# Lockheed Martin Delivers Atmospheric Imaging Assembly To Goddard Space Flight Center For NASA's Solar Dynamics Observatory

PRNewswire
PALO ALTO, Calif.

The Atmospheric Imaging Assembly (AIA), a suite of four telescopes for NASA's Solar Dynamics Observatory (SDO), has been delivered to the NASA Goddard Space Flight Center (GSFC) in preparation for a launch of SDO no earlier than December 2008. The AIA was designed and built at the Solar and Astrophysics Laboratory of the Lockheed Martin [NYSE: LMT] Advanced Technology Center (ATC) in Palo Alto.

(Photo: http://www.newscom.com/cgi-bin/prnh/20071217/AQM111)

"After four years of intense effort, it is enormously satisfying to arrive at this important milestone," said Lockheed Martin AIA program manager Gary Kushner. "The solid and productive partnership between ourselves, our teammates and our colleagues at GSFC enabled us to overcome challenges and provide the best instrument possible. AIA has the potential, along with the other instruments on SDO, to revolutionize our understanding of the sun, and we are all delighted to have played a role in this mission of discovery."

The AIA is designed to provide an unprecedented view of the solar corona, taking images that span at least 1.3 solar diameters in multiple wavelengths nearly simultaneously, at a resolution of about one arc-second and at a cadence of ten seconds or better. The wavelength span allows the imaging of gases in the temperature range from 10,000 to 30,000,000 K (~20,000 to 50,000,000 F). The high cadence allows the study of how coronal structures evolve in time while heating and cooling. All of the telescopes use state of the art high sensitivity 4096 x 4096 CCD cameras that allow sampling of the solar surface with a spatial resolution of 1000 km (1600 miles).

"This is a very significant step for the solar physics community. Having AIA complete and undergoing integration on to the SDO spacecraft means we're getting very close to the time when this instrument will be providing the kind of data we need to unravel mysteries of the sun that have been just beyond our grasp," said solar physicist -- and principle investigator on AIA -- Dr. Alan Title of the ATC. "Looking at the full sun in all temperature bands, at 12 different wavelengths every 10 seconds will give us unprecedented insight into the processes that shape the corona."

The AIA will produce data required for quantitative studies of the evolving coronal magnetic field, and the plasma it holds, both in quiescent phases and during flares and eruptions. The primary goal of the AIA Science Investigation is to use these data, together with data from other SDO instruments and from other observatories, to significantly improve our understanding of the physics behind the activity displayed by the sun's atmosphere, which drives space weather in the heliosphere and in planetary environments. Ultimately, it is hoped that the greater understanding gained of the observed processes will guide development of advanced forecasting tools needed by the user community of the Living With a Star (LWS) program.

The Solar Dynamics Observatory, which, along with AIA, is comprised of the Heliospheric and Magnetic Imager (HMI) and the Extreme Ultraviolet Variability Experiment (EVE) operates as an integrated system designed to determine how the Sun's magnetic field is generated and structured, how this stored magnetic energy is converted , how it is released into the heliosphere and geospace in the form of solar wind and energetic particles, and how these processes change the solar irradiance. Of course, it is the solar irradiance that is the source of virtually all the energy the enables life on Earth.

SDO is a major component of a fleet of focused science missions developed by the NASA Heliophysics Division designed as components of a Great Observatory whose goal is to understand our solar system -- the domain of the sun.

The Solar and Astrophysics Laboratory at the ATC has a long heritage of spaceborne solar instruments including the Soft X-ray Telescope (SXT) on the Japanese Yohkoh satellite, the Michelson Doppler Imager (MDI) on the ESA/NASA Solar and Heliospheric Observatory (SOHO), the solar telescope on NASA's Transition Region and Coronal Explorer (TRACE), the GOES-N Solar X-ray Imager, the Focal Plane Package on the Hinode Solar Optical Telescope (SOT), and the Extreme Ultraviolet Imager on NASA's Solar Terrestrial Relations Observatory. 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. All of the data produced by the instruments is available to the broad scientific community in near real time. Web sites allow both the science community and the general public access to the data.

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 full spectrum of advanced-technology systems for national security, civil and commercial customers. Chief products include human space flight systems; a full range of remote sensing, navigation, meteorological and communications satellites and instruments; space observatories and interplanetary spacecraft; laser radar; fleet ballistic missiles; and missile defense systems.

Headquartered in Bethesda, Md., Lockheed Martin employs about 140,000 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 2006 sales of $39.6 billion.

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