Tuning into Change: Students Fostering Inclusion in the Acoustics Field

Marissa L. Garcia

Introduction

Students and recent graduates who are members of the Acoustical Society of America (ASA) are already serving as exemplary leaders in the acoustics field, in both research and their communities. Many, in fact, have been the driving force behind movements to foster a greater culture of inclusion in acoustics. Centering our professional spaces around inclusivity is essential for our success as a field, but sometimes it can be tricky knowing just how to spur change in one's own working environment. Perhaps the best resource we have through the ASA is learning from each other, and so, this essay highlights students and recent graduates who have, in service of the same goal, pursued many different avenues of action: research, representation, community, and even the ASA itself. The Student Council hopes that these stories spark ideas about what others can do to cultivate a greater sense of belonging at their institutions.

Power Through Research

Abhijit Roy (AbhijitRoy2025@u.northwestern.edu) is in

his fourth year of his PhD program in communication sciences and disorders at Northwestern University, Evanston, Illinois. His academic journey began as a law student in India, but his passions inspired him to switch to a Bachelor of Fine Arts degree in sound design and music production from the Savannah College of Art and Design, Savannah, Georgia. After working closely with film, music, and sound effects, Abhijit became increasingly captivated by the impact that sound bears on the senses. He went on to gain a thorough understanding of sound as a physical concept through his MA in acoustical studies at Johns Hopkins University, Baltimore, Maryland. Since then, he has been pursuing a PhD at the Hearing Aid Laboratory (see bit.ly/3t1lqEF) under the mentorship of Pamela Souza (see bit.ly/3RbGDDT), where his unique background in music production, acoustics, signal processing, and hearing loss has manifested into research on optimizing the hearing aid experience for people hailing from multiple walks of life. His passion for equity and inclusion lives within his actual research design, the impacts of which could improve hearing aid performance no matter the preferred language and could also motivate lower hearing aid costs overall.

> "Motivations for the early portion of my PhD research were primarily focused on understanding whether language specificity in hearing aid signal processing may result in better outcomes. We compared the performance of English- and Mandarin-speaking individuals on their phoneme perception in various frequency compression settings. Our results found that there are some detailed variances in perception that could have a possible impact on clinical tools used to optimize frequency compression. In addition to assessing language-specific signal processing, I am also interested in creating more efficient compression and filterbank designs that can lower the overall cost of hearing aids. I am exploring various acoustic metrics and solutions to inform novel hearing aid signal-processing regimens, which can reduce computational requirements."

Power Through Representation

Olivia Heui Young Park (hkp5188@psu.edu; see

bit.ly/41feOz2) will graduate in Summer 2025 with a PhD in acoustics from the Pennsylvania State University, State College. Hailing from Seoul, Korea, she earned her BE and MEng in mechanical engineering from the Cooper Union for the Advancement of Science and Art, New York, New York. Since then, she has set her sights

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on better understanding the human aspect of acoustics through her research at the Sound Perception and Room Acoustics Laboratory (SPRAL; see bit.ly/41hYyxq) under the guidance of Michelle Vigeant-Haas (see bit.ly/4ae1miX). Here, she investigates the effects of noise on human cognition, physiology, perception, and speech intelligibility and applies these insights toward implementing realistic room acoustic environments. She also serves as the architectural acoustics representative on the Student Council. Through outreach materials and events, she has wielded the tool of representation to actively improve diversity in her academic environments.

"Representation and spreading awareness are some of the best ways of fostering inclusive, diverse environments. When I served as the secretary and then vice president for the Penn State Chapter of the ASA, I tried to incorporate different methods of promoting such environments. As secretary, I created monthly newsletters featuring events that happened during each month and took advantage of March being Women's History Month to promote female students, faculty, and staff. I featured 'in-action' photos of the department's female members conducting research or outreach. I also participated in various recruiting and outreach events to help promote diversity and inclusion. As an international student and a female person of color, I know how crucial representation is, especially to younger, underrepresented students. I love participating in outreach events because I get to teach younger students acoustics-related concepts through demos and lectures. I led the acoustics portion of the AEspiring Architectural Engineering summer camp (see bit.ly/48bGYxk) last year and have participated in the programs Ask a Scientist, ENVISION, Young Women in Science, and more. It is so rewarding to see students gain confidence and interest in acoustics and to hear from students who are underrepresented, like me, say that they feel validated seeing me as an instructor or even knowing that I am pursuing a PhD in engineering."

Power Through Community

Natalie Kukshtel (nkukshtel@whoi.edu; see bit.ly/47OKmOK) is in her fourth year of her PhD program in mechanical engineering and applied ocean physics in the Massachusetts Institute of Technology (MIT)-Woods Hole Oceanographic Institution (WHOI) Joint Program in Oceanography/Applied Ocean Science and Engineering (MIT-WHOI JP) located in both Cambridge, Massachusetts, and Woods Hole, Massachusetts. After receiving her BS from Northeastern University, Boston, Massachusetts, she gained experience working for two years as a mechanical engineer in defense robotics. Now representing underwater acoustics on the Student Council, she researches the use of autonomous underwater vehicles and computational ocean acoustic modeling to better understand underwater acoustic propagation along the New England Shelf Break. To level the playing field in acoustics, she has concentrated her efforts on a key part of the pipeline, helping acoustics-curious graduate students decipher the hidden curriculum behind applying to graduate school. She has served for three years as a board member on the MIT-WHOI JP Applicant Support & Knowledgebase (JP ASK) program, which aims to do exactly that.

"The MIT-WHOI JP ASK program is a mentorship program established in 2019 by graduate students who wanted to lower the barrier for the graduate school application process, particularly for potential students who are underrepresented and/or unfamiliar with ocean sciences and engineering (including ocean acoustics!). We advise and support prospective students through the graduate application process, with a focus on increasing the diversity of incoming students in these fields. JP ASK is run by a board of graduate student volunteers, and we pair prospective applicant mentees with current graduate student mentors. Through these one-on-one interactions, mentees get personalized advice for their applications as well as a realistic look into the life of a graduate student. Although the program advises mentees across various ocean science and engineering disciplines, we believe it's important to spread awareness of the ocean acoustics field due to the limited representation it has in most undergraduate studies. Since starting JP ASK, we've matched nearly 600 mentees from around the world, whose demographics are more diverse than our graduate program and ocean sciences overall."

EeShan Bhatt (Eeshan.Bhatt@appliedoceansciences.com; see bit.ly/488Tg9z) earned his PhD in mechanical and oceanographic engineering at the MIT-WHOI JP located in both Cambridge and Woods Hole. Although he is now a staff scientist at Applied Ocean

Sciences based in Springfield, Virginia, his dissertation research involved developing real-time ray identification to aid underwater navigation in the Beaufort Sea under the supervision of Henrik Schmidt (see bit.ly/41haak6). On graduation, EeShan received the George P. Panteleyev Award in honor of his commitment to improving graduate student life. One facet of this mission included being among the founding members of the MIT-WHOI JP ASK Program that Natalie now oversees. While he has since passed the baton to the new leaders of the program, he is reflective on the influence of starting the first ocean science applicant assistance program.

"I always felt that I lucked into studying ocean acoustics. Through many heartfelt conversations with peers in my first few years of graduate school, we realized that the most common and visible pathways to a graduate degree in oceanography (and perhaps this is generally true for most STEM fields) were relatively inaccessible opportunities: having grown up or summered near the ocean, having other academics in the family, or having significant prior diving or sailing experience. I was particularly motivated to start JP ASK because it felt like an effective way for us as students to lower the barrier for others to consider joining the ocean science and engineering community. Seeing JP ASK thrive with new cohorts of student leaders and mentors has been even more rewarding than starting it. I feel confident that this kind of program, by students and for students, will continue to be the kind of wholehearted welcome to graduate school everyone could use."

Power Through the Acoustical Society of America

Elizabeth Weidner (ereedweidner@ucsd.edu; see bit.ly/4ad0evR) earned her PhD in oceanography from a joint program between the University of New Hampshire, Durham, and Stockholm University, Stockholm, Sweden. A previous Student Council member representing acoustical oceanography, Elizabeth is now a postdoctoral fellow at Scripps Institution of Oceanography, La Jolla, California, and an affiliate research professor with the Center for Coastal and Ocean Mapping, Durham, New Hampshire. Her research encompasses the broadband acoustic characterization of high-latitude glacial fjords, gas bubbles, ocean water column structure, and buoyant fluid emissions. Her experiences in the ocean acoustics field led her to set her sights toward strengthening inclusion via the ASA itself.

"Underwater acoustics is a male-dominated field. The lack of gender diversity is reflected in my personal experiences; sitting in a conference session, I am one of very few women. I am aware that my feelings of isolation pale in comparison to those who are black, indigenous, and people of color (BIPOC) and/or with intersectional identities. However, understanding a small piece of otherness has motivated my efforts to both educate myself and combat issues limiting diversity, equity, and inclusion (DEI) in my spheres of influence, including within the ASA. I am part of the ASA's Committee to Increase Racial Diversity and Inclusivity (CIRDI), currently chaired by Andrea P. Arguelles, originally cochaired by Tyrone Porter and Peggy Nelson. Founded as an ad hoc committee in Fall 2020, CIRDI is focused on proposing and implementing strategies to

(1) Increase representation and participation of racially diverse groups in the ASA;
(2) Build awareness of the value of DEI among the membership; and
(3) Improve the sense of belonging of underrepresented minorities in the ASA.

"The committee has pursued multiple initiatives to achieve these goals, but one that I am most excited about is the Summer Undergraduate Research or Internship Experience in Acoustics (SURIEA). SURIEA was launched in 2021 and was specifically designed to reach underrepresented minority students, introducing them to the field of acoustics through paid research experience. During its development, one of the main focuses was building community support and participant camaraderie throughout the program to improve outcomes and retention. Since 2021, SURIEA has supported over 30 students in their acoustics research experiences, and we are in the planning phase for the next cohort right now! The application is open to students and mentors for 2024 and can be found at the SURIEA website (acousticalsociety.org/suriea)."

Conclusion

From optimizing room acoustics to making hearing aids more accessible to even modeling acoustic propagation in the ocean, these young researchers encompass a formidable range of academic expertise. Beyond making an impact in their research, however, these leaders have forged ways to support people from all walks of life whether it be through their research, representation, community, or even the ASA. The Student Council hopes that ASA members across all career stages find these stories to be empowering and emboldening, serving as the blueprint for new initiatives and sowing the seeds for the roots of change.

Contact Information

Marissa L. Garcia mg2377@cornell.edu

K. Lisa Yang Center for Conservation Bioacoustics
Cornell Lab of Ornithology
Cornell University
Ithaca, New York 14850, USA

and

Department of Natural Resources and the Environment
Cornell University
Ithaca, New York 14853, USA

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