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# 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 ten to one hundred times  
13 higher data rates than traditional radio frequency systems with  
14 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



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

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



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

19           The legislature also finds that transmitting data with  
20 laser, rather than radio frequencies, has the potential to  
21 revolutionize the way the military communicates. The military



1 considered free-space optical communications for decades because  
2 laser communications do not use the finite radio spectrum and  
3 laser communications are inherently protected. For example, to  
4 disrupt a laser transmission, an enemy would have to be able to  
5 detect the narrow beam and find a way to place an object in  
6 front of it. To actually intercept the data carried by the  
7 laser beam, they would have to place a receiver in its path.  
8 The security dimension of laser communication is paramount for  
9 the United States military, and the military's demand for laser  
10 communications will increase due to its need for tremendous  
11 bandwidth that will allow it to transmit intelligence,  
12 reconnaissance, and surveillance information in a timely manner.

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

17 SECTION 2. There is appropriated out of the general  
18 revenues of the State of Hawaii the sum of \$ or so much  
19 thereof as may be necessary for fiscal year 2015-2016 and the  
20 same sum or so much thereof as may be necessary for the fiscal  
21 year 2016-2017 for the purpose of supporting an engineering



1 assessment and study for a laser optical communication ground  
2 station, to be conducted jointly by the National Aeronautics and  
3 Space Administration and the Pacific international space center  
4 for exploration systems, and leading to infrastructure  
5 construction in the State beginning in 2016.

6 The sums appropriated shall be expended by the department  
7 of commerce and consumer affairs for the purposes of this Act;  
8 provided that the department of commerce and consumer affairs  
9 shall consult with the Pacific international space center for  
10 exploration systems prior to expending any of the sums  
11 appropriated by this Act; provided further that no moneys shall  
12 be expended under this Act unless matched dollar-for-dollar by  
13 the National Aeronautics and Space 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 for  
establishing a laser optical communications ground station in  
Hawaii. (HB1282 HD1)

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