PISCES NEWSLETTER

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

JANUARY, 2014 VOL 2 ISSUE 1

Mari-Ela David Chock,
PISCES Public Information Officer

Mari-Ela David Chock's expertise in the Communications field spans more than a decade, with a majority of her career spent as a journalist.

She's an award-winning newscaster who's worked as an anchor/prime-time reporter in California, Madison, Wisconsin, and most recently here in Hawaii.

It was during her time at KHNL/Hawaii News Now that she first learned of PISCES.

Chock wrote a story about the agency in 2010, and has been fascinated with its program and vision ever since. So much so, that she pursued an opportunity with PISCES immediately after moving from Oahu to Hawaii Island.

Three years later, that opportunity finally opened up, and Chock is now over the moon about serving as PISCES's Public Information Officer.

Chock is a graduate of San Francisco State University, and has a Bachelor's degree in Journalism.

MESSAGE FROM THE EXECUTIVE DIRECTOR

Dear PISCES Friends and Family,

The beginning of a new year always affords opportunities and challenges for achievement. And we at PISCES look forward to 2014 with great anticipation! This is also the time of the year that PISCES is busy completing its legislative bills for introduction into the coming fiscal year.

As a state-funded program, the Hawaii legislature has directed PISCES to perform technology maturation for planetary surface systems (robotics, rovers, energy, construction, etc.) using the world-class, basaltic planetary analogue test sites uniquely found in the Hawaiian Islands.

The overall focus of PISCES in coming year is to continue to expand on research and development (R&D) in planetary surface systems technologies, and provide state-funded infrastructure for customers using the planetary test sites in Hawaii. The goal is to validate technologies for “living off the land” for the tangible benefit of both space utilization/exploration and the Hawaiian Islands.

A NEW TEMPLATE FOR SPACEFARING AND HAWAII: RESOURCE UTILIZATION CONSIDERATIONS

To become a truly space faring species, humanity must learn to how to use what we find in space to survive and thrive. However, we are now and always will be limited in space capability. *(cont. on page 3)*

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PISCES ACQUIRES MOON ROVER

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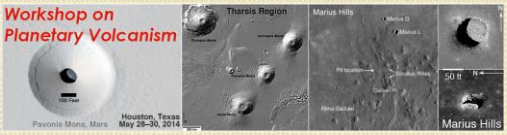
SAVE THE DATE!



PISCES Planetary Volcanism Workshop
May 28-30
Lunar Planetary Institute (LPI)
Universities Space Research Association Building
Houston, Texas
DEADLINE TO SUBMIT INDICATION OF INTEREST: JAN 28
Click HERE for more information

PISCES STAFF

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POLLY ROTH, Executive Administrator

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ROBOTIC ROVER ON ITS WAY TO HAWAII FROM CANADA

PISCES is just a few weeks away from having its very own robotic spacecraft! As of this writing, a rover is at Ontario Drive Gear (ODG), packed in a crate and ready to make its trek to the Big Island of Hawaii.

Thanks to our partnership with ODG, PISCES is able to use the rover via an extended loan agreement.

This 726 pound space vehicle is the first of its kind for the State of Hawaii, and PISCES will primarily be using it for in-situ resource utilization (ISRU) research.

ISRU involves developing technologies that can transform raw materials on other planets into resources needed for human survival in space. This Canadian rover, for example, can search the Moon for water and ice, which can not only be used to drink, but can also be broken down into hydrogen and oxygen – both of which are used to make rocket propellant.

On top of ISRU research, the rover will also play a central role in STEM education activities and tests.

ABOUT ONTARIO DRIVE GEAR

ODG is based in Ontario, Canada and manufactures amphibious vehicles for extreme conditions. The company has been invited by NASA and the Canadian Space Agency to develop lunar rovers for future missions to explore the moon and other planets.

Last year, PISCES signed a Memoranda of Understanding (MOU) with ODG.

Mahalo to ODG for making this rover available for our agency, as well as the State of Hawaii!

PISCES STRATEGY FOR NEW YEAR

MESSAGE FROM THE EXECUTIVE DIRECTOR CONT.

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Fun SPACE FACT

QUESTION: What color is the dark side of the moon?

ANSWER: TURQUOISE!

Image Credit: David Nunuk/Corbis

According to The Guardian, astronomers say two years of measurements taken from a telescope at the Mauna Loa Observatory show blue light reflected from Earth turns turquoise when it bounces off the Moon!

PISCES INITIATIVES

Six major strategic tracts have been established within PISCES that will be enabled through FY15 legislative funding:

1. Basaltic construction and fabrication

2. Integrated In-Situ Resource Utilization (ISRU): "PISCES Robotic Village"

3. PISCES Planetary Analogue Test Site (PPATS)

4. Implementation/operation of the NASA Laser Communication Ground Terminal

5. PISCES Lunar Surface Flight Experiment involving Hawaii High Schools

6. PISCES leading an international Robotics Mining Competition in Hawaii for Universities

This is the condition which both Hawaii and the International Space Station (ISS) find themselves. Both are dependent on resupply - of food, fuel, clothing, etc.

Yet, our ultimate goal in space and in Hawaii (per Gov. Abercrombie) is to become more self-sustaining and less dependent on resupply ties from the mainland.

Thus, there is growing interest and need in the State of Hawaii, space faring nations, and the private sector to develop new capabilities and technologies that allow greater self-sufficiency - to "go anywhere at any time and conduct any mission we can imagine."

That means developing and using the resources found off-planet (and in Hawaii). This has manifested into the mantra of "living off the land".

Planetary surfaces (Moon, Asteroids, Mars, etc.) are rich in resources and these bodies contain significant amounts of water - one of the most useful substances in space. It supports human life - to drink, to use as radiation shielding, and to breathe when separated into hydrogen and oxygen. In turn, hydrogen and oxygen can be used to store energy via fuel cells, as well as create the most powerful chemical rocket propellant known. Finding, extracting, storing and using water would create a logistics depot of immense value!

Thus, learning how to access and process natural resources to extract water on the Moon is a general skill that transfers to any future space destination, as well as the State's interest in sustainability.

So where does that leave us in relation to space resources and utilization?

- The Moon is close and has materials we want in the form we want it.
- The Moon is fairly easily accessible at any time and is conducive to remote operations from the Earth.
- It makes the most sense to go to the Moon first to learn the techniques, difficulties, and technology for planetary resource utilization ("living off the land") by manufacturing propellant from lunar water.
- Given the State of Hawaii's commitment in PISCES and the presence of Hawaii's unique lunar/Mars-like terrain, PISCES/Hawaii is rapidly becoming THE "go-to" place for both planetary surface technology development and applied research in resource utilization.

PISCES ROLE IN 2014

PISCES has established six major strategic program tracts for the coming year, which are listed on the left. They are designed to advance planetary surface systems technology that can also be used in Hawaii for economic and workforce development through strategic partnerships.

I look forward to sharing more details on these important initiatives in the coming months. Until then, RES GESTA PAR EXCELLENTIUM (Achievement Through Excellence).

-Rob Kelso, PISCES Executive Director

MOU SPOTLIGHT

RUSS OGI, HAWAII 3D PRINTING EXPERT

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

Russ Ogi showcasing a few of his 3D printed works of art at PISCES's booth during Children & Youth Day at the Hawaii State Capitol

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: *Russ Ogi, Hawaii 3D Printing Expert*
WHAT: *3D Printing and Design*
WHERE: *Hawaii*
DATE of MOU: *March 12, 2013*
GOAL: *To prepare the local workforce with the technical skills needed for Hawaii's ever-changing industrial and technological demands*
PROJECT(s) WITH PISCES: *3D Printing Technology and Workforce Development*

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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