

CrEST

CREATING EQUITY IN STEAM



CrEST COULD HAVE BEEN LAUNCHED ONLY AT UC SANTA CRUZ

For more than 50 years, the University of California, Santa Cruz, has pushed the boundaries of higher education, emerging as one of the youngest of the world's leading public universities—one with an unwavering commitment to research excellence. Its faculty members have helped to map the human genome and chart the stars while educating over 140,000 graduates to take what they learn in the lab and classrooms and create transformative change. UC Santa Cruz is one of only four universities in the prestigious 66-member Association of American Universities (AAU) that is also designated as a Hispanic-Serving Institution (HSI). The university is also designated as an Asian American and Native American Pacific Islander-Serving Institution (AANAPISI). UC Santa Cruz provides a transformative educational experience resonant with the university's values of social justice. CrEST enhances UC Santa Cruz's reputation as a world leader in the effort to make higher education more accessible and inclusive.

From climate change to biodiversity

loss, poverty, inequality, global health issues, and environmental degradation, the world faces significant challenges. The need for critical thinking is greater than ever.

A multitude of studies show that diverse groups outperform homogeneous groups in developing solutions that are more innovative, creative, and responsive to complex problems.

The key to success is inclusion.

Diversity through inclusion unlocks the full intellectual potential of the world's youth that's needed to solve these global problems and achieve excellence in research.

CrEST CREATES EQUITY AND PROMOTES DIVERSITY

By engaging students from historically excluded backgrounds in critical thinking (evidence-based practice) in the context of research and mentorship, CrEST creates equity and promotes diversity in the fields of science, technology, engineering, art, and math (STEAM). CrEST helps students around the world feel recognized as scientists—increasing their confidence and continued interest and participation in STEAM. Participants are encouraged to pay it forward by mentoring younger students, further enhancing community access to STEAM research.

CrEST is shaping the future face of research.

UC SANTA CRUZ

OUR
VOICES
WILL DEFINE
THE CENTURY

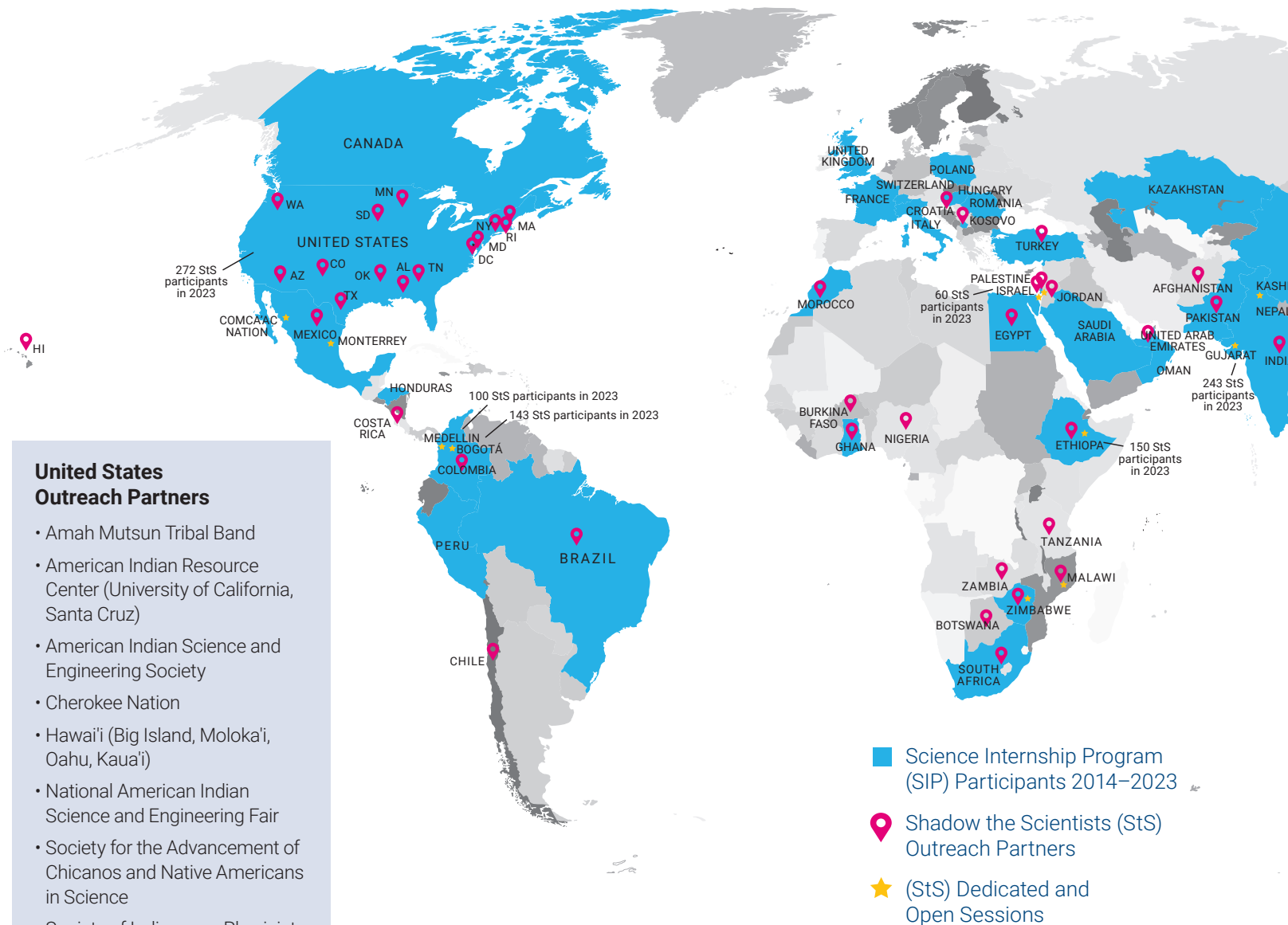
A GLOBAL PERSPECTIVE AND IMPACT

CrEST engages students from diverse backgrounds across the globe in real-world, cutting-edge research. Through nationwide and global partnerships (dozens of researchers, schools, and other organizations in 20+ countries), CrEST provides research access to students from historically marginalized/excluded communities. This includes students who are underresourced, ethnically or racially underrepresented, and/or first in their family to attend college. Women are also more strongly represented in CrEST than they are in the STEAM workforce.

"The profound impact of Shadow the Scientists on students at the University of Dodoma, Tanzania, has inspired them to pursue astronomy and STEM fields. The program has provided knowledge and inspiration, igniting the students' passion for scientific exploration and the cosmos. Through StS, they have discovered a world of opportunities and are now motivated to pursue their dreams in physics and beyond."

– Lordrick A. Kahinga (StS Subject Matter Expert, University of Dodoma, Tanzania; first-year Astronomy & Astrophysics Ph.D. student, UCSC)

Map of Program Reach



CrEST's umbrella of programs is a community of practice for STEAM researchers

DIPPING ONE'S TOES IN THE WATER: OBSERVING AND INTERACTING

- Shadow the Scientists (StS)



TAKING A DEEP DIVE: IMMERSING IN STEAM RESEARCH

- Science Internship Program (SIP)



LEARNING THE SWIM STROKES: DEVELOPING KEY TECHNICAL SKILLS

- Python and Research (PyaR)
- R and Research in Computational Biology (ReComBio)



AFTER THE PLUNGE: TRANSLATION, LONG-TERM BROAD IMPACT, AND PAYING IT FORWARD

- Teachers in SIP (TSIP)
- Community College Students in SIP (CSIP)
- Alumni Buddies
- Peer-to-Peer College and Career Network (P'C'N)
- Global SPHERE Network

CrEST's hallmark programs are Shadow the Scientists and the Science Internship Program, both of which increase research access for BIPOC (Black, Indigenous, people of color) students, individuals in regions with the least access to hands-on research, and students who are first in their family to go to college.

SHADOW THE SCIENTISTS (StS)

During the pandemic, astronomers began using "pajama mode" observing—operating telescopes remotely from their living rooms. Shadow the Scientists invites students and their teachers to eavesdrop via Zoom as astronomers around the globe operate the world-renowned Keck, Subaru, Gemini North, and Lick telescopes. Shadow the Scientists connects communities with today's scientists and the scientific process by immersing participants in a 100 percent authentic, uncurated scientific research experience. StS is already introducing more than 1,500 students each year to the exciting world of research and inspiring a future path in STEAM.

SCIENCE INTERNSHIP PROGRAM (SIP)

SIP immerses high school students, working in small groups under the close mentorship of university researchers, in open-ended STEAM research projects for 10 weeks during the summer months. Participants develop an academic peer community, mentor relationships, an academic identity, and a sense of belonging in their field of study while engaging in real-world application of critical-thinking skills. While SIP is a fee-based program, need-based full and partial scholarships help make the program accessible to students from all backgrounds. The program started in 2009 with three high school students from one high school working with one mentor. The program has since expanded to 410 interns from 220 high schools working with 126 mentors across 122 unique projects in 2023. The 2023 summer program includes participants from 29 countries and 22 U.S. states.



CrEST has established strong partnerships with large networks of Indigenous and other marginalized student and educator groups in Hawai'i, the continental United States, Mexico, Australia, and several countries in Africa, Asia, Eastern Europe/Middle East, and Latin America.

GLOBAL SPHERE NETWORK

Co-founded by Raja GuhaThakurta, faculty director of CrEST, the Global SPHERE Network is a community of practice for STEAM researchers who provide research opportunities for high school students. The network was founded in November 2017 by six well-established high school STEM research programs: SIP at UCSC; the Global STEM Alliance at the Junior Academy at the New York Academy of Sciences; Bay Area Teen Science at UC Berkeley; the Science Research Mentoring Program at the American Museum of Natural History, NY; RockEDU at Rockefeller University, NY; and the Harvard-MIT Science Research Mentoring Program. By accessing this powerful network of researchers, CrEST unleashes the potential of students from all backgrounds across the globe, empowering them to redefine the boundaries of what is possible in their pursuit of knowledge and change.

A vision for the future

CrEST seeks to expand its global and domestic reach to underserved communities by providing access to evidence-based research opportunities for students from all backgrounds. The program also aims to engage a large fraction—ambitiously, 50 percent—of academics and professionals from all spheres of life with young people across the globe and connect them with their work in an authentic way. It's an audacious goal. We invite you to be a part of it.

You can create equity in STEAM for all students

Access to research experiences and quality mentorship are key to a student's success in STEAM. Yet, for many highly motivated students around the globe, these opportunities may be out of view or reach. CrEST has established strong connections with schools and organizations at local, state, national, and international levels. These partners have identified thousands of students whose trajectories could be changed by CrEST. Your gift to CrEST will help unlock the potential of the world's youth and act as a catalyst for solving some of the world's most complex issues.

For the majority of CrEST alumni, our programs top the list of factors that made a difference in their scientific careers. Please consider the difference your gift will make.

Donor support is essential to advance the goals of CrEST in areas such as:

- Providing need-based scholarships and support for SIP interns, thereby expanding access to critical-thinking and evidence-based research opportunities for underserved students.
- Expanding mentor development and support by providing professional training and mentor stipends.
- Building a robust support framework for SIP interns, by funding expenses associated with in-person work.
- Increasing CrEST's global and domestic reach and broadening the research areas being shadowed with outreach funding.

"SIP was what confirmed that my career path was one that I was going to pursue, and it also allowed me to get a head start on that career path. Not only do I have experience with real scientific research in the area that I'm interested in, I am also continuing to work with my mentor on our research as I transition into college, which opens up many opportunities for me later on in life. Thanks to SIP, I have more confidence in what I want to do with my life, and I've gained a lot of insight into what it's like to be a real scientist!"

—Kayla Bartel (former SIP intern and current mentor; UCSC Crown College '24, astrophysics major)

"Thank you for your diligent and elaborate efforts to make SIP possible for students all around the world! SIP taught me how to be a researcher and behave professionally in an academic environment, as well as surrounding me with a world I have never seen before."

—Gul Karen Aca (SIP 2021 alumna from Diyarbakir Bahcesehir College Science and Technology High School in Diyarbakir, Turkey)