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Statement of
CHUNG I. CHANG
Office of Aerospace Development Coordinator
Department of Business, Economic Development, and Tourism
before the
SENATE COMMITTEE ON WAYS AND MEANS

Thursday, February 28, 2019
10:30AM
State Capitol, Conference Room #211

In consideration of
SB 313
RELATING TO MAKING AN APPROPRIATION TO THE UNIVERSITY OF HAWAII

Chair Dela Cruz, Vice Chair Keith-Agaran and members of the Committee. The Office of Aerospace Development (OAD) **SUPPORTS** SB 313 that appropriates funds for two full-time equivalent positions for the wayfinding education program at the 'Imiloa Astronomy Center.

OAD is a focal point within the State to facilitate dialogue and coordination to promote the growth and diversification of Hawaii's aerospace industry. As part of promoting the aerospace-related industries in Hawaii, we promote innovative education and workforce development programs that will enhance public awareness of our State's aerospace potential and enable local citizens to pursue employment in Hawaii's aerospace industry.

The proposed Navigation/Wayfinding program will ensure active support for the participation of Native Hawaiians, as well as general population engagement, and will support programs of study and support for the Hawaiian language, history and culture.

Thank you for the opportunity to testify.



Pacific International
Space Center for
Exploration Systems

Statement of
Rodrigo Romo
Program Director
Pacific International Space Center for Explorations Systems (PISCES),
Before the
Senate Committee on Ways and Means
Thursday, February 28, 2019 at 10:30, Room 211

In consideration of
SB 313 –
MAKING AN APPROPRIATION TO THE UNIVERSITY OF HAWAII

Chair Dela Cruz, Vice Chair Keith-Agaran

I am writing to express support of this bill. Programs like this play a key role in the education outreach of Hawaii's younger generations providing them with invaluable experiences outside the classroom.

Thank you for this opportunity to offer comments.

Rodrigo Romo.

SB-313

Submitted on: 2/26/2019 6:28:47 PM

Testimony for WAM on 2/28/2019 10:30:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Melodie Aduja	Testifying for O`ahu County Committee on Legislative Priorities of the Democratic Party of Hawai`i	Support	No

Comments:



UNIVERSITY OF HAWAII SYSTEM

Legislative Testimony

Testimony Presented Before the
Senate Committee on Ways and Means
Thursday, February 28, 2019 at 10:30 a.m., Room 211

By
Marcia Sakai
Interim Chancellor
University of Hawai'i at Hilo

SB 313 – MAKING AN APPROPRIATION TO THE UNIVERSITY OF HAWAII

Chair Dela Cruz, Vice Chair Keith-Agaran, and members of the committee:

Thank you for the opportunity to submit testimony on SB 313. UH Hilo and 'Imiloa support this bill which appropriates \$375,000 for fiscal year 2019-2020 and \$300,000 for fiscal year 2020-2021 for two full-time equivalent positions (2.0 FTE) for the wayfinding education program at 'Imiloa Astronomy Center ('Imiloa) at the University of Hawai'i at Hilo (UH Hilo).

'Imiloa was explicitly designed to integrate Hawaiian perspectives and modern science for both local and global communities. 'Imiloa sponsored the temporary position of a master navigator for the Malama Honua Worldwide voyage. As part of solidifying the values and continuation of that momentum of that voyage, UH Hilo requests to establish a permanent program at the 'Imiloa Astronomy Center that provides both formal academic training and community education in Celestial Navigation and Wayfinding.

The program will use the existing assets of 'Imiloa that includes a full sized Planetarium and Exhibit Hall. The positions being requested are as follows:

1. Navigator-in-Residence: this position will be responsible for the development and implementation of navigation/wayfinding programs including credit programs, community outreach education (offered both onsite at 'Imiloa/UH Hilo, as well as, offsite in schools and community settings), student recruitment initiatives, and student internship oversight. This position will participate in leadership for the 'Imiloa Astronomy Center, contributing to the development and execution of strategic initiatives of 'Imiloa and UH Hilo. This position will also continue to serve as a link between the UH Hilo and the broader voyaging community.
2. Education Specialist: this position will assist the Navigator-in-Residence in delivering and evaluating programs related to the navigation curriculum, as well as, 'Imiloa's broader education program priorities that serve K-12 and higher education students.

UH aspires to be the world's foremost indigenous serving university and embraces its unique responsibilities to the indigenous people of Hawai'i and to Hawai'i's indigenous

language and culture. To fulfill this responsibility, the proposed Navigation/Wayfinding program will ensure active support for the participation of Native Hawaiians - as well as general population engagement both local and global - and supports vigorous programs of study and support for the Hawaiian language, history and culture.

Wayfinding Education Program at 'Imiloa Astronomy Center

Development of a Wayfinding Education Program at UH Hilo based out of 'Imiloa will integrate Hawaiian perspectives and modern science through curriculum and placed-based learning that will include credit, non-credit, and community education components. The program will be staffed by a Traditional Master Navigator-In-Residence along with a Curriculum Development Specialist, and will include a full-sized planetarium dome for training and teaching purposes.

Collaborations with other University of Hawai'i Programs

'Imiloa engages UH Hilo programs and faculty in several ways and serves as a conduit for the University to the Public. In its thirteen-year history, 'Imiloa has partnered with many programs at UH. We highlight our major partners here: programs and faculty from the Ka Haka 'Ula O Ke'elikōlani College of Hawaiian Language (KHUOK); the University of Hawai'i at Mānoa LAVA Lab and Academy for Creative Media along with UH Hilo Art, Marine Science and Computer Science departments for world class Data Visualization; the Graduate Program at the UH Hilo School of Education; the Drama and Communications Program at UH Hilo; and the Graduate Program in Tropical Conservation Biology and Environmental Studies.

Ka Haka 'Ula O Ke'elikōlani College of Hawaiian Language

- There has been a long-standing relationship between KHUOK and 'Imiloa. At its inception, students and faculty from KHUOK were key in the planning and development of the center to ensure that Hawaiian perspectives and modern science were explicitly integrated. As the only fully bilingual science and culture center in Hawai'i, 'Imiloa is uniquely positioned to continue to support the perpetuation of Hawaiian language through continued partnerships with KHOUK. For example, KHUOK faculty and the 'Imiloa Executive Director have engaged in an effort to ensure that astronomical discoveries made in Hawai'i are given Hawaiian names using traditional naming protocols. This effort was recently recognized nationally at the American Astronomical Society meeting in Seattle Washington. Finally, several KHUOK faculty and classes use 'Imiloa.

CyberCANOE UH Mānoa LAVA Lab and Academy for Creative Media, UH Hilo Art, Marine Science, and Computer Science Departments

- In 2016, the 'Imiloa worked with the LAVA lab at UH Mānoa and the Academy for Creative Media to install a state-of-the-art data visualization lab called CyberCANOE (Collaborative Analytics Navigation and Observation Environment). The goal of this class was to teach practical techniques for

students to create effective data visualizations that can be applied to a broad range of disciplines. Students in the class formed interdisciplinary teams to produce interactive visualizations related to Marine Science to be exhibited to the general public at the 'Imiloa as well as at UH Mānoa. CyberCANOE was installed at 'Imiloa to showcase research by faculty and students that is taking place in departments and institutes at the University of Hawai'i, particularly Hilo. CyberCANOEs also connect UH Hilo to other islands as well as other research institutions around the world. This means that unlike exhibits, high end visualizations and research data from latest discoveries can be added to CyberCANOE and be presented by UH Hilo researchers very quickly. This cycle of research, discovery and outreach benefits 'Imiloa's audiences by giving them access to ongoing cutting edge locally grown research.

UH Hilo School of Education Partnership: Graduate Program in Education

- 'Imiloa works with Hawai'i Island teachers to deliver innovative STEM programming by partnering with the UH Hilo School of Education to design and coordinate a series of professional collaborations among 'Imiloa, the Hawai'i State DOE, UH faculty, and a cohort of in-service teachers on Hawai'i Island. We have currently recruited a pilot cohort of 12 teachers in East Hawai'i and support them with professional resources to help them develop their own grade-specific culture-based science "learning modules." This program broadens the reach of our programs beyond astronomy/wayfinding to other natural sciences ("earth/sea/sky") where 'Imiloa's resources can support integrated culture-based science instruction with a place-based approach. These modules will ensure alignment of curriculum products with student performance expectations embedded in both the newly adopted national NGSS (Next Generation Science Standards) and the new Nā Hopena A'o ("HĀ") learning outcomes framework developed by the Hawai'i State DOE. This program will allow us to begin to build a library of "learning modules" and professional development resources at 'Imiloa that can be shared more broadly, including outside Hawai'i.

UH Hilo Tropical Conservation Biology and Environmental Studies Graduate Program (TCBES)

- Science and Technology Centers around the world are more and more being viewed as critical sites for community engagement in socially challenging scientific topics. 'Imiloa has recently engaged with the UH Hilo TCBES program to raise graduate student awareness about the need to effectively communicate science to a broad spectrum of communities. The current cohort of TCBES graduate students used the Exhibit Hall to analyze 'Imiloa's exhibits for their effectiveness. 'Imiloa staff also participated in guest lectures on campus stressing the importance of integration of indigenous knowledge in to modern science perspectives.

**UH Hilo Drama and Communications Departments for a class in “Edutainment”:
Speaking and Performing for Educational Purposes**

- ‘Imiloa partners with the UH Hilo Drama and Communications Department to assist with the delivery of a course, “Edutainment”. Students were guided through the process of researching, writing, rehearsing and performing a series of presentations that deal with science and/or Hawaiian culture. Presentations were shared directly with the general public at ‘Imiloa, allowing students to use their skills in a real-world situation.

Mahalo for the opportunity to testify on behalf of SB 313.



Maunakea Observatories

To: Senator Donovan Dela Cruz, Chair
Senator Gilbert Keith-Agaran, Vice Chair
Senate Committee on Ways and Means

From: Maunakea Observatories

RE: **SB 313 Making an Appropriation to the University of Hawaii – In strong support**
February 28, 2019; 10:30 a.m.; conference room 211

Through this letter the Maunakea Observatories express their strong **support** for SB 313 Wayfinding Education Program. The Maunakea Observatories partner with 'Imiloa Astronomy Center, which is based at the University of Hawai'i at Hilo, on numerous programs and particularly values the advancement of 'Imiloa's wayfinding programs since they naturally relate to astronomy on many levels. The requested funding would support having a master navigator on 'Imiloa's staff to share wayfinding techniques with students across the State. This is a powerful mechanism to advance Hawaiian culture in classrooms, linking sea wayfaring techniques with Hawaiian star lines as navigational aids, all demonstrated by the recent incredible Malama Honua Worldwide voyage of Hōkūle'a. The planned program includes the use of an inflatable planetarium to take to classrooms and leverages the existing full size planetarium at 'Imiloa for students on Hawai'i Island. 'Imiloa's location next to the base facilities of most of the Maunakea Observatories has catalyzed a unique partnership in science and education. One example is the Maunakea Scholars program - 'Imiloa is a founding partner in Maunakea Scholars and is providing on-site cultural educational opportunities to all Maunakea Scholar host schools (12 schools on 6 islands). The funding requested via SB 313 would effectively leverage what 'Imiloa has provided to the Maunakea Scholars program, creating a larger and permanent educational program at 'Imiloa in the process. Given 'Imiloa's demonstrated ability to design and implement these types of educational programs, the funds requested represent a low risk, high yield investment by the State. If granted, they would enable a vibrant Wayfinding Education Program that taps into the Maunakea Observatories' resource base via the Maunakea Scholars program – a win from every angle.

Mahalo,

Director Doug Simons, Canada-France-Hawaii Telescope



Director Pierre Martin, Hoku Kea Observatory



Director Paul Ho, James Clerk Maxwell Telescope (East Asian Observatory)



Director Walter Briske, Long Baseline Observatory



Director John Rayner, NASA Infrared Telescope Facility



Director Michitoshi Yoshida, Subaru Telescope



Director Klaus Hodapp, UKIRT



Director Hilton Lewis, W.M. Keck Observatory (Keck I and Keck II)

SB-313

Submitted on: 2/26/2019 8:26:52 PM

Testimony for WAM on 2/28/2019 10:30:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Lisa Spain	Individual	Support	No

Comments:

The Wayfinding Program at 'Imiloa will perpetuate the Hawaiian traditions of Wayfinding and Celestial Navigation. It is important that the State invest in educational programs that will carry this indigenous knowledge onward to future generations.

SB-313

Submitted on: 2/26/2019 8:36:04 PM

Testimony for WAM on 2/28/2019 10:30:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Yu Yok Pearing	Individual	Support	No

Comments:

I ardently support this bill, SB313, requesting for 2 positions: Navigator-in-Residence and Education Specialist. These 2 positions are needed to develop and implement valuable programs, community outreach and recruitment initiatives and internship oversight, all associated with Wayfinding. This Wayfinding program offers a very unique learning opportunity and will greatly stimulate students' interest in traditional navigation techniques as well as a deeper understanding and appreciation of Hawaiian culture.

SB-313

Submitted on: 2/26/2019 8:43:06 PM

Testimony for WAM on 2/28/2019 10:30:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Kalani Spain	Individual	Support	No

Comments:

As a student at Kamehameha schools in the 1970s, I was not afforded the opportunity to learn this important part of my Hawaiian heritage. By establishing a permanently funded Wayfinding program at 'Imiloa, I can only hope that my grandchildren will now learn the indigenouse science and skills that were nearly lost to my generation.

Aloha Chairman DelaCruz and members of the Senate Ways and Means Committee,

My name is Kālepa Baybayan and in 2007 I was initiated as a Palu, an Oceanic Navigator, through a traditional ceremony known as Pwo. The Pwo ceremony allows entry into a three-thousand-year-old society of Oceanic Non-Instrument Wayfinders and affords recipients the honor, privilege, and stewardship of this ancient art. I am writing in advocacy of SB313, a bill to support the 'Imiloa Astronomy Centers wayfinding program.

In my 44 years as a crew member, captain, and navigator on board Hawai'i's voyaging canoes I have found no other example of an oceanic practice that connects fundamentally with the fields of science, technology, engineering, art, and math. The process of navigating a canoe, which allowed the settlement of the last region on the planet to be inhabited beginning six thousand years ago, is an academic and scholarly system. All this occurred before written language and is a direct reflection of the skill and intelligence of our mariner ancestors.

'Imiloa's wayfinding program would make relevant a Hawaiian cultural practice and fields in STEM in an appropriate and engaging way. It is time to institutionalize the art of wayfinding and imbed it into our educational curriculum for all ages. By institutionalizing wayfinding, we make a commitment to honoring a six-thousand-year-old tradition by affirming its relevancy and uniqueness in our society. For this reason, I encourage your support of SB313.

Mahalo,

Kālepa Baybayan,

Captain and Pwo Navigator

Hōkūle'a, Hikianalia, Hawai'iloa, Hōkūalaka'i