10-25-2011

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UNH Scientists Land Roles in European and Japanese Space Missions

October 25, 2011

DURHAM, N.H. -- Scientists and engineers from the University of New Hampshire’s Space Science Center (SSC) have been selected to provide instruments for two upcoming satellite missions led by the European Space Agency (ESA) and the Japan Aerospace Exploration Agency (JAXA). The successful proposals draw upon the long history of work done at UNH for other satellite missions, including NASA’s Solar-Terrestrial Observatory (STEREO) that was launched five years ago today.

The ESA Solar Orbiter mission will carry the Heavy Ion Sensor, which includes an ion composition telescope being built at UNH by a team led by research professor Antoinette Galvin of the Institute for the Study of Earth, Oceans, and Space (EOS) and the department of physics.

Solar Orbiter will venture closer to the Sun than any previous mission. It is designed to make major breakthroughs in our understanding of how the Sun influences its environment, in particular how it generates and propels the flow of particles, known as the solar wind, in which the planets are bathed.

Launch is slated for January 2017.

“The Ion Composition Time-of-Flight/Energy Telescope we’re building for the satellite’s solar wind composition instrument will do the actual particle measurement,” says Galvin. “So it’s an essential role and one we’re playing due to similar instrumentation we provided on NASA’s STEREO mission. At this time we’re the only U.S. institution still active in this particular field building this type of solar wind composition instrument.”

The STEREO spacecraft, launched October 25, 2006 carries the UNH-built PLAsma and Supra-Thermal Ion Composition (PLASTIC) instrument. Galvin is the principal investigator for the PLASTIC instrument, which measures characteristics of protons, alpha particles and heavy ions. STEREO has dramatically improved our understanding of the powerful solar eruptions that can send more than a billion tons of the Sun’s outer atmosphere hurtling into space.

For the JAXA “cross Scale COupling in Plasma universE” or SCOPE mission, a team led by professor Lynn Kistler was selected to proceed with an 11-month mission concept study for UNH’s Ion Mass Spectrum Analyzer (IMSA), which also draws on historical work done at UNH, such as the CODIF (composition distribution function) instrument developed for the ESA Cluster satellite mission.

SCOPE will investigate fundamental physical processes that are key to understanding the functioning of the Earth’s magnetosphere, as well as what drives solar flares, radio galaxy jets, supernovae remnants, and cosmic rays. The mission will put five formation flight spacecraft into the key regions of the magnetosphere.

“We are very excited to get an opportunity to be a part of this mission,” says Kistler of EOS and the department of physics. “The science is the next step after the on-going Cluster mission and the upcoming NASA Magnetospheric Multi-scale mission (MMS) that UNH is also involved in. Whereas those two missions use four spacecraft to study the physical processes at one scale – a larger scale for Cluster and a very small scale for MMS – SCOPE will look at the cross-scale aspects of these processes.”
The UNH SCOPE team has been given the go-ahead to conduct further work on the IMSA instrument. IMSA was only one of five selected by NASA from a field of 20 Mission of Opportunity proposals submitted to the agency, which will fund U.S. components for the Japanese satellite. The UNH team will receive $250,000 for the 11-month implementation concept study, after which NASA will determine whether the project goes forward.

For Solar Orbiter, UNH is a subcontractor to the Southwest Research Institute, the lead institution for the Heavy Ion Sensor (HIS). A team of national and international partners are also involved. UNH has already been awarded over $661,000 for the project.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,300 graduate students.

Photographs to download:
http://www.eos.unh.edu/newsimage/solarorbiter_lg.jpg
Caption: Artist’s rendition of Solar Orbiter. Image courtesy of Southwest Research Institute.

http://www.eos.unh.edu/newsimage/stereolaunch_lg.jpg
Caption: A Boeing Delta 2 rocket carrying the STEREO spacecraft lifts off at 8:52 pm on October 25th 2006 from Cape Canaveral, Florida.

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