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ECONOMIC DEVELOPMENT & TOURISM**

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Statement of
LUIS P. SALAVERIA
Director
Department of Business, Economic Development & Tourism
before the
HOUSE COMMITTEE ON ECONOMIC DEVELOPMENT AND BUSINESS
Wednesday, February 8, 2017
9:00 a.m.
State Capitol, Conference Room 309
in consideration of
HB 960
RELATING TO THE MULTINATIONAL LUNAR ARCHITECTURE ALLIANCE.

Chair Nakashima, Vice Chair Keohokalole, and Members of the Committee. The Department of Business, Economic Development and Tourism **supports the intent** of this bill. However, DBEDT recommends that the content of the bill would be more appropriately addressed in a Resolution.

The bill would establish a multinational team comprised of representatives from governments, industry, and universities around the planet to provide recommendations and guidance for development of a prototype lunar base on the Island of Hawaii that may be discussed at a proposed International Lunar Development Summit in Hawaii in fall of 2017.

The proposed Multinational Lunar Architecture Alliance (MLAA) would provide a framework for government, industry, and universities representatives to explore options for developing these prototype structures and technologies, which in turn could be tested and validated on the Island of Hawaii's lunar-like terrain (for eventual deployment on the Moon).

The proposed international lunar summit in Hawaii this fall would provide an opportunity to convene the MLAA to help launch the design and implementation of the prototype lunar structures and technologies, and would include site visits to possible prototype habitat sites at the Pohakuloa Training Area.

DBEDT supports the intent of this measure, but requests that the content be addressed in a Resolution. Thank you for the opportunity to testify on this bill.



The Aerospace States Association

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Members of the Hawaii State Legislature House Bill 960 RELATING TO THE MULTINATIONAL LUNAR ARCHITECTURE ALLIANCE.

On behalf of the Aerospace States Association and state Lieutenant Governors I am pleased to provide this testimony for your consideration.

The Aerospace States Association is a nonpartisan organization of Lieutenant Governors and other top-ranking leaders from every state that represents states' interests in federal aerospace and aviation policy development. Our overall goal is to help promote and synergize state assets and capabilities in ways that can strengthen and diversify U.S. leadership in this industry.

ASA's Space Committee has proposed a series of recommendations to advance our national space program. To achieve these goals, we believe our nation needs to embrace a collaborative, multinational vision for space exploration – one that incorporates the extensive knowledge, resources and capabilities developed through our nation's historic space missions, along with the substantial experience and achievements of other space-faring nations.

We also must leverage the substantial assets, expertise and entrepreneurial spirit of our private sector in pioneering the space frontier – not only to maximize the potential benefits from research and exploration, but also to facilitate development and utilization of extraterrestrial resources that can benefit people on Earth, as well as support long-term voyages to and settlements on other planets.

The bill before you today is consistent with our goals and objectives.

Sincerely,

Charles H. Huettner, Executive Director



International Lunar Decade Working Group

www.ildwg.wordpress.com

Multinational Lunar Architecture Alliance

Testimony in strong support of House Bill 960 and Senate Bill 1246

February 6, 2017

Members of the Twenty-Ninth Hawaii State Legislature
State of Hawaii

Dear Hawaii State Senators and Representatives:

As a member of the International Lunar Decade Working Group (ILDWG) that was formed in November of 2014 during the “Next Giant Leap: Leveraging Lunar Assets for Sustainable Pathways to Space” conference, I (and my colleagues at the FOTONIKA Research Center in Latvia) urge you to pass House Bill 960 and Senate Bill 1246.

The central premise of the International Lunar Decade (ILD) is that *international collaboration in space enterprise can help build the foundations for a self-sustaining space economy on space-based resources – to live “off the land”, rather than the tax dollar.*

The proposed Multinational Lunar Architecture Alliance and international lunar development summit in Hawaii (fall of 2017) outlined in this legislation will engage some of the world’s most innovative and influential people involved in space enterprise. These efforts are being designed to help participants launch a sustained return to the Moon, and the lunar architecture developed through these discussions will enable governments, research centers, and aerospace corporations to collaborate toward achieving this goal.

We strongly believe a return to the Moon could enable a self-sustaining space economy that would drive increasing private investments in space, as well as significantly enhance the value and capabilities of firms in the aerospace sector. A self-sustaining space economy would demonstrate long-term sustained growth from an increasing range of activities in space, characterized by declining costs, lower levels of risk, and the emergence and profitability of markets for products made from space resources.

Centrally located in the Pacific, Hawaii is ideally located to help bring together people from East and West to build a better future for all humankind. The proposed multinational lunar architecture and international lunar summit will clearly enable transformative step towards a “giant leap” for all mankind when people will walk, work and play on the Moon – ultimately reaching for the stars, and beyond!

Sincerely,

Vidvuds Beldavs, Strategist
FOTONIKA Research Center
University of Latvia



February 5, 2017

Testimony in Strong Support of HB960/SB1246

Members of the Hawaii State Legislature:

The National Space Society's vision and mission are the human settlement of space and the use of space resources for the benefit of humankind. NSS also supports the concept of an International Lunar Decade of cooperative and collaborative efforts to return humans to the Moon permanently, as well as to establish a thriving economy based on the usage of lunar resources. These ideas are elaborated in the NSS position paper, U.S. Development and Settlement of the Moon and Near Earth Asteroids ([http://www.nss.org/legislative/positions/NSS Paper Development of Moon and NE Os 2015.pdf](http://www.nss.org/legislative/positions/NSS_Paper_Development_of_Moon_and_NE_Os_2015.pdf)) . We are aware of legislation currently under consideration by the Hawaii State Legislature that would support these efforts – namely, HB 960 (A Bill for An Act Relating to the Multinational Lunar Architecture Alliance) and SB 1246 (A Bill for An Act Relating to the Multinational Lunar Architecture Alliance).

The development of a multi-national team to provide recommendations and guidance for a proposed lunar architecture on the island of Hawaii and the conduct of an International Lunar Summit meeting in October 2017 are initiatives that would further the permanent return of humans to the Moon and also advance NASA's space exploration goals, as well as engender international support for these objectives through engagement of multinational partners. Hawaii has unique assets to support these efforts, including its Lunar and Mars analog terrain, its astronomical community, its strong academic institutions, its strong international connections, and ongoing collaborative agreements with NASA.

As Executive Vice President of the National Space Society, and Chair of the NSS Policy Committee I have observed the high level of interest in collaboration in space exploration efforts. The objectives of this proposed legislation are strongly supported by the National Space Society, which has established a long-standing working relationship with the Hawaii Office of Aerospace Development. We are also most pleased to see the forward thinking and planning that sets the stage for a return to the Moon.

Respectfully,

A handwritten signature in black ink that reads 'Dale L. Skran'. The signature is written in a cursive style with a large, sweeping initial 'D'.

Dale L. Skran
Executive Vice President
National Space Society

TESTIMONY IN STRONG SUPPORT OF HB960/SB1246

February 8, 2017

Members of the 29 th Hawaii State Legislature

Aloha Hawaii State Senators and Representatives,

I'm currently leading the Stakeholder Engagement Working Group for the European Space Agency's Moon Village initiative and am happy to provide my strong support for HB960/SB1246 which would help establish a Multinational Lunar Architecture Alliance, coordinated through the Hawaii Office of Aerospace Development, to identify the goals, challenges, and methodologies for promoting the development and implementation of prototype habitats and technologies to support a sustainable return to the Moon.

This is a very timely action. There are several nations and commercial companies planning independent programs that target the Moon in the near and mid term, providing us with the opportunity to engage them under a shared and peaceful vision - a low-cost Moon Village. At a moment in history that's likely to be remembered for its alarming divisiveness, the space community has the unique opportunity to coordinate efforts to create a powerful symbol of unity - a partnership wider and stronger than the International Space Station - promoting cultural inclusivity.

However, the expensive, traditional approach to space, involving large, expensive, monolithic infrastructures, has not worked in the past, and is even less likely to work now. We need smaller initiatives on shorter timelines that have relevance to current day needs on Earth. If the Moon Village efforts was broken up into small chunks of capabilities which could be easily completed (even by students) and easily funded, there would be a good chance for success. Therefore, cooperation involving small, low-cost initiatives could enable a major step toward exciting and meaningful participation from all over the world. The proposed Multinational Lunar Architecture Alliance is one of these initiatives that could have a real impact in turning the Moon Village vision into reality.

Therefore I strongly recommend passage of this timely legislation and would be happy to address any further questions regarding my recommendation.

Kind regards,
Angeliki Kapoglou,
Strategist, Moon Village Stakeholder Engagement Working Group





Moon Base Hawaii

Since the dawn of man, humans have explored and colonized the ends of the Earth. The farthest and most difficult place to reach on planet Earth was Hawai'i. It took mastery of celestial navigation, double-hulled dugout canoes, and the unmatched fortitude to sail across Open Ocean and reach uncharted islands thousands of miles from the nearest land.

Today, Hawai'i has a diverse culture. The spirit of Aloha is real. People from all over the world have come to live in Hawaii in peace and harmony. This is the future culture of the Moon. People going to the Moon should first spend time immersed in Hawaii culture.

Hawaii has the closest geology to the Moon found anywhere on Earth. We can test robotically building structures using the lunar-like regolith that makes up our volcanoes. We are securing sites to build both a full size lunar base using existing building techniques as well as develop the techniques to utilize “in situ” (in this case, “stuff” found on the Moon) building materials for lunar habitat construction.

Hawaii is at the forefront of project-based education. We have won many international robotics championships. Our High School and University students are ready to handle the job of creating robots that will build a Moon Base. The average age of the engineer on the Apollo missions was 26. This means they were 16 when Kennedy gave his famous “We go to the Moon not because it’s easy. We go because it’s hard.” speech.

It’s time for our youth to claim a piece of the future. It’s time for them to have a worthy goal. It’s time for Hawaii to take leadership of a really big project. Accomplishing this undertaking will forever change the way people of the world think of Hawaii. It will become a place where amazing projects can be achieved. It will be to Hawai’i what Apollo was to America.

Hawaii is the closest state to the equator. It is an ideal site for small satellite launches. Such launch capability is all we need to send small payloads to low earth orbit and to the Moon. We can build robots, test robots and even launch the robots that will build the first Moon Base.

Hawaii is US territory. We have the advantages of being in the United States while still having close ties to Asia. NASA has the problem of being tied to the political whims of the administration in Washington. Hawaii is not bound by these political headwinds. We can and will include every country in our plans. The influx of robotic and construction technologies will be priceless.

It is up to us to invite all of the participants, mainland and international, public and private, who have stated that they are going to the Moon (and there are many) to build a prototype lunar settlement in Hawai'i and an actual Moon Base on the Moon.

If we can bring this project to Hawai'i, we will forever change the way people of the world see Hawaii. We can become the next space exploration center of the world. We can and therefore we must!

Aloha,

Henk B. Rogers

Chairman, PISCES (Pacific International Space Center
for Exploration Systems)

Chairman, Blue Planet Foundation

Chairman & CEO, Blue Planet Energy

Chairman, Blue Startups

Chairman, Blue Planet Software

Director, The Tetris Company

Crewmember, Hokule'a

TESTIMONY IN STRONG SUPPORT OF HB960

February 6, 2017

Members of the 29th Hawai'i State Legislature:

I am very pleased and excited to provide testimony in strong support of the efforts by the State of Hawai'i, through HB960, to establish the Multinational Lunar Architecture Alliance (MLAA) to plan and coordinate the development of the prototype lunar base architecture on Hawai'i Island. This MLAA initiative is an innovative, logical and timely follow-on to the prior establishment by the Hawai'i State Legislature of the Pacific International Space Center for Exploration Systems (PISCES). I believe that the MLAA can play a vital role in support of the U.S. and international space faring community's renewed interest in establishment of a robust, commercially stimulated Earth-lunar space economy which, for reasons well elucidated by the language within this Bill, can be of immediate and sustained benefit to the State of Hawai'i as well as to all MLAA members in their respective public and private sectors.

As a former NASA mission operations engineer and manager, I was directly involved in lunar geology and remote surface operations training of the Apollo astronauts on Hawai'i island. Since that historically auspicious time for the State of Hawai'i almost five decades ago, I have been actively and continuously involved in U.S. and international public and private sector human space initiatives at the project, program and administrative management level, including the Apollo-Soyuz, Space Shuttle, SPACEHAB and ISS Programs. Most recently, I served as President, then CEO of the American subsidiary of the Japan Manned Space Systems Corporation (JAMSS America, Inc.) supporting the human space initiatives of the Japan Aerospace Exploration Agency (JAXA). It was in this capacity, working closely with the State of Hawai'i Office of Aerospace Development (OAD) and the University of Hawai'i in Hilo, that I was a co-founder of PISCES. I continue to be the Senior Advisor to JAMSS America, Inc. and to vigorously support the stellar efforts of OAD to promote aerospace technology and applications development within the State of Hawai'i as well as to advocate forward-thinking, lunar/planetary human exploration initiatives such as MLAA!

The ongoing and highly successful International Space Station Program has facilitated an era of public-private partnerships which are increasingly multinational in nature. Agencies and commercial companies within leading space-faring nations have now executed numerous cooperative human and robotic Earth orbit, lunar and planetary missions: Japan has returned surface debris samples from a far away asteroid; ESA has landed a robotic spacecraft on a comet; China has landed a robotic spacecraft on the lunar surface; India has sent a robotic spacecraft to Mars; and NASA is currently working with other space agencies and a growing number of commercial entities planning for the start of human expeditions back to the Moon and onward to other worlds beyond using NASA's Orion Spacecraft and Space Launch System assets as well as those spacecraft and launch system assets to be provided by U.S. commercial and international space organizations. This HB960 legislation and its MLAA development strategy aligns perfectly in support of this confluence of traditional, agency-centric core program planning with private sector (aka "new-space") technology innovations

and cost-effective commercial practices.

I applaud and support this proposed legislation and encourage the continuation of the long legacy of aerospace leadership within Hawai'i. I also encourage the Hawaii State Government to continue its support of our nation's space exploration programs through continuing funding support of OAD, PISCES and the Hawai'i Space Exploration and Analog Simulation Program. Given the increasingly large team of home-grown professionals within Hawai'i that such advocacy promotes, along with the surety of all MLAA participants' appreciation for and investment in the abundant, "other-worldly" terrestrial resources of the Hawaiian Islands, I am confident in your majority support for the passage of HB960.

With an abundance of gratitude and admiration to the State of Hawai'i for its continued support of human space exploration of the Moon and beyond,

A handwritten signature in cursive script that reads "Dan A. Bland". The signature is written in dark ink and is positioned above the typed name and title.

Dan A. Bland
Senior Advisor to JAMSS America, Inc.
PISCES Co-Founder

TESTIMONY IN STRONG SUPPORT OF HB960

February 5, 2017

Members of the 29th Hawaii State Legislature
Hawaii State Capitol
Honolulu, Hawaii 96813

Aloha Hawaii State Senators and Representatives:

I am pleased to present this testimony in strong support of HB960/SR1246, which would help establish a Multinational Lunar Architecture Alliance, coordinated through the Hawaii Office of Aerospace Development, to identify the goals, challenges, and methodologies for promoting the development and implementation of prototype habitats and technologies to support a sustainable return to the Moon.

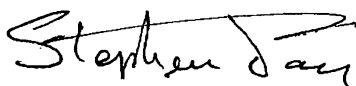
As a former Chairman of both the Japan-U.S. Science, Technology, and Space Applications Program (JUSTSAP), the Hawaii Aerospace Advisory Committee (HAAC), and a primary instigator of the Pacific International Space Exploration Systems (PISCES) based on the Big Island, I have engaged in numerous multinational programs enabling opportunities to leverage Hawaii's Moon-like terrain, resident scientific and technological expertise, and numerous research alliances with space-faring nations throughout the Asia-Pacific region and Europe (e.g. ESA) to advance the exploration and utilization of space beyond low-Earth orbit.

The Moon provides a logical near-term destination for future space enterprise that can serve as a testbed for a broad range of technologies, including robotics, IT, renewable energy, broadband telecommunications, additive manufacturing (3-D printing), *in-situ* resource utilization. These same technologies, once tested and validated in the lunar environment, could be applied to significantly improve the technological competitive position of the State and the U.S. In fact, PISCES is particularly well positioned to attract further investment from a variety of Space related organizations – thus helping to build a critical mass for Space related technology and development in Hawaii.

National space agencies worldwide, along with major aerospace corporations, research institutions, and leading universities, have expressed strong interest in supporting a return to the Moon - and Hawaii is exceptionally well positioned to both contribute to and benefit from this movement. The aerospace press has recently reported that there is an emerging and growing interest by the new Administration in Washington of a return to the Moon involving NASA **and** the private sector.

As such, I strongly recommend passage (and possible funding) of this timely legislation, and would be happy to address any questions from your committees concerning this recommendation.

With Aloha,

A handwritten signature in black ink that reads "Stephen Day". The signature is written in a cursive, flowing style.

Stephen Day