



## Edison Demonstration of Smallsat Networks (EDSN) A Swarm of Advanced, Affordable, COTS-based Nanosatellites that Enable Cross-Link Communication and Multipoint Physics

NASA's Edison Demonstration of Smallsat Networks (EDSN) mission provides a proof of concept demonstration of interactive satellite swarms. Satellite swarms enable a wide array of scientific, commercial, and academic research not achievable with a singular satellite.

EDSN uses a swarm of 8 CubeSats in a loose cluster arrangement approximately 500 km above Earth. The swarm performs distributed science measurements and data exchange between the satellites using a hub and spoke network. Swarm technologies have the potential to provide flexible data correlation and distribution, simplify satellite operations, and enable new science investigations.

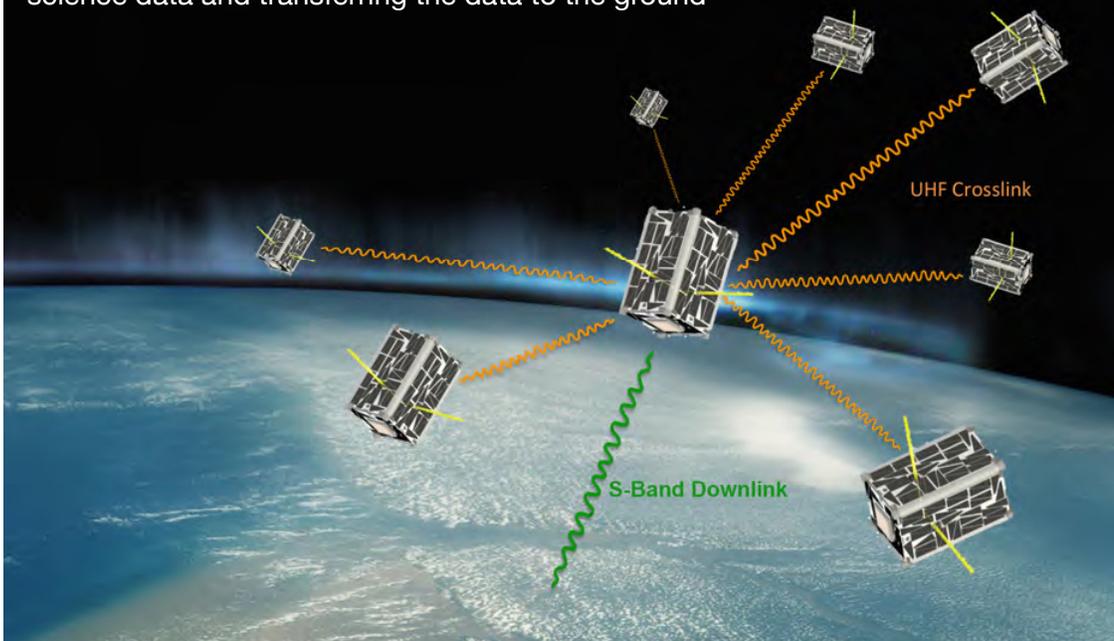
Each EDSN nanosatellite is 1.5 CubeSat units (1.5U) about the size of a tissue box (10 x 10 x 17 cms) and weigh approximately 4 pounds (2 kg). EDSN satellites leverage recent advancements in CubeSats and COTS hardware and software.

Onboard each satellite is a competitively selected EPISEM sensor payload that measure variations in the location and intensity of energetic charged particles. When measurements are combined together the uniformity of space radiation can be determined. The EDSN swarm has an on orbit operational period of 60-days. The EDSN satellites are planned to be launched into space as secondary payloads on a Department of Defense launch vehicle in late 2015.

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### Mission Goal

To demonstrate that a swarm of satellites is capable of collecting multi-point science data and transferring the data to the ground



*EDSN swarm with highlighted satellite data exchange methods*

The launch of tens (or someday hundreds) of interacting satellites would enable an unprecedented amount of sensors, communications and computing capability in low Earth orbit.

Future benefits include distributed architectures, sensor webs, disaggregated systems, and mission redundancy providing increased scientific data for industry, university researchers, and NASA scientists.

The EDSN project is based at NASA Ames Research Center, Moffett Field, California, and is funded by the Small Spacecraft Technology Program (SSTP), in NASA's Space Technology Mission Directorate at NASA Headquarters in Washington, DC.

Other EDSN project partners include NASA's Marshall Space Flight Center, Montana State University, and Santa Clara University.

**For more information about the SSTP, visit:**  
[http://www.nasa.gov/directorates/spacetech/small\\_spacecraft](http://www.nasa.gov/directorates/spacetech/small_spacecraft)

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*Completed EDSN Flight Units with Engineers Inspecting EDSN Flight Spares*

National Aeronautics and Space Administration

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