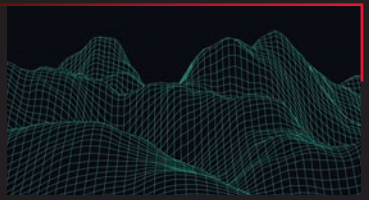
Civil and Environmental Engineering Newsletter
Spring 2022



BLUEPRINT

ENGINEERED FOR
WHAT'S NEXT.

CULLEN
COLLEGE OF ENGINEERING
UNIVERSITY of HOUSTON

Letter from the Chair

Dear Colleagues,

I am delighted to share with you some noteworthy highlights to come out of our department during the last six months. From revealing the unknown properties of fungi superpowers, to reconceptualizing early Mesoamerica, there is no shortage of exciting work going on at the UH Department of Civil and Environmental Engineering. I invite you to take a look through the following stories, and if one of these strikes your interest, do not hesitate to reach out. We welcome partnerships and opportunities for collaboration. I do hope you will be able to visit our department soon. Stay well!

Warm Regards,

Roberto Ballarini, Ph.D, P.E.
Thomas and Laura Hsu Professor and Department Chair
Civil and Environmental Engineering
Cullen College of Engineering
University of Houston

UH CEE **BY THE NUMBERS**

FACULTY *(FALL 2021)*

1 NATIONAL ACADEMY OF ENGINEERING MEMBER

NATIONAL ACADEMY OF ENGINEERING

ENROLLMENT *(FALL 2021)*

336 UNDERGRADUATE STUDENTS

104 GRADUATE STUDENTS

DEGREES AWARDED
(2020 - 2021)

65 B.S.

23 M.S.

8 PH.D.

REVEALING UNKNOWN PROPERTIES OF FUNGI SUPERPOWERS

Two professors with the University of Houston's Cullen College of Engineering, with colleagues from the University of Michigan and University of New Mexico, have embarked on a road rarely traveled by researchers – exploring the unknown qualities, capabilities and secrets of fungi.

"Fungi are among the least studied microorganisms. By comparison, bacteria are studied very much, so we know a lot about them. The diversity of fungi is enormous. I started working with fungi about four years ago, and I am fascinated by what they can do," said **Debora Rodrigues**, professor of civil engineering and the principal investigator of a five-year research project funded by a $3 million grant from the National Science Foundation. Of that, $1.5 million is budgeted for UH.

Joining Rodrigues on the research team is co-principal investigator **Stacey Louie**, assistant professor of civil and environmental engineering in the UH Cullen College of Engineering.

"My interest is in the chemistry side. I'll be looking at new data on how different fungal species interact with metals and how that interaction could be relevant to metals detoxification," Louie said.

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RE-CONCEPTUALIZING

EARLY MESOAMERICA

Through the analysis of airborne laser mapping (LiDAR), an international team of researchers – including several from the Cullen College of Engineering at the University of Houston – identified 478 ceremonial centers in the Mexican states of Tabasco and Veracruz.

Most of those sites likely date to 1100 to 400 B.C., several centuries before the Classic period (A.D. 250 to 950) or the heyday of Maya civilization. Their discoveries transform scholars' understanding of the origins of Mesoamerican civilizations, particularly the relation between Olmec and Maya cultures.

The research is featured in an article in *Nature Human Behavior*, initially published on Oct. 25. **Juan Carlos Fernandez-Diaz**, Ph.D., of the National Science Foundation (NSF) National Center for Airborne Laser Mapping (NCALM) at the University of Houston, and co-author in this study, led UH/NCALM participation in this research, which included other UH faculty and staff. Other researchers are from the University of Arizona.

RADAR TECH INDICATES THAT **ANTARCTIC GLACIERS ARE LOSING ICE FASTER** THAN EVER DOCUMENTED BEFORE

In a new University of Houston study using an advanced remote imaging system known as synthetic aperture radar interferometry, three glaciers at the South Pole are being documented with levels of clarity and completeness never seen before. The new remote sensing data system is not just uncovering icy secrets from Earth's least explored continent, it also is raising alarms about global climate risks – both present and future.

Documentation of the rapid and unprecedented retreat of the Pope, Smith and Kohler glaciers in West Antarctica's Amundsen Sea Embayment is detailed in an article published in *Nature Geosciences*. The article's lead author is radar scientist **Pietro Milillo**, assistant professor of civil engineering at UH.

In this ongoing international study of data collected via the TanDEM-X and COSMO-SkyMed satellites, Milillo is joined by University of California Irvine researchers and scientists from three national space agencies: NASA, the German Aerospace Center (DLR) and the Italian Space Agency (ASI).

The research team plans to expand the scientific understanding it gains from the relatively small and less studied Pope, Smith and Kohler glaciers to their giant and fragile West Antarctica neighbors, the Thwaites and Pine Island glaciers, as well as to the entire Antarctic glacier system. For now, Milillo concentrates on the near future, including NASA's plans in 2023 to launch its NISAR satellite, designed to provide even more quantity and more frequent data acquisitions than the current state-of-the-art synthetic aperture radar. Also known as NASA-ISRO SAR, the new satellite will measure the changes in ecosystems, dynamic surfaces and ice masses, providing Milillo and fellow scientists a bolder picture of our changeable Earth.

This story has been featured in *WIRED* magazine and *National Geographic España*.

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STUDENT SUCCESS

OMAR KHALID

CONTINUES TO PURSUE KNOWLEDGE

Omar Khalid, a native of Iraq, earned his B.S. in Computer Science in October 2003. But following that, he worked in a variety of fields, with an emphasis on supervising teams, project management and strategic planning in conflict zones. He also earned a B.S. in Civil Engineering in 2018, and a B.S. in Business Administration in 2020.

That educational journey has taken Khalid to the University of Houston, where he is pursuing a Master's degree in Civil Engineering, studying with **Dimitrios Kalliontzis**, Ph.D., an Assistant Professor of Civil and Environmental Engineering. With his work already, Khalid has earned a national award, as he is the 2021 recipient of the Paul and Helen Lenchuck Scholarship Program, administered by the National Concrete Masonry Association.

SANTIAGO EL-AWAR RECEIVES

GRADUATE FELLOWSHIP

Santiago El-Awad, a Ph.D. student in the lab of UH Civil Engineering assistant professor, **Konrad Krakowiak**, was recently awarded the Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Graduate Fellowship. According to the Federal Highway Administration, "The Dwight David Eisenhower Transportation Fellowship Program (DDETFP) awards fellowships to students pursuing degrees in transportation-related disciplines. This program advances the transportation workforce by helping to attract the nation's brightest minds to the field of transportation, encouraging future transportation professionals to seek advanced degrees, and helping to retain top talent in the U.S. transportation industry."

DDETFP awards are merit-based. The organization typically awards 150-200 grants annually across the country. .

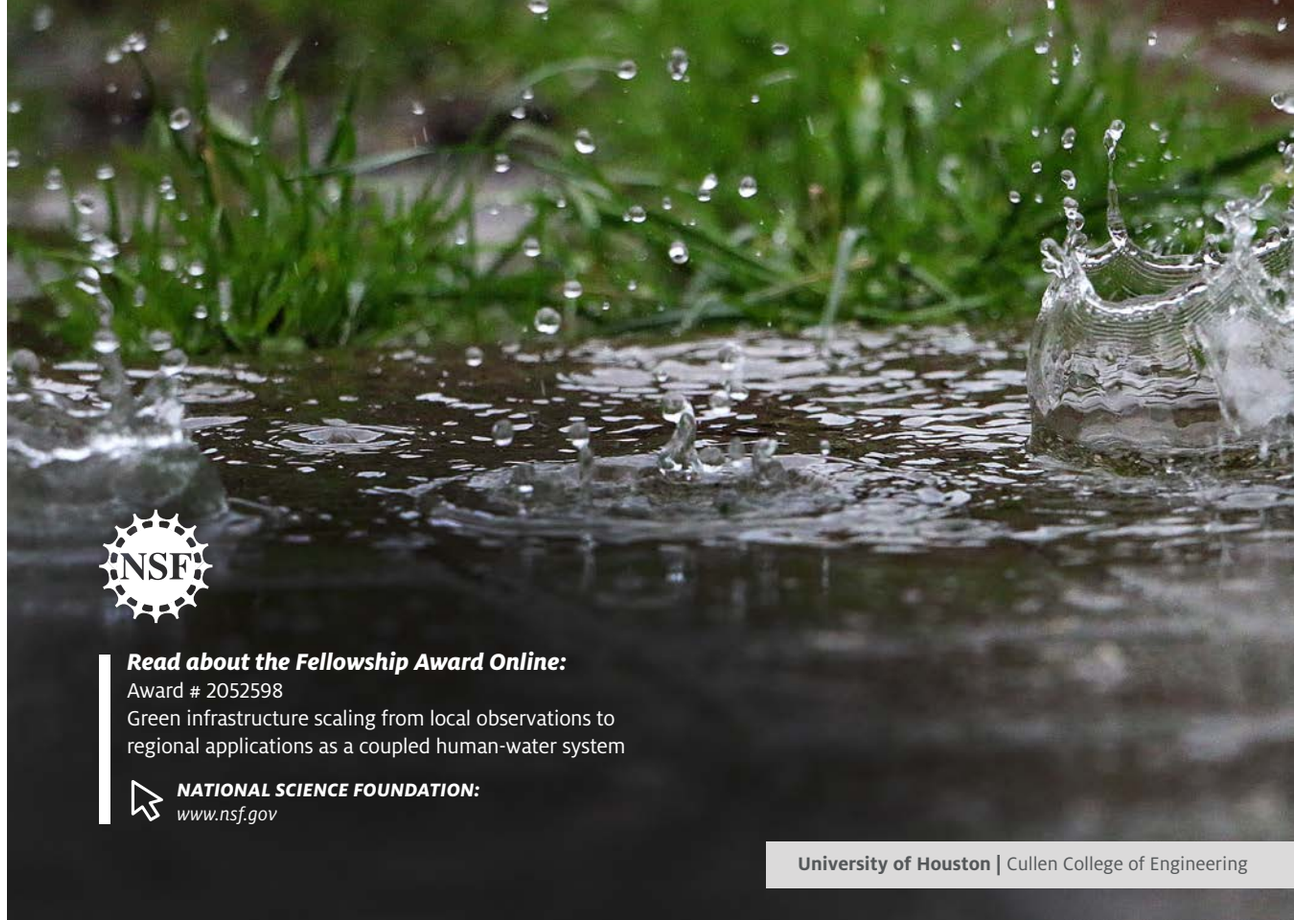
DOCTORAL GRAD CASTRO EARNS

NSF POSTDOCTORAL FELLOWSHIP

Cynthia V. Castro, Ph.D., can describe firsthand the importance of networking and being thoroughly prepared. For the Cullen College of Engineering graduate, both aligned for her when it came to meeting a respected figure in her field, which led to her securing a National Science Foundation award for a fellowship at the University of Illinois Urbana-Champaign (UIUC).

Castro's proposal, "Green infrastructure scaling from local observations to regional applications as a coupled human-water system," was selected for $174,000 in funding. She will be mentored by Murugesu Sivapalan (Siva), Ph.D., the Chester and Helen Siess Endowed Professor in Civil and Environmental Engineering at UIUC. Previously, Castro earned the American Water Works Association scholarship.

For the logistics of her fellowship, Castro said, "I will be working hybrid between Texas and Illinois," she said. "The entire department at UIUC overwhelmingly support this arrangement, and I look forward to being part of the UIUC campus and to network with their scholars."



KLOTZ FAMILY ESTABLISHES **NEW FELLOWSHIP FOR GRADUATE STUDENTS**

For **D. Wayne Klotz** (MSCE '76), it wasn't a tough decision when it came to the specific resource he wanted a new Cullen College of Engineering fellowship to support. The 2018 recipient of The Outstanding Practitioner in Water Resources Engineering Award from the American Academy of Water Resources Engineers, he has devoted much of his career to providing the important resource.

The Karen and Wayne Klotz Endowed Fellowship in Civil Engineering will help to fund the graduate studies of a Cullen College of Engineering graduate student, and reinforces a strong foundation of giving by the Klotz family. In 2018, Wayne and Karen – individually – and Klotz Associates – as a company, founded by Wayne in 1985 – were recognized as Bridgebuilders. The Bridgebuilder Society represents the college's most generous donors, who have accumulated a lifetime of giving greater than $100,000.

The Klotz family has given extensively to the university in the past, including establishing a scholarship for undergraduate students in addition to this recent fellowship. Some specific contributions and distinctions Klotz has received from the university include the Klotz Associates Endowed Scholarship in Civil Engineering (sponsored by the company); being named a Distinguished Engineering Alumni and to the Academy of Distinguished Civil & Environmental Engineers; serving on both the Civil Engineering Advisory Board and Engineering Leadership Board; and making class presentations for many years, as well as serving as a Fall 2018 commencement speaker.

DANIEL WONG NAMED

HOUSTON ENGINEER OF THE YEAR

Daniel Wong, Ph.D., P.E., a distinguished graduate of the University of Houston's Cullen College of Engineering, has been selected as the 2022 Houston Engineer of the Year.

Wong left his native Macau in 1984, with only the shirt on his back, to pursue a doctorate in the Civil and Environmental Engineering Department at UH. Under the guidance of Professor **Cumaraswamy Vipulanandan**, he completed his degree with a thesis that led to a publication and presentation that received the 1990 ASCE Texas Section John B. Hawley award for best paper.

For his most recent distinction, Wong was honored at the 2022 Engineer of the Year Gala, which took place on Feb. 25 at the InterContinental Houston-Medical Center. Wong is President and CEO of Tolunay-Wong Engineers, Inc., which is headquartered in Houston and has 10 offices in Texas and Louisiana. He is a licensed engineer in Texas, and an adjunct professor in the Civil and Environmental Engineering Department. Wong has given generously to the college in the past, and in June 2020, established the **Honorable Daniel Wong** Endowed Professorship.

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The University of Houston
Cullen College of Engineering

The University of Houston Cullen College of Engineering addresses key challenges in energy, healthcare, infrastructure and the environment by conducting cutting-edge research and graduating hundreds of world-class engineers each year. With research expenditures topping $40 million and increasing each year, we continue to follow our tradition of excellence in spearheading research that has a real, direct impact in the Houston region and beyond.

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