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Workforce Development

PISCES STARS Program Encourages Young Women in STEM

Above: Twelve Hawaii high school students from around the state spent a night on "Mars" at the HI-SEAS research habitat on Mauna Loa during the sixth-annual program in June.

PISCES wrapped up the sixth-annual Women's STARS Program in late June, graduating 12 Hawaii high school women from around the state.

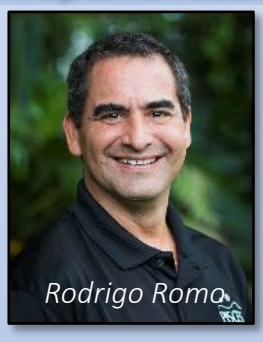
The students spent six days traveling across the Big Island visiting Hawaii's premiere research and development facilities and talking with female scientists, engineers and educators involved in STEM-related careers.

"I didn't know how many STEM opportunities were available on the island and I learned a lot more about what is out there for me and about different fields I can pursue," wrote one STARS student in her comments on the program this year. "This program has been an amazing experience and I really enjoyed traveling around the island to see all these incredible things and meet and hear from so many amazing people."

"I already was sure I was going into science, but the STARS Program boosted my confidence and excitement tremendously," another student commented. "It also gave me a more focused direction on where I want to be and how to get there."

Though previously focused heavily on astronomy and aerospace fields, the STARS Program has expanded to include a wider variety of subjects in STEM including conservation and marine biology and other natural sciences practiced in Hawaii. Since its inception, the STARS program has aimed to provide encouragement and inspiration to young women who are interested in STEM, but may lack the support, encouragement and mentorship to pursue their aspirations. *(Cont. on next page...)*

Message from the Program Director



Aloha Kakou,

I'm pleased to announce that we completed another successful Women's STARS Program last month. With the financial support of Caterpillar and the Hawaii Community Foundation's Career Connected Learning Program, as well as fiscal sponsorship support by Hawaii Science & Technology Museum (HSTM) who helped us manage the funding, we held our best program yet. We had a group of 12 wonderful young women from Oahu, North Hawaii, East Hawaii and West Hawaii, and support from three fantastic chaperones and one dynamic, young volunteer.

The STARS Program has now become a much-anticipated event by everyone at PISCES and we intend to continue to inspire and motivate young women to follow STEM-related careers through this space and science summer camp.

(Cont. on page 4...)

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PISCES STARS Program Encourages Young Women (cont…)

Above: 1) STARS students and staff huddle outside during a starry night at the HI-SEAS habitat on Mauna Loa. 2) A student programs the smart robot she built using Arduino software. 3) A student plants an endemic shrub in the Pu'u Wa'a Wa'a forest reserve during a service project where the students learned about native Hawaiian plant species and the efforts to preserve them. Students also learned about the cultural significance of Hawaii's forest land and the Hawaiian place names of the area. 4) At Legacy Reef Foundation located at NELHA's Hawaii Ocean Science & Technology Park in Kailua-Kona, students learned about coral reef conservation efforts. 5) Astronomer Miriam Fuchs led students on a dynamic tour of the Smithsonian Submillimeter Array observatory at the summit of Maunakea. 6) Students pose together on the catwalk outside the CFH Telescope on Maunakea.

The program is also designed to expose participants to the many opportunities, resources and individuals working on Hawaii Island, and give them insight into what is possible for their future in STEM-related fields.

So far, the program appears to be achieving its goals. Student feedback from the latest program shows 100% of participants are more likely to pursue a career in STEM after attending STARS. That number is up 10% from 2018 when student survey showed 90% of participants said the program influenced their future education and career plans.

In addition to a wide variety of in-depth talks and tours, this year's students got hands-on experience building smart robots and planting native plant species at the Pu'u Wa'a Wa'a forest reserve in West Hawaii. The students also formed groups to tackle different aspects of a human spaceflight mission to Mars as part of a week-long project to help them apply what they were learning.

In addition to new subject matter, the 2019 program was lengthened by an additional day. The expansion was made possible thanks to the generous support of many sponsors and partners involved in bringing STARS to fruition. This year the program was generously supported through funding from heavy equipment manufacturer Caterpillar, Inc. (which donated $10,000), and Hawaii Community Foundation's Career Connected Learning Program (which awarded a $5,000 grant to the program).

"It is incredibly important that we inspire students and help them develop an interest in science and technology at a young age," said Caterpillar Engineering Manager Anthony McNealy. "These young women are the innovators of the future."

Workforce Development

PISCES Welcomes Summer Interns for Work in Robotics, Materials Science

Above (Left to Right): PISCES' summer interns - Joshua Tokunaga and Janine Parico during their first day on the job at PISCES. Joel Paye and Alec Goodson stand on either side of the Helelani planetary rover they are working on this summer.

PISCES is welcoming four new interns this summer to work on several projects involving robotics technology, computer programming, engineering, materials science and geology. Through mid-August, these Hawaii-based students will work with the PISCES team to advance the agency's Helelani rover systems, unmanned aerial vehicle and basalt sintering research.

From Kapahulu, Oahu, Joshua Tokunaga comes to PISCES through the Akamai internship program with the desire to work alongside people doing scientific research for a living and gain experience for a future STEM career. He is going into his fourth year at Arizona State University studying astrobiology and bio-geosciences. This summer, Joshua is working with PISCES' Materials Science team to assess the structure and durability of sintered basalt tiles. He aspires to be a scientist researching terrestrial analog sites on Earth to advance knowledge in the field of astrobiology.

Alec Goodson is a Hawaii Island transplant from Eugene, Oregon who graduated from Kealakehe High School. Now in his fourth year studying computer science at University of Hawaii at Hilo, Alec participated in the PISCES MoonRIDERS program in high school. This summer he is working on the Helelani rover to improve its command systems and create an autopilot system. Alec said he wants to improve his programming skills with robots and hopes to one day work in AI development.

Joining Alec for the robotics development with Helelani is Joel Paye, a Hawaii Island native entering his fourth year at University of Hawaii at Hilo. Joel is a computer science major and has been an active volunteer with the PISCES-RISE robotics club for Keaukaha youth since it began last year. This summer he will work on the Helelani rover to improve its movements and sensors and add game pad support. He said he intends to develop his programming skills and learn more about electrical engineering. Joel's dream job is to become a software engineer.

Jaynine Parico is a Kapiolani Community College student who is working with PISCES through the Akamai internship program. Originally from Saipan, she is studying mechanical engineering with an interest in aerospace technology and will be developing the mechanical systems of PISCES' unmanned aerial vehicle this summer. She hopes to develop her skills in mechanical and electrical engineering during the program and one day work as in engineer here in Hawaii.

PISCES employs local college students every summer to get hands-on, paid work experience in aerospace technology and related projects. Students who are either studying at a University in Hawaii or who return home from an out-of-state university during the summer months are eligible to apply. The agency also offers credit-based internships during the school semester to students studying electronics technology, engineering, programming, and other STEM fields.

Since 2014, PISCES has mentored 36 Hawaii-based college students. Many have gone on to work for organizations and companies like NASA, Apple and Google.

Mahalo to our STARS Program sponsors and partners!

- *Caterpillar, Inc.*
- *Hawaii Community Foundation*
- *Hawaii Science & Technology Museum*
- *NASA*
- *EA Observatory/James Clerk Maxwell Telescope*
- *ʻImiloa Astronomy Center*
- *USGS Hawaiian Volcano Observatory*
- *Canada-France-Hawaii Telescope*
- *State of Hawaii DLNR - Puʻu Waʻa Waʻa Forest Reserve*
- *Ke Kai Ola Marine Mammal Center*
- *Legacy Reef Foundation*
- *Natural Energy Laboratory of Hawaii Authority (NELHA)*
- *Hawaii Space Exploration and Analog Simulation (HI-SEAS)*
- *University of Hawaii at Hilo*

Message from the Director (cont…)

Last month, we worked to seek out new business and networking opportunities at two mainland aerospace conferences: the International Space Development Conference (ISDC) in Washington, D.C. and the Space Resources Roundtable (SRR) in Golden, Colorado.

ISDC offered an inside look at NASA's exciting new lunar landing program, Artemis, including the challenge of developmental research work needed to return to the Moon and establish a permanent human settlement there. NASA's plan to return to the Moon has created renewed interest in field testing at planetary analog sites. PISCES is already talking with two NASA centers who are interested in conducting field tests on Hawaii Island. One test will utilize PISCES's analog planetary rover platform, Helelani.

ISDC also gave us insight into where the small launch vehicle industry is headed in the coming years. During one of the many discussion panels, representatives from five small launch vehicle companies (including Rocket Lab, Vector, Virgin Orbit, Firefly and Relativity Space) highlighted their various vehicle capabilities and the direction they see the industry taking.

It is worth noting that some 140 aerospace companies are currently developing small launch vehicles. While not all of them are likely to succeed, this astonishing effort demonstrates the accelerated growth this industry is seeing. The challenge this industry faces is finding a suitable location for launch. Worldwide, there is a shortage of dedicated small vehicle launch facilities. If the proposed Pacific Spaceport Complex in East Hawaii is constructed, the commercial site will have a steady stream of customers.

During SRR, we presented our volcanic basalt research and how variations in its chemical composition affect its sinterability. Our findings drew praise from experts in the field and interest from various parties to collaborate on further research.

NASA's Director Jim Bridenstine gave an inspirational keynote speech at ISDC about NASA's new lunar mission that is worth revisiting. While the Apollo program allowed the U.S. to land a man on the Moon and shaped the space program, Bridenstine commented that he was the first NASA Administrator who could not recall where he was during the Apollo 11 landing on July 20, 1969 because he had not been born. Many of NASA's staff now share that commonality. NASA's new lunar program is named after the Greek goddess, Artemis—Apollo's twin sister. In addition to establishing a permanent human settlement on the Moon during the Artemis program, NASA also intends to send the first woman to the lunar surface. To paraphrase Bridenstine, "the Apollo generation were great people, but it is time for us, the Artemis generation, to make our mark."

A hui hou,

R. Romo

Rodrigo Romo