

# Space Test Program to launch trio of NRL space science and technology experiments

August 5 2011

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The Naval Research Laboratory and the Department of Defense Space Test Program (STP) finalized a Memorandum of Agreement, May 30, 2011, to integrate and launch science and technology experiments to the International Space Station (ISS) by 2013.

The mission, known as [Space](#) Test Program-Houston 4 (STP-H4), will include the Global Awareness Data-Extraction International Satellite hosted payload (GLADIS) and will validate the performance of a dual channel UHF and VHF data-extraction payload compatible with the nano-satellite form factor of approximately 20 kilograms and 20 watts total weight and power respectively.

"Access to orbit is the objective of every investigator working in the realm of space science and technology," said Jay Middour, branch head, NRL Advanced Systems Technology. "The DoD STP-H4 mission is an apt illustration, allowing several NRL payloads to demonstrate miniaturized satellite technologies for improved maritime security and measurement of space weather and the radiation environment."

GLADIS includes small, lightweight antennas designed to improve signal reception and mitigate interference associated with space-borne collection of the Automatic Information System (AIS) vessel-tracking signal while simultaneously providing two-way communications to widely distributed Maritime Domain Awareness sensor arrays.

The science payloads are the Small Wind and Temperature Spectrometer

(SWATS) and the Miniature Array of Radiation Sensors (MARS).

The objective of SWATS is to make in-situ co-located measurements of the atmospheric density, neutral and ion density, composition and winds on a global scale. These data will support improvements to the thermospheric/ionospheric density and wind models to improve orbit determination and prediction.

MARS is an array of miniature, persistent, ubiquitous sensors that monitor the total dose radiation on the host spacecraft for three dimensional local radiation modeling. These sensors have a small footprint, low mass, and minimal power and telemetry requirements. The MARS sensors will be distributed around the STP-H4 experiment platform and directly attached to the GLADIS payload.

The STP-H4 mission will also include experiments from the Air Force Research Laboratory (ARL), United States Air Force Academy, and the National Aeronautics and Space Administration's (NASA's) Goddard Space Flight Center.

GLADIS is designed and built by the NRL Space System Development Department and was funded by the Office of Naval Research (ONR). The two science experiments are designed and built by the NRL Space Science Division with partial funding for SWATS provided by ONR.

In addition to the experimental payloads, STP is funding the NRL Spacecraft Engineering Department to design and build the STP-H4 power interface box.

Delivery of the flight hardware to STP will take place between late 2011 and early 2012. STP will perform systems integration of all experiments into the STP-H4 payload complement, followed by launch vehicle integration and testing in late 2012, with an anticipated launch to the

## International Space Station in 2013.

Provided by Naval Research Laboratory

Citation: Space Test Program to launch trio of NRL space science and technology experiments (2011, August 5) retrieved 20 April 2024 from <https://phys.org/news/2011-08-space-trio-nrl-science-technology.html>

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