Lunar Science Forum 2013

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July 2013
MAJOR TENETS IN PISCES PROJECTS

• 21st century skills / training
• Economic Development
• Workforce Development
• Importance of Aerospace to State/legislature
HAWAIʻI

Aerospace Means Business

PACIFIC INTERNATIONAL SPACE CENTER FOR EXPLORATION SYSTEMS (PISCES)
To offer high quality analogue testing in support of national and international space missions, and testing of planetary surface technologies
Planetary Lunar Concrete / Additive Manufacturing

Applied science research in using Hawaii basalt materials for playground flooring – ‘pathfinding’ methods of using planetary basalt materials for construction
PARTNERSHIPS

- NASA
- Center for Rapid Automation Fabrication Technologies @ USC
- International Society for Terrain-Vehicle Systems – Germany
- International Space Exploration Research Institute – Korea
- Hawaii Tech Works (Hilo)
- Russ Ogi/Hawaii 3-D Printing
- Universal Space Network
- Univ. of New South Wales
EMERGING OPPORTUNITIES

- Advanced Communications Technologies
- 3-D Printing enabling technologies
- Robotics
- Construction materials research
- Prospecting/mining technologies for planetary surfaces
- Education/Public Outreach
- Aerospace Technology Park
NASA Laser Communications Relay Demonstration

NASA desires to place a laser optical comm terminal in Hawaii above cloud layer.

1.2Gbps uplink
ADVANCED MANUFACTURING

...Developing 21st Century skills for 21st Century jobs

• National Additive Manufacturing Innovation Institute (NAMII)

• Boeing’s interest in a Hawaiian Mfg Institute

3-D PRINTING

National Network for Manufacturing Innovation (NNMI)

President Obama has proposed building a National Network for Manufacturing Innovation (NNMI) consisting of regional hubs that will accelerate development and adoption of cutting-edge manufacturing technologies for making new, globally competitive products.
3-D Printing, Advanced Manufacturing
Acquire PISCES’ Own Robotic Rover
- “Pathfinder” for validating PISCES support infrastructure
- Serve as a platform for sensor technologies and student experiments
Search & Rescue Robotics

T-Hawk at Fukushima

PISCES sponsored aerial robotics system and training program in both Search & Rescue, Space-Agriculture programs
Planetary Energy

• VERY interested in possibility of providing a prototype of their solar concentrator for testing at PISCES.
• Interested in how it could tie in w/ Hawaii's interest in renewable energy.
• Already working heavily w/ DoD. Interest in talking to DoD on Hawaii Island for application
• Application to Emergency Power in disaster relief
“Lunar Concrete” Pipeline

Component-level
Basalt brick

Subsystem-level
Slab, extrusion

System-level
Homes, Shelter, Launch Pad
Aerospace Technology Park

- Location to attract new aerospace industries
- Technology Park
- Close to international airport / deep sea port
- Survey potential sites
PISCES STEM initiatives

• Space Frontier Lecture Series
• Interns / participating scientist
• Student exp on GLXP flight (PISCES MOO)
• Add Hawai‘i to the NLSI “field school” for geologic field training
Educational Outreach

1. PISCES as an educational partner and innovator that supports K-12 STEM education in Hawai`i

2. Strive to develop student interests in aerospace and STEM

3. Implement 1-to-2 early “flagship” educational outreach projects to demonstrate commitment and success.
High School STEM contest resulting in selection of a student designed experiment that would be included in the next private space launch to the Moon in 2015.
Lunabotics Competition

NASA's 4th Annual Lunabotics Mining Competition
Kennedy Space Center Visitor Complex

• NASA has expressed interest in PISCES/Hawai`i Island becoming the location and host of a “WORLD FINALS” in the Lunabotics Competition