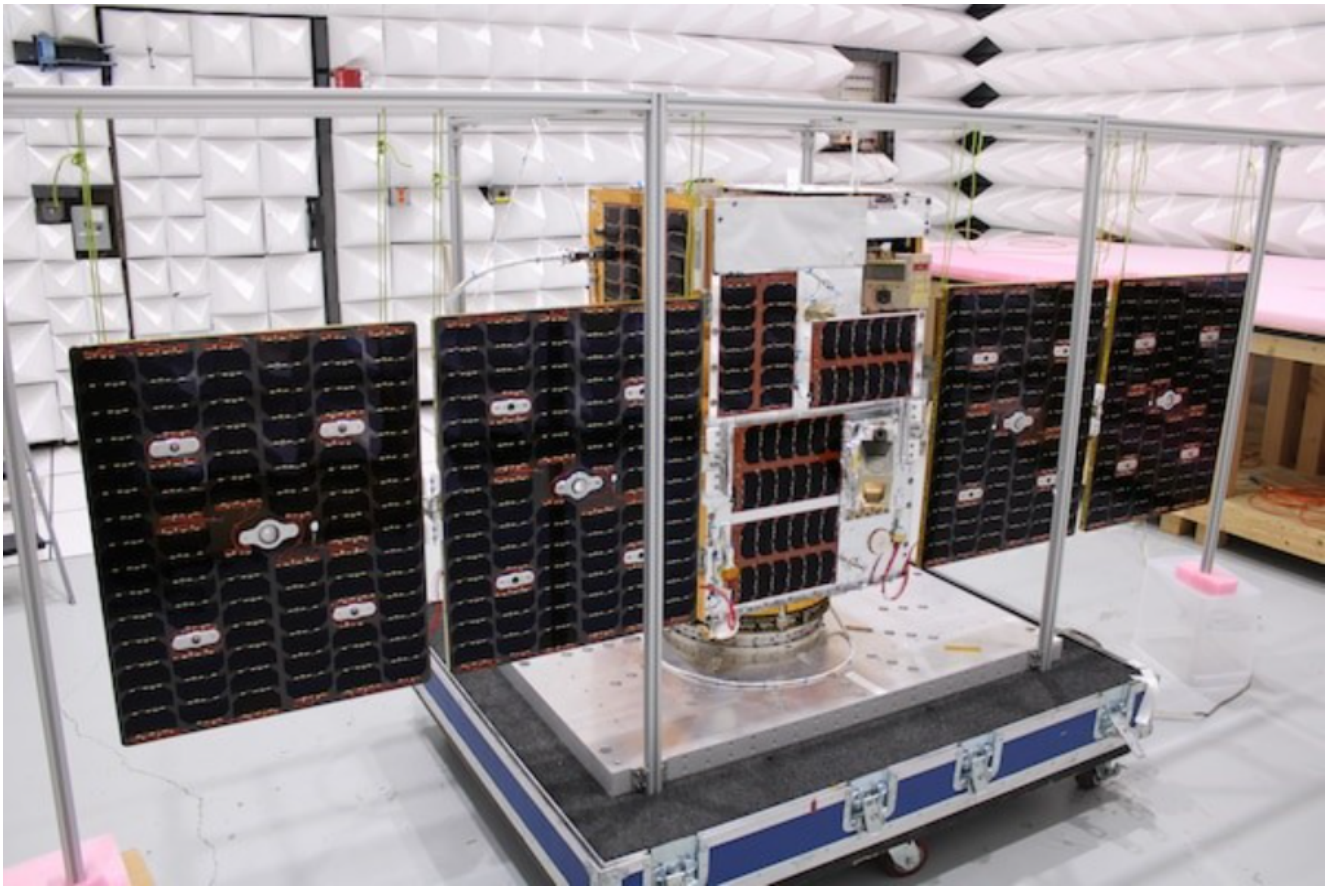
NRL’s Advanced Payloads Soar into Orbit Aboard STPSat-7 Mission



Department of War (DoW) Space Test Program’s (STP) STPSat-7 payload, at NASA Marshall Space Flight Center, Huntsville, Ala., June 25, 2025. (Photo by DoW Space Test Program)

From Emily Winget U.S. Naval Research Laboratory Corporate Communications, April 7, 2026

WASHINGTON,D.C. – U.S. Naval Research Laboratory (NRL) successfully launched three advanced experimental payloads aboard the Department of War (DoW) Space Test Program’s (STP) Satellite-7 mission at approximately 4:33 a.m. PDT on April 7 from Vandenberg U.S. Space Force (USSF) Base, Calif.

U.S. Naval Research Laboratory (NRL) successfully launched three advanced experimental payloads aboard the Department of War (DoW) Space Test Program’s (STP) Satellite-7 mission at

approximately 4:33 a.m. PDT on April 7 from Vandenberg U.S. Space Force (USSF) Base, Calif.

NRL's payloads included the Lasersheet Anomaly Resolution and Debris Observation (LARADO) instrument; the Global Navigation Satellite System (GNSS) Orbiting Situational Awareness Sensor (GOSAS); and the Gadolinium Aluminum Gallium Garnet (GAGG) Radiation Instrument (GARI-1C).

The STPSat-7 spacecraft is aboard the STP-S29A mission, which uses a Northrop Grumman Minotaur IV launch vehicle, marking a significant step forward in advancing U.S. space-based capabilities for the U.S. Navy and national security. By improving understanding of the space environment and testing next-generation satellite technologies, NRL is ensuring the United States maintains its technological advantage and protects critical assets in orbit.

LARADO

One of the key NRL payloads, LARADO will directly address the growing threat of orbital debris.

"LARADO is the next step in ensuring situational awareness in space," said Andrew Nicholas, NRL Sensor Development and Applications Section Head and LARADO principal investigator. "The instrument will detect and characterize small orbital debris that cannot be observed from the ground. This is vital to understanding the space environment and will provide essential data to update orbital debris models. These updates are important to the orbital debris research community, engineers designing spacecraft to survive and minimize growth to the debris environment, satellite operators, and policy makers."

The LARADO concept began in 2012. In FY22, NASA's Heliophysics Division Space Weather Program's Orbital Debris and Space Situational Awareness portfolio within its Science Mission Directorate began funding the development of the LARADO

instrument for STPSat-7.

GOSAS

GOSAS will improve the reliability of navigation and communication systems for warfighters.

“The GOSAS is a CubeSat-compatible, programmable dual GPS receiver designed to characterize the orbital GNSS environment and produce high quality ionospheric space weather products,” said Scott Budzien, Ph.D., NRL research physicist and GOSAS principal investigator. “Understanding and predicting space weather is critical for ensuring the accuracy of GPS and the integrity of military communications.”

GOSAS is a follow-on to the NRL experiment GROUP-C (GPS Radio Occultation and Ultraviolet Photometry-Collocated) experiment on the International Space Station from 2017-2023 that serendipitously detected GPS ground interference. GOSAS originated in 2020 with the mission of increasing GPS accuracy for the warfighter.

GARI-1C

GARI-1C is set to pave the way for future defense applications from space, including detecting weapons of mass destruction. The NRL team takes technology developed for ground-based applications and tests its performance in space. Since most commercial-off-the-shelf components are not radiation-hardened, understanding how they respond to the harsh radiation environment of space is critical for future operational use.

“GARI-1C is designed to space-qualify new gamma-ray detector technology for space-based defense applications,” stated Lee Mitchell, Ph.D., NRL Research Physicist and GARI-1C principal investigator. “This detector technology offers improved energy resolution, lower power consumption and reduced size compared to similar systems, which is key to developing more advanced

and efficient sensors for detecting threats from orbit."

The DoD/DoW Space Test Program (STP) was founded in 1966 to provide flight opportunities for all DoD/DoW research and development activities in an economic and efficient manner. Under the U.S. Space Systems Command, STP supports mission design, payload-to-bus integration, space vehicle-to-launch vehicle integration, and on-orbit operations for S&T payloads that exhibit potential military utility. By advancing scientific knowledge and capability, STP is foundational to ensuring continuous STP advantage in the space domain.

"The success of this mission, achieved through a powerful collaboration with the DoW's Space Test Program, highlights how cutting-edge research and development are fundamental to preserving America's strategic edge in space," said USSF Lt. Col. Brian Shimek, system program manager and director for STP.

NRL's Space Science Division conducts a broad-spectrum of Research, Development, Test & Evaluation in solar-terrestrial physics, astrophysics, upper and middle atmospheric science, and astronomy. The Division's Military Deputy, Lt. Elijah Ray, is embedded with DoW STP at Kirtland Air Force Base, N.M., as NRL's on-site liaison for space experiment coordination and advocacy.

About the U.S. Naval Research Laboratory
NRL is a scientific and engineering command dedicated to research that drives innovative advances for the U.S. Navy and Marine Corps from the seafloor to space and in the information domain. NRL, located in Washington, D.C. with major field sites in Stennis Space Center, Mississippi; Key West, Florida; Monterey, California.

NRL offers several mechanisms for collaborating with the broader scientific community, within and outside of the Federal government. These include Cooperative Research and

Development Agreements (CRADAs), LP-CRADAs, Educational Partnership Agreements, agreements under the authority of 10 USC 4892, licensing agreements, FAR contracts, and other applicable agreements.