PISCES NEWSLETTER

Pacific International Space Center for Exploration Systems * Hilo, Hawai`i

DECEMBER, 2013 VOL 1 ISSUE 5

Marc Seibert, PISCES Visiting NASA Engineer

Marc Seibert is a Senior Research Engineer at NASA Kennedy Space Center's Communications division.

As PISCES's Visiting NASA Engineer, Seibert has been working these last couple of months on building a communications system at the Center's test site on the Big Island – the same type of system that rovers would use on a planetary mission in outer space.

Thanks to Seibert, PISCES can now provide a simulated environment that's even closer to the real-life communications network needed to "talk to" and control a robotic spacecraft from Earth, factoring in, for example, the time delay between our home and other planets.

Seibert's expertise is on advancing technologies associated with space tracking, timing, networking and communications (TTNC) and exploration TTNC subsystems.

He has a Master's degree in Space Communications and Emulation from Case Western University.

MESSAGE FROM THE EXECUTIVE DIRECTOR

Shooting for the Moon

Dear PISCES friends and ohana,

This fall and early winter, a number of significant milestones are taking place relative to the MOON! On September 6th, NASA launched its Lunar Atmosphere and Dust Environment Explorer, or LADEE, (pronounced "laddie") which has now finished its journey looping around the moon and has gathered important information about the moon's dust and thin atmosphere.

Already, this spacecraft has tested a new system for interplanetary communication using pulsed lasers, delivering a blistering 622 megabits per second. Try getting that from your Internet service provider!

LADEE is a worthy mission, but it's a far cry from the romance and ambition of space exploration 50 years ago. When Frank Sinatra released a swing version of "Fly Me to the Moon" in 1964, the song captured the optimism of the U.S. space program.

The moon landings were a phenomenal achievement. Even knowing that they were motivated by a rivalry with the Soviets and fueled by an unsustainable budget didn't tarnish their luster. The Saturn V was the largest and most powerful rocket ever built, and the Apollo program was the most technically complex human undertaking in history. *(cont. on page 3)*

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PISCES HOSTS GLXP TEAM FROM HUNGARY

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Photo credit: Team Puli/OWF Katja Zanella-Kux

Puli at the beach

Visiting Kealakehe High School

Puli Meets Pele

Approaching the 600 Meter Finish Line

GLXP TEAM PULI TESTS ROVER WITH SUCCESS

Mission accomplished for Team Puli, an official Google Lunar XPRIZE (GLXP) contestant who flew in all the way from Hungary to Hawaii to test their rover at PISCES's planetary analogue site.

During the 10-day field test, the Puli rover drove 600 meters – that's 100 meters *farther* than the distance required under the rules of the GLXP contest. Team Puli's rover also successfully broadcast HD images and video from its starting and end point – also a requirement of this international, multi-million dollar race to the Moon.

"This is not the first time that Puli has been tested in analog sites," said Dr. Tibor Pacher, Team Leader and CEO/Founder. "We took part in a Morocco field campaign earlier in the year, but the PISCES facility offers the most challenging and realistic scenario that our rover has faced to date. We are delighted with how the Puli rover has performed."

Dr. Pacher, as well as team member Miklos Pathy, arrived in Hilo on December 4 and stayed through December 17.

Both were eager to share their journey with the local community as their visit was filled with public outreach events at the `Imiloa Astronomy Center, Canada France Hawaii Telescope headquarters in Waimea, Kealakehe High School, Natural Energy Lab of Hawaii Authority (NELHA), and the Galaxy Garden with Jon Lomberg.

ABOUT THE GOOGLE LUNAR XPRIZE

This fierce competition is organized by the XPRIZE Foundation and is sponsored by Google. It is designed to help the new space economy grow by challenging private companies to develop low-cost methods of robotic space exploration and be the first to make a lunar landing.

Whoever successfully drives a robotic spacecraft on the Moon for at least 500 meters while transmitting high-definition images and video back to Earth wins a piece of the $40 million purse, with $20 million going to the team that snatches first place.

This challenge must be completed by the end of 2015.

Good luck to Team Puli and the rest of the GLXP teams!

SHOOTING FOR THE MOON

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Imaae Credit: GLXP

MESSAGE FROM THE EXECUTIVE DIRECTOR CONT.

Two dozen brave and daring astronauts reached their target with computer processors less powerful than those inside our modern-day smartphones.

Today, the Apollo moon shots fade and flicker in the public consciousness, like the grainy black-and-white TV images that many of us recall from just over 44 years ago.

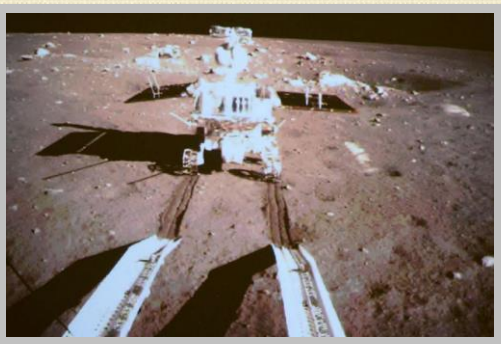
New players are stepping into the vacuum. Google announced the Lunar XPRIZE (GLXP) in 2007 - a $20 million prize will go to the first team to land a robot on the moon that can travel 500 meters and transmit images and video. Eighteen teams are still in the running. The competition expires when all the prizes have been claimed or at the end of 2015, whichever comes first.

China beat all these teams to the punch. Several weeks ago, the Chinese announced that the Chang'e 3 lunar rover will be launched by the end of the year. They succeeded, making it the first soft landing on the moon since the Russian Luna 24 in 1976.

But “commercial/private-sector space” has become the new watchword. Space is no longer dominated by large nations. We are now seeing the emergence of new companies interested in the resources on the moon and asteroids. New industries are looking to harvest resources such as water and metals.

Hawaii uniquely offers world-class, geologic test sites that closely simulate the surface of the moon and Mars. PISCES is actively engaging both the GLXP tests and mining startup companies like Planetary Resources, Deep Space Industries, and Moon Express for testing rover systems, sampling, extraction, and imaging systems. One GLXP, Team Puli from Hungary, arrived this month to test their lunar rover on the Big Island.

After almost 40 years of no robotic operations on the moon, the lunar surface is about to be re-explored! These next couple of years are going to be incredible for robotic lunar surface exploration. And PISCES will be doing its part in helping to enable that wonderful journey.



China’s lunar rover named Yutu (“jade rabbit”) rolling off the ramp of the Chang’e 3 lander, which made history on December 14 after it touched down on the moon.

Photo credit: CNTV

MOU SPOTLIGHT

Memoranda of Understanding signal growing global interest in Hawaii's aerospace industry

In our inaugural newsletter, PISCES announced that it had signed six MOU's. Since then, that number has increased to eleven, with more on the way. We will feature one MOU per newsletter here.

WHO: *ISTVS, International Society for Terrain-Vehicle Systems*
WHAT: *Terrain-Vehicle Systems and Machinery including Planetary Rovers and Mobile Robotics*
WHERE: *Hanover, New Hampshire*
DATE of MOU: *March 12, 2013*
GOAL: *To conduct joint research in planetary surface mobility and excavation systems*
PROJECT(s) WITH PISCES: *Robotic Vehicles*

PISCES IN THE NEWS

On Dec. 10th, PISCES and Team Puli were featured on the FRONT PAGE of the Honolulu Star-Advertiser!

MOU: a formal, written agreement that defines the roles and responsibilities of each party with respect to the program/project they are working on together.

WHY IMPORTANT: MOU's allow PISCES to form partnerships with both public and private sectors, thereby providing access to expertise and technical support from space agencies around the world. Such access is vital to the success of PISCES projects, and the expansion of Hawaii's economy and aerospace industry.

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).

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