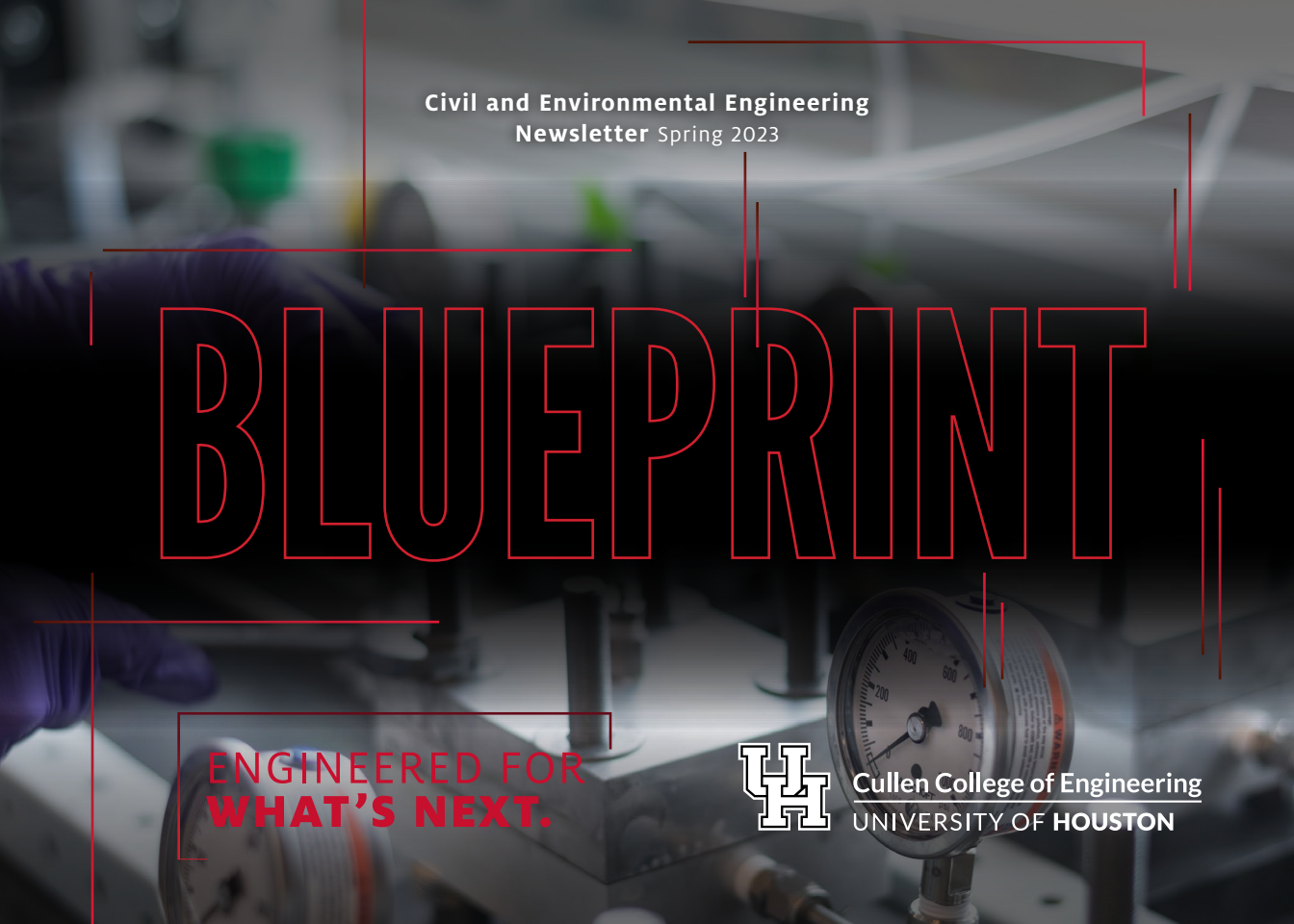


Civil and Environmental Engineering
Newsletter Spring 2023

BLUEPRINT

ENGINEERED FOR
WHAT'S NEXT.

Cullen College of Engineering
UNIVERSITY OF **HOUSTON**

Letter from the Chair

Dear Colleagues,

Greetings from the UH Civil and Environmental Engineering Department! The last six months have been a very busy time for our department. I invite you to explore the following stories which represent a small sampling of the exciting work being done by our faculty and students. If you see opportunities for collaboration, do not hesitate to reach out, and I invite you come and visit whenever you have a chance.

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 2022)*

1 NATIONAL ACADEMY OF ENGINEERING MEMBER

NATIONAL ACADEMY OF ENGINEERING

ENROLLMENT *(FALL 2022)*

424 UNDERGRADUATE STUDENTS

157 GRADUATE STUDENTS

DEGREES AWARDED *(FALL 2022)*

76 B.S.

23 M.S.

8 PH.D.

Pictured: *Pietro Milillo*

ASSESSING NASA'S COMMERCIAL SMALLSAT DATA ACQUISITION (CSDA) PROGRAM

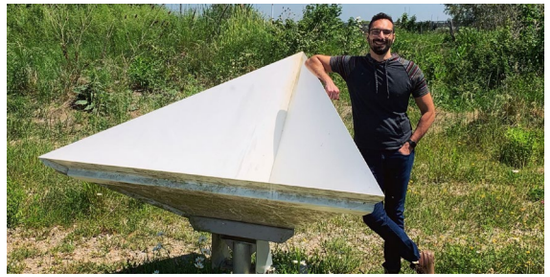
Pietro Milillo, an Assistant Professor in the Civil and Environmental Engineering Department at the University of Houston's Cullen College of Engineering, has secured a $200,000 grant from NASA funding for assessing NASA's Commercial Smallsat Data Acquisition (CSDA) Program.

The goal of the project is to assemble study teams for evaluating the potential impact spaceborne synthetic aperture radar (SAR) constellations may have in encouraging and enabling efficient approaches to advancing Earth System Science and applications development for societal benefit.

SAR is a cutting-edge technology that uses radar signals to create high-resolution images of the earth's surface. Unlike traditional optical systems that record light reflected by our planet Earth, SAR emits microwave radiations and uses advanced signal processing techniques to combine multiple radar reflections into a single, highly detailed image. SAR has a wide range of applications, from mapping and surveying to military reconnaissance and disaster response.

The CSDA Program was established to identify, evaluate and acquire data from commercial sources that support NASA's Earth science research and application goals. Specifically, the two proposals will evaluate Capella Space and Iceye high-resolution data for Coastal Monitoring and Sustainable Water Management Practices.

It will also further assess whether the added value of the new private constellation of SAR sensors including Capella and Iceye are leading to an unprecedented observational capability and advances in Earth Science and natural hazards response.



Pictured: *Pietro posing at the German Aerospace Center*

FLOOD ANALYSIS WORK ALONG **ASIA'S MEKONG RIVER**

Hyongki Lee, Associate Professor of Civil Engineering, has received about $692,410 in additional funding for a three-year extension of his research work, "Strengthening Regional and National Capacity for Operational Flood and Drought Management Services for Lower Mekong Nations via Mekong River Commission and SERVIR-Mekong."

The research team has proposed four more areas of improvement for evaluating flood risks.

The extension of the work will cover another three years of research. Funding will also be provided for a graduate student at the University of Houston and the University of Washington.

"We propose to expand and integrate the skills of current RAT-Mekong and FIER-Mekong as an individual and integrative operational decision support systems. Our proposed services are expected to be a unique and highly scalable decision support system for holistic water management with and without existing and planned upstream reservoir operation, and provide important recommendations for basin-wide reservoir operation policies toward sustainable allocation and management of water resources across time, space, and sectors of water-energy-food nexus. We will work closely with the SERVIR-Mekong Hub and various stakeholders in Mekong including MRC to build their capacity toward operational usage of the tools for better water resources management and disaster prevention."

Pictured: *Hyongki Lee*

Pictured: Debora Rodrigues

EPA RESEARCH GRANT FUNDS WORK ON POLYCYCLIC AROMATIC HYDROCARBONS

The U.S. Environmental Protection Agency announced Wednesday $7.7 million in research grant funding to improve risk assessment of chemical mixtures in the environment, which includes $749,926 for research by **Debora Rodrigues**, Ezekiel Cullen Professor of Civil and Environmental Engineering and her co-PI, Dr. Xinli Liu, Associate Professor of Pharmaceutics.

Rodrigues' research is one of 11 proposals funded by the EPA. Other institutions include Georgia Tech, Purdue, Texas A&M and the University of North Carolina.

This is the first EPA grant awarded to the University of Houston since 2007, and only the eighth since 1996. Earlier this year, Rodrigues was chosen as an NSF program director, and through 2018 she has earned more than $5.5 million in grant funding from major organizations..

CEE PH.D. STUDENT EARNS **WATSON FELLOWSHIP**

Dana R. Flores, a doctoral candidate in the Civil & Environmental Engineering Department at the Cullen College of Engineering, has earned the Ian C. Watson Fellowship for Membrane Advancement from the American Membrane Technology Association.

As part of the fellowship, Flores presented at the 2023 Membrane Technology Conference in Knoxville, Tenn., the week of Feb. 20 through Feb. 23.

Flores is advised by **Devin Shaffer**, Assistant Professor in Cullen's Civil and Environmental Engineering Department. He emphasized the need and importance of the research she is doing.

"Dana is smart and ambitious, as evidenced by her desire to tackle the unresolved research questions about transport in nanofiltration membranes," he said. "Her research is addressing a critical need for accessible, predictive models of nanofiltration performance that membrane scientists and engineers can use to develop nanofiltration membranes for drinking water treatment and wastewater recycling."

Flores attributed her academic success to a combination of inspiration and support from her family and from Shaffer.

According to the AMTA, the Watson fellowship is "in honor of his long and distinguished career dedicated to the beneficial application of membrane technology and his positive influence on both novice and seasoned membrane practitioners." Watson is known as a modern pioneer of membrane processes, and he served as AMTA's first Executive Director..

Pictured: *Dana R. Flores and Devin Shaffer*

Pictured: *Siddhartha Paul and Devin Shaffer*

CEE PH.D. STUDENT EARNS AMTA FELLOWSHIP

Siddhartha Paul, a Civil Engineering Ph.D. student at the Cullen College of Engineering, is one of four recipients of the 2022 American Membrane Technology Association (AMTA) and U.S. Bureau of Reclamation Fellowships for Membrane Technology.

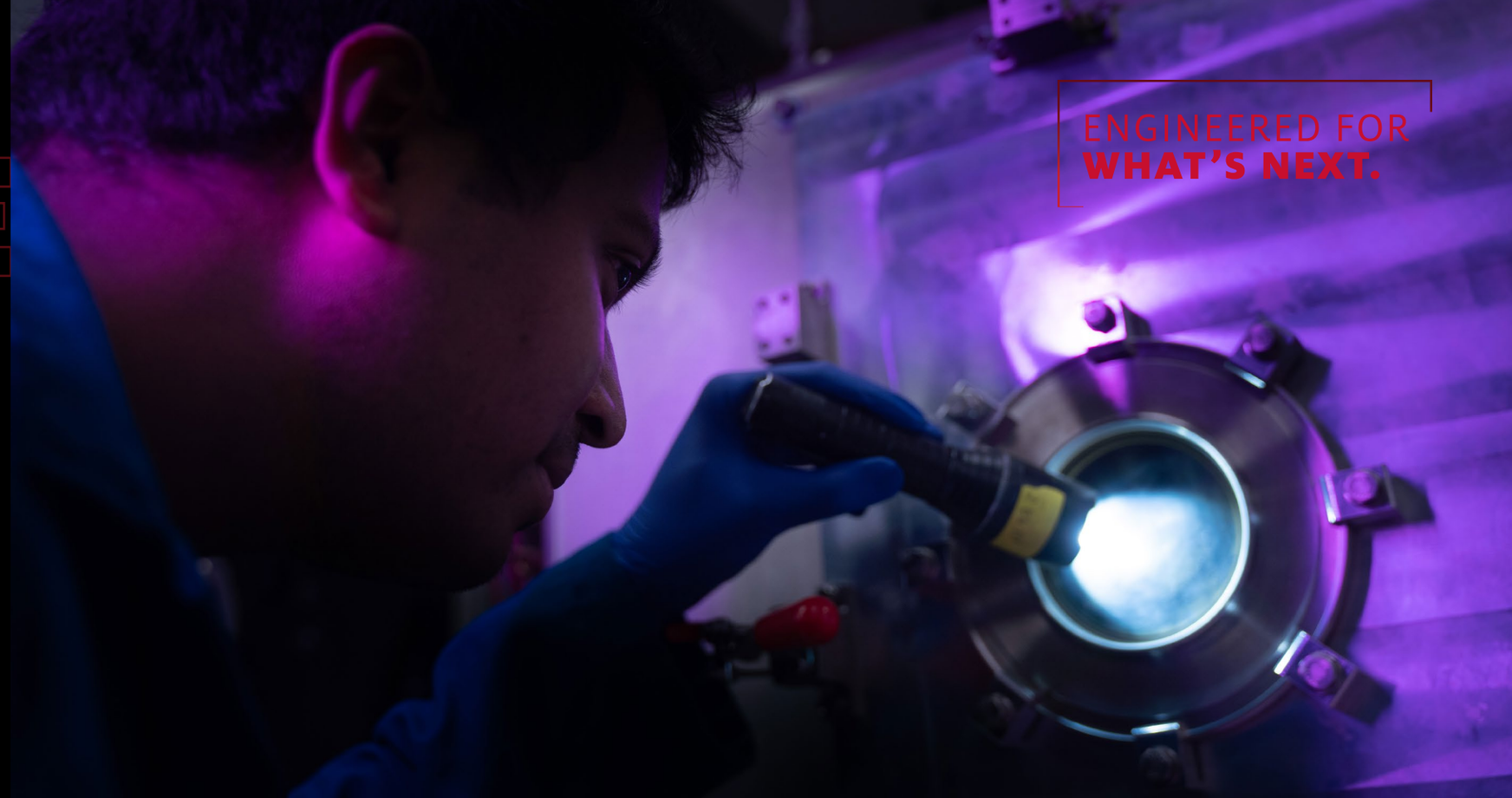
Paul earned his Bachelors in Technology from the National Institute of Technology Silchar and his Masters in Technology from the Indian Institute of Technology Guwahati, both in India. He started his Ph.D. studies at UH in 2021.

When asked why he chose the Cullen College of Engineering, Paul spoke positively of the vibrant industrial and business atmosphere of the Houston metro area.

"I always wanted to pursue a career in industry, and Houston seemed right for me, being in the energy capital of the world," he said. "There are lot of opportunities to build a start-up company through pitching ideas and to gather investments for my ideas."

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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