Broadcasting STEM education from Arecibo to the World [1]

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The historic Arecibo Observatory is being transformed into the future of Science, Technology, Engineering and, and Mathematics (STEM) education in Puerto Rico

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The NSF Arecibo Center for STEM Education, Computational Skills, and Community Engagement (AC3) is entering its next chapter in transforming the historic Arecibo Observatory into a dynamic hub for science, technology, and community innovation through a project called Arecibo C3 or AC3. It is led by the University of Puerto Rico, Río Piedras Campus, University of Maryland, Baltimore County (UMBC), and Cold Spring Harbor Laboratory. The project is funded by the U.S. National Science Foundation. AC3 aims to strengthen Puerto Rico's STEM ecosystem through programs that combine education, workforce development, and community partnerships.

In summer 2024, AC3 launched its pilot phase, introducing multiple projects and engagement initiatives to gather community feedback and co-design STEM learning opportunities at the site.

"Now, AC3 announces its January soft opening, where it will begin the offering of ticketed weekly events, including historical tours highlighting Arecibo's legacy of scientific discovery and explorations of the region's biodiversity. Visitors will enjoy hands-on STEM experiences in biology, computing, astronomy, and more. They will also preview the upcoming exhibition *Signals* (opening early 2026), which connects the Observatory's past to the emerging generation of scientists shaping the island's future in STEM" stated Jason Williams, Assistant Director at Cold Spring Harbor Laboratory's DNA Learning Center and the AC3 Project Lead.

Over recent months as part of its pilot project, hundreds of students, teachers, and researchers have collaborated with AC3 scientists through school-based projects, advanced field trips in molecular biology and genetics, and summer workshops. Computing programs have helped graduate students gain advanced research skills and lifelong learners acquire digital skills for entrepreneurship and everyday life.

"This center makes Puerto Rico a regional hub for STEM innovation through three key pillars: education research with global impact, workforce development for a STEM-based economy, and partnerships that address community challenges. We want scientific knowledge to benefit Puerto Rico directly," said José Agosto-Rivera, Associate Professor at the University of Puerto Rico, Río Piedras, and principal investigator of the AC3 project.

Over a dozen pilot activities in the past year have merged educational research and STEM technology to expand learning in schools, universities, and communities. Programs have included early-STEM education research using multisensory methods, molecular biology and genomics training for educators, digital skills workshops for parents, Human-Centered Computing courses for students and faculty, and interdisciplinary research experiences addressing real issues in Puerto Rican communities.

"With the rapid growth of AI, it's more important than ever to integrate computational thinking across all realms of education. We're engaging non-traditional participants to co-create community computing learning ecosystems through participatory design," added Patricia Ordóñez, Associate Professor at the University of Maryland, Baltimore County, and principal investigator for UMBC.

AC3 not only provides training opportunities in additional STEM fields but also enables the students on the island to engage in hands-on activities using professional laboratory equipment. "Through these experiences, participants build self-efficacy in biology, technology, computing,

and more," added Yasmin Santiago, AC3 Programming and Operations Director.

AC3 seeks to strengthen Puerto Rico's vibrant STEM ecosystem and workforce by creating new pathways for people of all ages to use science and technology to address challenges in their own communities.

Links
[1] https://www.cienciapr.org/en/external-news/broadcasting-stem-education-arecibo-world