

JAN 17 2014

A BILL FOR AN ACT

RELATING TO THE PACIFIC INTERNATIONAL SPACE CENTER FOR
EXPLORATION SYSTEMS AND NATIONAL AERONAUTICS AND SPACE
ADMINISTRATION LASER COMMUNICATIONS GROUND STATION
INITIATIVE.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

1 SECTION 1. The legislature finds that the Pacific
2 international space center for exploration systems stimulates
3 economic growth for the State, promoting the establishment and
4 growth of new sustainable and green industries, associated jobs,
5 workforce development, internships, and science, technology,
6 engineering, and mathematics education programs.

7 The legislature further finds that the National Aeronautics
8 and Space Administration is working to develop advanced
9 technologies involving laser optical telecommunications. Since
10 the beginning of the space age, the National Aeronautics and
11 Space Administration has communicated with their spacecraft
12 through the use of radio frequency ground antennas. However,
13 the ever increasing data rate requirements from more
14 sophisticated instruments on spacecraft will soon surpass the
15 National Aeronautics and Space Administration's ability to
16 support spacecraft with radio frequency communications. As



1 such, the National Aeronautics and Space Administration has
2 embarked on the development of innovative technology to support
3 laser communications between spacecraft and earth. This new
4 technology was successfully demonstrated in late 2013 with the
5 lunar laser communications demonstration experiment aboard the
6 Lunar Dust and Atmospheric Environment Explorer spacecraft,
7 which is now orbiting the moon. Space laser communications
8 technology has the potential to provide ten to one hundred times
9 higher data rates than traditional radio frequency systems with
10 the same mass and power. This technology also aligns with the
11 State's interests in broadband communication technologies.

12 The legislature additionally finds the National Aeronautics
13 and Space Administration plans to introduce laser communications
14 with its spacecraft at the beginning of the next decade. In
15 order to implement this laser communications network, the
16 National Aeronautics and Space Administration has begun planning
17 for a global network of laser communication ground stations.
18 Since clouds present a major obstacle for laser communications
19 in space, the National Aeronautics and Space Administration
20 recently conducted a detailed statistical analysis of weather
21 patterns that resulted in a set of potential locations in the
22 United States for their anchor ground station. This analysis



1 indicated that of all possible sites, Hawaii would be the best
2 location for their first operational laser communications
3 station.

4 As a result, the National Aeronautics and Space
5 Administration and the Pacific international space center for
6 exploration systems have begun to explore possible locations for
7 the National Aeronautics and Space Administration's first
8 operational laser communication ground station, to be
9 established in approximately 2020. This new technology will
10 require a base of technical experts that will not only support
11 the National Aeronautics and Space Administration's first laser
12 communications station, but also serve as a technical resource
13 for the entire network of laser communication ground stations
14 worldwide. It is envisioned that the University of Hawaii will
15 provide the needed technical expertise, beginning with support
16 for an atmospheric characterization effort in 2014 and maturing
17 to a center of excellence in ground to space laser
18 communications in the future. As such, the laser communications
19 ground station initiative will provide multiple opportunities
20 for high-tech jobs in the State, as well as substantial
21 improvements in broadband and optical fiber infrastructure
22 statewide.



1 The purpose of this Act is to provide funding for an
2 engineering assessment of the proposal to establish a laser
3 optical communications ground station in the State. This study
4 will be conducted in partnership with the National Aeronautics
5 and Space Administration. Matching funds will be appropriated
6 by the National Aeronautics and Space Administration and used to
7 conduct an engineering study to include completion of site
8 surveillance and selection, an analysis of power and cooling
9 requirements, environmental assessments and permits, an
10 assessment of structural pads, and an analysis of roadways and
11 clearances for transportation of communications equipment.

12 SECTION 2. There is appropriated out of the general
13 revenues of the State of Hawaii the sum of \$500,000 or so much
14 thereof as may be necessary for fiscal year 2014-2015 for the
15 purpose of supporting a joint National Aeronautics and Space
16 Administration and Pacific international space center for
17 exploration systems engineering assessment and study, leading to
18 infrastructure construction beginning in 2016; provided that no
19 funds shall be made available under this Act unless the National
20 Aeronautics and Space Administration provides a dollar-for-
21 dollar match of funds for the purposes for which this sum is
22 appropriated.

1 The sum appropriated shall be expended by the Pacific
2 international space center for exploration systems for the
3 purposes of this Act.

4 SECTION 3. This Act shall take effect on July 1, 2014.

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INTRODUCED BY:

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S.B. NO. 2583

Report Title:

Pacific International Space Center for Exploration Systems;
National Aeronautics and Space Administration; Laser
Communications Ground Station initiative; Appropriation

Description:

Appropriates funds for an engineering assessment of a proposal to establish a laser optical communications ground station in Hawaii.

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