Lockheed Martin Instrument Suite To Study Dynamic Solar Activity On New International Sun Mission

A suite of instruments called the Focal Plane Package (FPP) -- designed and built at the Solar and Astrophysics Laboratory of the Lockheed Martin Advanced Technology Center (ATC) in Palo Alto -- is scheduled for launch on the Solar-B satellite from the Uchinoura Space Center, Kagoshima, Japan on Sept. 23, 2006.

The primary scientific goal of the Solar-B mission is to observe how changes in the magnetic field at the Sun's surface propagate through the different higher layers of the solar atmosphere.

Solar-B is an international cooperative mission between NASA, the Japanese Aerospace Exploration Agency (JAXA), the Particle Physics and Astronomy Research Council of the United Kingdom, and the European Space Agency. It is the second mission in the Solar Terrestrial Probes Program within the Heliophysics Division of NASA's Science Mission Directorate, and follow-on to the successful Solar-A (or Yohkoh) mission, for which Lockheed Martin provided the Soft X-ray Telescope.

"The FPP suite will provide high-resolution optical measurements that will show us the connections between changes in the Sun's magnetic field and features of the solar atmosphere, both steady state -- like coronal heating -- or transient -- like flares and coronal mass ejections," said Dr. Ted Tarbell, Lockheed Martin FPP principal investigator. "The solar group at the ATC has been working towards flying an instrument like this in space for more than 25 years, and having it on this international collaborative investigation is enormously satisfying."

The FPP comprises four distinct sub-systems -- a broadband filter imager (BFI), a narrowband filter imager, a spectra-polarimeter and a correlation tracker to stabilize the images -- and resides on the Solar Optical Telescope (SOT) whose mirror and structure were designed and developed by the National Astronomical Observatory of Japan and Mitsubishi Electronics Company. The SOT is the largest solar optical telescope ever to be flown in space and will be able to resolve features on the surface of the Sun just 90 mi. (150 km) across.

Solar-B will perform coordinated measurements of the different layers of the solar atmosphere from a Sun-synchronous orbit around the Earth. Three instruments will perform these measurements, the previously mentioned SOT, an Extreme Ultraviolet Imaging Spectrometer and an X-Ray Telescope.

These instruments will measure the Sun's magnetic field in the photosphere and the ultraviolet and X-ray radiation, emitted by the transition region/low corona, and the upper corona. Scientists will use the data obtained to gain a more precise understanding of the sources and mechanisms of the Sun's variability.

JAXA is the overall lead for the Solar-B mission, the spacecraft, the launch vehicle and management of space operations. NASA provided the Focal Plane Package for the SOT, and components for the X-ray Telescope and the Extreme Ultraviolet Imaging Spectrometer, as well as engineering support for integration of the three instruments. The Lockheed Martin ATC designed and built the FPP.

The Solar and Astrophysics Laboratory at the ATC has a long heritage of spaceborne solar instruments including the Soft X-ray Telescope on the Japanese Yohkoh satellite, the Michelson Doppler Imager on the ESA/NASA Solar and Heliospheric Observatory, the solar telescope on NASA's Transition Region and Coronal Explorer and the Solar X-ray Imager on the GOES-N environmental satellite. The laboratory also conducts basic research into understanding and predicting space weather and the behavior of our Sun including its impacts on Earth and climate.

The ATC is the research and development organization of Lockheed Martin Space Systems Company (LMSSC). LMSSC, a major operating unit of Lockheed Martin Corporation, designs, develops, tests, manufactures and operates a variety of advanced technology systems for military, civil and commercial customers. Chief products include a full-range of space launch systems, including heavy-lift capability, ground systems, remote sensing and communications satellites for commercial and government customers, advanced space observatories and interplanetary spacecraft, fleet ballistic missiles and missile defense systems.

Headquartered in Bethesda, Md., Lockheed Martin employs about 135,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2005 sales of $37.2 billion.

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