STEM, *Part Two*

February 28, 2009

2009 is the year of "Apollo: the Next Generation, Return to the Moon" for the 19th annual Future Flight Hawaii summer program. The theme mirrors the goal of the U.S. as it competes with China and Japan to see which country will be the next to return an astronaut to the moon. Future Flight Hawaii inspires and equips the next generation of explorers by using the excitement of space to catalyze student interest in science, technology and the future. Initiated in 1991 under the Office of Space Industry in the Department of Business, Economic Development and Tourism, Future Flight has hosted more than 8,500 students and parents statewide. Training modules with a mission context help students feel like real scientists, with "laboratory voyages" taking them on journeys of exploration to the moon, Mars, and Earth. Staff educators design the programs with contributions from Hawaii Space Grant Consortium scientists and NASA resources.

Future Flight Director Art Kimura oversees a wide range of space-themed science programs in Hawaii: the summer enrichment program; residential and non-residential science and technology camps; family science nights that reach 4,000 children, parents, and teachers annually; support to NASA Explorer schools; coordination of the Astronaut Ellison Onizuka Science Day and the Astronaut Lacy Veach Day of Discovery; coordination of the Hawaii Botball robotics regional tournament; and support to schools and teachers in STEM.

Other summer camps. *Hawaii Island Robotics Academy (HIRA)*, for grades 3-8, challenges students to design, build, program, and perfect a robot to perform certain tasks, then compete. *Camp Eureka*, for grades 3-6, focuses on design, programming, and building a robot, ending in a SumoBot competition. *Camp Imiloa*'s space-themed summer camp sessions for elementary school students and their families explore science and technology over five days. Students in last year's "Return to the Moon: Failure Is Not An Option!" camp enjoyed a lunar curriculum tied in with NASA's mission to send orbiters and an impactor to the moon to look for the presence of water under the lunar surface to prepare for possible lunar habitation.

Starbase Atlantis

Since 2002, more than 10,000 fifth graders have attended the Pearl Harbor-based Department of Defense program, which graduated its 200th class in October 2008. The five day program stimulates uses instruction and teamwork-based experiments, as well as real flight simulation time to teach about aerospace. Experiments include protecting eggs in from cracking in a "crash," designing paper airplanes for drag or speed, and others. The youngsters are introduced to astronomy, physics, and aerospace science, and at their graduation ceremony, they blast off actual rockets they've built. Joseph Barrett, Program Director, said that the Ford Island program has been so successful that Hawaii's Air National Guard plans to open a location at their armory in Hilo for Big Island students.

NASA Explorer Schools

Each year, NASA establishes a three-year partnership between itself and 50 new explorer schools. Its education specialists work with teachers and administrators to spark innovative science and

mathematics instruction for grades 4-9. NASA Explorer School teams get new teaching resources and technology tools with NASA's unique content, experts, and other resources, to give students exciting learning experiences. Pearl City Elementary this year will be completing the partnership it began in the 2006-2007 school year.

Events

The University of Hawaii hosts several events to spark student interest in science. The College of Engineering's annual Engineering Expos challenge middle and high school students to build any number of items using engineering principles. Among last year's tasks: solar powered cars, "mouse-trap" CD racecars, football catapults, oaktag/chopstick rollercoasters, and more.

Each April the *UH-Manoa's Institute for Astronomy* holds an open house where families can enjoy astronomy lectures, "astronomy school," infrared demonstrations, observatory linkups, telescope manufacturing tours, fun-with-physics activities, and others. *UH-Manoa's School of Ocean and Earth Science and Technology* hosts a two-day Open House in October of every odd-numbered year. The action-packed event includes understanding seismic activity demonstrations, weather station observations, geology and watershed labs, space displays, and so much more. Seeing it all takes the entire two days, so plan on a fun family outing.

The ***Hawaii Ocean Science Bowl***, called the "Aloha Bowl," was developed to stimulate interest in ocean sciences among high school students, demonstrate the importance of the oceans in daily life, and foster the next generation of marine scientists, teachers, and policy makers. Last year's second place team, Kealakehe High School represented Hawaii well at the National Ocean Science Bowl in Seward, Alaska where they captured the Spirit Award. Staying warm during the "white-out" and avalanche that stopped their train (they boarded a bus) added excitement to the trip. (First place team Punahou, wasn't able to travel there.) This year's winning team will compete in Washington D.C. in April.

The Maui Economic Development Board's Women in Technology Project teams up with local organizations for its annual "Introduce a Girl to Engineering Day." Now in its ninth year, middle school girls shadow local engineers to learn how they contribute to the community. Only 20% of engineering undergraduates are women. Nationwide, women comprise only 10% of the engineering workforce, and only 5% in Hawaii.

The Lacy Veach and Ellison Onizuka Science Days honor the memories of these late astronauts. The day-long programs feature hands-on activities and lectures and displays.

These are just some of the creative ways that STEM education has taken off in Hawaii, stimulating young minds and encouraging them to enter careers in these high-skilled, satisfying and challenging jobs. The Senate's Economic Development and Technology Committee, of which I was past vice-chair, wholeheartedly supported these programs. I'm proud to have played a role in it, and look forward to the next generation of upcoming scientists.