Arecibo STEM educational center to open soon

Biology and computer science activities replace the iconic radio telescope at the Puerto Rican observatory site.

AMANDA JOY MEYERS/NSF

THE ÁNGEL RAMOS FOUNDATION Science and Visitor Center at the former Arecibo Observatory site is being converted into an educational center, scheduled to open in November.

Two years after the 305-meter radio telescope collapsed at Arecibo Observatory on 1 December 2020, NSF announced that the site would be converted into an educational center (see "NSF's Arecibo strategy puts future research into question," Physics Today online, 15 November 2022). NSF's Arecibo Center for Culturally Relevant and Inclusive Science Education, Computational Skills, and Community Engagement (NSF Arecibo C3) is scheduled to open in November. The move is simultaneously welcomed by and disappointing to people who visited or used the observatory for research.

NSF Arecibo C3 will feature a laboratory and an interactive science center with STEM exhibits and activities focused on biology and computer science. The center will target educators, K–12 students, and the general public.

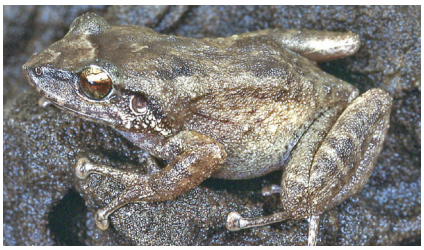
A pilot phase began in late May. High school and college faculty from Puerto Rico and the rest of the US were invited to a workshop for a deep dive into nanopore DNA sequencing, a process used to determine the sequence of nucleotides in a DNA strand.

At the time Physics Today went to press, the schedule also included two biology-education workshops in which high schoolers and middle schoolers could extract, analyze, and model DNA. The goal of those activities is to expand students' understanding of genetics and cell biology.

Professional development for life sciences instructors will be a focus moving forward, says NSF Arecibo C3 lead investigator Jason Williams. A group of Puerto Rican high school teachers is helping to shape the center's programming. The center's executive director, Wanda Liz Díaz Merced, worked with the Puerto Rico Department of Education to incorporate astronomy learning for teachers and students.

Another pilot-phase activity hosted by the center is a citizen science project on biodiversity in which volunteers across the island collect samples of various plants, insects, and small animals and map their distribution.

Over the past two decades, NSF has invested more than $200 million in Arecibo operations, management, and maintenance. In 2023 NSF said that it is putting $5 million over five years into the center. Four institutions are partnering with NSF to organize and implement educational programs with



THE COQUI FROG is among Puerto Rico's indigenous plants and animals studied in the biodiversity mapping project run by the new educational center at the site of the former Arecibo Observatory. (Photo by Louis Porras; from V. H. González-Sánchez et al., *ZooKeys* **1022**, 79, 2021.)

that funding. The University of the Sacred Heart in San Juan will incorporate astronomy topics and create STEM activities for those with disabilities. The University of Maryland, Baltimore County, will focus on computational science. New York's Cold Spring Harbor Laboratory will promote biology through hands-on activities. The University of Puerto Rico at Río Piedras will offer undergraduate biology education through research and connect the University of Puerto Rico system to the center.

During its long run as the world's largest radio telescope, the Arecibo Observatory was used to detect hundreds of near-Earth asteroids, discover the first binary pulsar, and find the first exoplanet. The dish faced years of deterioration but continued to be used for many other significant discoveries before it collapsed (see "NSF puts Arecibo Observatory on chopping block," Physics Today online, 24 November 2020). NSF will highlight the observatory's legacy in an exhibit at the center.

A 12-meter radio telescope at the Arecibo site stopped operations last year when the facility officially closed. Astronomer Abel Méndez at the University of Puerto Rico at Arecibo's Planetary Habitability Laboratory trained students on the dish. He says that he hopes that funding will be found to bring the telescope back on line for educational and research purposes at the center. So far, though, that's not in the plans, according to an NSF spokesperson. Although gathering new astronomical data is not on the horizon for Arecibo, archived data from the telescope may be used in center activities.

Anish Roshi, who headed radio astronomy at Arecibo, says that a center for science education will benefit Puerto Rico. Still, he says, without a major research facility, visitors won't be exposed to world-class science.

Hannah H. Means

Indigenous women thrive in Los Alamos internships

A small program is having a big impact on its participants.

When Victoria Nofchissey spotted a flyer for a program called Engaging Indigenous Women in Nuclear Physics, she thought, "That's me!" She was a sophomore at Fort Lewis College in Durango, Colorado. Growing up without water or electricity on the Navajo Reservation in Arizona, she says, "I didn't imagine I had the possibility of being a physicist."

A few months later, in the summer of 2023, she was at Los Alamos National Laboratory.

Indigenous women in STEM "are the minority of minorities," says Cesar Da Silva. (According to data from the Department of Education, Indigenous women earned 0.2% of bachelor's degrees in the physical sciences in 2021. See the interactive tool at https://ww2.aip.org/statistics/physics-engineering-degrees-earned.) He and fellow Los Alamos physicist Astrid Morreale proposed the program in 2021 in response to a call by the Department of Energy to increase participation by groups historically underrepresented in science. Their proposal to mentor such students won $200 000 for a pilot program, plus $484 000 from other sources. The program is now up for renewal funding.

The program has grown each year, from two to four to—this year—six participants.

ELAINA SALTCLAH (left) and Arielle Platero (right) went to Los Alamos National Laboratory as part of the Engaging Indigenous Women in Nuclear Physics pilot program. Bade Sayki (center) is a student at the University of Colorado, Boulder, who is working full time at the lab as a graduate research assistant.