

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



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

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NEIL ABERCROMBIE
GOVERNOR

RICHARD C. LIM
DIRECTOR

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Statement of
RICHARD C. LIM
Director

Department of Business, Economic Development & Tourism

before the

HOUSE COMMITTEE ON FINANCE

Thursday, February 21, 2013

4:00 p.m.

State Capitol, Conference Room 308

in consideration of

HB 1419, HD1

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

Chair Luke, Vice Chairs Nishimoto and Johanson, and Members of the Committee. The Department of Business, Economic Development and Tourism supports the intent of HB 1419, HD1 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 Act 169 appropriated \$500,000 in initial funding for FY 2013 for PISCES operations, it is anticipated that the funds will be expended by September of this year.

The amount of \$400,000 has been requested through a Governor's Budget Message to enable PISCES to continue operations through June of 2014.

We support this bill provided that the appropriation amount does not replace or adversely impact priorities in our Executive Budget.

Thank you for the opportunity to testify on this bill.



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", is written over a horizontal line.

Elliot Holokauahi Pulham
Chairman

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

February 5, 2013

TESTIMONY SUPPORTING HOUSE 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, appearing to read "Lawrence E. Osborn". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Lawrence E. Osborn

February 11, 2013

Mr. Jim Crisafulli, Director
Office of Aerospace Development
DBEDT/State of Hawai'i
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Crisafulli and Members of the 27th Hawaii State Legislature:

I am very pleased to provide testimony in strong support of the State of Hawaii's continuing efforts through companion bills HB 1419 and SB1256, as well as through the project-specific bill SB930, to continue development and promote the evolution in capabilities of the Pacific International Space Center for Exploration Systems (PISCES) into 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. Due in large measure to the State of Hawaii's steadfast support for PISCES during the past few years - as well as that of the PISCES team, led by former NASA Flight Director Mr. Robert Kelso - PISCES has made substantial progress during the past year in laying the strategic foundation for such an ambitious endeavor. However, their efforts must continue to receive your unwavering support.

I continue to informally serve as a senior industry advisor and staunch advocate for the PISCES team; I am a sixteen-year participant in Hawaii's JUSTSAP forum (recently renamed PISA); I am currently the Chief Executive Officer of JAMSS America, Inc. (a U.S. registered aerospace company with U.S. and international contracts); I formerly served as Senior Vice President of SPACEHAB, Inc.; and, served as a former project manager within the NASA Mission Operations Directorate at the Johnson Space Center.

My continuous 46 years in the U.S. aerospace business have made me acutely aware of the unique challenges that space exploration places on human innovation as well as on the resource limitations of sponsoring federal, state and local government, private sector and university organizations. However, it is my experience that the best way to mitigate project and program costs during space exploration hardware and software product development cycles is through rigorous planning on the front end and through use of those research and testing facilities that can best represent the in-space environments within which robots and human space explorers will conduct their actual operations using these products. Hawaii and PISCES provide such a research environment!

As those whom I support within PISCES know, as a young NASA engineer during the Apollo Program, I was indeed fortunate to accompany several of the Apollo crews to the Big Island where they experienced a simulated lunar surface training environment unlike any other on Planet Earth. Each Apollo astronaut returning from the moon said that Hawaii was the most useful training environment that they experienced during their extensive geologic and surface operations training program.

With the establishment of the highly successful International Space Station Program, space utilization and exploration programs have become increasingly multinational in nature. Many nations have now executed robotic earth orbit, lunar and planetary missions; Japan has returned surface debris samples from a far-away asteroid; and NASA is currently working with other space agencies and a growing number of commercial entities planning for the next international foray beyond low earth orbit.



As an avid participant in several of these exploration initiatives, I am proud to have been a part of the evolution of Hawaii's PISCES organization and its capabilities, and I have been encouraged by the continuing and enthusiastic bipartisan support received for PISCES from your office and from the State of Hawaii's Legislature. NASA also has taken note in your collective support - as have international space agencies, private sector companies and universities - and PISCES has received contract funding over the past five years from multiple sources to support technology development projects within NASA, CSA, DLR and private sector organizations.

Within my familiar territory of Japanese industry, academia and the Japan Aerospace Exploration Agency (JAXA), I continue to speak to top management in each sector about the many opportunities for exploration technologies development, test and checkout that PISCES offers. As such, I recently coordinated the visit to PISCES test site of a lunar rover vehicle being developed by Tohoku University in Tokyo. I anticipate an ever-growing interest within Japan for collaboration with other international organizations in the utilization of Hawaii's PISCES assets going forward.

In particular, I strongly endorse the current PISCES plans to promote the use of PISCES assets in support of In-Situ Resource Utilization Projects such as those involved with research into the extraction of hydrogen and oxygen from remote terrain regolith, the use of remote terrain regolith as source material for a sustainable supply of remote surface concrete and other habitat-forming materials, the exploration of known lunar lava tubes and skylights and, of course, the eventual training of future robotic tele-operators and astronauts in the "art" and science of remote surface operations. These important projects will not only enable future space exploration missions but will simultaneously spinoff tangible benefits to the State of Hawaii and to its people in the form of resident jobs, dual-purpose "green" technologies which can be used to great economic, environmental and cultural advantage within Hawaii.

And last but most assuredly not least, the student explorers of Hawaii's K-12 schools and universities - as well as those from other states and nations - will continue to participate in and learn from the PISCES robotic and human space exploration visions and leadership, technology demonstrations and through visits to schools and lectures by visiting technical and scientific professionals in the field of space exploration. These students will have an unprecedented opportunity to participate in PISCES' outreach programs and hands-on teaching experiences as they strive to become tomorrow's space voyagers to the Moon, Asteroids, Mars, and beyond.

Jim, I applaud and encourage the continuation of your leadership and that of Hawaii's State Government in supporting our nation's space exploration program and in continuing funding support of PISCES. With its team of professionals, its access to the abundant resources of the Hawaiian Islands, and your continuing support through the passage of these three legislative bills, I am confident that PISCES has a great future ahead!

My very best wishes for your continued success,

A handwritten signature in black ink that reads "Dan A. Bland".

Dan A. Bland
Chief Executive Officer
JAMSS America, Inc.
16055 Space Center Blvd, Ste 240
Houston, Texas 77062

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

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



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
Assoc VP Community Colleges
Director, Hawaii Innovation Initiative
quigleyp@hawaii.edu
(808) 351-8499

2327 Dole Street
Honolulu, Hawai'i 96822
Telephone: (808) 956-3870
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UNIVERSITY OF HAWAII SYSTEM

Legislative Testimony

Testimony Presented Before the
House Committee on Finance
Thursday, February 21, 2013 at 4:00 p.m.
by
Donald O. Straney, Ph.D.
Chancellor, University of Hawai'i at Hilo

HB 1419 HD1 RELATING TO THE PACIFIC INTERNATIONAL SPACE CENTER
FOR EXPLORATION SYSTEMS

Chair Luke, Vice Chairs Nishimoto and Johanson and Members of the Committee:

My name is Donald Straney, Chancellor of the University of Hawai'i at Hilo (UHH). We support the intent of HB1419 HD1 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 HD1 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 HD1. Aloha.



Lieutenant Governor Mead Treadwell
STATE OF ALASKA

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

**Judith Fox-Goldstein
1236 Moku Place
Hilo, HI 96720**

TESTIMONY

February 19, 2013

Re: Testimony in support of **HB 1419** – Relating to the Pacific International Space Center for Exploration Systems (PISCES)

Dear Members of the Twenty-Seventh State Legislature:

I am grateful for the opportunity to present testimony in strong support of this legislation, which will provide funding to employ staff and purchase equipment that is critical to sustaining PISCES through FY 2014.

Our office has a long-standing involvement with the global scientific community. As the Administrative Director of the University of Hawai`i at Hilo's Conference Center, I have witnessed a rapidly expanding interest in Hawai`i as a site for scientific meetings, conferences, science-based educational programs, and business and industry initiatives related to science.

Over the past five years, interest in STEM (Science, Technology, Engineering & Math) has escalated enormously, especially as evidenced by the Hawaii's leading role in the field of robotics and scientific research. Hawai`i is fast becoming the "Super Science" Mecca of the world, and the requests for programs in this area are in high demand. If our State's economic development is not linked to STEM (Science Technology, Engineering & Math), then we will indeed be missing the proverbial boat!

As the President-Elect of the Hawaii Island Chamber of Commerce, I also see the marriage of science and technology with business and industry as the major economic driver for our state. We now must be proactive in supporting this linkage, and I believe PISCES, an initiative that our U.H. Hilo Conference Center has supported for over five years, can be the program that can achieve this goal - allowing us to SET THE STANDARDS and the DIRECTION for developing a world-class center of excellence in Hawai`i that will advance space science and research toward the "next giant leap" for humankind.

The long-standing message articulated by academia, the visitor industry, and the business community is that "*Hawaii is an outstanding destination for cutting edge research, exploration, discovery and science-related business.*" With our strategic East-West location in the Pacific, our diverse environment, multi-cultural population, strong scientific research community, and Moon and Mars-like terrain, Hawai`i presents itself like no other resource in the world!

So, the question is... ***How can we best capitalize on this?*** I strongly believe PISCES can be the answer to this vital question – developing a world-class center of excellence that will facilitate the design, testing and validation of new technologies to support both robotic and human missions to space.

PISCES can be a catalyst to serve as an economic driver for our State to help develop a clean, sustainable, and diversified aerospace industry statewide. It also is exceptionally well positioned to leverage Hawaii's strategic geographical, geological, technical, and multicultural resources toward advancing Hawaii's leadership on the frontiers of space.

I therefore am respectfully requesting your support in approving this timely legislation, and that you pass HB1419 with the full funding allocation requested.

Thank you for the opportunity to testify on this measure.

Respectfully submitted,

Judith Fox-Goldstein

Judith Fox-Goldstein, Administrative Director
University of Hawaii at Hilo Conference Center
President-Elect, Hawaii Island Chamber of Commerce

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, appearing to read "Hoyt Davidson". The signature is written in a cursive, flowing style.

Hoyt Davidson



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.
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"Fueling the Space Frontier"



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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

Ontario Drive & Gear / Argo

220 Bergey Court, New Hamburg, Ontario, Canada
N3A 2J5

Office: 519 662-2840 x360

Cell/BB: 519 505-2323



5 February 2013

**Testimony in Support of SB1256 and 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.

The enormous economic potential of space has generated a cluster of new initiatives from private industry, government agencies, and international organizations. This includes commercial companies based on the prospect of extending the economic sphere beyond Earth's orbit, and actually harvesting and utilizing resources in space. This trend is notable in the number of participating organizations. The days when the concerns of space exploration were limited to the governments of just two nations are long gone. Instead, we now have a mix of public and private, US and international. The capability to foster collaboration is an important asset in this environment.

PISCES fills an important role in pulling together multiple international partners to develop the technology for the exploration and utilization of our solar system's resources. Mauna Kea provides an important testing ground for the technology, and the Hawaiian Islands provide a convenient and attractive meeting point for participants from the US, Canada, South America, and Asia to 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



Kris Zacny, PhD
Vice President
Director, Exploration Technology Group

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mob: 510-207-4555 / blackberry: 646-508-9807 / fax: 626-689-4823
zacny@honeybeerobotics.com
<http://www.honeybeerobotics.com>

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).

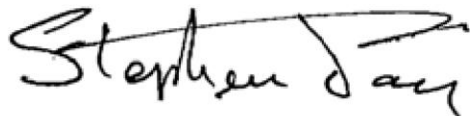
The Hawaii State Legislature has been a strong supporter of PISCES since its inception, and, as a result, PISCES has gained substantial visibility at NASA, as well as among other international Space agencies in Asia, Canada and Europe, and also has entered into research and development alliances with 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

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.

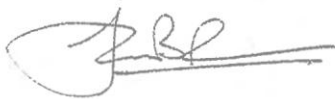
You, as our legislators, have a rare opportunity. You can help to bring the business of space exploration to Hawaii for our children. You can once and for all give them the hope, the pride and the self-confidence to compete with the best STEM centers in the country, in fact with the best STEM centers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



BUZZ ALDRIN
Astronaut

02/11/2013

Testimony in strong support of SB 930, SB 1256, and HB 1419

Statement of Buzz Aldrin, Apollo XI

To the Members of the 27th Hawaii State Legislature:

I am pleased to offer my strong endorsement of Hawaii State Bills - SB930, SB1256 and HB1419 to provide continued support for the Pacific International Space Center for Exploration Systems (PISCES).

I had the pleasure of attending the excellent PISCES 2012 Conference on the Big Island in November, and was very impressed with the potential contribution that this unique asset represents for Hawaii, the United States, and the international space community, in helping humanity prepare for our next bold frontier – the sustainable exploration, commercial development, and settlement of space. I commend this Legislative Body for their vision and commitment to support this important effort - an investment that I feel confident will be returned many fold to the great State of Hawaii.

From my own personal experience in preparing for our historic Apollo XI mission to the Moon, the ability to conduct high-fidelity simulation and training in a highly relevant environment proved to be critical to the success of our mission. Hawaii is blessed to have a landscape on the Big Island that provides an excellent analog for the lunar surface, which will enable PISCES to play a leading role in collaboration with multiple space agencies, commercial space companies, and academic institutions toward the development, testing and validation of key technologies, systems and processes that will not only advance both robotic and human missions beyond low-Earth orbit, but also spin off commercially viable processes and technologies that will dramatically enhance economic enterprise and prosperity in Hawaii.

In addition to expanding commerce on the Big Island, this enterprise will also create the need for a highly-skilled technical workforce to support this work, while simultaneously inspiring student interest in, and pursuit of, science, technology, engineering and mathematics (the “STEM” disciplines).

It is my view that future journeys into space can and will begin here in Hawaii - with innovators, scientists, technologists, and explorers from across the world conducting vital research at PISCES on the Big Island. These experiments will subsequently be operated tele-robotically from other sites around our planet to simulate the control of lunar robots on the surface of the Moon from stable orbits near our natural satellite - thus reducing the time delays associated with attempting to conduct these operations from Earth.

I expect that ultimately, this approach will enable space commerce on the surface of the Moon on a scale that we have yet to anticipate, and that PISCES will continue to serve as the premier Earth-based proving grounds for these systems for the foreseeable future.

As you may be aware, my personal long term goal for humanity is a permanent international settlement of Mars, and I believe that the best way to accomplish this will be to replicate the process we will use to achieve the vision noted above on the Moon, by exploiting the moons of Mars to conduct similar, nearly real-time tele-robotic operations on the surface of Mars.

Having led a major effort toward the development of these remarkable systems for robotic commercial lunar operations, PISCES will again be able to play a most significant and critical role in validating more advanced capabilities to conduct these operations on Mars, thus paving the way for permanent human settlement of this planet.

This approach would afford PISCES several decades of continuing pioneering research on the Big Island, and bring long-term development and prosperity to this region, and indeed to all islands of Hawaii.

By supporting PISCES through the legislation before you today, you will affirm that Hawaii can be a leader in the international exploration and development of space, which will afford exceptional economic and societal returns to humanity on Earth, as well as to this great State, and that will enhance economic prosperity and wellbeing for generations to come.

I again would, strongly encourage your continued leadership in supporting PISCES - a timely and vitally important asset for not only your State, but also the international space community.

Thank you for the opportunity to testify on this measure.

Sincerely,

A handwritten signature in black ink that reads "Buzz Aldrin". The signature is written in a cursive style and is underlined with a single horizontal line.

BUZZ ALDRIN
Apollo XI