Making Space-Based Research More Affordable—With a Little Help From the Girl Scouts & SpaceKids

Using ants, plants, and even brine shrimp, a group of Girl Scouts will be among the first researchers to help test a new autonomous research platform on the International Space Station (ISS) that is helping to expand the affordability of microgravity research.

The Faraday Research Facility, developed by ISS U.S. National Laboratory Commercial Service Provider ProXopS, LLC., will launch on SpaceX's upcoming 23rd Commercial Resupply Services (CRS) mission. If validated, the platform—capable of housing up to 12 remotely operated "microlab" experiments—could provide a cost- and resource-effective way to transport, conduct, and return spaceflight investigations.

Among the first test experiments using the facility are a trio of projects designed by winners of the 2020 Making Space for Girls space exploration challenge, organized by SpaceKids Global and ProXopS in partnership with the Girl Scouts of Citrus Council. Through the competition, more than 680 Girl Scouts from around the world submitted ideas for spaceflight experiments, space-themed art, and space-related essays. The winning ideas for a spaceflight experiment have been developed into flight projects that are ready for launch to the ISS.

Running the Girl Scouts experiments in the Faraday Research Facility will allow ProXopS to test the platform's capabilities while helping inspire young women to pursue interests—and hopefully careers—in space-related fields, said ProXopS senior safety engineer Jeff Fitch.

"If we can cement kids at a young age into thinking they can be scientists, into thinking science is cool, we might get more engineers and scientists coming out of college. That's what we need right now," Fitch said.

One of the Girl Scouts experiments will examine how tomatoes, peppers, and lemongrass grow in microgravity. Another will assess the tunneling behavior of ants in space, in the hopes that ants could someday help aerate the soil for crops grown on other planets. The third will incubate and sustain a colony of brine shrimp, popularized as "sea monkeys," to see whether other crustaceans could be raised in space as a fresh protein source for future astronauts.

In the Faraday Research Facility, the specimens will be watered and fed remotely and autonomously, controlled by a team back on Earth with minimal crew interaction. Images taken with the platform's internal cameras will be transmitted daily so the scouts can monitor the progress of their experiments and compare the spaceflight samples with their control experiments on the ground. At the end of the mission, the Faraday Research Facility will safely return the samples to Earth for further analysis.

"The Making Space for Girls Program developed by SpaceKids Global and our Council is intent on inspiring the next generation of female leaders in the space industry," said Maryann Barry, Girl Scouts of Citrus CEO. "Our 2020 ISS Mission Challenge, which could not have been accomplished without the tremendous support of ProXops, offered participating girls a life-changing hands-on opportunity to become part of the space industry's scientific community."

If successfully validated, the Faraday Research Facility—with its flexibility, customizability, and economy of scale—could drastically reduce the cost of sending experiments into space, said ProXopS managing partner Chad Brinkley. This cost reduction could enable researchers and educators to conduct multiple spaceflight investigations, honing their research.

“Being repeatable and scalable is all tied to being able to get some maturity in your science,” Brinkley said. “We wanted the Faraday Research Facility to be a simple and affordable solution to enable repeatable spaceflight research and be capable of executing a long-term research strategy.”

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