

PISCES NEWSLETTER

PACIFIC INTERNATIONAL SPACE CENTER FOR EXPLORATION SYSTEMS * HILO, HAWAII

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Pacific International
Space Center for
Exploration Systems



Former PISCES Worker Makes Forbes “30 Under 30” List



Above: Sophie Milam posing “on Mars” near the HI-SEAS Habitat on Mauna Loa volcano in Hawaii. Credit: Forbes

Former PISCES worker Sophie Milam made the 2015 Forbes “30 Under 30” in the science category for her cutting edge research in robotics and role in the Mars simulation mission currently happening in Hawaii.

At 26 years old, Milam is designing control systems for ‘tensegrity’ robots – spherical bots held together by tension – working with the Intelligent Robotics Group at NASA Ames Research Center in California.

Milam worked with PISCES in 2008 and 2010 during field tests evaluating ISRU (in-situ resource utilization) technology. She also led the APEC (Asia-Pacific Economic Cooperation) international rover demonstration for PISCES with the NASA Ames Exploration Rovers in 2011.

Milam is now in her third month serving as the Chief Engineer at the HI-SEAS (Hawaii Space Exploration and Analogue Simulation) habitat in Hawaii, an eight month mock Mars mission that began in October, 2014.

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MESSAGE FROM THE EXECUTIVE DIRECTOR

A NEW YEAR BRINGS NEW BEGINNINGS

Dear PISCES Friends and Family,

PISCES is entering the year 2015 with great excitement. There were significant achievements and advancements within PISCES during 2014. And now we look toward 2015 with even more expectation.

PISCES has already been laying important ground work for some fantastic new projects for 2015 and these will be formally announced soon...stay tuned!

This month, we will be preparing our legislative bills for submission to the State for FY16 funding. PISCES is encouraged by the growth of aerospace within the State of Hawaii as well as within the agency. We look forward to working closely with Governor Ige and the legislature to continue to position PISCES and other important aerospace initiatives to contribute to economic growth within Hawaii. Aerospace continues to be seen as an important emerging economic development sector in balancing with our number one local industry: tourism.

We also celebrate this January an important anniversary in spaceflight - the 30th anniversary of the launch of NASA Space Shuttle Challenger on STS-51-C, launched from Kennedy Space Center (KSC) on January 24, 1985. The launch carried Hawaii’s first astronaut, Ellison Onizuka. During the mission, Onizuka was responsible for the activities of the primary payloads, which included the deployment of the Inertial Upper Stage (IUS) rocket booster from the Shuttle’s cargo bay.

This critical mission is special in history because it was the *first* shuttle flight dedicated to the Department of Defense (DoD), and most information about it remains classified. For the first time, NASA did not provide pre-launch commentary to the public until nine minutes before liftoff. The Air Force only stated that the shuttle successfully launched its payload with an Inertial Upper Stage on the mission’s seventh orbit.

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*Rob Kelso, PISCES Executive
Director*

PISCES AND NASA SIGN NON-REIMBURSABLE SPACE ACT AGREEMENT

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PISCES Tech and UH Hilo Teammates Win Microsoft Challenge



PISCES Robotic Tech Casey Pearring and a fellow team of University of Hawaii at Hilo (UHH) computer science students claimed victory in the 2015 Pitch Video Challenge in the Microsoft Imagine Cup – a global student technology competition for tech innovation, gaming, coding, and world citizenship.

The group, called Team Hoku, won \$3,000 in prize money for their submission of a three-minute video pitching an original game they created called “reForge”. Judges selected their entry as the best among competitors from all over the world.

Team Hoku members include UHH students Pearring, Brian Hall, Lucas DeRego and Theodore DeRego. The group pursued the contest as part of a senior software engineering project at UHH.

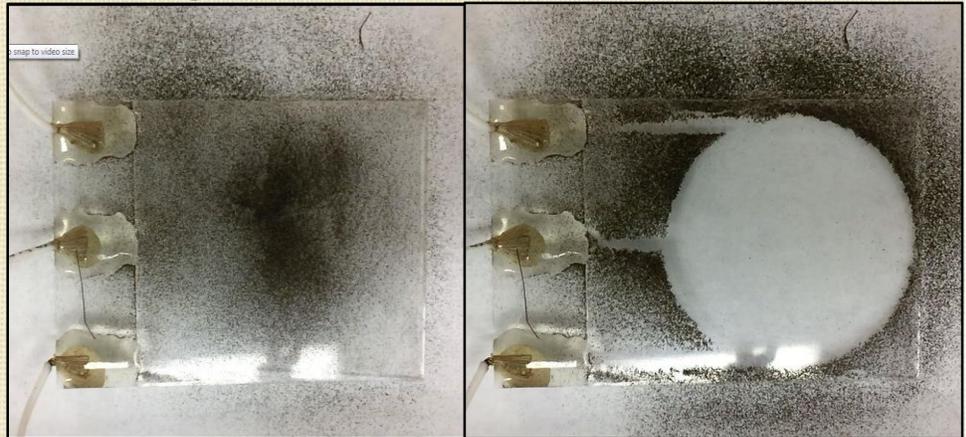
ReForge is described as a “casual 2D online sci-fi sandbox game where players command highly customizable ships in tactical battles.”

Imagine Cup judges called the game “a clever synthesis of the sci-fi Roguelike hit FTL with the base construction and customization of Minecraft.”

The Pitch Video Challenge was a preliminary contest in the greater Imagine Cup Games competition, and Team Hoku will pursue more challenges to follow. The grand prize winner of the Imagine Cup will walk away with \$50,000, awarded to the team with the “best new student game”.

Congratulations Casey and Team Hoku!! Outstanding Work!!

Hawaii High School Students to Shoot for the Moon



Above: A dusty surface shown before (left) and after (right) an electric current is applied using the electrodynamic dust shield. Courtesy: NASA.

The Pacific International Space Center for Exploration Systems (PISCES) has signed a non-reimbursable Space Act Agreement with NASA’s Kennedy Space Center (KSC), formally establishing a partnership to jointly work on a Hawaii high school STEM (science, technology, engineering, and mathematics) project that will give students the opportunity to develop a space experiment and send it to the surface of the Moon.

The experiment involves electrodynamic dust shield (EDS) technology (pictured to the right, repelling dust). Under the Space Act Agreement, KSC will mentor the selected Hawaii students. This includes consulting with them on the physics of the EDS; the design, development, and construction of mounting and integration hardware; and testing and analysis of a flight experiment configuration.

In return, Hawaii high school students will provide their design and test data to KSC, which could benefit KSC research and design efforts in the area of dust mitigation.

PISCES will help the students construct a lunar lander mockup spacecraft, install and mount the EDS on it, and provide students the use of the Center’s planetary analogue site on the Big Island of Hawaii so they can test their experiment before launching it to the Moon.

Dust is a major problem on the moon because it interferes with and damages space equipment. KSC developed the EDS to remove the dust, but the technology has yet to be tested on the Moon. If this Hawaii high school experiment is successful, to our knowledge, it will be the first time in history that a student experiment has ever been conducted on the lunar surface.

The target date for the launch of this experiment is the end of 2016.



PISCES Executive Director Rob Kelso paid a visit to Hawaii Rep. Tulsi Gabbard’s office in Washington D.C. on January 5, 2015 to brief her staff on current PISCES projects in aerospace development, including robotics and basaltic regolith development. Shown at left is Kelso (right) with Gabbard’s Senior Legislative Assistant, Anthony Ching (left).

30TH ANNIVERSARY OF ELLISON S. ONIZUKA'S FIRST SPACEFLIGHT

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Letter from the Executive Director Cont...

I was honored to lead NASA's flight operations efforts for 3-1/2 years on this DoD spacecraft leading to launch, working closely with my good friend Ellison as we jointly prepared for the mission.

Ellison grew up on the Big Island of Hawaii and graduated from Konawaena High School in Kealahou in 1964. He had two older sisters, Shirley and Norma, and a younger brother, Claude. Claude runs the Ellison Onizuka Space Museum located at the Kona Airport. Ellison was selected for the astronaut program in January 1978. After perishing in the Space Shuttle Challenger accident on January 28, 1986, Ellison was buried at the National Memorial Cemetery of the Pacific in Honolulu, Hawaii. We miss him greatly!

Until next time,

Res Gesta Per Excellentiam
(Achievement Through Excellence)

-Rob Kelso, PISCES Executive Director

Sophie Milam, Forbes 30 Under 30 Cont...

Milam and five other crew members are living in a geodesic dome on the slopes of Mauna Loa volcano to simulate a space colony and study the emotional, cognitive, and social effects of long-term isolation on a group of people.

It is the third and longest simulation yet to be conducted at the Mars-like habitat – and second only in duration to the Russian MARS-500 experiments conducted between 2007 and 2011.

The University of Hawaii at Hilo graduate has a strong interest in space exploration and education, and hopes to work in STEM (Science, Technology, Engineering, Math) outreach for youngsters.

"I believe that mankind's future is space travel and that it is the responsibility of all to encourage the next generations of explorers to further our collective knowledge and inspire adventure," Milam said.

From everyone at PISCES, congratulations Sophie!!



Remembering Hawaii Astronaut's Mission Overseeing Secret Cargo



Saturday, January 24, 2015 marks the 30th anniversary of Hawaii astronaut Ellison S. Onizuka's first space flight aboard the Space Shuttle Discovery mission, STS-51C. The Big Island native and Air Force Colonel served as a Mission Specialist for the first NASA shuttle mission to carry a top-secret Department of Defense (DoD) payload into orbit.

"Being his first mission, there was nothing else to compare it to. It was the ultimate thing for him to be able to go," shared Ellison's widow, Lorna Onizuka during a phone interview. "We were really excited for him."

Because the cargo aboard STS-51C was top secret, details of the mission were withheld and remain classified to this day. During the intensive training period leading up to launch, Ellison had to conceal much of his activities at work.

"In the family, it was kind of odd because he really couldn't tell us where he was going, or when he was leaving," said Lorna. "He would call in and help his kids with their homework over the phone, even though we didn't know where he was calling from."

Rob Kelso, Executive Director at The Pacific International Space Center for Exploration Systems in Hilo, Hawaii, served on NASA's payload team at mission control for STS-51C, and worked closely with Ellison for three years leading up to the mission. Kelso was responsible for preparing the classified payload for flight at mission control, and Ellison shared parallel duties aboard the shuttle after liftoff.

"He was a joy and so easy to work with. He was very friendly and funny, and he really worked hard toward building an ohana between the flight control team and the flight crew which I think ties into his Hawaii heritage," said Kelso.

Slated for departure on January 23, 1985, STS-51C kept the crew and families in suspense one more day when extreme winter temperatures postponed the launch. But on the following day, Ellison's dream of spaceflight became a reality as he and his crewmates made a successful launch from NASA's Kennedy Space Center.

Ellison was accompanied by Commander Thomas K. Mattingly, II, Pilot Loren J. Shriver, Mission Specialist James F. Buchli, and Payload Specialist Gary E. Payton. The team became very close throughout their time working together.

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"They trained so long I think they all thought they were related," Lorna laughed. "They shared a common bond and common respect for the work that needed to be done and they shared a friendship. They had each other's backs."

Because of the mission's secrecy, NASA did not broadcast the usual pre-launch flight commentary until nine minutes before lift-off – a first in NASA history. The Air Force issued a brief statement indicating that the shuttle had successfully launched its payload with an Inertial Upper Stage rocket during its seventh orbit. The only comment by crew members on the top secret endeavor was recently uttered by Payload Specialist Payton, the first military astronaut in space: "It's still up there, and still operating."

Having successfully completed their mission, the crew and shuttle returned to Cape Canaveral, Florida, on January 27 following three days in space and 48 trips around the Earth.

Lorna commented on Ellison's disposition after returning from space: "His first night back home he was really quiet, and he was kind of in awe of what he had done and where he had gone... I think he was just basically awestruck by the entire experience. I thought that was fabulous that something like that could impact regular people in such a way."

Ellison was born in Kealahou, Kona, on Hawaii Island on June 24, 1946. He graduated from Konawaena High School and earned both a bachelor's and M.S. degree in Aeronautical Engineering at the University of Colorado at Boulder in 1969. The Big Island native joined the U.S. Air Force in January, 1970 and excelled as a test pilot and flight instructor. In 1978, NASA recruited him as an astronaut candidate where he worked in various roles supporting spaceflight missions.

Referring to the anniversary of Ellison's first flight, Lorna said: "It's a day that I always look forward to, a day to send Mahalo to the people of Hawaii who supported him and believed in him all along and made it possible for him to fly on STS-51C. I know that he would want to extend his Mahalo to everyone. Hawaii played a big part in who he became and why he became who he was."

Ellison Onizuka's legacy in Hawaii is unmistakable and continues to inspire local youth through educational programs, events, and the memory of his incredible journey into the heavens.



Above: The crew of STS-51C: (L-R) Cmdr. Thomas K. Mattingly II, Pilot Loren J. Shriver, Mission Specialist Ellison S. Onizuka, James F. Buchli and Payload Specialist Gary E. Payton. Credit: NASA.

WE ARE LIVE!!!

Check Out PISCES on the Web!



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ABOUT US

PISCES is a Hawaii State Government Aerospace Agency located in beautiful Hilo, Hawaii. The research and education/training center is part of the State Department of Business, Economic Development, and Tourism (DBEDT), and conducts environmentally safe field demonstrations to test and validate innovative space technologies on Hawaii's volcanic terrain under the jurisdiction of the Hawaii State Department of Land and Natural Resources (DLNR).

Probe to Relay First Up-Close Data and Imagery of Pluto

Scientists are anticipating the rendezvous of NASA's New Horizons satellite with Pluto to return the first up-close imagery and scientific data ever relayed from the distant dwarf planet.

The probe, which has travelled over nine years to reach Pluto, and broke the record for fastest flying satellite at launch to do so, is expected to make contact on July 14, 2015. But New Horizons will be going much too fast (roughly 13km/s) to catch orbit around Pluto's small body of gravity, and will have to capture its data in a blazing flyby with its seven on-board instruments.

NASA's groundbreaking probe will also set the stage for deep-space observation over the next decade, as colossal telescopes in the works become operational and set their sights on the outer lying Kuiper Belt – a region beyond Pluto that is home to some 70,000 icy objects orbiting the Solar System. The probe is also serving as a scout for these anticipated astronomical endeavors.



Artist rendering of the New Horizons probe at Pluto. Credit: JHUAPL/SwRI.