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ICON

Studying the Earth-Sun Connection in the Ionosphere

Under a contract from the University of California Berkeley/Space Sciences Laboratory (UCB/SSL) Northrop Grumman is designing, manufacturing, integrating and testing the Ionospheric Connection Explorer (ICON) satellite. ICON will study the interface between the upper reaches of the Earth's atmosphere and outer space in response to recent scientific discovery that the ionosphere, positioned at the edge of space where the Sun ionizes the air to create charged particles, is significantly influenced by storms in Earth's atmosphere. ICON will also help NASA better understand how atmospheric winds control ionospheric variability.

The mission will improve the forecasts of extreme space weather by probing the variability of Earth's ionosphere with in-situ and remote-sensing instruments. Fluctuations in the ionosphere can disrupt satellite and radio communications from low- and geostationary-orbit communications spacecraft, creating a direct impact on the nation's economy.

Spacecraft

The ICON mission employs Northrop Grumman's LEOStar™-2 platform which is a flexible, high-performance spacecraft for space and Earth science, remote sensing and other applications. LEOStar-2 series spacecraft have supported multiple missions for commercial and government customers over the past 15 years. ICON will be the ninth LEOStar-2-based spacecraft built by Northrop Grumman.

Mission

Probing the variability of Earth's ionosphere with in-situ and remote-sensing instruments

Customer

University of California at Berkeley

Specifications

Spacecraft

Launch Mass:	287 kg (630 lb.)
Redundancy:	single string
Solar Arrays:	780 W, articulated arrays
Stabilization:	3 axis, zero momentum bias
Pointing:	160 arcsec control, 150 arcsec knowledge
Data Storage:	16 Gbit
Data Downlink:	S-band: 3.5 Mbps
Orbit:	575 km circular @ 27° inclination
Mission Life:	two years

Launch

Launch Vehicle:	Pegasus XL
Launch Site:	Cape Canaveral Air Force Station
Date:	2018

Instruments

- Michelson Interferometer for Global High-Resolution Thermospheric Imaging (MIGHTI) will detect the aurora-like glow of air molecules in the thermosphere and measure their temperature and speed via doppler imaging.
- Extreme Ultraviolet imager (EUV) will provide images of the upper atmosphere in extreme ultraviolet spectrum.
- Far Ultraviolet imager (FUV) will provide images of the upper atmosphere in the far ultraviolet spectrum.
- Ion Velocity Meter (IVM) will measure in-situ the charged particles and flowing plasma.

Mission Partners

University of California at Berkeley/Space Sciences Laboratory

Principal investigator: Dr. Thomas Immel; mission management, science and mission operations, EUV & FUV instruments; payload integration and test

Naval Research Laboratory

MIGHTI instrument

University of Texas at Dallas

IVM instrument

Northrop Grumman

Spacecraft development, observatory integration and test, launch operations

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