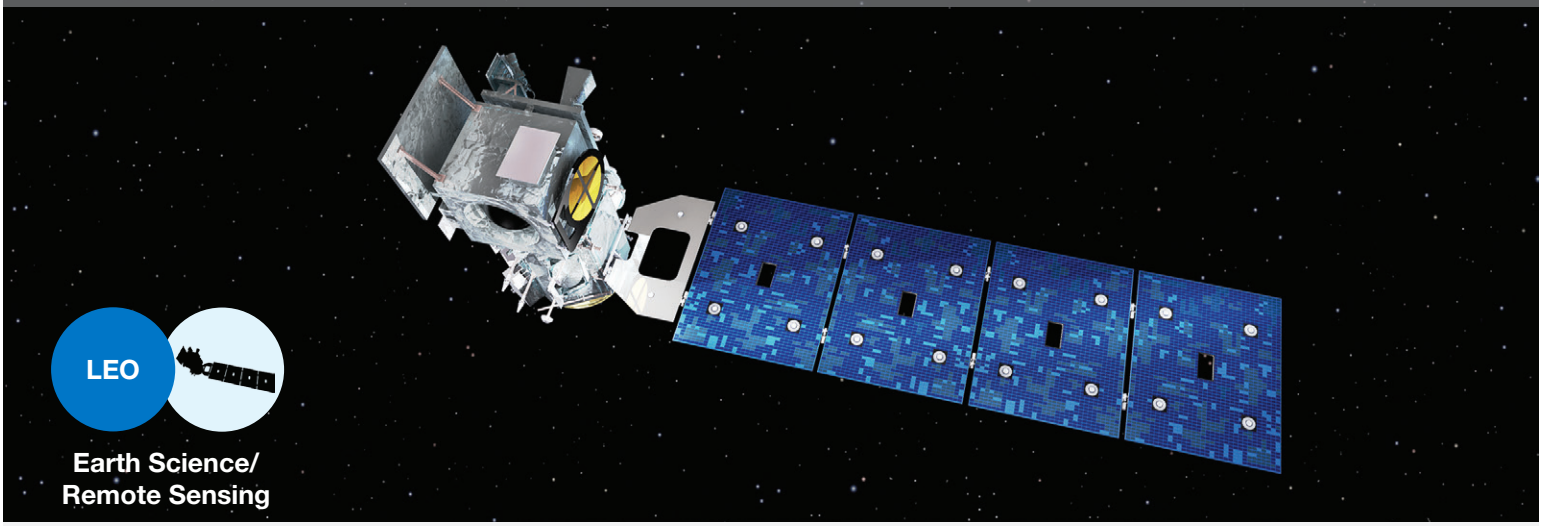
ICESat-2

Ice, Cloud, and Land Elevation Satellite



Mission Description

ICESat-2 is a continuation of the global time series of precision ice topography measurements initiated by the first ICESat mission and extended in selected areas by the IceBridge campaigns, a series of ongoing surveys of selected polar areas using aircraft-borne instruments. The first ICESat, on orbit from 2003 to 2010, provided invaluable data needed to assess ice sheet mass balance, sea ice thickness and to estimate biomass.

ICESat-2 uses improved precision laser-ranging techniques to measure the topography of the Greenland and Antarctic ice sheets and the thickness of sea ice. The mission was recommended by the National Research Council in its 2007 decadal survey of NASA Earth science research priorities. ICESat-2 supports NASA's Earth science program by helping scientists develop a better scientific understanding of the Earth system and its response to natural or human-induced changes.

Spacecraft

Orbital ATK is responsible for the design and manufacture of the ICESat-2 spacecraft, as well as payload integration and system test of the completed observatory. The spacecraft design is derived from Orbital ATK's proven LEOStar-3™ bus used for NASA's Landsat 8, the GeoEye-1 Earth imaging satellite, and NASA's Fermi Gamma-Ray Space Telescope.

The ICESat-2 spacecraft is being designed, assembled, and tested at Orbital ATK's 135,000 square foot satellite manufacturing and test facility in Gilbert, Arizona.

FACTS AT A GLANCE

- Managed by NASA's Goddard Space Flight Center
- Launching in 2017, ICESat-2 continues the time series of precision ice topography measurements made by the first ICESat from 2003 to 2010
- The second generation ICESat orbiting laser altimeter provides precise measurements of ice-sheets, sea-ice, and vegetation
- Scientists use ICESat-2 data to accurately project just how rapidly ice sheets will melt as temperatures rise to enable policy makers to prepare vulnerable coastal populations for rising sea levels
- ICESat-2 uses a micro-pulse multi-beam approach providing dense cross-track sampling to improve elevation estimates over areas with high-slopes and rough terrain
- The ICESat-2 spacecraft builds on Orbital ATK's LEOStar-3 design used on NASA's Landsat 8

Customer:
NASA Goddard Space Flight Center

ICESat-2

Specifications

Spacecraft

Launch Mass:	1,387 kg
Solar Arrays:	Single wing with fixed and articulating mode (see illustration below), 3818 W EOL
Stabilization:	3-axis, zero momentum bias, nadir pointing
Pointing Control:	13.3 arcsec (3σ)
Data Storage:	704 Gbits EOL
Data Downlink:	X-band, 220 Mbps
Propulsion:	Blowdown hydrazine, four 22 N thrusters and eight 4.5 N thrusters, 158 kg tank capacity
Mission Life:	3 years; 7 years propellant
Orbit:	481 km @ 92° inclination (91 day repeat cycle)
Orbit Determination:	High precision GPS and laser ranging
Current Status:	In development

Launch

Launch Vehicle:	Delta II
Launch Site:	Vandenberg Air Force Base, California
Date:	1Q 2017

ATLAS

Advanced Topographic Laser Altimeter System (ATLAS) Multi-Beam Visible Photon-Counting Altimeter. Manufactured by NASA/GSFC.

Mission Partners

NASA Goddard Space Flight Center

Procuring agency and customer program management, system integration, ATLAS instrument development and manufacture

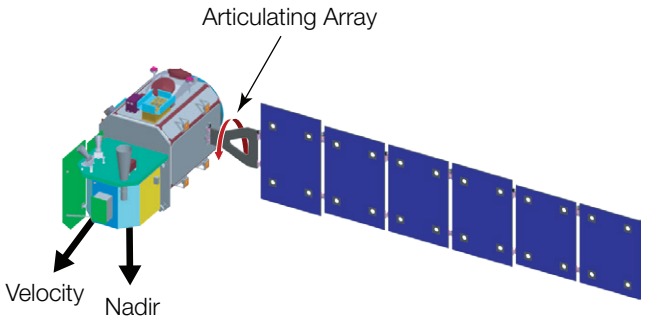
Orbital ATK

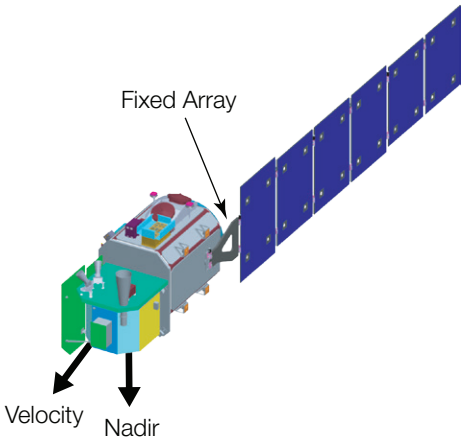
Spacecraft prime contractor and integrator responsible for spacecraft design and manufacture, instrument integration, and observatory test; launch vehicle integration support; launch support; and mission operations control center

Fibertek, Incorporated

Design, develop, fabricate, test and deliver lasers for the Advanced Topographic Laser Altimeter System instrument

Airplane Mode (Articulating Array)	Sailboat Mode (Fixed Array)





The single-wing solar array has two operating modes.

Orbital ATK

www.orbitalatk.com

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