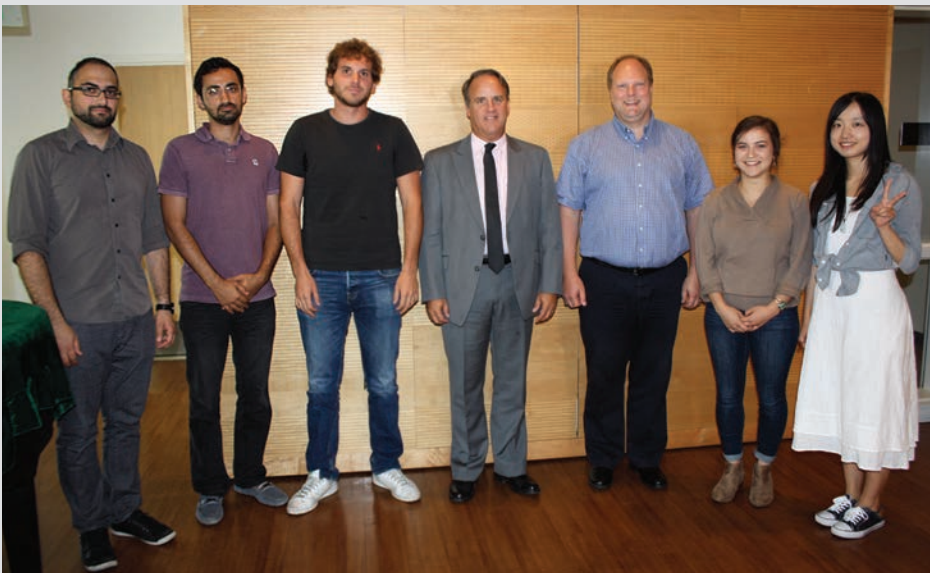
Measrainsey Meng

### NATIONAL SCIENCE FOUNDATION GRADUATE RESEARCH FELLOWSHIP

- **Measrainsey Meng**, a first-year PhD student working with **Kelly Sanders**, was selected for a 2016 National Science Foundation Graduate Research Fellowship. The NSF Graduate Research Fellowship is a competitive and prestigious award that provides three years of full financial support as well as an array of professional development opportunities.

### OUR PHD STUDENTS HAVE MADE CEE PROUD WITH THEIR PRESTIGIOUS AWARDS:

- **Jiachen Zhang**, a PhD student advised by **George Ban-Weiss**, recently received a scholarship from the Chinese-American Engineers and Scientists Association of Southern California, one of the largest, most prominent Chinese-American professional organizations in Southern California.
- Environmental engineering PhD student **Ryan Gustafson**, who works with **Amy Childress**, received a fellowship through the National Water Research Institute and Southern California Salinity Coalition.



The Sonny Astani Department of Civil and Environmental Engineering held its annual RA/TA awards luncheon for distinguished research and teaching assistants on September 23 at the Parkside Performance Café. This ceremony recognizes the recipients of the best teaching score and the best peer-reviewed and published journal papers. For the 2015–2016 year, the Best TA awards went to **Arsalan Heydarian**, **Vassilios Skanavis** and **Lauren Crawford**, and the Best RA awards went to **Ali Gharamani** and **Jiachen Zhang**. ■

## UNDERGRADUATE STUDENT NEWS

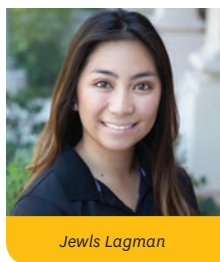


### Celebrating Standout Civil Engineering Students

*At the 2016 Viterbi Undergraduate Awards on May 12, two civil engineering undergraduate students were honored for their scholarly achievements. **Christopher Dorn** (standing next to Dean Yortsos in picture on left) won the award for Outstanding Achievement by a Transfer Student as well as a university-wide USC Provost's Award. **Tyler Pullen** was named a National Academy of Engineering Grand Challenge Scholar. They were among the selected 2016 graduates who were honored that night for their accomplishments. ■*

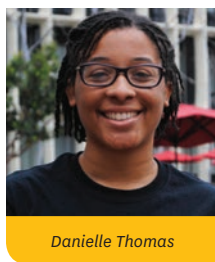
### Undergrads Promote Inclusiveness in Engineering

The Sonny Astani Department of Civil and Environmental Engineering makes substantial efforts in promoting diversity. To see female minorities in leadership gives us great pride, knowing that we are taking steps toward making the engineering field more diverse and inclusive.



Environmental Engineering senior **Jewls Lagman** works to promote greater representation of women and Hispanics in engineering. She serves as the USC chapter president for the Society of Hispanic Professional Engineers (SHPE) and has also worked with the Society of Women Engineers (SWE). Both organizations operate through the Viterbi

School's Center for Engineering Diversity (CED), which Lagman credits as an important support system for engineering students who are part of historically underrepresented groups. She currently interns in the Research and Development Department of Orange County Water District (OCWD) and plans to pursue a graduate degree in environmental engineering.



**Danielle Thomas**, a senior pursuing a bachelor of science in civil engineering, serves as the USC chapter president for the National Society of Black Engineers (NSBE). This student-run organization is dedicated to "the academic and professional success of African-American engineering students and professionals."

Thomas organizes chapter meetings, social events and community outreach events and has helped send large delegations to NSBE's regional and national conferences. Additionally, she participated in the McNair/Gateway Scholars Program, working with Professor Kelly Sanders to complete a cost-benefit analysis of a proposed solar panel installation at USC's University Park Campus. ■

# ALUMNI NEWS

## PAST EVENTS:



The USC Construction Alumni Group took a hard hat tour of the Metropolis jobsite on August 24.



USC Construction alumni toured the SpaceX facility on March 19.

## ALUMNI DONATIONS:

- A recent gift from **Stephen C. Schrank** (BS '69, MBA '74) supports the capital construction of the USC Viterbi Civil and Environmental Engineering Structures Laboratory, particularly the Reaction Wall.
- **Chris Kortner** (BS '50) has included the Sonny Astani Department of Civil and Environmental Engineering in his estate plans so that students may find solutions for tomorrow's challenges.
- A gift from **Walter Singer** (BS, '82), founder and president of ACTenviro, supports equipment for – and the overall expansion of – the USC Viterbi Water and Environmental Technologies laboratory. Singer's gift will supplement existing funds to enable the purchase of the Exactive Orbitrap Mass Spectrometer.

## CHECK OUT THE USC CONSTRUCTION ALUMNI GROUP

*The USC Construction Alumni Group's mission is to provide an environment that fosters professional growth, professional relationships and a love for construction among all USC architecture, engineering and construction professionals.*

*If you would like to learn more about the USC Construction Alumni Group and our upcoming events, visit [uscaec.org](http://uscaec.org) and enter your contact information, or email us at [usconstructionalumni@gmail.com](mailto:usconstructionalumni@gmail.com). ■*





Chair Dr. Lucio Soibelman

## Chair's Message

Greetings! Another school year has arrived, and we continue striving to make the Astani Department the best it can be. I am humbled to see our students proving their worth, from **Jiachen Zhang**, a PhD student advised by **George Ban-Weiss**, who received an outstanding student paper award from the Chinese-American Engineers and Scientists Association of Southern California, to **Measrainsey Meng**, a first-year PhD student working with **Kelly Sanders**, who received a 2016 National Science Foundation (NSF) Graduate Research Fellowship. Our new faculty has proved its mentoring skills by fostering the minds of these brilliant students. This does not surprise me since the faculty has already demonstrated its talents with the large number of grants and awards received over the summer. I know our students are in good hands when it comes to their educational success, from **Qiming Wang** receiving his first NSF grant, to **Ketan Savla** receiving three different grants, to **Patrick Lynett** being named the Outstanding Civil Engineer in Research of the Year by the Metropolitan Los Angeles Branch of the American Society of Civil Engineers. **James Anderson's** retirement party brought together successful CEE alumni, allowing me to realize the incredible talent this school has produced.

One of the school's goals is to train students to become leaders in the engineering field, and this past semester has shown that we are prevailing in this goal. This semester, we continue to prepare our students to thrive as engineers by, not only encouragement, but by providing them with the best possible tools. We have nearly completed the construction on our new structures lab in the basement of **Kaprielian Hall**. It is turning out beautifully and I encourage all to come see it after its completion. ■