
A BILL FOR AN ACT

RELATING TO THE PACIFIC INTERNATIONAL SPACE CENTER FOR
EXPLORATION SYSTEMS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

1 SECTION 1. The legislature finds that for the last fifty
2 years the State of Hawaii has partnered with the National
3 Aeronautics and Space Administration to develop and advance the
4 national space program -- beginning with the astronaut training
5 program for the Apollo lunar missions and including a broad
6 range of discoveries in astronomy and planetary geosciences,
7 satellite communications, space-based environmental monitoring,
8 deep-space surveillance, and other activities that have
9 established the United States as a global leader in space
10 exploration.

11 The legislature finds that the State entered into an
12 agreement with the National Aeronautics and Space Administration
13 to expand the State's role as a contributor to and beneficiary
14 of the national space enterprise. The agreement will enable the
15 State to leverage strategic assets and capabilities for space
16 exploration, including the State's unique geographical features
17 that resemble lunar and Martian terrain, resident expertise in



1 space science and technology, and extensive research
2 partnerships with other space programs throughout the Asia-
3 Pacific region.

4 The legislature finds that the Pacific international space
5 center for exploration systems was formally established by the
6 legislature by Act 169, Session Laws of Hawaii 2012, to provide
7 unique opportunities to expand and diversify technology-based
8 enterprises and education statewide and to advance the national
9 space program by leveraging Hawaii's substantial assets and
10 capabilities in space exploration.

11 One goal for the Pacific international space center for
12 exploration systems is to develop a world-class space center in
13 Hawaii that can facilitate the design, testing, and validation
14 of new technologies that support both robotic and human missions
15 to space. Another goal is to serve as an economic driver for
16 the island of Hawaii that will promote the establishment and
17 growth of new sustainable and green industries along with
18 associated jobs, workforce development, internships, and the
19 science, technology, engineering, and math education program.

20 The legislature finds that the Pacific international space
21 center for exploration systems has a unique opportunity to
22 facilitate and accelerate the development of aerospace surface-



1 system technologies by exploiting Earth-based commercial
2 applications in the State. The preliminary focus for this
3 program should be in research of a sustainable concrete supply,
4 robotic operator training and certification, and attraction of
5 companies to presently unpopulated business sectors in Hawaii.

6 For the study and development of a sustainable concrete
7 supply, the legislature recognizes that current market demands
8 for concrete in Hawaii are primarily met through imported cement
9 and asphalt. Research and development that enable innovative
10 technologies for basalt concrete composition and delivery is an
11 attractive and self-sustaining alternative to continued cement
12 and bitumen imports. Currently, the Pacific international space
13 center for exploration systems is working with the International
14 Space Exploration Research Institute of Hanyang University in
15 South Korea, the National Aeronautics and Space Administration,
16 including the Kennedy Space Center, the Ames Research Center,
17 and the Johnson Space Center, the University of Notre Dame, the
18 University of Hawaii at Manoa, the University of Hawaii at Hilo,
19 the American Society of Civil Engineers, and local industries to
20 identify, verify, and validate sustainable and in-situ concrete
21 binders using the existing basalt resources in the State. This
22 is a critical step toward realizing Hawaii's potential in this



1 industry and provides an investment in the future of Hawaii and
2 its economy by offering a self-sufficient and in-situ source of
3 concrete for local applications.

4 The legislature finds that with increasing technological
5 availability of robotics for emergency response and hazard
6 mitigation, there is an emerging need for robotics training and
7 certification for civil and government robotic operators. The
8 Pacific international space program is working with the Northern
9 Center for Advanced Technology in Canada to develop a robotic
10 operator training and certification program, and will be
11 collaborating with the University of Hawaii community college
12 system on course facilitation and development. Additionally, the
13 Pacific international space center for exploration systems is
14 exploring opportunities with the Northern Center for Advanced
15 Technology in underwater robotics.

16 The legislature also finds that the recent emergence of
17 private commercial space access and a resurgence of global space
18 initiatives will involve significant private sector investment
19 in the development, testing, validation, and verification of
20 robotics, broadband, energy production, energy storage,
21 recycling, and renewable and sustainable technologies that can
22 have immediate application to improve the economy and the



1 general well-being of the State. The legislature also
2 recognizes the need to formulate partnerships with private
3 industry to facilitate State-based manufacturing and operations
4 in conjunction with the associated local workforce development.
5 The Pacific international space center for exploration systems
6 is exploring possible partnerships with Planetary Power that
7 produces solar and hybrid energy generation and storage systems,
8 to establish a Pacific base of operations in Hawaii to
9 facilitate the manufacturing of specific components for fixed
10 and mobile solar concentrator units that will offer higher
11 efficiency than photovoltaic systems, as well as hybrid
12 biodiesel systems.

13 The Pacific international space center for exploration
14 systems is also working to establish a memorandum of
15 understanding with Hawaii Techworks and the east Hawaii
16 community development corporation to ensure that there is a
17 skilled local workforce in place to support these manufacturing
18 operations.

19 The legislature finds that all of these initiatives align
20 with current demands in the State, as well as President Obama's
21 Advanced Manufacturing Initiative, and represent critical
22 components for a stronger economy in the State.



1 The purpose of this Act is to appropriate funds to provide
2 funding for the Pacific international space center for
3 exploration systems to manage and facilitate its work in
4 bringing aerospace technology and corporations to Hawaii, to
5 expand and diversify Hawaii-based industry, and to provide the
6 training relevant to prepare Hawaii's workforce for employment
7 in technology-related fields.

8 Funding appropriated through this Act will be used to
9 fund:

- 10 (1) Existing employee salaries and create new positions to
11 include a marketing officer, a project integration
12 manager, an information-technology field technician,
13 and two student internship positions;
- 14 (2) Operational expenses, including rental of staff
15 offices and warehouse space for the Pacific
16 international space center for exploration systems
17 hardware and equipment; utilities; intrastate and
18 interstate travel to meetings and conferences;
19 marketing costs associated with website creation,
20 graphic design, and the development of brochures and
21 trade advertising; travel and lodging expenses for the
22 Pacific international space center for exploration



1 systems board of directors; and the Pacific
2 international space center for exploration systems
3 conferencing contracts; and

4 (3) The purchase of essential equipment, materials, and
5 services, including electronic test and design
6 equipment in support of robotics training and
7 education; mechanical equipment in support of robotics
8 training, the sustainable concrete project, advanced
9 manufacturing skills training, and ongoing testing of
10 robotic surface systems by the Pacific international
11 space center for exploration systems; command and
12 control equipment for new and existing robotic
13 hardware; situational awareness monitoring for robotic
14 operations training; software licensing; and a data
15 server for archiving project results, product designs,
16 and online training materials for a robotic operator
17 training course.

18 SECTION 2. There is appropriated out of the general
19 revenues of the State of Hawaii the sum of \$1,163,000 or so much
20 thereof as may be necessary for fiscal year 2013-2014 to
21 effectuate the purposes of this Act.



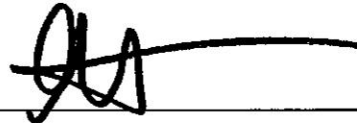
1 The sum appropriated shall be expended by the department of
2 business, economic development, and tourism for the purposes of
3 this Act.

4 SECTION 3. The Pacific international space center for
5 exploration systems shall submit a report that includes an
6 updated business plan regarding the aerospace technology
7 research and development park project to the legislature no
8 later than twenty days prior to the convening of the regular
9 session of 2014.

10 SECTION 4. This Act shall take effect on July 1, 2013.

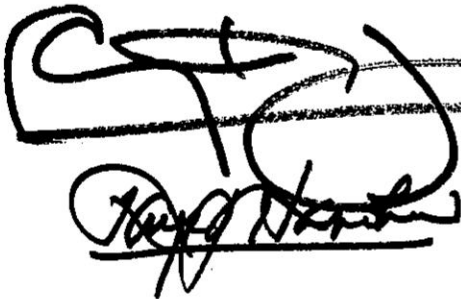
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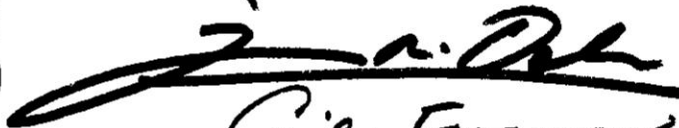


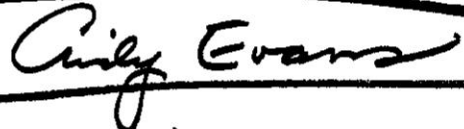




















H.B. NO. 1419

Report Title:

Pacific International Space Center for Exploration Systems;
Appropriation

Description:

Appropriates funds to PISCES.

The summary description of legislation appearing on this page is for informational purposes only and is not legislation or evidence of legislative intent.





**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

NEIL ABERCROMBIE
GOVERNOR

RICHARD C. LIM
DIRECTOR

MARY ALICE EVANS
DEPUTY DIRECTOR

No. 1 Capitol District Building, 250 South Hotel Street, 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804
Web site: www.hawaii.gov/dbedt

Telephone: (808) 586-2355
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Statement of
RICHARD C. LIM
Director
Department of Business, Economic Development & Tourism
before the

**HOUSE COMMITTEES ON
HIGHER EDUCATION
AND
ECONOMIC DEVELOPMENT AND BUSINESS**

Tuesday, February 5, 2013
2:00 p.m.
State Capitol, Conference Room 309

in consideration of

HB 1419

RELATING TO THE PACIFIC INTERNATIONAL SPACE CENTER FOR EXPLORATION
SYSTEMS (PISCES).

Chairs Choy and Tsuji, Vice Chairs Ichiyama and Ward, and members of the Committees. The Department of Business, Economic Development and Tourism supports the intent of HB 1419 to provide state funding to employ staff and purchase equipment essential to sustain PISCES operations.

This legislation builds upon Act 169 from the 2012 Session, which established PISCES as a program attached to our department through the Office of Aerospace Development. Although this Act appropriated initial funding for PISCES operations, it is anticipated that these funds will be completely expended by September of this year.

Funds may be requested through a Governor's Budget Message to enable PISCES to continue operations through June of 2014.

We support this bill provided that its passage does not replace or adversely impact priorities in our Executive Budget.

Thank you for the opportunity to testify on this bill.



UNIVERSITY OF HAWAII SYSTEM

Legislative Testimony

Testimony Presented Before the
House Committee on Higher Education
and the
House Committee on Economic Development and Business
February 5, 2013 at 2:00 p.m.
by
Donald O. Straney, Ph.D.
Chancellor, University of Hawai'i at Hilo

HB1419 RELATING TO THE PACIFIC INTERNATIONAL SPACE CENTER FOR
EXPLORATION SYSTEMS

Chairs Choy and Tsuji, Vice Chairs Ichiyama and Ward and Members of the
Committees:

My name is Donald Straney, Chancellor of the University of Hawai'i at Hilo (UHH). We support the intent of HB1419 to fund the Pacific International Space Center for Exploration Systems (PISCES) to manage and facilitate its work to expand and diversify technology-based enterprises and education in Hawai'i.

This proposal will help to stimulate the growth of our State economy through aerospace research, the development, testing and evaluation of new technologies that support the exploration of space and the creation of new careers. UH Hilo views the proposal as an opportunity to collaborate with PISCES to provide higher education and career options to the people of our Hawai'i Island.

We support HB1419 provided that its passage does not replace or adversely impact priorities in our BOR approved budget.

Thank you for the opportunity to testify on HB1419. Aloha.

SENT VIA EMAIL

February 4, 2013

Representative Isaac W. Choy
Chair, Committee on Higher Education
Representative Clift Tsuji
Chair, Committee on Economic Development and Business
Hearing on House Bill 1419
Relating to the Pacific International Space Center for Exploration Systems (PISCES)
State Capitol, Conference Room 309

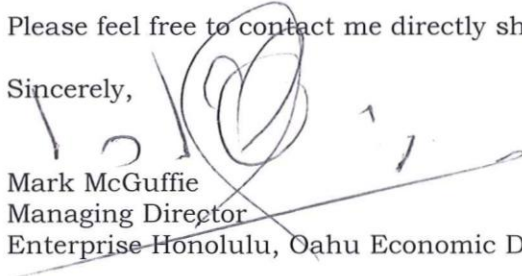
Aloha Chairs Choy and Tsuji!

Enterprise Honolulu stands in strong support of House Bill 1419, the purpose of which is to appropriate the necessary funds for the operations and the purchase of equipment required for PISCES activities during fiscal year 2013-14.

The PISCES initiative is showing tremendous promise supporting Hawaii's existing robotics programs, STEM education and connecting students to future new technological opportunities. We ask for your legislative support.

Please feel free to contact me directly should you have any questions.

Sincerely,


Mark McGuffie
Managing Director
Enterprise Honolulu, Oahu Economic Development Board



ENTERPRISE
HONOLULU

THE BUSINESS CLIMATE OF PARADISE



February 3, 2013

Members of the 27th Hawaii State Legislature
Hawaii State Capitol
415 S. Beretania Street
Honolulu, Hawai'i 96813

Aloha Members of the Hawaii State Legislature,

As the Chairman of the Hawai'i Aerospace Advisory Committee, I am writing to express my strong support for HB1419, which would appropriate funds through June 2014 essential to sustaining operations and the purchase of equipment for the Pacific International Space Center for Exploration Systems (PISCES), building upon the aerospace R&D park initiative created through Act 169 during the 2012 Legislative Session.

PISCES is now off and running, with a project agreement in place between the Department of Business, Economic Development and Tourism (DBEDT) and the Research Corporation of the University of Hawai'i (RCUH). An Executive Director has been hired and a Space Act Agreement signed between the State of Hawai'i and the National Aeronautics and Space Administration (NASA) to support PISCES-related programs. The PISCES staff is currently in vigorous pursuit of space research and development initiatives to be implemented through the Center, while at the same time establishing community partnerships that will support PISCES growth and diversification on Hawai'i Island.

This significant momentum needs to be maintained to enable PISCES to achieve its full potential. As such, I strongly urge your committee to support passage of HB1419 to help bring this Center's timely opportunities to the Aloha State.

'O wau me ka ha'aha'a,

A handwritten signature in black ink, appearing to read "E. Pulham".

Elliot Holokauahi Pulham
Chairman



SHACKLETON ENERGY COMPANY
3511 Caldwell Lane, Del Valle, TX 78617-3017

2nd February 2013

**Testimony in Support of HB1419
Relating to the Pacific International Space Center for Exploration Systems (PISCES)**

Dear Members of the 27th State Legislature

I strongly support the intent of this bill to employ staff and purchase equipment essential for PISCES ongoing operations through June 2014.

There exists a gathering resurgence of commercial space exploration initiatives that include both surface to space launch activities but of more relevance a number of in-space commercial companies established to provide services such as resource utilization, habitation, autonomous operations and other activities.

Many of these organizations are of US origin but many are also developing in Europe, Asia and other territories. Unlike the large isolated space programs of a generation ago, today's commercial space activities are collaborative in nature over international boundaries. More than ever, cost efficiencies as well as standards and procedures collaboration are paramount in new space ventures and activities, even between National Space Agencies.

As the trend for collaboration meets with the emergence of space resource utilization companies, a pressing requirement emerges for a center of excellence that can cross international boundaries, yet offers unique operational value for the development and testing of new vehicles, processes and methods of resource extraction and surface mobility on other worlds and extreme environments. The unique geology of the Islands of Hawai'i serves as a testing ground for these and many other operational functions. More than that, the equitable location between the Americas and Asia provides a convenient convergence for a great majority of the participants involved in this field to cooperate and collaborate.

It is essential that this facility receives the required financing for staff and capital equipment to perform its duties as a flagship center to secure leadership in this new field which will enhance the local economy, provide jobs, education and inspiration for an entire generation.

In light of the above, I strongly support the intent of HB1419 and would urge the Legislature to appropriate the full funding amount requested through this legislation.

Best regards

Jim Keravala
Chief Operating Officer
Shackleton Energy Company, Inc.
+1 650 387 0844
jim.keravala@shackletonenergy.com
www.shackletonenergy.com

"Fueling the Space Frontier"

February 3, 2013

Galen I. Ho

1946 Young Street, Suite 480

Honolulu, Hawaii 96826

TESTIMONY IN SUPPORT OF HB-1419 –FUNDING SUPPORT FOR THE PACIFIC

INTERNATIONAL SPACE CENTER FOR EXPLORATION SYSTEMS (PISCES)

Dear Members of the 27th State Legislature,

I am writing to strongly support the intent of this bill to provide funding for the staff and facilities of PISCES. Their mission to bring Hawaii's assets & capabilities in an emerging commercial space sector along with a growing set of global space based initiatives will serve Hawaii well, in the areas of robotics, energy generation & storage and broadband communications. Developing a world class center of excellence that can support robotic and human missions to space will provide a knowledgeable workforce, internships and the supporting Science, Technology and Engineering careers that will have a substantive impact on the future of our State. I have seen the remote robotics efforts being developed on the Big Island, in conjunction with NASA and have seen students who have participated in State Robotic activities, almost mesmerized by these developments when they are demonstrated. That capability was also demonstrated by PISCES at APEC-2011.

I personally have been affiliated with the PISCES program and people thru my non-profit work as President of SEE-IT (Science, Engineering Exhibition-Innovative Technologies), Hawaii, which was displayed at APEC and at the Hawaii Convention Center in 2012.

As an Interim (newly appointed) PISCES board member, I am pleased to lend my time and support to this strategic effort in Hawaii and hope that you will provide the funding thru this bill for efforts thru FY 14 and urge you to pass SB 1256.

You can reach me by phone at 607-759-6342 or by my e-mail, gho@cbipolymers.com or by letter at the above address, should you have any questions.

Sincerely,



Galen I. Ho

Hoyt L. Davidson
Managing Partner
Near Earth LLC
243 Tresser Boulevard, 17th Floor
Stamford, CT 06901

February 3, 2013

TESTIMONY IN SUPPORT OF HB1419 – RELATING TO THE PACIFIC INTERNATIONAL SPACE CENTER FOR EXPLORATION SYSTEMS (PISCES)

Dear Members of the 27th State Legislature,

I strongly support the intent of this bill to provide Hawaii State funding to cover the employee and overhead costs and essential equipment purchases to sustain PISCES operations through June, 2014.

I believe PISCES represents a great opportunity for Hawaii to use its location and special geological terrain to benefit its citizens and the global community. These last few years have seen increased international interest in robotic space exploration. This interest is coming from the governments and space agencies of multiple nations, prominent universities, research institutions, aerospace companies, and, perhaps most encouraging, commercial space entrepreneurs. Together these entities want to extend human knowledge, explore our solar system, and build sustainable businesses in space. There is also a heightened sense of excitement within the general population supporting these space endeavors, as can be witnessed in our media and culture.

NASA's successful Curiosity mission to put a roving scientific lab on Mars is perhaps the most well-known recent space initiative to highlight what can be achieved robotically; however, the European Union and such countries as China, India and Russia have stated plans to run their own robotic space exploration missions, many targeted at the Moon. For instance, we now know the Moon holds many important minerals and enough water to one day support a lunar colony. However, before such a manned presence can be sustained economically and with optimal efficiency, many precursor robotic missions will need to be conducted for surveying, mineral and water extraction, and construction of bases and communication networks. Meanwhile, several private enterprises have arisen with business plans focused on robotic in-orbit refueling, repair and relocation of satellites, transportation services to the lunar surface, and even asteroid mining. As the Managing Partner of an investment bank focused on the commercial space sector, I am seeing increased investor interest in backing companies that plan to develop or use space robotics.

Before governments and investors commit to conduct such missions and develop these new robotic capabilities, they need to reduce the risk of failure and increase the level of performance per dollar invested. Basically, what the world needs is a center of excellence where these robotic technologies can be developed, tested and demonstrated in an environment that matches as close as terrestrially possible the regolith and terrain to be found on the Moon, Mars and other celestial bodies. That is where Hawaii and PISCES come in. Hawaii has a unique opportunity at a unique point in time.

Perhaps of equal or greater importance will be all of the side benefits that may come from the Earth-bound uses of robotic technologies perfected in part at PISCES. This century will most likely see an increasing use of robotic technology in almost every industry. PISCES could help the State of Hawaii play an important role in this new wave of innovation.

I therefore strongly encourage you to pass HB1419 with the requested funding allocation. I am available to answer any questions you may have and can be reached at (203) 355-3527 or by email at hoyt@nearearthllc.com.

Thank you for the opportunity to testify on this bill.

Aloha,

A handwritten signature in black ink that reads "Hoyt Davidson". The signature is written in a cursive style with a long horizontal flourish at the end.

Hoyt Davidson

George R. Ariyoshi
999 Bishop Street, 23rd Floor
Honolulu, HI 96813

February 1, 2013

**TESTIMONY IN SUPPORT OF HB1419 - RELATING TO THE PACIFIC
INTERNATIONAL SPACE CENTER FOR EXPLORATION SYSTEMS (PISCES)**

Dear Members of the 27th State Legislature,

I strongly support the intent of this bill to provide state funding to employ staff and purchase equipment essential to sustain PISCES operations through June of 2014.

Hawaii's strategic mid-Pacific/near-equatorial location, Moon/Mars-like terrain, resident expertise in multiple aerospace-related technologies, and long-standing ties with space-faring nations throughout Asia and the Pacific, clearly afford strategic assets and capabilities that can be leveraged to realize humankind's full potential in space, and in so doing enable our State to engage as both a major contributor to and beneficiary of the global space enterprise.

In addition, there are emerging trends in the aerospace industry – both national and global – that will afford additional opportunities for the Aloha State. Consider, for example, the recent emergence of commercial space enterprise and a resurgence of international space programs that will involve significant private sector investment in the development, testing, validation, and verification of robotics systems, broadband telecommunications, energy production, energy storage, and waste recycling – all of which could be supported through and lead by innovative initiatives in Hawaii.

The Pacific International Space Center for Exploration Systems (PISCES), for which I serve as Board Chairman, is designed to leverage Hawaii's intrinsic assets and capabilities, as well as the emerging global trends in the aerospace industry, toward developing a world-class center of excellence in Hawaii that can facilitate the design, testing and validation of new technologies to support both robotic and human missions to space. In so doing, PISCES will serve as an economic driver for the island of Hawaii that

will promote the establishment and growth of new sustainable “green” industries, along with associated high-paying jobs, professional internships, and new science, engineering and math education programs statewide.

Recognizing this significant opportunity, the State Legislature established PISCES as an attached agency to the Department of Business, Economic Development and Tourism (DBEDT), appropriating general funds to support PISCES operations (through Act 169 in the 2012 Session). Although this funding has enabled the department to hire professional staff to manage PISCES operations and begin development of the proposed PISCES aerospace R&D park on the Big Island, these funds will be completely expended by the end of this fiscal year. As such, additional general funding will be critically needed to maintain PISCES operations through FY14 (which is the primary intent of this legislation).

As such, I would urge you pass HB1419 with the requested funding allocation, and would be happy to address any questions you may have concerning this recommendation. I can be reached by e-mail at kyahiku@wik.com , by phone at (808) 544-6765 or by fax at (808) 544-8398.

Thank you for the opportunity to testify on this bill.

Aloha,



George R. Ariyoshi

GRA:khy

Testimony in strong support of **SB 930**, **SB 1256**, and **H.B. 1419**

To the Members of the 27th Hawaii State Legislature:

I am deeply honored to have the opportunity and great privilege to offer my testimony in strong support of Hawaii State Bills SB930, SB1256 and HB1419, providing State support for the Pacific International Space Center for Exploration Systems (PISCES).

I regret that I am unable to offer my testimony in person, however unfortunately these hearings conflict with a long-standing prior commitment, as I will be hosting an important event for NASA, and many of our international space agencies partners, at NASA's Kennedy Space Center this week, so please accept this written testimony as my strongest endorsement of your continued leadership in this important work.

I would like to begin by thanking you for the opportunity to serve as a member of the Board of Directors for PISCES, an opportunity that affords me the honor of working with an incredible team from the Hawaii Office of Aerospace Development, the University of Hawaii, and the Legislators of the great State of Hawaii, that collectively embraced the vision to establish this vitally important asset that will enable Hawaii to become both a leader in, and major beneficiary of, the next bold step for humanity - the sustainable exploration, commercial development, and settlement of space.

PISCES is clearly an enterprise that will allow Hawaii to demonstrate its continued leadership in international space endeavors, and that will continue to afford exceptional economic and societal returns to humanity on Earth, as well as inspire strong interest in the pursuit of science, mathematics and engineering among students in pursuit of careers that will enhance economic prosperity and wellbeing for future generations.

It is entirely fitting that Hawaii, founded by courageous navigators during the great age of human migration and exploration on our planet, would now become a world leader in forging humanity's next "giant leap" into the future, and I commend your leadership for supporting the great vision and opportunity that is embodied in PISCES.

As a retired Senior Executive Service member of NASA, I have dedicated my entire career to the exploration of space, and I continue to support this enterprise as a consultant and advisor to NASA, as well as a space advocate on behalf of both key policy makers in Washington, DC, and many international space agency partners.

In fact, I spent most of this past week with my long-time good friend and space pioneer, Dr. Buzz Aldrin (who also joined me at the recent PISCES Conference on the Big Island in November 2012), talking with key policy officials and executives at the White House, NASA Headquarters, the State Department, and other government organizations. During these discussions, we frequently referenced the important role that PISCES can play in helping our nation realize its full potential on the space frontier.

As we learned from the earliest days of human space flight (during the Mercury, Gemini and Apollo Programs), the ability to conduct high-fidelity analog demonstrations is key to validating the instruments, systems, and processes that will be used in actual space missions.

As the former Director of Advanced Programs at NASA, I co-founded the NASA/NSF (National Science Foundation) Antarctic Analog Program nearly twenty-five years ago. This program continues to sponsor some of the world's leading scientists to conduct groundbreaking science in this region, as well as to validate the types of scientific investigations that we will one day conduct on the Moon, on Mars and its moons, on Saturn's moon Europa, and on other planetary bodies.

I also sponsored work at additional exploration analog sites in the Arctic region, as well as in the deserts of the Southwest and in other areas, which offer high-fidelity analogs for the scientific and technological investigations we will conduct elsewhere in our solar system.

Clearly, this type of analog research will enable us to understand our own origins, address questions about the uniqueness or abundance of life in the universe, and expand our fundamental knowledge about the fate of our home planet and our future in the universe.

The Big Island affords one of the highest fidelity lunar analog sites on Earth that can be used to test and validate new technologies that will enable humankind's inevitable journey beyond Low-Earth Orbit (to the Moon, Asteroids, Mars and beyond). As such, PISCES will present tremendous opportunities for the United States, and for other space-faring nations, to economically demonstrate and refine space-faring hardware and systems in preparation for future interplanetary missions, while also creating exceptional economic benefits to Hawaii.

In addition, this research will also support the development of new manufacturing processes and procedures to utilize natural, *in situ* resources in an environmentally conscious way, while also enabling new approaches to harness energy to power to sustain future exploration sites on the moon and Mars, as well as state of the art tele-robotic and autonomous robotic systems for applications both in space and on Earth – all of which will provide new business and employment opportunities in Hawaii.

The unique attributes of PISCES as a premier analog site will also afford opportunities for new education, workforce development, and other social, environmental and economic programs statewide.

I am most honored to have an opportunity to contribute toward the development of PISCES, and again would strongly encourage your continued leadership in supporting this timely and vitally important program for Hawaii, and for the international space program community.

Respectfully,

Lewis L. Peach, Jr.
Member, PISCES Board of Directors

International Ventures, Associates, 5333 Potomac Ave. NW, Washington. DC 20016

January 30, 2013

Members of the 27th State Legislature
Hawaii State Capitol
415 S. Beretania Street
Honolulu, Hawaii 96813

Re: **HB1419**. Appropriates funds essential to sustain operations and support purchase of equipment for PISCES through June, 2014, building upon the PISCES aerospace R&D park initiative launched through Act 169 during the 2013 Session.

I am pleased to provide testimony in strong support of this measure.

The Pacific International Space Center for Exploration Systems (PISCES) is a timely and most promising initiative that evolved over several years through multinational dialogue and exchange between space-faring nations around the Asia-Pacific region (sponsored by the Japan-U.S. Science, Technology and Space Applications Program, or JUSTSAP, for which I served as Chairman).

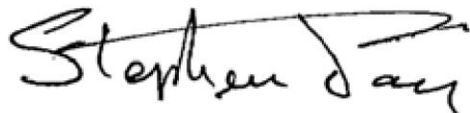
The Hawaii State Legislature has been a strong supporter of PISCES since its inception, and, as a result, PISCES has gained substantial visibility at NASA, as well as among other international Space agencies in Asia, Canada and Europe, and also has entered into research and development alliances with private sector partners, such as the Boeing Company, NORCAT, and Shackleton Energy, to conduct a variety of research applications and field experiments.

It is clear that PISCES has tremendous potential to help advance U.S. Space exploration technology, with direct applications in Hawaii that will provide substantial revenue streams, high-paying jobs, and enhanced technical and educational (STEM) capabilities statewide.

It is therefore critical that appropriate funding be sustained for this initiative through the coming Fiscal Year. As such, I strongly urge your Legislature to appropriate the funding support requested for PISCES through this legislation.

Thank you for the opportunity to testify on this measure.

Sincerely,

A handwritten signature in black ink that reads "Stephen Day". The signature is written in a cursive, slightly stylized font.

Stephen M. D. Day

Chairman Emeritus
Japan-U.S. Science, Technology & Space Applications Program (JUSTSAP)
Member, Hawaii Aerospace Advisory Committee

Testimony in strong support of S.B. 930, S.B. 1256, and H.B. 1419

January 31, 2013

To Members of the 27th Hawaii State Legislature:

I am writing to strongly endorse three bills relating to the Pacific International Space Center for Exploration Systems (PISCES). These bills include: S.B. 930, S.B. 1256, and H.B. 1419. Please include these comments as written testimony in favor of these measures.

As the former and founding director of PISCES, I am intimately familiar with its history and, as a result, with its great potential as an economic development tool for the State of Hawai`i in general and the Big Island of Hawai`i in particular.

During its first five years of operation (while I served as its director), PISCES became a household word at NASA headquarters and throughout the NASA field centers. This came about through the numerous collaborative efforts we instituted with the agency, the funding proposals we submitted for NASA funding, the PISCES conferences NASA personnel attended, and the three major field demonstrations NASA conducted at the PISCES test sites. These campaigns brought substantially more money into the local economy and UH Hilo than was spent by the State, providing seed funding to PISCES.

Also during this five-year period, while establishing our credibility with our principal funding agency (NASA), we also made major progress building relationships with the local community. These relationships were anchored in our Cultural Advisory Board comprised of local community leaders, many of them from the education sector (both K-12 and university). This Board guided our efforts to reach out to other civic leaders and organizations. A key component of this outreach included periodic presentations we gave to local K-12 classes, often involving NASA engineers who were visiting Hawaii to perform field tests at PISCES. Other outreach efforts included Onizuka Days and the Big Island Science Fair, which PISCES personnel helped judge and at which a PISCES award was given to the entry with the greatest significance for space exploration.

All of these successes with external funding and local engagement have put PISCES in a sound position for further progress under new leadership and restructured administration with the Department of Business, Economic Development and Tourism (DBEDT), the University of Hawai`i at Hilo (UHH), and the Research Corporation of the University of Hawai`i (RCUH). I am very optimistic that PISCES can grow even stronger in this new environment. I also am fully supportive of PISCES' new director, Rob Kelso, and am encouraged by the confidence and enthusiasm with which he has evidenced in this position. His contacts and experience with public/private partnerships at the NASA Johnson Space Center will bring added credibility to PISCES as it pursues its own partnerships with industry, particularly with Google Lunar X-Prize contestants.

However, in order to ensure that PISCES is able to achieve its full potential, it is absolutely critical (from both an internal and external perspective) that the Legislature maintain its traditional support for this outstanding program, and that adequate funding be provided in the coming fiscal year to enable PISCES' continued development. The funding levels indicated in all three bills are essential for this purpose, and I would strongly urge you to appropriate the full amounts proposed.

Concerning aerospace in Hawai'i in general, of which PISCES is a most prominent component, I can think of no other industry with greater economic development potential for your State. Given its central location relative to the many space-faring countries around the Pacific Rim, its proximity to attractive ocean-based launch sites, its own advantageous location for horizontal-launch sub-orbital flights that promise to be early leaders in the emerging space tourism market, its Martian- and Lunar-like terrain and soil that have made PISCES the premier "go-to" place for international tests of rovers, material processing equipment bound for space, and energy collection technologies for future space outposts, and the countless spinoffs to the State's economy from all of these opportunities, Hawai'i is in an excellent position to become both a major leader in and beneficiary of global space enterprise. The best way to realize this potential, in addition to funding PISCES, is to fully fund and support the Office of Aerospace Development within DBEDT.

This leadership won't happen overnight, and as such should not be compared to quick "show-me-the-money" economic fixes for the State. Over the long run, with steady State support, aerospace will produce good, high-paying jobs that can't be outsourced. Other states that historically have led in this field have found this to be true; but again, it didn't happen overnight. California's formidable aerospace industry was built mostly on defense and other government enterprises initiated during World War II. Other states, such as Alabama, Florida and Texas saw their aerospace fortunes evolve with NASA. But Hawai'i has different and, in some ways, stronger attributes for becoming a truly international leader in aerospace (as discussed above), and can leverage these assets and capabilities to help pioneer the space frontier.

In conclusion, I urge you to continue funding PISCES at a level that will evidence to both our nation and the world that Hawai'i means business when it claims to pursue a leadership role in aerospace. PISCES is a superb example of what State funding can enable in this industry. Thank you for your historical and continuing support for this program.

Sincerely,



Dr. Frank Schowengerdt
Former Director, PISCES
Former Director, Space Product Development and Innovative Partnerships Programs
NASA Headquarters
Former Vice President for Academic Affairs and Dean of the Faculty
Colorado School of Mines

Dear Members of the 27th State Legislature,

My name is Henk Rogers. I am a computer software entrepreneur, although my interests have now turned to how to make Hawaii, and then the world, into a better place. My efforts in this area include ending the use of carbon based fuel, to which the Blue Planet Foundation is dedicated, making worldwide peace and making a backup of life on earth (on another planet).

Why should we care about space exploration?

65 million years ago, an average size asteroid hit this planet and wiped out the dinosaurs. The reason they went extinct is that they were too dumb to get off planet. It's worse for humans in that we know how to do it, we are just haven't gotten around to doing it. In other words, we have the technology, we just haven't applied it.

Another way of looking at space exploration is that the most amazing thing ever to happen to this planet is life. It doesn't matter whether you believe life is here because of spontaneous generation (meaning it happened on this planet by accident), pan-spermia (meaning it came from outer space) or divine intervention (meaning God made it happen). It's still the most amazing thing to ever happen on this planet.

Planets around other stars are being discovered at an amazing rate. One could almost say that most of the stars out there today have planets. There are, something like, one hundred billion stars in the Milky Way (that would be the galaxy we live in). Just imagine how many planets there could be out there that can support life (as we know it). If we were to bring life (as we know it) to just one of those planets, it would be the greatest single deed that we as a species could ever hope to accomplish.

Why should Hawaii care about space exploration?

Make no mistake about it, space exploration will happen. Those who will make it happen will become the most technologically advanced people on this planet. What greater gift could we give to the children of Hawaii than that kind of technological leadership? We will go from being known as a tourist destination to being a center or even the center for space exploration. And, we can do it in one generation!

Hawaii suffers from an inferiority complex. We think we can't do serious STEM related stuff in Hawaii. People think that areas involving science, technology, engineering and mathematics are better done in places on the mainland or in Japan, Korea or China. The only reason that we think so is that our smartest graduates have to go to the mainland to work on jobs that involve STEM. If we were to be able to make Hawaii a center for space exploration we would be creating STEM related jobs in Hawaii for generations to come.

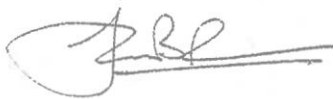
You, as our legislators, have a rare opportunity. You can help to bring the business of space exploration to Hawaii for our children. You can once and for all give them the hope, the pride and the self-confidence to compete with the best STEM centers in the country, in fact with the best STEM centers in the world.

I implore you not to miss this opportunity. I ask you for this not for myself. I ask you for this not for my friends or my family. I ask you to support PISCES for all of the keikis of Hawaii for generations to come. Give them a future they can be proud of. Give them high paying jobs here at home in Hawaii. Give them the opportunity to be a part of the next big wave in technology... space exploration.

This is your moment to act.

Support PISCES!

Mahalo and Aloha,

A handwritten signature in black ink, appearing to read 'H. B. Rogers', with a horizontal line extending to the right.

Henk B. Rogers
Entrepreneur



UNIVERSITY
of HAWAII®
SYSTEM

February 3, 2013

Members of the 27th State Legislature
Hawaii State Capital
415 S. Beretania St.
Honolulu, HI 96813

Aloha Members of the 27th State Legislature

As a member of the Hawai'i Aerospace Advisory Committee, I am writing to express strong support, jointly, for SB 1256 and HB 1419. These bills insure that sustained operations and equipment will be available for the further advancement of the aerospace R and D park initiative, created by Act 169 and issued during the 2012 Legislative Session. Hawai'i, and the Big Island in particular, has a real opportunity to grow an aerospace/aviation industry creating more jobs for the citizens of our state. The fact that DEBDT and RCUH have a project agreement around this initiative is a very positive development; in addition, the project now has an Executive Director. The Space Act Agreement between the state of Hawai'i and NASA also serves as a high profile foundation to launch research projects and other partnerships; and again, this all brings jobs to Hawai'i.

The PICSES project is, therefore, gaining momentum and needs the support of SB 1256 and HB 1419 to assure that forward movement is sustained. The State needs to develop economic sectors in addition to tourism and this area is promising. I urge your committee to voice support of these important funding bills.

All best

A handwritten signature in cursive script that reads 'Peter S. Quigley'.

Peter Quigley, PhD
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HAWAI'I COUNTY COUNCIL
25 Aupuni Street, Hilo, Hawai'i 96720

February 4, 2013

The Honorable Isaac Choy, Chair
and Members of the House
Committee on Higher Education

Dear Chair Choy and Committee Members,

Thank you very much for this opportunity to provide testimony in strong support of House Bill 1419.

The goals of the Pacific International Space Center for Exploration, or PISCES, are expressed concisely in Section 1 of the bill:

... **To develop a world-class space center in Hawaii** that can facilitate the design, testing, and validation of new technologies that support both robotic and human missions to space. Another goal is **to serve as an economic driver for the island of Hawaii** that will promote the establishment and growth of new sustainable and green industries along with associated jobs, workforce development, internships, and the science, technology, engineering, and math education program.

I believe PISCES will serve an important role in determining whether Hawai'i's best and brightest students in the field of aerospace technology and engineering will be able to stay in Hawai'i, thereby securing a better future for our state. Money invested in space exploration is not fired from a rocket to litter the moon. Instead, by entering the local economy, the money appropriated by House Bill 1419 will create skilled, quality jobs in support of the burgeoning interest in the human exploration of space.

The modest investment secured in this bill, should it pass, will reap rewards many times over for jobs, economic development, state revenue, and in the big picture, the advancement of knowledge for the human exploration of space.

As President Obama said in 2010, when he announced a refocusing of the U.S. space program:

Hawai'i County is an Equal Opportunity Provider and Employer.

“After decades of neglect, we will increase investment – right away – in other groundbreaking technologies that will allow astronauts to reach space sooner and more often, to travel farther and faster for less cost, and to live and work in space for longer periods of time more safely. That means tackling major scientific and technological challenges. How do we shield astronauts from radiation on longer missions? How do we harness resources on distant worlds? These are questions that we can answer and will answer. **And these are the questions whose answers no doubt will reap untold benefits right here on Earth.**

We believe the benefits of the renewed focus on space exploration should be felt in Hawai‘i, and that PISCES will lead the way.

Please support this bill.

Sincerely,

Dennis “Fresh” Onishi
Hawai‘i County Council
District 3



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February 5, 2013



Dear Members of the 27th Hawaii State Legislature,

I am pleased to provide testimony in strong support of SB1256 and HB1419, which would appropriate sustained fiscal support for the Pacific International Center for Space Exploration, also known as PISCES. We have had the privilege of working together with Pisces personnel on multiple occasions since 2008 and have come to appreciate the high value of this organization as well as the unique geography of Hawaii. Specifically, the natural Mars-like and lunar-like terrain found in the mountainous regions of the Big Island provided an ideal location to demonstrate and validate our lunar rover designs. The logistical support provided by John Hamilton, Christian Anderson, and the rest of the Pisces personnel resulted in a series of smooth running analogue deployments in 2008, 2010, and 2012. The success of these deployments is a primary reason for the forthcoming flight opportunity that the National Aeronautics and Space Administration and the Canadian Space Agency are currently pursuing.

I would also like to express my appreciation for the hospitality shown to all of the people from the different organizations involved with our project. A very deliberate and effective effort was made to educate us about the Hawaiian culture and geography. This was greatly appreciated and resulted in a much more enjoyable and informative stay.

Mahalo,

Peter Visscher, PEng, BEng

Space/Robotics Manager

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Lawrence E. Osborn
841 Bishop Street, Suite 200
Honolulu, Hawaii 95825



February 5, 2013

TESTIMONY OPPOSING SENATE BILL 1419 - RELATING TO PACIFIC INTERNATIONAL SPACE
CENTER FOR EXPLORATION SYSTEMS

Dear Members of the 27th Hawaii State Legislature,

I am writing in support of this bill, the intent of which is to fund activities of the Pacific International Space Center for Exploration Systems.

As a Hawaii resident and member of the Hawaii Aerospace Advisory Committee I believe very strongly that funding of the Pacific International Space Center for Exploration Systems, at least until such time as it is self sustaining, will pay diverse and substantial dividends for our local aerospace industry and the state's long term economic well-being.

Please do not hesitate to contact me directly if you have further questions about my testimony. I can be reached via email at losborn@dreamhammer.com or by phone at (808) 554-4684.

Best regards and aloha,

A handwritten signature in black ink that reads "Lawrence E. Osborn".

Lawrence E. Osborn



Lieutenant Governor Mead Treadwell
STATE OF ALASKA

LATE

February 5, 2013

Dear Members of the 27th Hawaii State Legislature,
As chair of the Aerospace States Association, I commend the state of Hawaii for the work of the Pacific International Space Center for Exploration Systems (PISCES). We are informed routinely on its progress and my state, along with many others, have taken advantage of the venue Hawaii provides to advance U.S. aerospace leadership.

I had the privilege of visiting PISCES last spring, received a personal tour, and was truly impressed with the work and research being done to advance space exploration in your state. As a fellow major aerospace state, Alaska understands the importance of capitalizing on the opportunities of its strategic location and space assets. Alaska and Hawaii have these assets in common, and our states are uniquely positioned to benefit the whole nation as we work to achieve our full potential in space.

As you consider SB1256 and HB1419 with the requested funding allocation for PISCES, know that Hawaii has friends and supporting partners who can attest that the entire nation benefits from your work.

Sincerely,

A handwritten signature in blue ink that reads "Mead Treadwell".

Mead Treadwell
Lieutenant Governor
Chairman, Aerospace States Association