

Aeronautics

Dellingr 6U CubeSat

An innovative, reliable CubeSat design for executing small science-grade missions inexpensively and rapidly

CubeSats, once the domain of university researchers, have become increasingly more popular in recent years among government researchers. Motivated in large by their growing capabilities and relatively inexpensive cost, NASA and other government agencies are increasing their investments in CubeSats. NASA now is funding CubeSat mission opportunities through various programs.

In addition to their low cost, CubeSats enable mission configurations not possible with more traditional approaches. Instead of launching just one satellite, mission planners could deploy swarms or constellations of these tiny platforms to execute simultaneous, multi-point observations.

Technologists, meanwhile, also are interested in using CubeSats. Before mission planners can infuse a prototype technology, its developers must first demonstrate the technology in a relevant end-to-end space environment. CubeSats have the potential to offer the needed access at greatly reduced costs.

BENEFITS

- More reliable than previous CubeSat designs
- Cost effective design
- More robust in terms of volume and power than previous CubeSat designs

technology solution



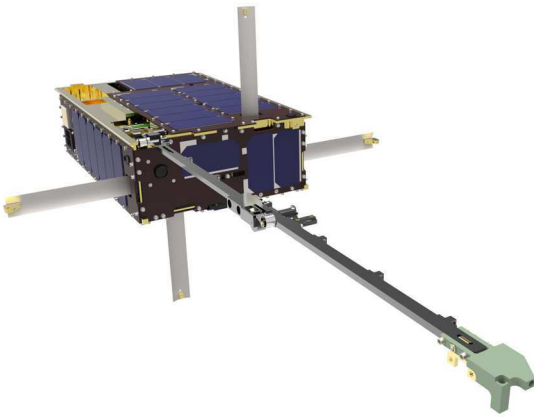
THE TECHNOLOGY

A NASA team gave itself just one year to develop, test and integrate a CubeSat that could reliably and easily accommodate agency-class science investigations and technology demonstrations at a lower cost. The CubeSat known as Dellingr, a name derived from the god of the dawn in Norse mythology will carry three heliophysics-related payloads. It doubles the payload capability of the ubiquitous and proven three-unit, or 3U, CubeSat pioneered by the California Polytechnic Institute in 1999 primarily for the university community.

The need for such a platform, which measures about 12 inches long, nearly 8 inches wide and 4 inches high, was for more cost-effective approaches to achieve compelling Earth and space science.

Disadvantages of the 3U size include more constraints on volume and power. Furthermore, some studies suggest that previous CubeSats failed 40 percent of the time. By doubling the platform's girth, increasing its power capacity, and employing novel processes to increase its on-orbit reliability, the team believes it will have created a platform capable of carrying out more robust missions for science.

Once successfully demonstrated, the team says it will make the platform's design implemented with low-cost, commercial off-the-shelf parts available to any U.S. organization interested in using it.



Dellingr 6U CubeSat (Photo Credit: Luis H. Santos)

APPLICATIONS

The technology has several potential applications:

- Dellingr can serve as a replacement to any 3U CubeSat in academia, government, and industry.

PUBLICATIONS

Patent No: 9938023

National Aeronautics and Space Administration

Strategic Partnerships Office

Goddard Space Flight Center

Code 102
Greenbelt, MD 20771
301.286.5810
techtransfer@gssc.nasa.gov

<http://technology.nasa.gov/>

www.nasa.gov

NP-2015-04-1627-HQ

NASA's Technology Transfer Program pursues the widest possible applications of agency technology to benefit US citizens. Through partnerships and licensing agreements with industry, the program ensures that NASA's investments in pioneering research find secondary uses that benefit the economy, create jobs, and improve quality of life.

GSC-17152-1
GSC-TOPS-37

