



SPACE EXPLORATION ACADEMY FOUNDATION TURNS HIGH SCHOOL STUDENTS INTO SPACE EXPLORERS

February 20, 2025

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BY TRACY IDELL HAMILTON

SAN ANTONIO, TX – It's Saturday morning, and Lauren Gonzalez, Destiny Ramos and Evany Longoria, all students at South San Antonio High School, sit at the end of a tall table at the Boeing Center at Tech Port, puzzling over the miniature lunar rover they just built.



They're working to program it, so that the tiny craft will follow a track printed on a large piece of paper.

"They've chosen not to use a pre-built program," says Dr. Prassana Kolar, an applied physics research engineer at the Southwest Research Institute who is mentoring the girls. "They took the challenging route of coding it." At the moment, he's hanging back, watching them figure it out.

Dr. Kolar is a co-founder of the Space Exploration Academy Foundation, a new nonprofit in San Antonio

that aims to expose high school students to engineering and STEM concepts through hands-on activities related to space exploration.

The girls are part of the SEA Foundation's first class of students, from high schools across San Antonio, who signed up to spend five Saturday mornings in a row absorbing short lectures before getting to apply what they've just learned.

The girls let out a collective whoop when their rover finally rolls along the track as they programmed it to do. One of them then makes it spin around, eliciting more cries. They are all students of Domingo Ruiz, who oversees the cybersecurity program at South San.

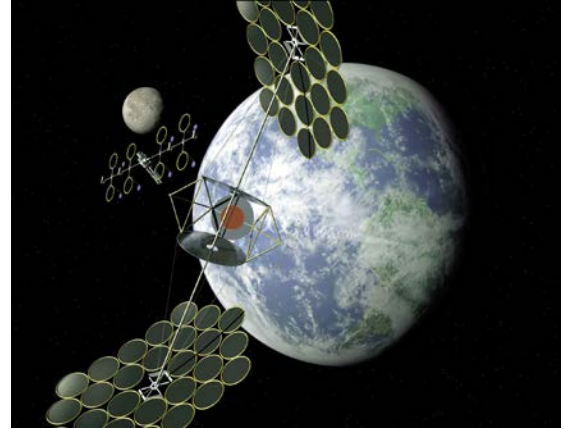
"Mr. Ruiz told us about it," said Destiny. "He told me it was about space and computers and I was like, I wanna do it because I'm so fascinated by space."

Dr. Kolar beams as the girls set their rover down on the ground and drive it over his shoe. It tips but remains upright as its six wheels stayed gripped to his shoe leather. "We're seeing some magic here!"

The SEA Foundation "has been a dream" of his and Dr. Kiran Bhaganagar, a mechanical engineering professor at the University of Texas at San Antonio (UTSA), "for a long time," he said. Other founders, who are also serving as student mentors, include top scientists from UTSA, NASA and Southwest Research Institute (SwRI).

Dr. Bhaganagar said she was seeing first-year students who hadn't been exposed to engineering concepts in high school and so wanted to find a way to introduce them while also piquing their interest in space.

Once upon a time, if a young person was interested in space, becoming an astronaut was one of the only paths, Dr. Bhaganagar said. Today, with NASA's plans to create human settlements on the moon by 2040, a whole universe of new careers will be necessary.



Students learned engineering concepts that can help humanity make important advancements in the space domain in the near future. Among them is the possibility of limitless power generation through large satellites placed in orbit to convert solar radiation into electricity that can be beamed wirelessly back to Earth. (Image credit: NASA)



Dr. Jim Johnson and Dr. Kiran Bhaganagar oversaw the Space Exploration Academy Foundation's first class of students.

"Everything we've done on Earth — building roads, energy infrastructure, habitations — will need to be done on the moon. So, we need all kinds of engineers, figuring out these challenges. This is the workforce of tomorrow," she said, indicating the more than two dozen students working on their miniature lunar rovers.

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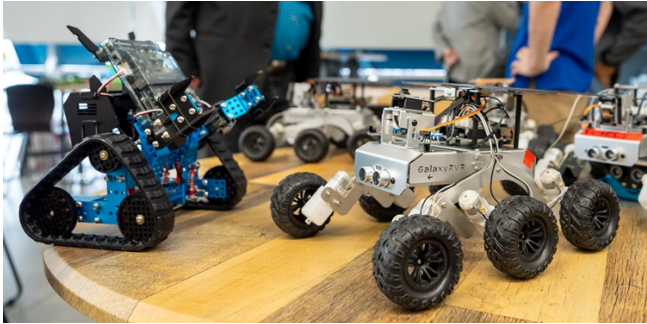
Late last year, the SEA Foundation received a \$47,000 grant from the Port-affiliated Kelly Heritage Foundation (KHF), which allowed the new program to cover overhead expenses for its first cohort and to buy equipment like the mini rover kits, a vacuum chamber and laptops for each participating student, which they keep at the end of the class.

"This is a program we really love at Kelly Heritage Foundation," said Port San Antonio President and CEO Jim Perschbach, who serves as KHF board chairman, and came out on a recent Saturday to watch the students in action.

"Port San Antonio was Kelly Air Force Base. As we go forward with advanced air mobility, space exploration and robotics, a lot of that is going to be done here in San Antonio. so, by encouraging that next generation of San Antonio students to reach for the stars, we are continuing the heritage of what people did here for 100 years to get us here."

The Kelly Heritage grant also enabled the SEA Foundation to waive tuition for qualified students and offer a stipend to three UTSA engineering undergraduates to guide the students.

That includes Jada Brown, a San Antonio native studying mechanical engineering at the university. She's also an intern working at SwRI in the space science division, working on teams that build instrumentation that is sent into space.



Jada said she's been struck by how bright and inquisitive the high school students have been. "They're really fast learners, and they're very straightforward. So we're also getting a lot of good feedback."

For their final Saturday class in early February, the students received the free laptops, and learned how to download NASA datasets and use the code developed by SEA Foundation that will let them track the

environment of Mars from the data collected by the rover on Mars. This data includes details such as temperature, wind speeds and dust storms on Mars.

Diego Sanchez, a senior at South San High School, said he'd always been interested in space, so when he learned about the program he jumped at the chance to learn more. "I thought learning about it would be cool, and if I go into engineering in college, I hope this helps," he said.

The SEA Foundation team is already planning an upcoming cohort this spring, where the class will offer a deep dive into the vacuum sciences — the study of spaces without matter or air. Dr. Bhaganagar said the students who attended the introduction to space exploration course are welcome to attend this class and another one to follow over summer break, which will study conditions on Mars and design techniques for building there.

Those classes are appropriate and open to new students as well as those who have been part of the just-completed first cohort. Students earn a certificate at the end of each program, and if they take all four — introduction to space robotics is the forth, which will be scheduled later in 2025 — they will have enough foundational knowledge to seek an internship, she said.

While the ultimate goal, said Dr. Bhaganagar, is to keep adding modules to the program, even if a student takes one course, they will benefit.

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"At the end of five weeks, they are now a very curious explorer," Dr. Bhaganagar said. The foundation, meanwhile, is creating a community where the kids can follow up on opportunities.

That's the same goal as the Kelly Heritage Foundation, which, in less than two years, has distributed almost \$1 million to local STEM/STEAM enrichment programs that have touched more than 1,000 students.

"We want to help not only open those doors," said Perschbach, "but connect them to people who can help pull them through."



Click the QR code below to learn more about the Space Exploration Academy Foundation, including how to register for upcoming programs.



Photo credits: Dave Simms.