

FEATURE



# STUDENT/FACULTY COLLABORATION

*Yields Acclaim and National Science  
Foundation-Sponsored Internship*

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BY PAULINE BARTEL

In September 2018, Electrical Engineering senior **Christian Brady-Alvarez '18** and Assistant Professor of Electrical Engineering **Dr. Salem Elsaiah** attended the North American Power Symposium (NAPS). This annual meeting of the Institute of Electrical and Electronic Engineers (IEEE) brings global researchers together to discuss the present and future development of the nation's power grid.

The Maritime student and his professor had collaborated on a switched reluctance motor drive system paper. Brady-Alvarez disseminated their joint research at the conference, alongside graduate and Ph.D. students from Georgia Tech, Michigan State University and Virginia Tech.

"When Chris presented his work, he was fully confident and disseminated the research work professionally," Professor Elsaiah recalled. But Brady-Alvarez remembers being "a bit intimidated" by all the presentations.

Many professors in attendance endorsed Brady-Alvarez's presentation and expressed surprise that he was an undergraduate. Then it was the Maritime team's turn to be surprised. Out of the 200 conference papers presented, Professor Elsaiah and Brady-Alvarez were awarded Best Paper Award, third place, in the Emerging Topics in Modern Power Systems track. According to Brady-Alvarez: "For me, the recognition was amazing." Professor Elsaiah added: "I'm so proud of him. I'm so proud of my work, too. We competed with graduate students from prominent U.S. schools and we won! It is a big victory."

That big victory had its roots in fall 2016 when student and teacher first met in Maritime College's Engineering course, entitled Network Analysis. Brady-Alvarez was a newly minted honors graduate with an Associate degree in Electrical Engineering from LaGuardia Community College. Professor Elsaiah was teaching his first semester at Maritime, having previously been a Visiting Assistant Professor at Pennsylvania's Bucknell University. Through class discussions and after-class conversations, student and teacher realized they shared an interest in the optimal integration of renewable energy resources into the nation's electric grid, distribution systems and microgrids.

"I found him very eager to learn," Professor Elsaiah recalled. "Because of this eagerness and passion to learn, we started working together."

Over time, the pair wrote several research papers, presented their findings at scholarly conferences and even co-authored a book chapter about renewable energy. Impressed with his student's scholarship, Professor Elsaiah mentored Brady-Alvarez through the competitive application process for a summer internship offered through the prestigious National Science Foundation (NSF). Their collaboration delivered the first National Science Foundation award to a student in Maritime's history.

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## Christian Brady-Alvarez '18



A Queens' native who grew up in public housing, Christian Brady-Alvarez was drawn to science from an early age. His interest in physics spurred him to research the science, technology engineering and mathematics (STEM) fields, where he discovered his educational path.

"The lifeblood of scientific exploration is how much power is available, how long it will last and what's the source," he said. "I found that electrical engineering was an avenue for me."

That discovery and a friend's recommendation brought him to SUNY Maritime College as a transfer student from LaGuardia Community College for undergraduate study. At Maritime, Brady-Alvarez found his career trajectory through the teaching and teamwork of Dr. Salem Elsaiah.

"That collaboration helped me more than I ever imagined," Brady-Alvarez said. He credits the academic partnership with preparing him for the opportunities that followed. "I would like my success to show that it really doesn't matter where you come from. You can be successful in whatever you do, as long as you have the drive."

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In June 2018, Brady-Alvarez joined a select group of undergraduate interns from across the country to participate in the NSF's Research Experience for Undergraduates – Immersive Research in Energy Generation, Storage/Conversion and Power Transmission. He partnered with Electrical Engineering faculty from Tennessee Tech University, where the 10-week internship program was housed, for an original research project focused on improving integration and power transfer between solar panels and the electric grid.

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Upon his graduation from Maritime College in September 2018 with a Bachelor's degree in Electrical Engineering with highest honors, Brady-Alvarez pondered his future path and his interest in pursuing a power systems engineering track in an industry that has markets in aerospace and defense. "My general skill set and background can contribute to those areas," Brady-Alvarez said.

While he explored job opportunities in industry, he applied for the Department of Energy's Science Undergraduate Laboratory Internships program. Accepted by his first choice, Los Alamos National Laboratory, he began a five-month stint in January of this year.

"Los Alamos is the perfect place for me to get experience as a research assistant and become familiar with the operational formalities of a large DOE laboratory," Brady-Alvarez said. "Conducting research has always fascinated me. To contribute to the growth of a knowledge base, from the basic principles to the latest discoveries, is extremely rewarding and fulfilling." ■

## Dr. Salem Elsaiah



Dr. Salem Elsaiah joined Maritime College's Department of Engineering as an assistant professor and researcher. He holds undergraduate and graduate degrees from the University of Benghazi and a doctoral degree in Electrical Engineering from Michigan State University. At Maritime, he focuses his research in the area of power distribution, specifically microgrids. A microgrid system disperses various power generation sources throughout the main network, creating redundancy and reliability for end users.

He and Christian Brady-Alvarez collaborated on research for the maritime microgrids. They assisted with implementation of the U.S. Navy Vision of 2035, which requires All Electric Ships to be powered by hybrid AC and DC systems. Elsaiah indicated that since a ship must generate its own power, redundancy is critical. Losing power for an extended period of time could jeopardize the ship, its crew and cargo.

In 2018 and 2019, Maritime College recognized Professor Elsaiah with the President's Award for Outstanding Scholarship for his research and collaborative work with undergraduate students.