

SCIENTIA

A publication for College of Science and Health alumni

Assistant Professor Bala Chaudhary (right) spoke to the UN about her research on soil samples such as the ones she is collecting on McGowan South's green roof. More on page 3.



Spring 2019

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One would think that because I've been at DePaul since 2000, I would know everything there is to know about the College of Science and Health (CSH). Not in the least. These last few months serving as the interim dean have resulted in the steepest learning curve I've had to climb in years. I am thoroughly enjoying meeting alumni, as well as faculty, staff and students, throughout our college. It's been wonderful learning about all of the incredible educational programs, research projects, student services and community involvement taking place. I am so proud of all that we do. I invite you to learn about the amazing accomplishments featured in this issue; they are only the tip of the iceberg.

I spent my first few months as interim dean thinking about the future of our college. This summer, DePaul's Board of Trustees approved the university's strategic plan, *Grounded in Mission: Engaging Students, Transforming Communities: The Plan for DePaul 2024*. You can find it in its entirety here: bit.ly/DePaulUStrategicPlan2024.

In December, we at the college conducted a two-day strategic-planning retreat where we discussed what was important to us as a college, thinking about our strengths, opportunities and aspirations and how we would measure success in the coming years. The retreat resulted in five strategic priorities: strengthening faculty and staff diversity; enhancing student inclusivity and retention; growing opportunities for student and faculty research; increasing support for programs in health; and expanding and strengthening graduate programs. It was an inspiring retreat that only increased my admiration for the faculty and staff of our college and their dedication to our mission (bit.ly/CSHMission). It was an excellent example of the words of St. Vincent de Paul: "By union and counsel we can achieve anything."

I invite you to share in our union and contribute your counsel. Reconnect with faculty and staff and share how they have helped you achieve. Come back to campus and check out our ever-improving facilities. Welcome our students into your

organizations as interns or allow them to shadow you. Sign up to be a mentor in our Alumni Sharing Knowledge program (bit.ly/DePaulUASK), or donate to support the college and its multiple endeavors, including scholarships, the Dean's Undergraduate Summer Fellowships and individual departments or programs at give.depaul.edu/scientia. Although you may no longer be on campus, you are still members of the College of Science and Health, and we'd love to stay connected!

Dorothy Kozlowski

Dorothy Kozlowski, PhD
Interim Dean

CORRECTION The name of Dean's Summer Research Fellow Raisa Munshi was misspelled in the fall 2018 issue of *Scientia*, and incorrect copy appeared under the heading for the new neuroscience degree. We regret the errors.

MISSION



THE VATICAN, THE UN AND THE SCIENTIST

When Bala Chaudhary, assistant professor of environmental science and studies, presented her research on plant-fungal interactions as indicators of soil health in Rome last October, her attentive audience included members of the Vatican's environmental team. They were there to monitor worldwide progress toward "Laudato Sí," Pope Francis' 2015 encyclical urging better care of the planet.

"'Laudato Sí' has been called the most important environmental writing in history," says Chaudhary, who spoke at the Second Symposium on Global Sustainability. The event, sponsored by the Institute for Process Systems Engineering & Sustainability at Pazmany Peter Catholic University in Budapest, Hungary, focused on how accurately current models can predict humanity's resource use.

Chaudhary's research has direct implications for soil health. She and her students study the ecology of mycorrhizas, symbiotic relationships between fungi and plant roots. Environmental changes and agricultural practices can shift the fungal relationship from mutualistic to parasitic, damaging plant health. Because nearly all plants form this relationship, Chaudhary's work has implications for environmental planning and research worldwide.

"We rely on soil resources for food production and ecosystem maintenance and stability. That's why [symposium attendees] wanted to know how well we are able to estimate the services that we get out of soils," she says.



Assistant Professor Bala Chaudhary (right) and her student researchers extract DNA from plant samples to study urban mycorrhizas. (DePaul University/Jamie Moncrief)

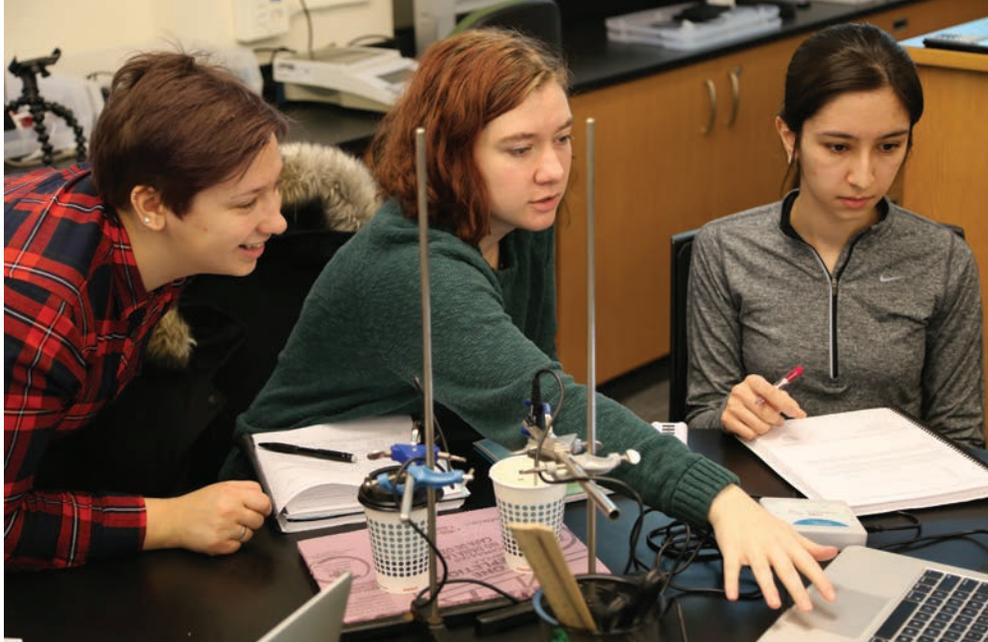
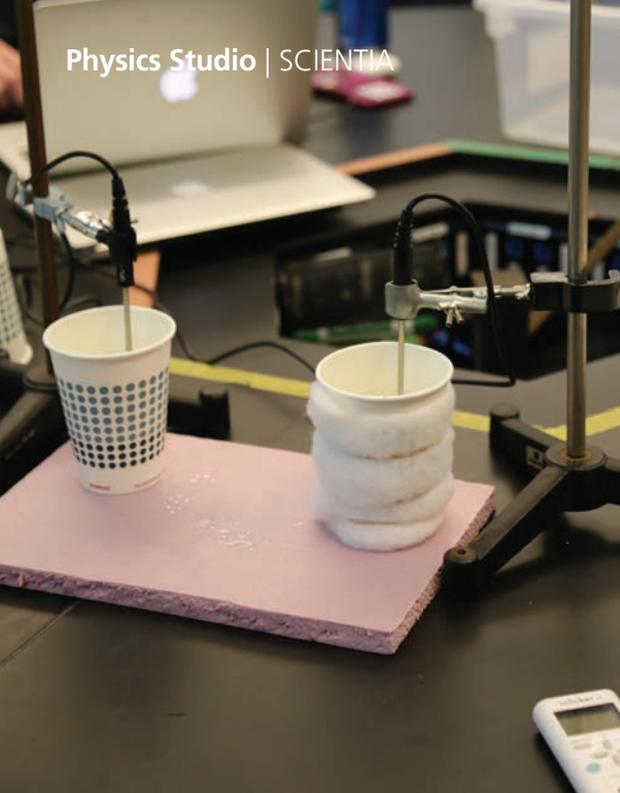
Chaudhary connected with other scientists and policymakers at the symposium.

"It was really great for me to be able to share my research on soil ecological systems with representatives from UNFAO [Food and Agriculture Organization of the United Nations] because they are responsible for collating, synthesizing and sharing best practices and soil work throughout the world," she says.

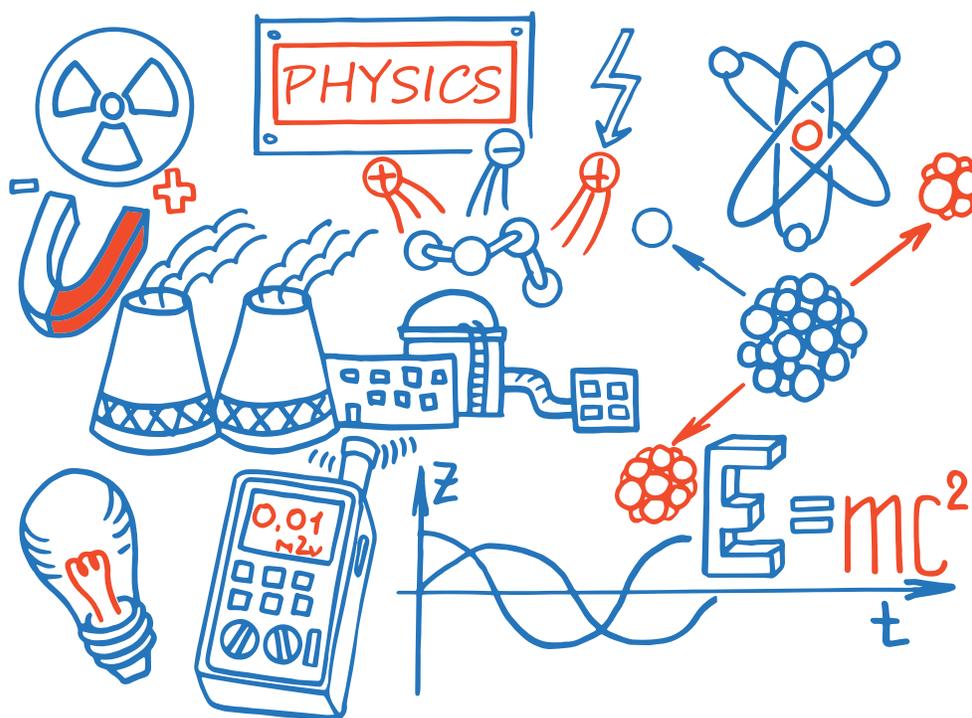
Chaudhary also studies traditional agricultural techniques in South America

and among the Hopi in Arizona, work that caught the attention of several UN staff members. "They work a lot with agricultural tradition and practices in developing nations, so they wanted to hear more about it," she says. "I think I'll be speaking with them again on these topics."

She says it was a high point of her career to represent DePaul at a global symposium with strong Catholic connections. "It's not every day that a scientist gets an audience with representatives from the Vatican."



'There's something really magical about this setup'



Susan Fischer didn't invent the studio teaching model for physics, but she knows a good idea when she sees one. In 2014, she piloted the approach when she taught a class of just 20 students, less than half the typical class size. Instead of lecturing, Fischer had students work in small groups, exploring hands-on activities and solving problems.

"Those 20 students were the most tight-knit group of students I've ever had in a class. They really were a cohort," recalls Fischer, an associate professor of physics. She was impressed with how well they learned concepts and how they talked about her class with other students. "The word on the street was that it was a really good way to learn."

The studio approach contrasts starkly with the more common lecture format,



The studio model enables Associate Professor Susan Fischer (left) to talk with all of her students individually every week.



“Research shows that the optimum space has people a little bit on top of each other. You want collaboration. You don’t want everybody to feel comfortable and isolated, you want them to work together.”

– Susan Fischer

in which faculty speak to dozens if not hundreds of students at a time, while teaching assistants provide student support outside of the lecture hall. Under that model, Fischer jokes that she would get sleepy 60 minutes into a lecture—and she would be the one giving it.

“There’s research that says people learn better when they’re actively engaged,” notes Fischer, who is leading the conversion of physics instruction to the studio approach at CSH. The first step was to remodel several rooms in Byrne Hall and equip them with round tables to facilitate small-group work.

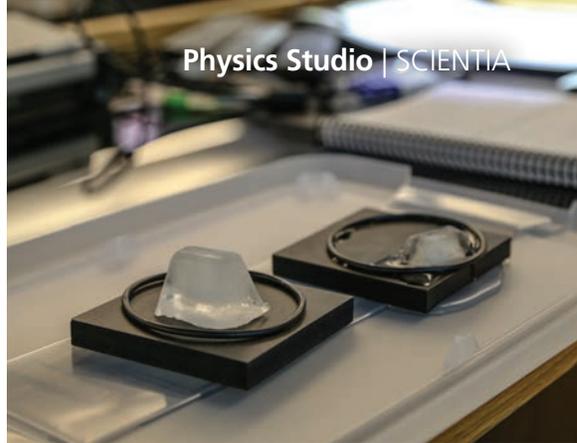
Under the studio format, students are divided into teams of three and use workbooks, laptop simulations, whiteboards and experiments to solve problems. Fischer may explain concepts or lead a discussion for a few minutes and then spend the rest of the 90-minute class talking with each group. She works with her graduate assistant and undergraduate assistant as a team to get to know each student and provide tailored assistance. “There’s something really magical about

this setup. ... Every week you’ve had a real discussion with every student.”

The studio model emphasizes building students’ reasoning skills. “The focus is on understanding concepts rather than making measurements to confirm some value,” she says. “We play around with stuff and make predictions and understand why things happen.”

Understanding the “why” instead of merely the “how” helps students retain concepts longer, Fischer adds. Since she started using the studio model, “there’s been a shift in the grade distribution toward higher scores; you don’t get as many people who are really struggling,” she says.

A growing number of DePaul physics faculty are adopting the format, and faculty members from other departments also are interested. Fischer thinks the studio teaching model will continue to spread. “It’s just perfect for ‘science as a way of knowing’ courses. I’m hopeful the college and the whole university will convert more classrooms to studios.”



Student Excitement Propels Neuroscience Major



In just three years, CSH’s new bachelor’s degree in neuroscience has exploded from an initial 17 students to more than 150. Students asked for a degree in the new interdisciplinary field, and DePaul’s faculty were well-credentialed to respond.

“Psychology, biology and philosophy are the founding fathers of neuroscience,” says Dorothy Kozlowski, interim dean and creator of the program. “You can see the biology of the brain, but you need psychology and philosophy to provide a framework for asking questions about behavior and the mind.”

The program is co-directed by Eric Norstrom, an associate professor of biology, and Sandra Virtue, a professor of psychology. “We drew on DePaul’s expertise in computing and philosophy as well as the college’s strengths in fields such as health sciences and psychology,” Norstrom says. Reflecting the university’s mission, CSH requires students to take an ethics course such as neuroethics, which often isn’t offered at other universities.

DePaul’s distinctive program also provides undergraduates with extensive access to faculty. Students gain research experience through partnerships with institutions such as Rosalind Franklin University of Medicine and Science, Norstrom says. “One of our goals going forward is to establish more neuroscience-specific research and internship opportunities. That’s an area where our alumni can really help us.”

To talk with Norstrom about workplace opportunities, email enorstro@depaul.edu. For more information about the degree, visit bit.ly/DePaulNeuroscience.



IN SEARCH OF *Awe*

**Kimberly Quinn wants to know
what makes your eyes pop out, and she's
got the gear to do it**

Photo courtesy of the Museum of Science and Industry

Quinn and her collaborators have spent the past two years persuading visitors to the Museum of Science and Industry (MSI), the Lincoln Park Zoo and other area institutions to spend the day wearing special glasses that record their eye movements. Their research is revealing how people experience awe and what cultural institutions can do to enhance that reaction. Quinn is leading the project along with former psychology faculty member Sheila Krogh-Jespersen and Aaron Price, MSI's director of research and evaluation.

"When people feel awe, they report feeling like they are very small in a very vast world. There's a sense of humility," says Quinn, associate professor of psychology. Awe and humility correlate with positive behaviors such as helpfulness and generosity, which are important to cultural institutions. "The zoo, for example, is interested in how awe relates to conservation behavior, donations, interest in the environment and interest in animal welfare."

The researchers also are investigating the relationship between awe and learning, adds Price. "If we can show a relationship, that's a strong justification for school field trips" and other outreach programs, he says.

Eye-tracking technology provides insights that surveys can't. "As a social psychologist, I know that people don't always have insight into what causes their reactions," Quinn says. "Eye tracking is giving us data that participants can't tell us about."

And that's what exhibit designers are eager to know, Price says. "When we are developing new exhibits, we want to make sure that the awe moments happen at the right time to facilitate learning. Should it be at the beginning, the end, the middle?"

The team's data show that the more time visitors spend looking at MSI's famed U505 submarine, the more awe they feel. Visitors also feel increased awe when they know more about World War II history and military

technology. However, awe was lower when visitors spent proportionally less time looking at the U-boat than at other aspects of the exhibit. Quinn thinks the information in the museum's long corridor leading to the U505 prepares visitors to be awed, and other signage might be distracting.

Such insights have drawn standing-room-only crowds when the team presents at museum and learning science conferences. Now Quinn and Price want to collect more data and look for demographic differences among visitors. Says Price, "What is awe-inspiring to one might not be awe-inspiring—or even fearful—to another. We want programming that includes everyone."

The end goal is a content coding system for museums and cultural institutions, Quinn says. "We are looking for common themes and features that resonate with guests across exhibits. Museums could use that information to improve scientific literacy by improving engagement."

'This is where they learn to be a scientist'

"There's a difference between learning science and being a scientist. I don't think that happens except at gatherings like this," says Jesús Pando, director of the 16th Annual Science, Technology and Mathematics Undergraduate Research Showcase, gesturing toward the crowded hallways in McGowan South.

More than 100 undergraduate students presented posters and made oral presentations about their research at the event. "It's important to get experience with public speaking, especially on science topics," says Grant Anderson, a senior majoring in biochemistry. "It's a challenge to put research into words that serve people with deep knowledge, as well as people who aren't as knowledgeable."

The presentations benefit scientists as well as students, says Alexandra Krak, a senior majoring in biology, who used relatively unknown software to study fossilized sharks. "It's good for other paleontologists to see how the software has been applied so they can consider it for their own research."

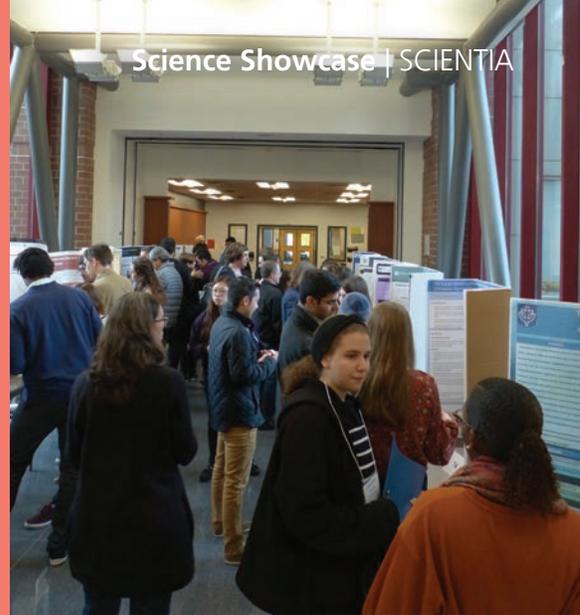
Stephanie Torres (CSH '13) shared her postgraduate experiences with undergraduates during the alumni panel. "My foundation was at DePaul," she told students. "I've spent the past few years building up the work that started here."

Panelist Lauren Umek (CSH '03) added, "I didn't think that DePaul's social justice mission was at the front of my studies, but it was part of everything I did. It wasn't until I was in my first job that I realized that [social justice] is the fundamental driver for a lot of my professional desires."

Loay Khalifa (CSH MS '18) was one of several alumni who joined graduate students and faculty members in reviewing posters and giving students feedback. "I received guidance from faculty and other students during the time I spent at DePaul, so this is my act of giving back," says Khalifa, who now teaches astronomy at Columbia College.

"As faculty, we get recharged by seeing these students present and by their excitement about their research," says Pando, associate professor and chair of the Department of Physics. "The depth and the breadth of research that is being done is fantastic. The showcase lets everyone know what an outstanding job our students are doing."

If you are interested in giving students feedback at next fall's showcase, please contact Pando at jpando@depaul.edu.



LAB NOTES



NEUROSCIENCE HONOR SOCIETY ▲

In conjunction with the creation of the neuroscience major, CSH established a chapter of Nu Rho Psi, the neuroscience honor society. Shubhik DebBurman (left), national president of the society and a professor of biological sciences at Lake Forest College, inducted two faculty members and 13 students in spring 2018.



PHYSICS STUDENT CHAPTER ▲

For the first time, the DePaul chapter of the Society of Physics Students (SPS) won the Outstanding Chapter Award from the national SPS organization. Given to less than 10 percent of chapters, the award recognizes students for being highly engaged with and contributing to their campus and professional physics communities and the public.



CALLING ON CALLERS ▲

Interim Dean Dorothy Kozlowski (third from left) visits with Telefund student callers. They share news and updates about DePaul and CSH with alumni and friends while asking for financial contributions to important college initiatives, such as the Dean's Undergraduate Summer Fellows program, which supported 13 students in 2018.

TRAILBLAZERS

CSH students who are the first in their family to complete college degrees are successful in part because faculty members understand their challenges. Visit bit.ly/CSHFirstGenStories to watch the stories about Ruben Parra, professor of computational chemistry and Interim Dean Dorothy Kozlowski, Vincent de Paul professor of biological sciences.



GREAT READS

Windsor Aguirre, associate professor of evolutionary biology, co-authored "Guía práctica de Morfometría Geométrica: Aplicaciones en la ictiología," a Spanish-language guide to geometric morphometry focusing on ichthyology. The book was published by the Pontifical Catholic University of Ecuador, Esmeraldas.

Gerald Biala (CSH '77) and Therese Fitzpatrick (CSH '75, MS '84) co-authored "The Healthcare Executive's Guide to Navigating the Surgical Suite: A Roadmap to the OR and Perioperative Services," published by the Sigma Theta Tau International Honor Society of Nursing. Fitzpatrick is chair of the CSH Advisory Board.

Matthew Sorenson, associate professor of nursing and director of the School of Nursing, co-authored "Pathophysiology: Concepts of Human Disease," published by Pearson.



NURSING SOCIETY INDUCTEES ▲

There were smiles all around as 29 students were inducted into the DePaul chapter of the Sigma Theta Tau International Honor Society of Nursing in fall 2018.

SCHWEITZER FELLOWS

School of Nursing students Nhu Do, Sarah Kwon and Alexandra Strawbridge were selected for the Albert Schweitzer Fellowship, enabling them to design and implement projects that address health needs in underserved Chicago communities.

MAJOR NSF GRANT

Kenshu Shimada, professor of paleobiology, is part of a research team that received a \$571,000 grant from the National Science Foundation for "Collaborative Research: Biogeochemical Fingerprinting of the Megatoothed ("Megalodon") Shark: A Dual Study in Thermophysiological Evolution and Seawater Chemistry."



There were tears and hugs and laughter when the CSH community threw a surprise party for Brenda "Grandma" Yates, who retired after nearly 20 years as a custodian in the science buildings.

"They have no idea how they touched my heart and touched my life. Just to know that you are appreciated, that's wonderful," Yates says, her voice filling with emotion. It was a dose of the medicine that she doled out daily to students, faculty and staff.

"It's the simple things like a smile, a good morning, a hug," says Yates, who says she could tell with one look if someone was struggling. "I would just give them a hug and let them know it would be OK and if they wanted to talk, I'm here. It makes my heart happy to know that those little things helped them."



'It costs nothing to be kind'



COME HERE. STAY HERE.

Diversity advocate gives voice to the underrepresented

Liz Aquino (CSH MS '06) (white coat, above), CSH's new diversity advocate, knows firsthand about the challenges that underrepresented faculty and staff face.

"I was the first one [in my family] to graduate from college," says Aquino, an assistant professor of nursing who grew up in Berwyn, Ill. "I didn't even really know what a PhD was until I came here for my MENP [Master's Entry to Nursing Practice], and I had never seen someone who looked like me with a PhD."

Now Aquino is working to help CSH recruit and retain diverse faculty and staff, enabling the college to conduct more insightful research and service in Chicago communities as well as provide role models for students. As part of her personal research, Aquino also is investigating the barriers, such as inexperience with the nuts and bolts of classroom teaching and limited institutional support, that discourage practicing nurses from becoming faculty members.

"When you have nurses who transition from bedside to faculty, it's a different world. It can be challenging," she says. "Beginning

any new role and working to advance your career comes with challenges, so it's important that institutions demonstrate a true commitment to their employees. We need to identify and remove barriers. We need an inclusive environment that is supportive and recognizes people for their unique contributions. We want people to come here and we want them to stay."

Her first step was to survey existing CSH faculty and staff about the challenges they face. "I want to make sure that I am representing everyone, not just coming in with my own ideas," she says.

Aquino knows how to represent. She is president of the Illinois chapter of the National Association of Hispanic Nurses, which provides mentoring and scholarships to nursing students, offers professional development opportunities for licensed nurses, and collaborates with community organizations to conduct health screenings and related services for underserved populations. Under Aquino's leadership, chapter members participated in three medical mission trips to Puerto Rico following the devastation caused

by Hurricane Maria. Aquino sits on the national organization's policy and advocacy committee, staying on top of legislation and regulations that will affect nurses.

She also works with the American Nurses Association Illinois, whose activities include an annual conference to educate nurses and nursing students about bills that will affect the profession. She travels with students recruited by the DePaul Student Nurses Association to the annual student nurse political action day in Springfield, Ill. Aquino, who is married to Illinois State Senator Omar Aquino, helps students meet their elected officials so they can gain confidence in voicing their opinions.

Aquino has learned to be confident in her own voice. During the past decade she has served on many national, state and local boards and committees, including the national diversity leadership committee for the American Heart Association.

"I'm bringing them my perspective, being a nurse, being Hispanic, being younger, being a woman," she says. "It's important to have that collective voice represented."



'I felt like I was part of the whole scientific community'

"I have not always felt like I fit in with the stereotype of a scientist," says physics major Sam Smiley. Then, in 2017, she attended the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) conference. "It was the first time that I felt like I was part of the whole scientific community."

That's why Jesús Pando, associate professor and chair of the Department of Physics, scrapes together the funding to take 10 to 30 students to the SACNAS conference each year.

"Our underrepresented students get to see a sea of brown and black scientists," says Pando. "It's important for them to know that there are role models, that it's possible for them to do science."

"It was such an incredible networking opportunity," raves Smiley. As a sophomore, she was amazed by the number of universities recruiting students for summer research experiences.

"Every major university and medical school, as well as government agencies like NASA and NOAA that use science, are there recruiting students," Pando confirms. "Our students take advantage of these opportunities to get summer research internships."

Smiley did. She spent last summer doing material physics research at Vanderbilt University in Nashville, Tenn., discovering her passion for condensed matter physics. When she returned to the SACNAS conference in 2018, the poster she presented about her research was awarded Best Physics Poster.

While the award is a great addition to her graduate school application, the best part of

the poster session was talking with others about her research, says Smiley, now a junior. "It was just so awesome to engage with people who are actually in the field, professors and researchers and people who work in industry, as well as graduate and undergraduate students, who all are passionate about the same thing I am."

Smiley is grateful for the support that enabled her to attend the conference not just once but twice, something she could not have afforded on her own. "Honestly, it's the most worthwhile conference I've been to and I've been to quite a few. This is the one that really allowed me to feel part of the scientific community and that introduced me to all the opportunities in science and in STEM."

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undergraduates were able to pursue research internships last summer at leading museums, laboratories and institutions thanks to gifts, large and small, to the Dean's Undergraduate Research Fellowship.

Your gift can make research opportunities happen this summer. Visit give.depaul.edu/Scientia to make your gift today.

SCIENTIA

We welcome your story ideas,
questions and comments.

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Introducing our new alumni blog—the Blue Demon Line! Join us at the Blue Demon Line for an exclusive look into all things DePaul alumni, including in-depth interviews, “DePaul family” recipes, photo contests, tips and tricks from experts, and more!

Blue Demon Line

Once a Blue Demon, always a Blue Demon