



Leveraging World-Class Expertise

The Aerospace Corporation has a 20-year history in the design, construction, and flight of miniature spacecraft, with a particular emphasis in the nanosatellite and picosatellite regimes. Aerospace's deep bench of world-class engineers and researchers, with expertise in every aspect of spacecraft design and operation, consistently and successfully develop and integrate state-of-the-art components into functioning miniature space systems.

A SmallSat Pioneer

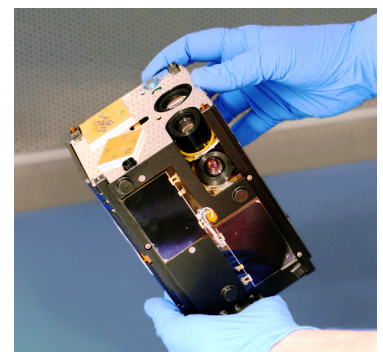
Aerospace's AeroCube team has constructed and flown 28 satellites ranging in size from a quarter-kilogram to 6 kilograms and, since 2012, has fielded a constellation of CubeSat-class spacecraft that incorporate all of the "classic" elements of mature space systems: three-axis attitude control, navigation, operation in eclipse, execution of scheduled actions outside of radio contact, on-orbit reprogrammability, and robust internal anomaly response.

Flying smallsats from the space shuttle and as "rideshare" payloads on other U.S. and international launches, Aerospace experts continue to advance and refine smallsat technology, making advances in propulsion, laser communications, control systems, thermal management, and electro-optical systems, among many others.

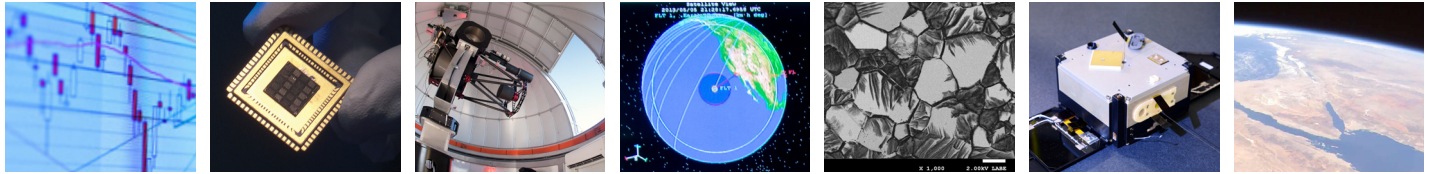
As demands for greater picosatellite capability continue to grow, Aerospace will continue to apply lessons learned and successful solutions to new challenges in the smallsat regime, assuring mission success in research, exploration, and commercialization to its U.S. Air Force, NASA, NOAA, and commercial customers.

Our smallsat mission support capabilities cover cradle to grave:

- › Mission concept design
- › Modeling and simulation
- › Analysis
- › Integration and test
- › Launch
- › Ground systems
- › Mission operations



The NASA-supported Optical Communication and Sensor Demonstration (OCSD), launched in September 2015, and demonstrates laser downlinks from LEO to ground at up to 200 Mb/s, an improvement of a factor of 10 to 100 over existing CubeSat-scale communication systems.



SmallSat and Cubesat Services

The Aerospace Corporation's experts and facilities can support all aspects of smallsat missions. All of the following services can be tailored to meet the specific needs of any mission objectives to ensure your success.

Independent Review Assessment	Independent assessment of your designs at critical development stages	Identifying issues or key components for technical and design enhancement
Mission and Payload Design	<ul style="list-style-type: none"> › Architecture/mission concept design › Requirements definition and analysis › Concepts of operations, systems, and project engineering › Tradeoff analyses and performance modeling/analysis 	<p>Focus on key long-term space-system design factors with the largest impact on the success of a space system:</p> <ul style="list-style-type: none"> › Risk, cost, schedule, regulations › Systems engineering
Constellation Analysis and Design	<p>Constellation design</p> <ul style="list-style-type: none"> › Mapping out principal and secondary design variables; constellation patterns, orbital planes, parameters, end-of-life strategy, etc. 	<p>Modeling and simulation</p> <ul style="list-style-type: none"> › Astrodynamics, communications, payload design ground operations
Test Facilities	<p>Access to world-class facilities</p> <ul style="list-style-type: none"> › Lab evaluation, testing, and failure analysis › Maturation of proprietary technology 	<ul style="list-style-type: none"> › More than 100,000 sq ft of laboratory space › State-of-the-art test and analysis equipment and expertise
Mission Risk Assessment	High-level in-depth risk assessment and mitigation planning across the space system	<ul style="list-style-type: none"> › Payload and hardware assessments › Software assessments
Anomaly Resolution	Service covers the lifetime of your system	<ul style="list-style-type: none"> › Anomaly and incident response › Failure and fishbone analysis
Specialized Technical Consulting	Consultation with Aerospace experts in all segments of smallsat systems	<ul style="list-style-type: none"> › Attitude determination and control, astrodynamics, power systems, sensors, communications, systems engineering
Ground Systems and Operations	Expertise in ground operations and satellite constellation management	<ul style="list-style-type: none"> › Ground network supporting AeroCube constellation › Ground RF sites and an optical communications site

The Aerospace Corporation

Aerospace is a nonprofit corporation that operates a federally funded research and development center (FFRDC) for the United States Air Force. This FFRDC spans the entire space domain for government as well as civil space and other federal agencies. With a world-class workforce of roughly 3,000 engineers and scientists, Aerospace is able to respond with agility to the unique challenges posed by national security space requirements, delivering well-defined, innovative solutions that assure mission success.