

A Spotlight on STEM in Rural Areas

On a sunny Saturday in April, in a stall sandwiched between lemonade and cotton candy stands at the 29 Palms Farmers Market, chemistry graduate student Andrea Stegner shows 10-year-old Kira Collins how copper film can be stretched, broken, and repaired thanks to the metal's atomic structure.

Since November 2021, Stegner and other Caltech grad students and postdocs have driven to the market on the first Saturday of nearly every month to showcase the wonders of science to the community. Unusual specimens from Caltech's extensive geology collection, such as augen gneiss and a meteorite, are often big hits in this 28,000-person rural community in the California desert. "Because of the area, people just love rocks," says Elle Chimiak (MS '19, PhD '21), a visitor in geochemistry, as scents from the Mine Train Smokery barbecue stall waft by. Nearby, the local junior high school concert band plays "Twinkle Twinkle Little Star." At a previous market, one mom even asked Chimiak if the group could come to her child's birthday party.

"I had to sadly decline," she says. "But I thought that was great."

Chimiak, who came up with the STEM Stall idea, works in the lab of John Eiler, the Robert P. Sharp Professor of Geology and Geochemistry. She receives some funding from the American Geophysical Union's Voices for Science program to cover gas and food expenses. While the science experiments wow the young visitors, the group has loftier aims.

"We want to let people know if you want to be a scientist, there is not one route to this, and you do not have to be a perfect student to



From left to right: Arjuna Subramanian, Elle Chimiak, Mike O'Connell, and Steven Bulfer at the 29 Palms Farmers Market.

get there," Chimiak says. As kids stop by to draw flowers and write their names on small sheets of copper film, the Caltech students also hand out postcards to adults that are addressed to area state and federal representatives, encouraging guests to ask their politicians for more broadband internet access and greater investment in STEM education.

"In rural areas like this, the broadband is terrible. We'll be your science Google. If you have a question we can't answer, we'll return next month with an answer," Chimiak says, wearing a tag that reads, "Ask me, I'm a scientist!"

According to a 2019 report from The Rural School and Community Trust, more than 9.3 million American students, or nearly one in five, attend a rural school. A particular focus of Chimiak and company's attention is the Rural STEM Education Act, which was passed by the U.S. House of Representatives in May 2021 and is now under consideration in the Senate. The legislation would provide research grants to

fund teaching STEM in rural schools and fund broadband expansion.

Steven Bulfer, a grad student studying electrical engineering, has a personal connection to the group's mission having grown up on a farm in rural Minnesota.

"I didn't have a lot of science mentorship growing up, but I noticed when going to college that a lot of my colleagues had people who pushed them toward science," Bulfer says, noting he would like to help make kids aware of what science has to offer. "STEM was really quite a useful vector for me to do the things I'm doing today."

Sandy Smith, who has owned the Farmers Market with her husband Roger Thomas for four years, loves having members of the Caltech community come by.

"They're so patient, and they're good one-on-one with the kids and answering questions," Smith says. "Our kids need to know that these options are out there. We have a national park, but I don't think they realize, besides climbing on the rocks, what it all entails."

—Omar Shamout

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