
A BILL FOR AN ACT

RELATING TO BROADBAND COMMUNICATIONS TECHNOLOGY.

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

1 SECTION 1. The legislature finds that, since the beginning
2 of the space age, the National Aeronautics and Space
3 Administration has communicated with their spacecraft through
4 use of radio frequency ground antennas. However, the increasing
5 data requirements of more sophisticated instruments on
6 spacecraft will soon surpass the National Aeronautics and Space
7 Administration's ability to support its spacecraft with radio
8 frequency communications. As such, the National Aeronautics and
9 Space Administration has embarked on the development of
10 innovative technology to support laser optical communications
11 between spacecraft and earth. Space laser communications
12 technology has the potential to provide data rates that are ten
13 to one hundred times higher than traditional radio frequency
14 systems with the same mass and power.

15 The legislature also finds that this technology aligns with
16 the State's interests in broadband communication technologies.
17 In today's global economy, high speed internet is no longer a
18 luxury. Instead, it is a utility as essential to the community



1 as water or electricity. This broadband infrastructure project
2 will vastly improve Hawaii's dismal connectivity by offering the
3 fastest and highest capacity broadband service in the world,
4 with the potential to lower consumer costs and improve coverage
5 as well.

6 The legislature additionally finds that the National
7 Aeronautics and Space Administration plans to introduce laser
8 communications with its spacecraft at the beginning of the next
9 decade. In order to implement this laser communications
10 network, the National Aeronautics and Space Administration has
11 begun planning for a global network of laser communication
12 ground systems. Because clouds present a major obstacle for
13 laser communications in space, the National Aeronautics and
14 Space Administration recently conducted a detailed statistical
15 analysis of weather patterns that resulted in a set of potential
16 locations in the United States for their anchor ground station.
17 The analysis indicated that of all possible sites, Hawaii is the
18 best location for the first operational laser communications
19 station.

20 The National Aeronautics and Space Administration's first
21 operational laser communication ground station is scheduled to



1 be established in approximately 2020. This new technology will
2 require a base of technical experts that will not only support
3 the laser communications station, but also serve as a technical
4 resource for the entire network of laser communication ground
5 stations worldwide. As such, the laser communications ground
6 station initiative will provide multiple opportunities for high-
7 technology jobs in the State, as well as provide substantial
8 improvements in broadband and optical fiber infrastructure. The
9 University of Hawaii will provide the needed technical
10 expertise, beginning with support for an atmospheric
11 characterization effort in 2014 and maturing to a center of
12 excellence in ground-to-space laser communications in the
13 future. Additionally, a space-borne high bandwidth link would
14 provide the State with a back-up link, thus providing Hawaii
15 with protection if a natural disaster occurs that disrupts the
16 fiber trunk line at the bottom of the ocean.

17 The legislature also finds that transmitting data with
18 laser, rather than radio frequencies, has the potential to
19 revolutionize the way the military communicates. The military
20 considered free-space optical communications for decades because
21 laser communications do not use the finite radio spectrum and



1 laser communications are inherently protected. For example, to
 2 disrupt a laser transmission, an enemy would have to be able to
 3 detect the narrow beam and find a way to place an object in
 4 front of it. To actually intercept the data carried by the
 5 laser beam, they would have to place a receiver in its path.
 6 The security dimension of laser communication is paramount for
 7 the United States military, and the military's demand for laser
 8 communications will increase due to its need for tremendous
 9 bandwidth to allow the transmission of intelligence,
 10 reconnaissance, and surveillance information in a timely manner.

11 The purpose of this Act is to appropriate moneys to
 12 establish a laser optical communications ground station in the
 13 State in partnership with the National Aeronautics and Space
 14 Administration.

15 SECTION 2. There is appropriated out of the general
 16 revenues of the State of Hawaii the sum of \$ or so
 17 much thereof as may be necessary for fiscal year 2015-2016 and
 18 the same sum or so much thereof as may be necessary for the
 19 fiscal year 2016-2017 for the purpose of supporting an
 20 engineering assessment and study for a laser optical
 21 communication ground station, to be conducted jointly by the



1 National Aeronautics and Space Administration and the Pacific
2 international space center for exploration systems, that will
3 lead to infrastructure construction in the State beginning in
4 2016.

5 The sums appropriated shall be expended by the department
6 of business, economic development, and tourism for the purposes
7 of this Act; provided that the department of business, economic
8 development, and tourism shall consult with the Pacific
9 international space center for exploration systems prior to
10 expending any of the sums appropriated by this Act; provided
11 further that no moneys shall be expended under this Act unless
12 matched dollar-for-dollar by the National Aeronautics and Space
13 Administration.

14 SECTION 3. This Act shall take effect on February 19,
15 2025.



Report Title:

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

Description:

Appropriates moneys for an engineering assessment and study for
establishing a laser optical communications ground station in
Hawaii. Takes effect on 2/19/2025. (SD1)

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