

# Engaging Refugee Youth in STEM Research and Education

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Researchers have developed a 3-year STEM project in which refugee students will learn physics and computer programming principles while building devices that detect cosmic rays in Earth's atmosphere.

Researchers from the Emma Eccles Jones College of Education and Human Services are collaborating with the University of Utah to study how refugee students, particularly those who speak minoritized languages or dialects, are socialized into or out of STEM disciplines.

Refugee youth are particularly vulnerable to exclusion from STEM fields due to limited exposure to STEM education, interruptions to schooling following displacement, and their status as linguistic, cultural, ethnic, socioeconomic, or racial minorities. Refugee students may also experience conflict between their family or community culture and identity and the personal characteristics expected for success in STEM settings.

An interdisciplinary research team led by Tino Nyawelo of the University of Utah is comprised of physicists, math and science education researchers, and digital storytelling designers, including Utah State University professors Sarah Braden, Sherry Marx, Aryn Dotterer and graduate assistant Bolaji Bamidele.

The team has developed a three-year project to better understand the challenges these students face and how to mitigate them. A group of nearly 30 teens will learn physics and computer programming principles by building detectors for cosmic rays, which are highly energetic particles that constantly collide with Earth's atmosphere.

Students will be taught using an instructional approach that builds from their home languages and cultures, and they will have opportunities to present what they have learned and reflect on their own STEM identity development over the course of the project.

[Sarah Braden](#), School of Teacher Education and Leadership professor at Utah State, is one of the principal researchers on the team. She has two goals: to understand the degree to which students from minoritized backgrounds are disenfranchised from STEM fields, and to explore more equitable learning environments through instructional design, teaching practice, and education policy.

"We have three years to explore these questions and try to make a positive impact in the lives of one set of teens," she said. "We hope that the students who participate in our program will leave with a deep appreciation for and interest in science, and a sense of self-efficacy in being capable of pursuing STEM degrees beyond high school if they choose to."

The project is backed by a \$1.1 million grant from the National Science Foundation and is part of an after-school program called Refugees Exploring the Foundations of Undergraduate Education In Science, which Nyawelo founded in 2009 to help middle and high school refugee students thrive in STEM subjects.

[Learn more about the project and the other researchers involved.](#)