



HAWAII'S AEROSPACE INDUSTRY: THE NEXT FRONTIER



Convened By

Hawai'i State Legislature

Senate Economic Development and Taxation Committee
House Economic Development and Business Concerns Committee



Hawaii State Capitol Auditorium
August 21, 2008
9:00 a.m – 7:00 p.m.

Program

8:30 **Registration: Capitol Auditorium Foyer**

9:00 **Welcome**

Senators Carol Fukunaga and Will Espero
Senate Committee on Economic Development and Taxation

Representatives Kyle Yamashita and Glenn Wakai
House Committee on Economic Development and Business Concerns

9:10 **Words of Aloha**

The Honorable James R. "Duke" Aiona, Jr.
Lt. Governor of Hawaii

9:15 **Aerospace in Hawaii: The Big Picture**

Jim Crisafulli
Director - Hawaii Office of Aerospace Development, DBEDT

The Honorable George R. Ariyoshi
*Former Governor of Hawaii
U.S. Advisor - Japan-U.S. Science, Technology & Space Applications Program*

9:40 **Enabling the Next Frontier: Our National Vision for Aerospace**

Elliot Pulham
President & Chief Executive Officer - The Space Foundation

David Kerr
*Director of Partnership Management
Joint Planning & Development Office/Federal Aviation Administration*

Chris Moore
*Program Executive for Technology
Exploration Systems Mission Directorate - NASA Headquarters*

Charles Smith
Chief, Space Technology Division - NASA Ames Research Center

10:30 **Refreshment Break**

10:45 **Building Bridges: Hawaii as a Catalyst for Multinational Partnerships**

Frank Schowengerdt
*Director - The Pacific International Space Center for Exploration Systems (PISCES)
U.S. Vice Chair - The Japan-U.S. Science, Technology & Space Applications Program*

Michael Crosby
Interim Vice Chancellor for Research - University of Hawaii at Hilo

Jim Grady
Chief Strategy Officer - Alliance of Commercial Enterprises and Education for Space

John Strom
*Program Manager for Aerospace - Economic Development Alliance of Hawaii
Vice President for Business Development - Enterprise Honolulu*

Chris Moore
Program Executive for Technology, Exploration Systems Mission Directorate – NASA HQs

Bill Larson
Chief, Applied Sciences Division - NASA Kennedy Space Center

12:00 **Lunch: Sponsored by Lockheed Martin (Third Floor, Room 309)**

1:00 **Innovating the Next Frontier: Dual-Use Applications in Aerospace**

Joe Lehman

Director, Government Affairs - Lockheed Martin Space Systems Company

Tim Dolan

Business Development Executive - Raytheon Honolulu Field Office

Rick Holasek

President - NovaSol

Ken Cheung

Science & Technology Manager - OCEANIT

Daron Nishimoto

R&D Space Superiority Program Manager – Trex Hawaii

John Benzie

Technical Director - Pacific Missile Range Facility (Kauai)

Lt. Col. Scott Hunt

Manager, Space Situational Awareness Program – Maui Air Force Research Laboratory

Keith Knox

Boeing LTS Chief Scientist – Air Force Maui Optical & Supercomputing Site (AMOS)

2:30 **The Heavens in View: Pioneering Astronomy & Planetary Geosciences**

Nick Kaiser

Associate Director for National Telescope Projects – Institute for Astronomy, University of Hawaii

Peter Mougini-Mark

Director – Hawaii Institute for Geophysics & Planetology, University of Hawaii

Jeff Taylor

Lunar Scientist – Hawaii Institute for Geophysics & Planetology, University of Hawaii

3:15 **Refreshment Break**

3:30 **Reaching for the Stars: NextGen Aviation & Commercial Space Launch**

Ramsey Pedersen

Manager, Aviation Development - University of Hawaii

Chuck Lauer

Vice President for Business Development - Rocketplane Global

Luke Flynn

Director, Hawaii Space Grant Consortium & Hawaii Space Flight Laboratory - University of Hawaii

4:15 **Training the Next Generation: Aerospace Education in Hawaii**

Wayne Shiroma

Co-Director, Hawaii Space Flight Laboratory - University of Hawaii

Joe Ciotti

Director, Center for Aerospace Education - Windward Community College

Robert Fox

Chairman, Dept. of Physics & Astronomy and Deputy Director, PISCES - University of Hawaii at Hilo

Jim Dator

Director, Hawaii Research Center for Futures Studies - University of Hawaii at Manoa

Art Kimura

Director, Future Flight Program - Hawaii Space Grant Consortium, University of Hawaii

5:00 **Special Presentation: In the Shadow of the Moon** (see back)

Introduced by Nainoa Thompson

Chairman, Polynesian Voyaging Society

Biographies

(in order of presentation)

- **Elliot Pulham, President and CEO, The Space Foundation**
Since 2001, Elliot Pulham has led the Space Foundation's team of space and education professionals whose purpose is to provide services to educators and students, government officials, the news media, and the space industry worldwide. Mr. Pulham also serves on the national boards of advisors of the RNASA Foundation, of the Institute for Space and Security Studies, and is a member of the Chief of Staff of the U.S. Air Force Civic Leader Advisory Group.
- **David Kerr, Director of Partnership Management, Joint Planning & Development Office, Federal Aviation Administration (FAA)**
David Kerr works on industry outreach, congressional relations and message development. He previously served in various positions with the FAA as a regulatory economist, as Chief of Staff to the Associate Administrator for Research and Acquisition Organization, and as a staff member in the Office of Government and Industry Affairs.
- **Christopher Moore, Program Executive for Technology Development, NASA Headquarters**
Currently working within the Exploration Mission Directorate at NASA Headquarters in Washington, DC, Christopher Moore has served at NASA for 23 years. During this period, he was involved in the design, integration and testing of several Space Shuttle payloads and performed research in telerobotics. He presently leads the development of advanced technology for future exploration missions that will establish a human outpost on the moon near 2020.
- **Charles Smith, Chief, Space Technology Division, NASA AMES Research Center**
Charles Smith leads the development of heat shields and thermal protection systems for NASA's space transportation vehicles for entry into the atmosphere of other planets, as well as re-entry into Earth's atmosphere. He has held a variety of technical and management positions at NASA's Marshall Space Flight Center and Ames Research Center, including Manager, Systems Engineering and Integration Office for the 2nd Generation RLV Program at Ames.
- **Frank Schowengerdt, Director, PISCES, University of Hawaii-Hilo (UHH)**
Currently a Professor of Physics and Astronomy at the University of Hawaii at Hilo (UHH), Frank Schowengerdt formerly served as the Director of Space Products Development at NASA Headquarters, founded the Center for Commercial Applications of Combustion in Space (a NASA Research Partnership Center), was instrumental in establishing the Colorado Advanced Technology Institute, and has held distinguished posts at the Colorado School of Mines and the Jet Propulsion Laboratory in California.
- **Michael Crosby, Interim Vice Chancellor for Research, University of Hawaii-Hilo (UHH)**
On leave from his position as Executive Director for the National Science Board in Washington, D.C., Dr. Crosby has over 30 years of diverse research, teaching, science management and leadership experience, and over the the last 15 years, has played an active role in leading both national and international multi-disciplinary research programs, as well as in developing national policy and administrative guidelines for our country's science programs.
- **Jim Grady, Chief Strategy Officer, Alliance for Commercial Enterprises and Education in Space (ACES)**
Both the co-founder and Chief Strategy Officer for the Alliance for Commercial Enterprises and Education in Space (ACES), Jim Grady has over 20 years of experience in managing commercial space programs and technology enterprises in various countries around the world. He also led the Hubble Space Telescope integration effort with the U.S. Space Shuttle, and was operations lead on both the first Air Force Space Shuttle flight and on the Lockheed Martin Strategic Defense Initiative ("Star Wars") program.
- **John Strom, Vice President for Business Development, Enterprise Honolulu**
John Strom plays an instrumental role in developing quality tech jobs and businesses for Oahu's economy. His work with converging technology companies in the fields of Optics and Space Sciences has been invaluable to the development of Hawaii's aerospace industry.

Biographies

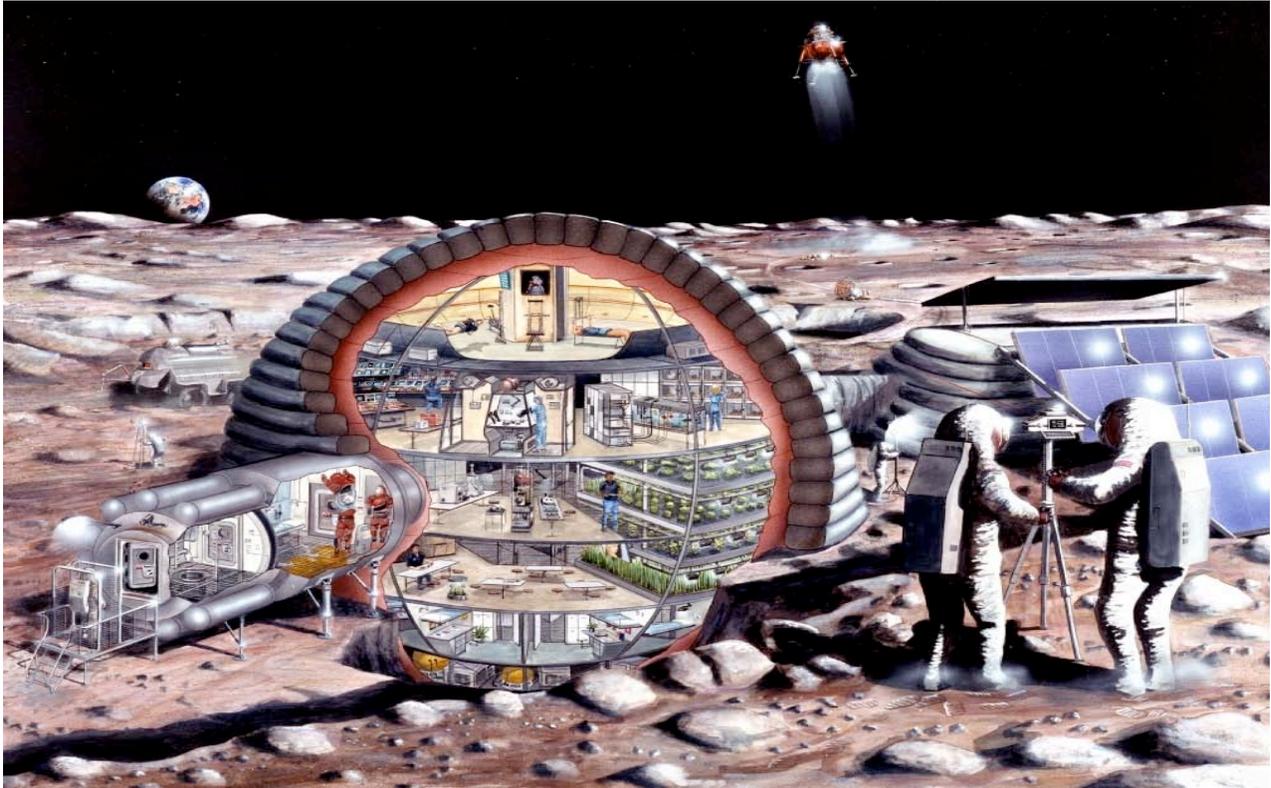
- **Bill Larson, Chief Applied Science Division, NASA Kennedy Space Center**
Bill Larson leads a diverse group of scientists and engineers in developing solutions for a variety of NASA programs. He also serves as NASA's Deputy Program Manager for In-Situ Resource Utilization. His NASA career began at the Langley Research Center, where he led development teams that designed and installed data acquisition of engineering data at launch pads. During the past decade, he has been involved in the Agency's efforts to investigate technologies to use indigenous space resources to produce life support consumables and rocket fuel.
- **Joe Lehman, Director, Government Affairs, Lockheed Martin Space Systems Company**
Joe Lehman is responsible for the management of legislative and regulatory matters at the federal, state, and local level. He previously served as Director of Business Development for Lockheed Martin's Denver aerospace operations, and served with distinction at the U.S. Arms Control and Disarmament Agency.
- **Tim Dolan, Manager, Raytheon Honolulu Field Office**
As the Business Development Lead for Raytheon's Honolulu Field Office, Tim Dolan is responsible for providing customer and program support in coordinating business development opportunities for all the company's products and services. He joined Raytheon from a distinguished career as a Marine Corps officer and aviator.
- **Rick Holasek, President, NovaSol**
With nearly two decades of experience in managing electro-optical technologies and applications, Rick Holasek has successfully managed numerous scientific programs for data analysis, environmental mapping, Anti Submarine Warfare (ASW), and spectral taggant identification and location.
- **Ken Cheung, Science and Technology Manager, OCEANIT**
Leading a team of 20 scientists and engineers, Ken Cheung works on developing technology solutions to problems in the areas of optics, lasers, advanced materials, RF and life sciences, with the goal of incubating technologies and looking for dual-use applications and opportunities for commercialization.
- **Daron Nishimoto, R&D Space Superiority Program Manager, Trex Hawaii**
With over 19 years of systems engineering and program management experience, Daron Nishimoto is responsible for current and new programs being developed in Hawaii for the Air Force Research Laboratory's Directed Energy Directorate, the National Reconnaissance Office, and the Space and Missile Systems Center.
- **John Benzie, Technical Director, Pacific Missile Range Facility (Kauai)**
With a distinguished career as both a U.S. Naval officer and Navy civilian, John Benzie provides integrated range services in a multi-threat, multi-dimensional environment, assuring safe conduct and evaluation of Training and T&E Missions at the Pacific Missile Range.
- **Lt. Col. Scott Hunt, Manager, SSAP, Maui Air Force Research Laboratory**
As Program Manager for the Space Situational Awareness Technology Program, Lt. Col. Scott Hunt has served as both the Deputy Commander and as Director of Operations and Space Intelligence Support and brings his past experience working with R&D space surveillance programs and imaging/laser tracking experiments to the Air Force Research Laboratory.
- **Keith Knox, Boeing LTS Chief Scientist, Air Force Maui Optical and Supercomputing Site**
Joining Boeing on Maui five years ago, Keith Knox works to expand Boeing's aerospace research in Hawaii. He has over thirty years of experience in industrial research, and leads a team in developing new algorithms for data analysis and image restoration.
- **Nick Kaiser, Associate Director for NTP, Institute for Astronomy, University of Hawaii**
A leading astronomer at UH Manoa's Institute for Astronomy, Nick Kaiser has pioneered techniques for probing dark matter and "dark energy" that dominate the dynamics of the universe. He has devoted his time to building the Pan-STARRS observatory, which will survey both the distant cosmos and the solar system in search of dangerous asteroids.

Biographies

- **Peter Mouginis-Mark, Director, Hawaii Institute for Geophysics and Planetology, UH-Manoa**
With over 30 years' experience as Principal Investigator in a wide range of geophysical projects, Peter Mouginis-Mark has conducted extensive research in the fields of planetary geomorphology and volcanology and has served as a leading member of numerous NASA and other space-related institutions and organizations.
- **Jeff Taylor, Lunar Scientist, Hawaii Institute for Geophysics and Planetology, UH-Manoa**
A world-renowned researcher in planetary geosciences, Jeff Taylor studies the mineralogical and chemical composition of lunar samples and meteorites toward understanding the processes involved in planetary evolution, with emphasis on the Moon, Mars, Mercury, and asteroids.
- **Ramsey Pedersen, Manager, Aviation Development, University of Hawaii**
As former Chancellor of University of Hawaii's Honolulu Community College, Ramsey Pedersen has spearheaded numerous aviation initiatives on behalf of the State and the UH. He currently is developing a national aviation maintenance training network with aerospace manufacturers and airlines worldwide to help grow and diversify Hawaii's aviation resources and capabilities.
- **Chuck Lauer, Vice President for Business Development, Rocketplane Global**
A strong proponent and visionary for developing a global space transportation highway, Chuck Lauer is dedicated to the development of reusable and safe space vehicles for commercial space flight. He is actively involved in several new spaceport projects worldwide.
- **Luke Flynn, Director, Hawaii Space Grant Consortium & the Hawaii Space Flight Laboratory**
Since 2002, Luke Flynn has directed the Hawaii Space Grant Consortium, an organization that facilitates NASA space science and engineering research statewide through a variety of programs for students of all ages. He focuses on promoting collaboration among educational, governmental and corporate institutions with a vested interest in space exploration.
- **Wayne Shiroma, Co-Director, Hawaii Space Flight Laboratory, UH-Manoa**
Wayne Shiroma is the Co-Director of the Hawaii Space Flight Laboratory and a Professor of Electrical Engineering at the University of Hawaii at Manoa. A recipient of the UH Board of Regents Medal for Excellence in Teaching, he has guided over 150 students through the UH's Small-Satellite Program.
- **Joe Ciotti, Director, Center for Aerospace Education, Windward Community College (WCC)**
Joe Ciotti works to support WCC's space science related curriculum and community outreach efforts. He is currently Professor of Astronomy, Physics and Mathematics at WCC, as well as Associate Director of the Hawaii Space Grant Consortium.
- **Robert Fox, Chairman, Dept. of Physics and Astronomy, University of Hawaii at Hilo (UHH)**
A member of the UHH faculty since 1971, Robert Fox also serves as the Deputy Director of the Pacific International Space Center for Exploration Systems (PISCES), and is working with colleagues statewide to advance the Space Science curriculum at the University of Hawaii.
- **Jim Dator, Director, Hawaii Research Center for Futures Studies, UH-Manoa**
A Co-Chair of the Space and Society Division, International Space University, Strasbourg France, and the former President, World Future Studies Federation, Professor Dator consults on the futures of law, governance, education, tourism and space. He is particularly interested in the design of governance systems for space settlements.
- **Art Kimura, Director, Future Flight Program, Hawaii Space Grant Consortium, UH-Manoa**
Art serves as an education specialist with the Hawaii Space Grant Consortium, University of Hawaii at Manoa, after a 28 year career in the Hawaii Department of Education and the U.S. Air Force and Hawaii Air National Guard. He has conducted aerospace workshops and courses for Hawaii educators and spearheaded the growth and development of K-12 robotics programs statewide.
- **Nainoa Thompson, Chairman, Polynesian Voyaging Society**
Nainoa Thompson is captain and navigator of the double-hulled canoe Hokule'a, which has inspired a revival of traditional arts associated with long-distance ocean voyaging in Hawai'i and throughout Polynesia. He also is the first Hawaiian in 600 years to practice the art of non-instrument deep sea navigation in the South Pacific by retracing ancient deep sea ocean routes.



Pacific International
Space Center for
Exploration Systems



The Pacific International Space Center for Exploration Systems, or PISCES, is a research and education center dedicated to the development of technologies to sustain life on the Moon and beyond. Based at the University of Hawaii at Hilo (UHH), the goal of PISCES is to become a global leader in the emerging field of research that will enable human settlement of space – the only international center of its kind in the world.

PISCES will support a wide range of research, education and public outreach programs. Initial research will focus on *In-Situ* Resource Utilization (ISRU) and robotics, and subsequently will expand to include programs on agriculture, energy, materials and other pertinent areas in the physical and biological sciences, engineering and the social sciences. Educational activities include a degree program in space studies based at UHH, with involvement from other UH campuses statewide.

PISCES was conceived by the Japan-U.S. Science, Technology & Space Applications Program (JUSTSAP), under the auspices of the State of Hawaii's Department of Business, Economic Development and Tourism (DBEDT). A headquarters for PISCES was established at UHH in the Fall of 2007, with preliminary seed funding provided by the Hawaii State Legislature. PISCES research teams also have received funding from NASA's Innovative Partnership Program to support two projects for field testing of robotic and ISRU systems.

The Center is being developed through partnerships among industry, academia and the governments of space-faring nations around the world, particularly those on the Pacific Rim. Five of these nations – the U.S., Russia, Japan, China and India – currently have (or are planning) missions to the Moon.

A major feature of PISCES will be a simulated lunar outpost on the Big Island of Hawai'i, where research will be conducted, new technologies will be developed, students will be educated, astronauts will be trained, and the public will be invited to experience first-hand what it will be like to live and work on the Moon, and eventually, on Mars.

Exerpt from June 2008 PISCES Strategic Plan



We gratefully acknowledge the support of the following institutions and organizations in helping make this presentation possible:

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Joint Planning & Development Office,
Federal Aviation Administration
The Space Foundation
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The Boeing Company
BAE Systems
Oceanit
NovaSol
Trex Hawaii
Pacific Missile Range Facility
Maui Air Force Research Laboratory
Alliance of Commercial Enterprises and
Education for Space
Office of Aerospace Development, DBEDT,
State of Hawaii

University of Hawaii:
Institute for Astronomy
Hawaii Space Grant Consortium (Manoa)
Hawaii Space Flight Laboratory (Manoa)
Hawaii Institute for Geophysics & Planetology (Manoa)
Hawaii Research Center for Futures Studies (Manoa)
Dept. of Physics & Astronomy (Hilo)
Center for Aerospace Education, Windward Community College
Pacific Aerospace Training Center, Honolulu Community College
Pacific International Space Center for Exploration Systems
(PISCES)
Japan-U.S. Science, Technology & Space Applications Program
(JUSTSAP)
Economic Development Alliance of Hawaii
Polynesian Voyaging Society
Hawaii State Senate and House Communications Offices
Hawaii State House and Senate Clerk and Sergeant-at-Arms Staff
Capitol TV

Special Presentation: *In the Shadow of the Moon*

Between 1968 and 1972, nine American spacecraft voyaged to the Moon, and twelve men walked upon its surface – the only humans ever to have visited another world. An insightful and award-winning documentary of this epic journey, In the Shadow of the Moon brings together for the first (and possibly last) time surviving crew members from every Apollo mission that flew to the Moon, and relates (in their own words) the monumental inspiration, challenge and promise of space exploration.