NEIL ABERCROMBIE
GOVERNOR

RICHARD C. LIM
DIRECTOR

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

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

Telephone: (808) 586-2355
Fax: (808) 586-2377

Statement of

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

before the

HOUSE COMMITTEE ON FINANCE

Thursday, April 7, 2011
(time)
State Capitol, Conference Room 308

in consideration of

SB 165 SD2, HD1
RELATING TO AEROSPACE DEVELOPMENT.

Chair Oshiro, Vice Chair Lee, and members of the Committee. The department supports SB 165 SD2, HD1 to promote the continuing development of the aerospace industry in Hawaii by providing funding for office of aerospace development (OAD) and the key initiatives it supports. Several of these programs afford significant opportunities to generate matching federal and private sector funds, such as the International Lunar Research Park (ILRP) initiative, being developed through a partnership among OAD, the National Aeronautics and Space Administration (NASA), the Pacific International Space Center for Exploration Systems (PISCES) at the University of Hawaii at Hilo, and the Pacific International Space Alliance (for which OAD serves as secretariat).

NASA is currently crafting a new roadmap for space exploration – one that embraces

interdisciplinary research and development, forged through public-private partnerships and multinational alliances, that can lead humankind back to the Moon, to asteroids, to Mars and other destinations within our Solar System.

Recognizing Hawaii's exceptional ability to help advance these goals, NASA has awarded a grant to OAD to help seed development of the ILRP – a multinational research park on the Moon, prototyped through analog facilities in Hawaii, that will constitute humankind's first sustainable settlement beyond the Earth. Our State's strategic mid-Pacific location, Moon-like terrain, and extensive partnerships with space agencies and research institutions throughout Asia and the Pacific uniquely qualify Hawaii to lead this pioneering effort.

Funding appropriate through SB 165 will provide the critical support needed to sustain both PISCES and PISA operations throughout the coming year, leading to the formal inauguration of the ILRP initiative at the 2011 PISA Symposium in Hawaii this November. It also will enable OAD to represent our State at strategic ILRP planning meetings at NASA centers, national research laboratories, and international aerospace symposia, as well as to seed partnerships with major aerospace corporations and philanthropic institutions nationwide to secure private sector support for ILRP development.

At a time when declining revenues are creating significant financial challenges for residents statewide, we need to pursue job-creating, income-generating programs that can rejuvenate our economy. With very modest up-front investments, the ILRP initiative will bring substantial and sustainable scientific, educational and commercial returns to Hawaii, as well as enhance our State's role as both a major contributor to and beneficiary of global space enterprise. As such, I respectfully request your committee's support for this legislation.

Thank you for the opportunity to testify on this bill.

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

TESTIMONY

February 4, 2011

Re: Testimony in support of SB 165 and SB 1496 relating to Aerospace Development and Enterprise Zones

Dear Members of the Twenty-Sixth Legislature:

I am writing this testimonial in strong support of two very important and related measures this Session – SB 165 and SB 1496 – which together will provide *unprecedented* opportunities for our State to lead pioneering efforts in the exploration and utilization of space, as well as to benefit from the substantial scientific, educational and commercial opportunities these programs will bring to Hawaii residents.

As I know many of you appreciate, and as noted in these measures, aerospace is a strategic and timely growth industry for Hawaii. Our unique mid-Pacific location, Moon and Mars-like terrain, substantial resident expertise in a broad range of scientific and engineering disciplines, and both academic and business partnerships with nations throughout Asia and the Pacific, clearly afford multiple assets and capabilities that can be leveraged to realize humankind's full potential in space, and in so doing engage our State as both a major contributor to and beneficiary of global space enterprise.

Since its inception in 2007, the Office of Aerospace Development (OAD) at the Dept. of Business, Economic Development and Tourism has played a major role in both facilitating and coordinating aerospace activities statewide, including major international conferences and workshops, multinational space agreements and coalitions, STEM education and public outreach programs, and the development and implementation of space exploration centers. In doing so, OAD has established extensive networks with state, national and international aerospace institutions and organizations, and is now well positioned to leverage Hawaii's strategic advantages in this industry to expand and diversify Hawaii's leadership on the space frontier.

For example, the National Aeronautics and Space Administration (NASA) is currently crafting a new roadmap for space exploration – one that embraces interdisciplinary research and development, forged through public-private partnerships and multinational alliances, that can lead us back to the Moon, to asteroids, to Mars and beyond. To succeed in this effort, considerable resources will need to be devoted to the design, testing and evaluation of new technologies to support both robotic and human missions to space; to training the next generation of scientists, engineers and entrepreneurs that will implement these missions; and to empowering the public to participate in these adventures.

Recognizing Hawaii's exceptional ability to help achieve all of these goals, NASA has contracted with OAD to develop a *multinational model* for a *sustainable settlement beyond low-Earth orbit* – a permanent human presence in space that is a core objective of both President Obama's National Space Policy and the 2010 Congressional NASA Authorization Act. The model is being designed in collaboration with the Pacific International Space Center for Exploration Systems, or PISCES (which OAD helped establish at the University of Hawaii at Hilo), and is focusing on development of an International Lunar Research Park (ILRP) on the Moon that would be that would be operated by a consortium of space-faring nations from around the world.

The ILRP will be implemented in three phases, beginning with development of a prototype lunar base at PISCES to test and evaluate innovative robotic, communications, and other technologies required to establish and sustain a long-term settlement on the Moon, as well as to train the scientists, engineers, and other professionals that would develop and utilize the proposed lunar outpost.

The second phase will involve implementing a "robotic village" on the lunar surface - building upon unmanned missions currently under development at NASA and other space agencies, as well as commercial efforts championed by Google Lunar X-Prize contestants and other entrepreneurial ventures. Robots in the village would be teleoperated from Earth, and provide a unique capability for scientists, educators and students in Hawaii to explore the lunar surface and conduct groundbreaking experiments.

The final phase would include the full build-out of sustainable robotic and human modules on the lunar surface, including a platform for atmosphere-free observations of our Earth, Sun and other planets within our solar system; comets and asteroids that potentially could strike Earth; and galaxies at the very edge of the universe. These modules would also facilitate mining of the lunar regolith to spur space commerce, an outpost for media to enhance public awareness of the benefits of space exploration, a profitable destination for space tourism, a staging ground for both robotic and human missions to asteroids, Mars, and other "deep space" bodies, and a testbed for advanced technologies that eventually would enable pioneering voyages beyond our solar system.

I serve as the United States Advisor to the Japan-U.S. Science, Technology & Space Applications Program (JUSTSAP), which is the international body that worked with OAD to develop the PISCES concept for the State of Hawaii. To facilitate the development and implementation of the ILRP, we are now expanding JUSTSAP into a Pacific International Space Alliance (or "PISA") that will provide a unique forum, headquartered in Hawaii, through which government, industry and university representatives from nations worldwide will collaborate to fund and construct the prototype ILRP facilities and programs in Hawaii.

I receive no compensation for this effort. I have been involved in excess of 15 years, because I truly feel that aerospace can be an important part of Hawaii's future and that we must not lose this opportunity.

I firmly believe the ILRP and PISA represent exceptional and timely opportunities for our State that will advance space science, education and commercial development in the islands, as well as extend and sustain Hawaii's leadership role in the exploration and settlement of space. But to realize these substantial benefits, we must proactively resolve to nurture our State's full potential in aerospace.

Funding appropriate through SB 165 will allow OAD to support the development of ILRP prototype facilities at PISCES over the coming year, as well as launch the Pacific International Space Alliance (for which it serves as Secretariat) through a multinational symposium on the island of Hawaii this November. It also will enable OAD to represent our State at strategic aerospace planning meetings at NASA Headquarters and regional space centers, develop strategic partnerships with major aerospace corporations nationwide, and provide community outreach programs that can inspire Hawaii's youth to pursue both STEM-related educational programs and associated career opportunities.

Establishing the development and operation of space exploration and lunar research related activities as eligible business activities for an Enterprise Zone in Hawaii (through SB 1496) is also critical to encourage aerospace companies to invest in the development and implementation of the ILRP prototype modules at PISCES, as well as to support affiliated research and development programs at the University of Hawaii at Hilo.

At a time when declining commercial activity and soaring budget deficits are creating significant financial challenges for residents statewide, we need to pursue innovative and sustainable measures that can rejuvenate our economy. *I believe the key to reversing our current economic downturn is to invest in Hawaii's future* – providing measured and sustained support for strategic growth industries that have strong potential for job creation, revenue generation, and expanding our technologically-skilled workforce.

I believe aerospace is precisely this type of industry for Hawaii, and as such would urge you to pass this timely legislation.

Thank you for the opportunity to provide these comments.

Sincerely,

George R. Ariyoshi

GRA:khy

PISCES | Pacific International Space Center for Exploration Systems

TESTIMONY

Date: February 9, 2011
To: Members of the Twenty-Sixth Hawaii State Legislature
From: Dr. Frank Schowengerdt
Subj: Testimony in Support of SB112, SB165 and SB1496

I write in strong support of the aerospace-related bills SB112, SB165 and SB1496. These bills deal with a commercial spaceport license for Hawaii from the FAA; funding for the Office of Aerospace Development (OAD), the Pacific International Space Center for Exploration Systems (PISCES) and the Pacific International Space Alliance (PISA); and inclusion of space exploration and lunar research activities as eligible business activities for enterprise zones in Hawaii.

A measure similar to SB112 was passed in the 2009 legislature, but Hawaii's former Administration did not release funding appropriated through this bill. While commercial space transportation represents a long-range economic development opportunity, it is important that the licensing process begin now so that your state will be ready to launch (literally!) when the technology for sub-orbital point-to-point transportation matures. Other states are much further along in this process than Hawaii, even though your State has many demonstrable advantages over the others. In addition, private investors critical to developing the commercial space transportation network will send their dollars to states that have demonstrated both an interest in and commitment to grow this industry. The best way Hawaii can evidence this interest and commitment is by funding the environmental studies required to obtain a commercial spaceport license from the Federal Aviation Administration. SB 112 will provide the critical funds needed for this purpose.

For the past four years, your State Office of Aerospace Development (OAD), created through State statute, has been working to promote Hawaii's future in aerospace. Hawaii clearly has significant advantages in terms of location, geographical resources and international connectivity that well position aerospace as a strategic growth industry for your State. This is one of the most progressive and forward-looking industries in the world, and Hawaii can play a leadership role, both for our nation and the global space community, in pioneering new vistas for aviation, aeronautics, and space exploration. But to succeed in this endeavor, OAD needs adequate funding and staff support, and SB 165 would provide what I feel is the minimum amount of support this office requires to responsibly carry out its mandate - especially when other states, with significantly fewer advantages than Hawaii, are moving aggressively to expand their aerospace programs as drivers for economic development.

PISCES is one of the unqualified success stories of OAD's efforts to make a mark in space exploration. Through its testing, research, education and public outreach activities, PISCES has put Hawaii on the map in a way that no other activity has in this area. Tests at our site on the lower slopes of Mauna Kea have brought hundreds of scientists, engineers, technicians, government officials, public figures and members of the news media to the Big Island in recent years, and have injected millions of dollars into Hawaii's economy. The tests at PISCES also have demonstrated many new technologies that can help sustain life on the Moon and beyond, but again, which will also benefit the local economy.

For example, during the 2010 tests powerful solar concentrators were used to process the lunar-like soil at the PISCES test site in the same way that they will be used on the Moon to extract oxygen and water for life support. This and similar technology can help make Hawaii more energy-independent through widespread application of solar power in residential and commercial buildings. In addition, technologies tested at PISCES involving communication, robotics, and materials processing can help provide sustainable, high-paying jobs in non-polluting industries that are crucial to economic development in the State. We are also currently planning a robotics challenge involving students and a ground-penetrating radar study at our test site, in addition to a proposed life-support habitat for a human-factors study of interest to NASA.

Support of PISCES through SB165 will also enable us to move forward on developing the International Lunar Research Park (ILRP) initiative on the University of Hawaii at Hilo campus. The prototype ILRP to be developed on the Big Island (simulating one to eventually be deployed on the lunar surface) will provide the space, infrastructure and field areas needed to develop and test technologies for sustaining life on the Moon and beyond, while spinning off technologies to benefit the local economy.

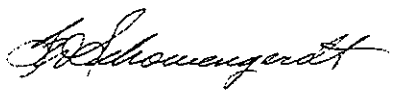
The ILRP will be built in or adjacent to the existing Science and Technology Park at the university, where the base facilities for many of the Mauna Kea telescopes are located, and would be part of the enterprise zone as requested in SB1496. With this designation, companies could lease space in the park to conduct research with government and university personnel, developing and validating technologies that will figure prominently in their business plans for space commerce. The ILRP has received enthusiastic response both inside and outside of NASA, and will be the subject of a workshop at NASA Ames Research Center on April 5th of this year involving such space luminaries as Buzz Aldrin and high-ranking officials from space companies and international space agencies.

In summary, I believe the State of Hawaii could find no better area for economic development to complement its existing traditional sectors than aerospace. This industry produces jobs that pay roughly twice the U.S. national average, that are clean and attractive, and that cannot be outsourced to other countries. In fact, the space exploration activities in which we are currently engaged and that are supported through this legislation can attract people and businesses from all over the world.

We have already demonstrated this at PISCES by bringing in sustained business from the Canadian and German space agencies, in addition to research support from NASA. Rather than competing with current economic drivers in Hawaii such as tourism and agriculture, aerospace activities will attract more tourists to the Big Island to see what it will be like to live and work on the Moon, and will contribute new technologies to the agriculture sector as spin-offs from the sustainability research to be conducted at the ILRP.

I therefore urge your State Legislature to support these bills for the good of the state, the nation and the world.

Sincerely,



Frank Schowengerdt
Director

University of Hawai`i at Hilo
200 W. Kawili St.
Hilo, HI 96720

UNIVERSITY
OF HAWAI'I
HILO

TESTIMONY

February 7, 2011

Re: Testimony in support of SB 165 and SB 1496 relating to Aerospace Development and Enterprise Zones

Dear Members of the Twenty-Sixth Legislature:

I am grateful for the opportunity to present testimony in strong support of two vital bills being presented before the Twenty-Sixth Legislature. These two measures, SB 165 and SB 1496, offer an extraordinary opportunity for our State to take a proactive and positive step in promoting innovation in science, education and business development through aerospace. The benefits to our students, residents and community at large will truly be extraordinary, and as such I am respectfully asking for your support in approving this most timely legislation.

As the Administrative Director of the University of Hawaii at Hilo's Conference Center, our office has a long-standing involvement with the global scientific community. Over the past twenty years, I have witnessed an incredible growth of interest in Hawai`i as a site for meetings, conferences, professional development and business. In particular, over the past five years the interest in STEM (Science, Technology, Engineering & Math) activities has escalated enormously, as evidenced by the significant increse in requests for both scientific meetings and opportunities for collaborative research.

The overriding message articulated by both academia and the visitor industry is that "Hawaii is an outstanding destination for high-level scientific meetings, research, exploration, discovery and science-related business." Given our strategic East-West location in the Pacific, our diverse, multi-cultural environment, interdisciplinary scientific research community and Moon/Mars-like terrain, Hawai`i presents itself like no other resource in the world! So, the question is... ***How can we capitalize on this phenomenal opportunity and realize the substantial benefits afforded by this momentum***?

200 W KAWILI STREET
HILO, HAWAI'I 96720-4091
PHONE: (808) 974-7555
FAX: (808) 974-7684

In my work with the Office of Aerospace Development (OAD) at the Dept. of Business, Economic Development and Tourism over the past few years, it has become very evident that this office has played a *major role* in both facilitating and coordinating aerospace activities statewide, including major international conferences and workshops, multinational space agreements and coalitions, STEM education and public outreach programs, and the development and implementation of space exploration centers.

OAD can become the *piko* of this momentum, but we need to empower this office to execute its initiatives. OAD's extensive networks with state, national and international aerospace institutions and organizations well position the office to leverage Hawaii's strategic advantages in this industry to expand and diversify Hawaii's leadership on the space frontier. But it cannot achieve this mission without adequate funding (and staffing!) support.

One of President Obama's new objectives for the National Aeronautics and Space Administration (NASA) is to **"Stimulate renewed interest in science and space for this next generation."** I believe we can support the President's challenge in Hawaii by providing much needed support for OAD and the multiple programs it works to advance in space science, education and commerce.

Last year our office hosted the "International Underwater Robotics" competition, with participation from Russia, Iran, China, Korea and many of the economies that will be represented at the APEC conference this coming November. We need to continue these scientific conferences and programs, as well as train the next generation of scientists, engineers and entrepreneurs that will implement future scientific missions to the Moon, Mars and beyond. OAD has, and can continue to take the lead in these initiatives, but only if we, as a State, agree to provide adequate and sustained support for its mission.

NASA has demonstrated its confidence in Hawaii's potential in aerospace by contracting with OAD tp develop a *multinational model* for a *sustainable settlement beyond low-Earth orbit in* collaboration with the Pacific International Space Center for Exploration Systems, or PISCES, which is housed at University of Hawaii at Hilo.

As a member of the Steering Committee for the Japan-U.S. Science, Technology & Space Applications Program (JUSTSAP – the international body that worked with OAD to develop the PISCES concept for the State of Hawaii – I have been privileged to watch this bi-lateral collaboration grow and mature into the Pacific International Space Alliance (or "PISA").

200 W. KAWILI STREET
HILO, HAWAI'I 96720-4091
PHONE: (808) 974-7555
FAX: (808) 974-7684

Following the APEC conference this November, PISA will convene an international symposium bringing together leading representatives from both the scientific and business communities to inaugurate a collaborative effort to return humankind to space through development of a multinational research park on the Moon. Prototyped through "analog" facilities at PISCES on the Island of Hawaii, this outstanding intiative will provide multiple scientific, educational and commercial development opportunities for residents statewide, as well as secure Hawaii's role as a major leader in global space enterprise. What a remarkable opportunity for the Aloha State – and PISA is the perfect vehicle through which government, industry and university representatives will collaborate to realize this vision!

But to secure and sustain Hawaii's leadership role in the exploration and settlement of space, we must support efforts like PISCES, PISA and the Office of Aerospace Development not only "in principle", but also with the resources they need to "win the race" – which is why I urgently request your support for SB165.

In addition, by establishing the development and operation of space exploration and lunar research related activities as eligible business activities for enterprise zones in Hawaii (through SB 1496), we will be able to encourage private sector investments that will complement those of our State in expanding aerospace-related research and development programs at the University of Hawaii at Hilo and elsewhere across Hawaii.

If we truly wish to realize a brighter future for Hawaii's economy and our keikis, we need to invest in that future by supporting visionary legislation such as SB 165 and SB 1496. By supporting out next generation's efforts in fields such as aerospace, we can help ensure that Hawaii will be a leader, not a follower, in this enterprise.

Thank you for the opportunity to testify on these measures.

Respectfully submitted

Judith Fox-Goldstein

Judith Fox-Goldstein, Administrative Director
University of Hawaii at Hilo Conference Center

200 W. KAWILI STREET
HILO, HAWAI'I 96720-4091
PHONE: (808) 974-7555
FAX: (808) 974-7684

PACIFIC INTERNATIONAL SPACE ALLIANCE

"To promote and facilitate multinational space enterprise"

February 9, 2011

Testimony in Strong Support of SB 165 and SB 1496
Hawaii State Legislature - 2011 Session

Dear Members of the Twenty-Sixth Legislature:

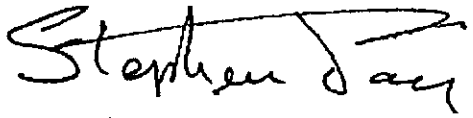
I am pleased to submit this testimony in strong support of S.B. 165 and S.B. 1496, which together will provide both critical State support *as well as* help attract significant private sector investment to help expand and diversify Hawaii's aerospace industry.

Over the past two decades, our Japan-U.S. Science, Technology & Space Applications Program (JUSTSAP), which has now been expanded into the Pacific International Space Alliance (PISA), has worked closely with the Hawaii State Government to spawn a broad range of innovative projects promoting advanced satellite communications, remote sensing for disaster management, microgravity research, the development of solar-powered alternative energy systems, and other space-related applications benefiting communities within the Asia-Pacific region. The Pacific International Space Center for Exploration Systems (PISCES), the most recent brainchild of PISA, is now being developed in Hawaii as an international center for space-related research and development, aerospace education, professional training, and the formulation of collaborative multinational space exploration missions – including a potentially "game-changing" program to establish an International Lunar Research Park (ILRP) on the Moon, prototyped through analog facilities in Hawaii! All of these programs have engaged the substantial scientific and technological expertise resident statewide to promote collaborative research and educational partnerships with University of Hawaii faculty and students, as well as with local business entrepreneurs.

Looking to the future, innovative programs like PISA, PISCES, and the ILRP will be able to leverage Hawaii's diverse natural resources, abundant scientific and technological expertise, unique geographical terrain, and strategic mid-Pacific location to support the development and implementation of pioneering global space missions, including Earth orbiting systems supporting global communications and space-based observations of our planet, as well as robotic and manned missions to the Moon, Mars, and other solar system bodies. Collectively, these efforts will provide a broad range of scientific, economic, and educational opportunities to help grow Hawaii's research and development infrastructure, expand and diversify private sector initiatives in aerospace-related technology, enhance secondary and college-level training and mentorship programs in advanced mathematics, engineering and science disciplines; and ultimately strengthen Hawaii's role as a globally-recognized leader in space exploration.

S.B. 165 and SB. 1496 will enable Hawaii to help realize this phenomenal potential in aerospace, an as such I strongly recommend their expeditious approval.

Respectfully submitted,



Chairman Emeritus

PISA Secretariat: Office of Aerospace Development / State of Hawaii, P.O. Box 2359, Honolulu, HI 96804
Tel: (808) 586-2388 / Fax: (808) 586-2536 / E.mail: jcrisafu@dbedt.hawaii.gov

SPACE CENTER

To: Hawaii Legislators
From: Nancy C. Tashima
RE: Support of SB112, SB165 & SB1496
Date: February 8, 2011

Dear Members of the Twenty-Sixth Legislature:

I am pleased to provide testimony in very strong support of SB112, SB165, and SB1496 advocating support of aerospace related funding.

Considering the current financial situation of Hawaii, it is imperative and prudent that our State seek inventive and innovative methods of improving our economy for all of its citizens. We can no longer depend on the traditional tourist or agriculture industries to provide enough jobs to sustain our economy. As a science teacher for the past forty-one years in Hawaii, I envision our students being educated and trained to support aerospace related professions along with the improvement of their Science, Technology, Engineering, and Mathematics skills Hawaii's youth need the desire to remain in our State and the possibilities afforded by the aerospace industry will allow them to have the vision and inspiration to succeed in professional careers here in Hawaii.

SB112 will expand our traditional tourism based industry by providing funds for a spaceport license application. This Federal Aviation Administration license will afford the possibility of many new jobs and professions for Hawaii's citizenry. An international commercial spaceport will allow the stabilization and expansion of our economic base.

SB165 will fund several aerospace related possibilities and as a science teacher, I especially support the public education and community outreach aspects of the bill. Additionally, I strongly support the funding for the Office of Aerospace Development and the NASA related programs. These programs will undoubtedly benefit our students and the general public by providing the education, skills, and support to allow them to remain in Hawaii rather than moving to other locations to secure good jobs.

I also support SB1496 since it makes possible the creation of businesses related to lunar and space research which would not only broaden our economic base, but motivate our Hawaii residents to succeed in their desires to become business entrepreneurs within their own communities. With opportunities afforded by SB1496, many new space related businesses will be created to sustain Hawaii in the future.

I strongly urge you to support SB112, SB165, and SB1496 since they expand the aerospace related industries and therefore, create jobs and careers for Hawaii's population.

Respectfully submitted,

Nancy C. Tashima

Nancy C. Tashima
Onizuka Space Center, Curator
Hawaii Resource Science Teacher
NASA Solar System Educator
NASA Messenger Educator Fellow
NASA New Horizons Educator Fellow

[illegible] BOX [illegible], KAILUA-KONA, HI 96745 PHONE (808) [illegible] FACSIMILE [illegible]

HAWAI'I ACADEMY OF SCIENCE
Educational Programs Office
c/o College of Education, UHM • 1776 University Avenue • Honolulu, HI 96822
Phone: (808) 956-7930 • Fax: (808) 956-5183 • E-mail: acadsci@hawaii.edu
Website: www.hawaii.edu/acadsci

February 9, 2011

Testimony in Support of SB112, SB165, SB1496
Hawai'i State Legislature – 2011 Session

Aloha,

On behalf of the Hawai'i Academy of Science, we are providing testimony in strong support of bills **SB112, SB165 and SB1496,** which offers our state viable avenues for employment, growth and sustainability.

As sponsors and coordinators for the annual State Science and Engineering Fairs since 1957, the Academy has witnessed the potential of thousands of Hawaii's top students in the science and engineering fields, and has seen many of these students go on to excellent universities and careers. However, many of those high-level technical and research jobs remain on the mainland, leaving our young professionals to make the decision to live and work away from home, or come back to compete for a smaller pool of desired careers.

Hawai'i needs sources of industry not only for the sake of our future generations, but for the sustainability of our islands as well. The aerospace industry is a tremendous opportunity for our children and a "high-tech" bridge between east and west that also secures Hawai'i as an integral part of the U.S. economy. Please join with us in our effort to build Hawaii's future.

Mahalo,

Carolyn Kaichi
Director
Hawai'i State Science and Engineering Fair

Gareth Wynn-Williams
Past-President
Hawai'i Academy of Science
University of Hawai'i Institute for Astronomy

MARS INSTITUTE

10 Feb 2011

Attn: 26th Legislature of the State of Hawaii

RE: Mars Institute Testimony to the State of Hawaii Legislature in Support of Senate Bills 112, 165 and 1496.

Dear Members of the Twenty-Sixth Legislature,

I am happy to provide testimony in strong support of Hawaii State Senate Bills 112, 165, and 1496, scheduled for consideration today.

I am chairman of the Mars Institute, a 501 c3 non-profit research organization whose mission is the advance the scientific study, exploration, and public understanding of the planet Mars. The Mars Institute is a world leader in space research, with focus on not just Mars itself, but also on the stepping stones that will allow humans to explore Mars: the Moon, near-Earth asteroids, and Mars's moons, Phobos and Deimos.

The Mars Institute has collaborations and partnerships with academia and industry across the nation and internationally, including with emerging space-faring nations of the Pacific Belt, particularly Australia and Japan. The Mars Institute is internationally recognized for its expertise in planetary analog research (research at sites on Earth that resemble the Moon or Mars and allow simulations of their exploration), and is the organization operating the *Haughton-Mars Project Research Station*, the world's largest privately operated polar research station (on Devon Island, in the Arctic). The Mars Institute collaborates with PISCES in Hawaii to advance Moon and Mars exploration, and views Hawaii potential in helping advance space exploration as critical and of strategic importance, for scientific, economic, and national security reasons.

We are 100% behind Senate Bills 112, 165, and 1496.

Pascal Lee, Ph.D.
Chairman, Mars Institute
NASA Research Park
Moffett Field, CA 94035-0006
Tel: (408) 687-7103; E-mail: pascal.lee@marsinstitute.net

Testimony Presented Before the
House Committee on Finance

Thursday, April 7 2011

By

Cam Muir, PhD
Associate Dean, College of Arts & Sciences, University of Hawai`i at Hilo

SB165 RELATING TO AEROSPACE DEVELOPMENT

Chair Oshiro, Vice Chair Lee and Members of the Committee:

The University of Hawai`i at Hilo supports the intent of SB 165 to promote the continuing development of the aerospace industry in Hawai`i by providing funding for office of aerospace development (OAD) and several of the key initiatives it supports.

On behalf of the University of Hawai`i at Hilo, thank you for the opportunity to testify in support of SB 165. The initiatives supported by SB 165 have important potential for diversifying the economic drivers of the State of Hawai`i and enabling the further development of an "Innovation Economy". An important character of this initiative is the inherent suitability of Hawai`i, and its location, making the program resistant to being transplanted once developed. Funding to OAD, formed by Act 149 of Session Laws of 2007, will enable important educational, and research programs that will help to revitalize the Hawai`i Island economy. Support of the Pacific International Space Center for Exploration Systems (PISCES), the Pacific International Space Alliance (PISA), and NASA's Habitat Demonstration Module, will enable development of important national and international public-private partnerships, improved national and international research collaboration potential, and the development of educational opportunities for our local students not available anywhere else. Such developments have the potential to make the UHH Astronomy program unique in the world and unparalleled in experiential education. The unique character of this initiative will promote not only education and research in aerospace travel, but also extra-terrestrial habitats. Research in sustainable extra-terrestrial habitats will leverage our resident expertise in sustainable agricultural systems, conservation biology and environmental science.

Development of an Aerospace support industry in Hawai`i is a timely initiative that offers great educational, research, and economic benefits. The relatively modest investment proposed has great potential for development of high paid workforce development, unique educational and research collaboration opportunities, and diversification of our State's economic drivers.

Mahalo for the opportunity to testify on this bill.

The Aerospace States Association

107 S. West Street, Suite 510, Alexandria, VA 22314
Tel: 202 257-4872 E:mail: AerospaceStates@comcast.net

February 7, 2011
Testimony for SB 112, SB 165 and SB 1496
2011 Session - Hawaii State Legislature

Dear Members of the Twenty-Sixth State Legislature:

We are most pleased to provide testimony in strong support of SB 112, SB 165, and SB 1496 – all of which recognize aerospace as a strategic and timely growth industry for Hawaii, and collectively provide the critically needed support to help realize your State's full potential in this dynamic technology sector.

As you may know, the Aerospace States Association is a nonpartisan organization, led by Lt. Governors and other top-ranking state leaders, that advocates on behalf of all fifty states for R&D funding, workforce training, economic development in aerospace and aviation, and excellence in math and science education to help keep states competitive in the global aerospace marketplace. We view the aerospace industry as an engine that defends our nation, drives our economy, and provides Americans with inspiring and highly paid jobs. Our homeland security, economic vitality, and national mobility clearly rely upon and benefit from a strong and diversified aerospace sector.

The State of Hawaii has been an active member of ASA since its inception, and over the years has substantially contributed to both the growth of our organization and our national debate on aerospace. Your State also has several unique characteristics - in particular, its mid-Pacific location, Moon-Mars like terrain, and strategic international ties with the Asia-Pacific community – which make it an ideal location to support a wide range of aerospace-related activities, including pioneering research in astronomy, planetary geosciences and deep space surveillance; the development, testing and evaluation of innovative technologies to advance both robotic and human space missions; growth as a strategic international node supporting advanced aviation training and the rapidly emerging commercial space transportation sector; and innovation in STEM education to inspire the next generation of aerospace entrepreneurs. The Hawaiian team won the first national Real World Design Challenge sponsored by ASA. Your new Space Act Agreement with NASA also well positions Hawaii to be both a major contributor to and beneficiary of our national space program.

ASA is committed to supporting state-based initiatives that can strengthen our nation's leadership in aerospace, and believe the recommendations set forth in these resolutions will both advance this objective as well as strengthen Hawaii's role as a major contributor to and beneficiary of the global space enterprise. We look forward to working with all of you in realizing this vision.

Thank you for the opportunity to testify on these measures.

Respectfully,

Brian Dubie

Brian Dubie
Chair, Aerospace States Association

HAWAI'I AEROSPACE
ADVISORY COMMITTEE

Elliot Holokauahi Pulham, Chair

April 6, 2011

Representative Marcus R. Oshiro, Chair
House Finance Committee
Hawai'i State Legislature

Representative Marilyn B. Lee, Vice Chair
House Finance Committee
Hawai'i State Legislature

SUBJECT: Senate Bill No. 165 and Senate Bill No. 1496

Dear Representative Oshiro, Representative Lee, and Members of the Committee:

On behalf of the Hawai'i State Aerospace Advisory Committee, I am writing to encourage your strongest possible support for S.B. No. 165 and S.B. 1496, which collectively would significantly advance the growth and diversification of the aerospace industry in Hawai'i.

As you know, the creation of the Hawai'i Aerospace Advisory Committee was authorized by the Legislature (Act 52, 2009 Session) and approved by the Governor on May 6, 2009. Our purpose, per this Act, is to advise and assist the Legislature and State agencies in monitoring, assessing and promoting aerospace development statewide. The Committee is comprised of leading aerospace industry executives, distinguished academicians from across the state, and economic development executives from Oahu, Kauai, Maui and Hawai'i – all united with a common purpose to help the State diversify its economy and promote innovative education and employment opportunities for the people of Hawai'i.

The Hawai'i Aerospace Advisory Committee met in Honolulu on January 11, 2011 to explore these opportunities and ways to realize them. During this meeting, we discussed the merits of the proposals set forth in both S.B. 165 and S.B. 1496, and agreed that they provide a logical, sustainable and wise investment of State support toward realizing Hawaii's full potential in aerospace.

Established through Act 149, Session Laws of 2007, the Office of Aerospace Development (OAD) at DBEDT was charged with the mandate to identify and promote opportunities for expanding and diversifying aerospace-related activities statewide. In order to carry out this significant responsibility, OAD needs funding to operate – especially to network with leading aerospace institutions and organizations nationwide to develop both public-private partnerships and multinational alliances that can stimulate collaborative research programs and private sector investments for Hawaii. In additioin, OAD needs the ability to promote and advance key aerospace initiatives in Hawai'i with substantial scientific, educational and commercial potential for local residents, and the programs targeted for State support through SB 165 are precisely in this category.

For example, the Pacific International Space Center for Exploration Systems (PISCES), a multinational space research and education center headquartered at the University of Hawaii at Hilo (which OAD helped establish), has already brought over $2 million in research funding and private investments to Hawaii, established undergraduate space science curricula at the University, conducted public outreach programs on aerospace at local schools and community centers, and sponsored national aerospace design competitions enabling undergraduate students to apply their skills in STEM-related disciplines to develop prototype models for future human habitats in space.

In collaboration with PISCES, OAD is now under contract with NASA to develop a model for an International Lunar Research Park (ILRP) on the Moon that would be prototyped through analog facilities on the Big Island. This represents an enormous opportunity for Hawai'i to play a major leadership role in humankind's future exploration of space, with substantial opportunities for new federal research grants, private sector investment, and innovate space education and training programs throughout the islands.

The Pacific International Space Alliance (PISA), another program coordinated through OAD, is a multinational coalition providing unique opportunities for local scientists, entrepreneurs and educators to form collaborative research and training partnerships with counterparts at leading institutions and universities throughout Asia and the Pacific. The annual PISA conference in Hawaii is expected to generate approximately $200,000 in tourist-related revenues for the State, and this year's symposium (timed in tandem with the upcoming APEC Summit in November) will launch the ILRP initiative under Hawaii's Space Act Agreement with NASA – another aerospace milestone for the State!

Our State also has a unique opportunity to contribute toward understanding (and reducing!) the risks of long-term human space exploration by simulating space missions in analog environments. NASA's Human Research Program has identified Hawaii as an optimal site to conduct such research, and is offering to cost-share the transport and installation of its Habitat Demonstration Unit for an interdisciplinary research program in Hawaii that will provide substantial educational and training benefits to both university researchers and students. Funds requested through SB 165will also be used as matching support for a $750,000 NASA EPSCoR award to expand the scope of this research over the next three years.

Complementing all of this is SB 1496, which extends eligibility for enterprise zone benefits to the development and operation of space exploration and lunar research activities. This designation will provide a critical, and I believe highly effective, catalyst to attract substantial and sustainable private sector investment to Hawai'i that will help establish the Aloha State as both a major contributor to and beneficiary of global space enterprise.

As such, and on behalf of the Hawai'i Aerospace Advisory Committee, I strongly encourage your support for both S.B. 165 and S.B. 1496.

Me ka ha'aha'a,

Elliot Holokauahi Pulham

PACIFIC INTERNATIONAL SPACE ALLIANCE

"To promote and facilitate multinational space enterprise"

TESTIMONY

Hawaii State Legislature

February 8, 2011

Re: Testimony in support of SB 165 and SB 1496 relating to Aerospace Development and Enterprise Zones

Dear Members of the Twenty-Sixth Legislature:

I am writing this testimonial in strong support of two very important and related measures this Session – SB 165 and SB 1496 – which together will help both expand and diversify Hawaii's aerospace industry, as well as promote substantial opportunities for multinational collaboration in the exploration and settlement of space.

Hawaii's unique mid-Pacific location, Moon and Mars-like terrain, substantial resident expertise in a broad range of scientific and engineering disciplines, and both academic and business partnerships with nations throughout Asia and the Pacific, clearly afford multiple assets and capabilities that can be leveraged to advance both robotic and human space missions, and in so doing engage Hawaii as both a major contributor to and beneficiary of global space enterprise.

Over the years, the Japan-US Science, Technology and Space Applications Program (JUSTSAP) has provided an excellent forum for dialogue and exchange on multinational space research and policy. It also has facilitated several collaborative ventures between Japan and the United States, including the development and demonstration of the first trans-Pacific high data rate (155 mbps) seamless satellite-fiber optic communications bridge; microgravity experiments aboard the U.S. Space Shuttle to test the efficiency of manufacturing new products in a zero-G environment; innovative data-base networking to support collaborative disaster management protocols throughout the Asia-Pacific Region; and the establishment of an annual University Space Systems Symposium to provide innovative mentorship opportunities for the next generation of space scientists and entrepreneurs.

JUSTSAP members have convened in Hawaii each November to report on individual team projects and plan for future year activities. The United States Secretariat for JUSTSAP coordinates this annual symposium and is housed within the Office of Aerospace Development (OAD) at the Department of Business, Economic Development & Tourism for the State of Hawaii. The main goal of JUSTSAP has been to network government, private sector and university-based capabilities and resources in both Japan and the United States to facilitate innovative and cost-effective earth orbiting missions and both robotic and manned exploration of the moon and Mars.

PISA Secretariat: Office of Aerospace Development / State of Hawaii, P.O. Box 2359, Honolulu, HI 96804
Tel: (808) 586-2388 / Fax: (808) 586-2536 / E.mail: jcrisafu@dbedt.hawaii.gov

From the perspective of the Japan Space Exploration Agency (JAXA), the strategic objectives of lunar exploration include opportunities to promote international collaboration, to support Japan's national growth and development, to facilitate innovation in science and technology, and to educate the next generation of space scientists, engineers and entrepreneurs. JAXA will help realize these goals by developing a technology demonstration, science observation, and robotic exploration program (the SELENE-2 and SELENE.X missions). JAXA will also support the development of human exploration related technologies in preparation for a Japanese astronaut to participate in an international human lunar exploration program, which could support the International Lunar Research Park proposed by the State of Hawaii.

At the 20th anniversary symposium of JUSTSAP, held November 14-18, 2010 on the Big Island of Hawaii, a decision was made to broaden this organization from a bilateral to multinational organization to include other space-faring nations from around the world. Consistent with this expansion, the committee decided to change the name of the organization to the Pacific International Space Alliance (PISA). Comprised of leading scientists, engineers, industry professionals and government leaders from space-faring nations around the world, this unique forum will promote multinational dialogue and public-private partnerships, leading toward the establishment of an International Lunar Research Park on the Moon that would be prototyped through analog facilities at the Pacific International Space Center for Exploration Systems (PISCES) at the University of Hawaii at Hilo. This prototype facility would eventually pave the way for a permanent settlement on the lunar surface within the next decade.

In addition to preparing for an eventual habitat on the Moon, the prototype facilities in Hawaii would also allow international research groups to study how space exploration can contribute to the betterment of humankind and life on Earth from both a national and global perspective, including improvements to the environment, education, health care and medical science, communications and information networks, security, disaster alert and recovery, economic growth, and scientific knowledge.

Funding appropriate through SB 165 will allow OAD to support the development of ILRP prototype facilities at PISCES over the coming year, as well as launch the Pacific International Space Alliance (for which it serves as Secretariat) through a multinational symposium on the island of Hawaii this November. It also will enable OAD to represent global space exploration activities at strategic aerospace planning meetings at NASA Headquarters and regional space centers, develop strategic partnerships with major aerospace corporations nationwide, and provide community outreach programs that can inspire Hawaii's youth to pursue both STEM-related educational programs and associated career opportunities.

Establishing the development and operation of space exploration and lunar research related activities as eligible business activities for an Enterprise Zone in Hawaii (through SB 1496) is also critical to encourage aerospace companies to invest in the development and implementation of the ILRP prototype modules at PISCES, as well as to support affiliated research and development programs at the University of Hawaii at Hilo.

Thank you for the opportunity to provide these comments.

Sincerely,

Osamu Odawara

Osamu Odawara
Chairman of PISA
Professor, Tokyo Institute of Technology

Testimony in Support of SB 112, SB 165, SB 1496

Date: 10 February 2011

Submitted by: Joseph E. Ciotti, PhD
Director, Center for Aerospace Education
Hawai'i Teacher-in-Space/NASA Ambassador
Windward Community College

Dear Members of the Twenty-Sixth Legislature:

I am pleased to provide testimony in strong support of SB 112, SB 165 and SB 1496—all three of which address the strategic and timely growth of aerospace industry in the State of Hawai'i.

I've been intimately involved with space education in Hawai'i for over 40 years and can personally testify to the significant impact that past and recent commitments to this endeavor have had on our youth and the welfare of our State. I've witnessed this through my decades of teaching astronomy and space science at both the secondary and college level, through my extensive K-12 and community outreach efforts at Windward Community College's Center for Aerospace Education which has reached over 300,000 people, through the rocketry projects my Hawai'i Space Grant students continue to undertake, and through over forty years of experience I enjoyed at all three planetariums in Hawai'i—including designing and constructing two of them.

Following in the wake of its rich seafaring heritage, Hawai'i has already undertaken bold spacefaring ventures. From world-class astronomical observatories ... to NASA-sponsored *in situ* rehearsals of manned and robotic space missions ... to its role in international airline transportation and potential future space tourism, Hawai'i is uniquely poised for significant economic growth through the leadership choices it makes regarding the aerospace industry.

Hawai'i is currently perched to assume a prominent role in aerospace research and technology. The decisions made today by the Twenty-Sixth Legislature will determine the flight path our State will follow in a field that has potential for major positive impact on its economy. By committing to the development of a spaceplane launch/landing facilities in Hawai'i (SB 112), operation of space exploration and lunar research related activities as eligible local business (SR 1496), and support for the Office of Aerospace Development to carry out this bold and far-reaching vision (SR165), Hawai'i will have laid its claim as the crossroads along this major space highway.

By recognizing aerospace as a strategic industry in Hawai'i, passage of these Senate Bills will provide the urgently needed support and boost to DBEDT's Office of Aerospace Development in fulfilling its responsibility to oversee the economic growth of this fast-paced and strategically important industry in Hawai'i.

I strongly support SB 112, SB 165 and SB 1496.

Sincerely,

Joseph E. Ciotti

Joseph E. Ciotti, PhD

Professor, Physics, Astronomy & Mathematics
Director, Center for Aerospace Education
Hawai'i-Teacher-in-Space/NASA Space Ambassador
Windward Community College
45-720 Kea'ahala Road
Kane'ohe, Hawai'i 96744
808-236-9111 (w)
808-225-5637 (c)
ciotti@hawaii.edu
http://aerospace.wcc.hawaii.edu

Testimony Presented Before the
House Committee on Finance

Thursday, April 7, 2011

By

Donald O. Straney, PhD
Chancellor, University of Hawai'i at Hilo

SB165 AND SB1496 RELATING TO AEROSPACE DEVELOPMENT AND ENTERPRISE ZONES

Chair Oshiro, Vice Chair Lee, and Members of the Committee:

I would like to lend my support to both SB 165 and SB 1496, which will promote the continuing development of the aerospace industry in Hawai'i by providing funding for the Office of Aerospace Development (OAD) and several of the key initiatives it supports, as well as by encouraging the private sector to invest in our university-based research and development programs.

The initiatives supported by SB 165 have important potential for diversifying the economic drivers of the State of Hawai'i and enabling the further development of an "innovation economy." An important character of this initiative is the inherent suitability of Hawai'i, and its location, making the program resistant to being transplanted once developed. UH Hilo is vitally interested in a strong OAD, so that it may enable important educational and research programs that will help to revitalize the Hawai'i Island economy.

For instance, OAD support of the Pacific International Space Center for Exploration Systems (PISCES) will enable development of an International Lunar Research Park (ILRP) on the island of Hawai'i, including a simulated lunar outpost, where research will be conducted, new technologies developed, students educated, and astronauts trained. For our local students, this will mean the development of educational opportunities not available anywhere else. Such developments have the potential to make the UH Hilo Astronomy program unique in the world and unparalleled in experiential education. The unique character of this initiative will promote not only education and research in aerospace travel, but also extra-terrestrial habitats. It is a project with great promise for the university, the state, the nation, and all of humankind.

In addition, establishing the development and operation of space exploration and lunar research related activities as eligible business activities for an Enterprise Zone in Hawai'i (as enabled through SB 1496) will be critical to encourage private industry to invest in the development and implementation of the ILRP prototype modules at PISCES, as well as to support affiliated research and development programs at the University of Hawai'i at Hilo.

Development of an aerospace support industry in Hawai'i offers important educational, research, and economic benefits. The relatively modest investment proposed has great potential for development of high paid workforce development, unique educational and research collaboration opportunities, the promotion of our state as a progressive and future-oriented venue for high technology enterprises, and diversification of our state's economy.

On behalf of the University of Hawai`i at Hilo, thank you for the opportunity to testify in support of SB 165 and SB 1496.

February 9, 2011

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 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 partnership with the State of Hawaii in advancing our nation's space exploration efforts, especially through a new annex to our Space Act Agreement that will focus on developing an analog test site on the Island of Hawaii to support development of a multinational research park on the Moon – a program that will not only extend humankind's exploration of our solar system, but also help bring the manifold scientific, educational, economic and humanitarian benefits of space back to Earth.

With best wishes,

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

ECONOMIC DEVELOPMENT
ISLAND OF OAHU

April 6, 2011

Hawaii State Legislature
State Capital
Honolulu, Hawaii 96813

COMMITTEE ON FINANCE
Rep. Marcus R. Oshiro, Chair
Rep. Marilyn B. Lee, Vice Chair

Thursday, April 7 , 2011

Conference Room 308
State Capitol
415 South Beretania Street

SUPPORTING TESTIMONY RELATING TO: SB 165-SD2-HD1
RELATING TO AEROSPACE DEVELOPMENT
Aerospace Industry Development; Appropriation Enterprise Zones; Lunar Research

Aloha Chair Oshiro, Vice Chair Lee and Members of the Committee:

Enterprise Honolulu, the O'ahu Economic Development Board, **strongly supports the passage of SB 165-SD2-HD1** that provides operating funds for the State Office of Aerospace Development to conduct outreach, coordination and management together with Pacific International Space Center for Exploration Systems (PISCES) and the Pacific International Space Alliance (PISA formerly JUSTSAP).PISCES and PISA funding will support the development of the International Lunar Research Park (ILRP) an initiative that will maintain U.S. leadership in space exploration and provide multiple scientific, educational and commercial benefits to Hawai'i, our nation and the world.

Thank you for allowing this testimony to be included at this hearing.

Mark McGuffie
Managing Director

ENTERPRISE
HONOLULU
THE BUSINESS CLIMATE OF PARADISE

735 Bishop Street, Suite 412, Honolulu, Hawaii 96813 • 808-521-3611
Fax: 808-536-2281 • www.enterprisehonolulu.com