DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

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Statement of

RICHARD C. LIM
Director
Department of Business, Economic Development & Tourism
before the

SENATE COMMITTEE ON WAYS AND MEANS

Friday, March 28, 2014
9:20 a.m.
State Capitol, Conference Room 211

in consideration of

HB 2152, HD1, SD1

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

Chair Ige, Vice Chair Kidani, and members of the Committee. The Department of Business, Economic Development and Tourism supports the intent of this bill to provide supplemental state funding to support administrative tasks, the purchase equipment, strategic program initiatives, and preliminary development of the PISCES research and development park.

This legislation builds upon and supplements funding from Act 169 from the 2012 Session and Act 273 from the 2013 Session, which established PISCES as a program administratively attached to our department through the Office of Aerospace Development. The supplemental funding requested will be critical to sustaining PISCES operations and buildout through the upcoming fiscal year.

We support this measure provided that its passage does not replace or adversely impact priorities indicated in the Executive Budget.

Thank you for the opportunity to testify on this bill.

UNIVERSITY OF HAWAI'I SYSTEM
Legislative Testimony

LATE

Testimony Presented Before the
Senate Committee on Ways and Means
March 28, 2014 at 9:20 a.m.
by
Donald 0. Straney
Chancellor, University of Hawai'i at Hilo

HB 2152 HD1 SD1 – RELATING TO THE PACIFIC INTERNATIONAL SPACE CENTER FOR EXPLORATION SYSTEMS

Chair Ige, Vice Chair Kidani and Members of the Committee:

My name is Donald Straney, Chancellor of the University of Hawai'i at Hilo (UH Hilo). We support the intent of HB 2152 HD1 SD1 to fund the Pacific International Space Center for Exploration Systems (PISCES) to support administrative and general tasks, strategic program initiatives, and the preliminary development of the PISCES research and development park.

This proposal will help to expand and diversify economic and workforce development opportunities throughout the State by promoting the establishment and growth of new sustainable and green industries, internships, and science, technology, engineering, and mathematics education programs. 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 HB 2152 HD1 SD1 provided its passage does not replace or adversely impact priorities in our BOR approved budget.

Thank you for the opportunity to testify on HB 2152 HD1 SD1. Aloha.

BUZZ ALDRIN
Astronaut

01/28/2014

Testimony in strong support of Hawaii State HB2150, HB215184, and HB2152

Statement of Buzz Aldrin, Apollo XI

To the Members of the 27th Hawaii State Legislature:

I am pleased to offer my strongest endorsement of Hawaii State Bills HB2150, HB2151, and HB2152, which will provide continued support for the Pacific International Space Center for Exploration Systems (PISCES).

I commend the Great State of Hawaii for the outstanding leadership you are demonstrating in developing and maintaining this unique and vitally important capability that will serve Hawaii, the United States, and the international space community as a premier planetary analog test bed to help prepare for humanity's next bold frontier - the scientific investigation, sustainable exploration, commercial development, and settlement of space.

One of the most important lessons learned from our remarkably successful Apollo experience was the need to conduct high-fidelity simulation and training sessions in a highly relevant analog research environment, and Hawaii provides perhaps the best site on Earth to develop, test and validate the technologies, capabilities and systems that will be required to realize the vision I have articulated above.

The investment that you are making today in supporting this urgently needed capability will undoubtedly assure Hawaii a unique leadership role in this challenging new frontier – an investment that will also contribute substantially to the economic prosperity and well being of the State, while also inspiring Hawaii's future aerospace workforce to pursue Science, Technology, Engineering and Math (STEM) related academic training in your schools and universities.

I have had the pleasure of personally attending and participating in several PISCES conferences and workshops over the past several years, and have seen, first hand, how well this new capability is coming together. As such, I urge you to continue to support its development and operations so it can achieve its full potential to meet this critical need for our space program – an investment that I am confident will be returned many fold to the great State of Hawaii.

As you may be aware, I recently published my latest book – *Mission to Mars, My Vision for Space Exploration* – in which I lay out my long term strategy for the exploration and settlement of space, as well as the steps I feel are required to implement this strategy. As I emphasize in my book, it is my view that future journeys into space can and will begin here in Hawaii - with innovators, scientists, technologist, and explorers from across the world conducting vital research at PISCES on the Big Island. These Hawaii-based 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.

Ultimately, I expect 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 ground for these systems for the foreseeable future.

In the longer term, having demonstrated the value of conducting these planetary research investigations with PISCES, I anticipate we will use these same capabilities and procedures to prepare for a permanent international settlement of Mars by exploiting the moons of Mars to conduct similar, nearly real-time tele-robotic operations on the Martian surface.

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

In support of the vision I have articulated in my new book, I have spent the past six-months meeting with senior leadership in the U.S. Administration and on the Hill, and have hosted book signings and forums all over the world. At each venue I have also made it clear that this bold journey into space can begin with PISCES and the Great State of Hawaii.

By supporting PISCES through the legislation before you today, you will affirm that Hawaii will expand its role as a leader in the international exploration and development of space, which in turn will afford exceptional economic and societal returns to humanity on Earth, as well as to the Aloha State – enhancing economic prosperity and wellbeing for generations to come.

I again, strongly encourage your continued leadership in supporting PISCES – a timely and vitally important asset not only for Hawaii, but also for our Nation and the broader international space community.

Thank you for the opportunity to testify on this important initiative.

Buzz Aldrin
Apollo XI

BUZZ ALDRIN

National Aeronautics &
Space Administration
Ames Research Center
Moffett Field, CA 94035

January 29th, 2014

Jim Crisafulli
Office of Aerospace Development
Dept. of Business, Economic Development & Tourism
State of Hawaii
Honolulu, Hawaii 96813

Dear Jim:

Per our recent discussions concerning aerospace initiatives in Hawaii, I commend your State for its visionary efforts to help grow and diversify both your local aerospace industry and our national space program. Hawaii has many diverse resources, capabilities and advantages that can positively contribute to our national space endeavors.

For example, your strategic mid-Pacific location and long-standing ties with nations across Asia and the Pacific make the islands an ideal site to support collaborative international scientific, educational, and commercial development programs related to space exploration. In particular, the Big Island's diverse volcanic terrain is most suitable for developing an analog lunar base to test and evaluate new technologies to support future robotic/human missions to the moon and Mars.

Hawaii also has resident expertise in space-related fields, with over forty NASA principal investigators at the University of Hawaii performing ongoing research in astronomy, planetary geosciences, robotics, satellite communications, laser-based power systems, and other technologies critical for supporting future space exploration missions around and beyond planet Earth.

The NASA Space Portal fully recognizes these strategic advantages, and looks forward to our continued collaboration with the State of Hawaii in advancing our nation's space exploration efforts. In my role as the NASA ex-officio member of the PISCES board, I would like to endorse the activities proposed by the three following Senate Bills that will help advance our mutual goals: H.B. No. 2152, "A Bill for An Act Relating to the Pacific International Space Center for Exploration Systems (PISCES)", H.B. No. 2150, "A Bill for an Act Relating to the PISCES Planetary Sustainability Technologies Initiative", and H.B. No. 2151, " A Bill for an Act Relating to the PISCES NASA Laser Communications Ground Station Initiative".

Sincerely and with best wishes,

Dr. Daniel J. Rasky
Director, Space Portal, NASA Research Park
Senior Scientist, NASA Ames Research Center
M/S 555-3, Moffett Field, CA 94035
Phone/fax: (650) 604-1098/4666

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

February 3, 2014

TESTIMONY IN SUPPORT OF HB2152 - 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, purchase equipment, and advance pioneering programs at the Pacific International Space Center for Exploration Systems (PISCES) during FY15.

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 led by innovative initiatives in Hawaii.

The Pacific International Space Center for Exploration Systems (PISCES), for which I formerly served 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 and Act 273 in the 2013 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, additional general and CIP funding will be critically needed to maintain PISCES operations in FY15 and advance its efforts to establish a world-class center of excellence for space research and development.

As such, I would urge you pass HB2152 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 Hawaii State Bills HB2150, 2151, and, 2152

Statement of Lewis L. Peach, Jr., NASA (retired), and PISCES Board Secretary

To the Members of the 27th Hawaii State Legislature:

I would like to thank you for the opportunity to offer my strongest endorsement for Hawaii State Bills - HB2150, 2151, and, 2152 to provide continued international leadership in space with the establishment and operation the Pacific International Space Center for Exploration Systems (PISCES).

Having been involved with the development of this exceptional capability for much of its definition and execution phases, it has been very rewarding to see it coming to fruition, so I would like to commend the Great State of Hawaii for the outstanding leadership you are demonstrating by establishing this unique and vitally important capability that will serve Hawaii, the United States, and the international space community, as a premier planetary analog test bed to help prepare for humanity's next bold frontier - the scientific investigation, sustainable exploration, commercial development, and settlement of space.

If the unfortunate circumstances of our Nation's involvement in two World Wars helped establish America as a world super power, certainly our Nation's leadership in space has cemented the US as the technological leader and economic power that has enhanced the quality, prosperity, and well being of our Nation for more than five decades.

Many of the products and services that we now take for granted have direct origins to the technological and scientific advances that resulted from our leadership in space, and this relatively modest investment in our future has provided an exceptional returns that far outweigh their costs.

During my tenure as Director of Advanced Programs at NASA, I co-founded the NASA/NSF Antarctic Analog Program, which continues to serve the international space community as an important capability to validate some of the scientific investigations we will undertake in planetary science for the foreseeable future. Many of NASA's current leaders in planetary science participated in these investigations over the past nearly 25-years since it's founding in 1990.

I also supported other analog research in the northern arctic regions, and in the desert southwest, as well as at most of the NASA centers, as we have found that it is essential to conduct high-fidelity technology development and scientific research investigations in a highly relevant analog research environment.

Fortunately, Hawaii provides one of the very best analog sites to develop, test

and validate the technologies, capabilities and systems that will be required to realize conduct the future scientific and human exploration missions that are being planned within NASA, and by our international space partners, as well as by a growing and vigorous commercial space community.

By virtue of the investments that you are making today in supporting this unique and urgently needed capability, PISCES will undoubtedly help assure Hawaii's leadership role in this challenging new frontier, an investment that will also contribute substantially the economic prosperity and well being of the State, while also inspiring the State's future aerospace workforce to pursue Science, Technology, Engineering and Math (STEM) related academic training in your schools and universities.

I would like to close by thanking you for the opportunity to serve as Secretary to the PISCES Board of Directors, and again , strongly encourage your continued leadership in supporting PISCES - a timely and vitally important asset for not only your State, but also for our Nation, and for the broader international space community.

Thank you for the opportunity to testify on this important Legislation and opportunity for Hawaii, and for our Nation.

Lewis L. Peach Jr.

Lewis L. Peach, Jr.
Aerospace Consultant
Former Director, Advanced Programs, NASA (retired)
Secretary, PISCES Board of Directors

JAMSS AMERICA INC.
16055 Space Center Blvd. Suite 240 Houston, Texas 77062 • Tel: (281) 461-3700 • Fax: (281) 461-3776

January 29, 2014

Mr. Jim Crisafulli, Director
Office of Aerospace Development
Strategic Industries Division
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 efforts through Senate bills HB2150, HB 2151 and HB 2152 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 five years - as well as that of the PISCES team, led by former NASA Flight Director Mr. Robert Kelso - PISCES continues to make notable progress in laying the strategic foundation for such an ambitious endeavor, including endorsements by NASA, Google, Planetary Power, and other private sector and academic organizations involved in development of technologies that will be enabling to lunar and planetary exploration as well as to the future environmental and economic well being of the State of Hawaii. 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 seventeen-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 47 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 provides 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. To a crewmember, 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; ESA is within months of landing a robotic spacecraft on a comet; China has landed a robotic spacecraft on the lunar surface; India has a robotic spacecraft en route to Mars; and NASA is currently working with other space agencies and a growing number of commercial entities planning for

the start of expeditions to other worlds using their new Orion Spacecraft and mammoth Space Launch System rocket.

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. 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 basaltic-based construction materials, in-situ resources utilization and integrated resources extraction technologies, a planetary analog test site, a secondary school's lunar surface flight experiment, and an international robotics mining competition. Additionally, PISCES plans to develop and beneficially exploit the applications of self-sufficient technologies in renewable energy, water reclamation and basaltic construction will inevitably result in benefits to local, State and National ground and space-based scientific, technological, educational and economic interests. Lastly, the development of a laser communications technology research center in Hawaii will further solidify Hawaii's and PISCES's reputation as forward thinking entities who intend to position themselves at the forefront of our nations efforts to directly improve life on Earth while developing technologies essential to robotic and human exploration of the cosmos. The increasing number of cash and in-kind and "investors" in PISCES programs including NASA, the State of California and Google among others is further evidence of the return-on-investment the State of Hawaii is receiving for its funding support to PISCES through the passage of bills such as those currently being considered.

Jim, and Rob Kelso, I applaud and encourage the continuation of your Hawaii aerospace and PISCES leadership. I also encourage the Hawaii State Government to continue its support of our nation's space exploration program through continuing funding support of PISCES. With the PISCES team of professionals and its access to the abundant resources of the Hawaiian Islands, along with 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,

Dan A. Bland

Chief Executive Officer
JAMSS America, Inc.
16055 Space Center Blvd.
Houston, Texas 77062

LAND USE RESEARCH
FOUNDATION OF HAWAII
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March 25, 2014

Senator David Y. Ige, Chair
Senator Michelle N. Kidani, Vice Chair
Senate Committee on Ways and Means

Testimony in Support of HB 2152, HD1, SD1 Relating to the Pacific International Space Center for Exploration Systems' ("PISCES") (Appropriates funds to the PISCES program to support administrative and general tasks, strategic program initiatives, and the preliminary development of the PISCES' research and development park. Effective January 20, 2050).

Friday, March 28, 2014, 9: 20 a.m., in Conference Room 211

The Land Use Research Foundation of Hawaii (LURF) is a private, non-profit research and trade association whose members include major Hawaii landowners, developers and a utility company. LURF's mission is to advocate for reasonable, rational and equitable land use planning, legislation and regulations that encourage well-planned economic growth and development, while safeguarding Hawaii's significant natural and cultural resources, and public health and safety.

LURF **supports HB 2152, HD1, SD1**.

HB 2152, HD1, SD1 The purpose and intent of this measure is to appropriate funds to the PISCES project to support administrative and general tasks, strategic program initiatives, and the preliminary development of the PISCES' research and development park. The effective date for this measure is January 20, 2050.

LURF's Position. The Legislature established PISCES through Act 169 (SLH 2012), to leverage Hawaii's substantial assets and capabilities in the space industry to advance our national space program and provide unique opportunities to expand and diversify technology-based enterprise and education in the State of Hawaii.

LURF supports PISCES, which will develop a world-class center of excellence in Hawaii that can facilitate the design, testing, and validation of new technologies to support robotic and human missions to space. In so doing, PISCES can 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 science, technology, engineering, and mathematics education programs.

Thank you for the opportunity to present testimony in support of this measure.