

Lockheed Martin Cryostat To Fly On NASA's Wide-Field Infrared Survey Explorer Mission

NASA's Wide-Field Infrared Survey Explorer (WISE) - scheduled for launch on Dec. 11, 2009 from Vandenberg Air Force Base, Calif. - will scan the entire sky in infrared light, picking up the glow of hundreds of millions of objects and producing millions of images. Two Thermos-like annular tanks filled with solid hydrogen, called a dual-stage cryostat, built by the Lockheed Martin Space Systems Company Advanced Technology Center (ATC) in Palo Alto, will keep the mission's sensitive infrared telescope and detectors chilled to near absolute zero. Expected to last about 10 months, the solid hydrogen cryostat will cool the WISE focal plane to 7.6 Kelvin (minus 446 degrees Fahrenheit) and the optics to 12 Kelvin (minus 438 degrees Fahrenheit).

"After years of effort, it is very satisfying to finally reach the milestone of launch," said Iran Spradley, Senior Manager of the Thermal Sciences Department at the ATC. "We look forward with anticipation to the many discoveries that WISE is sure to make, and are enormously pleased to have played a role in this very important mission."

"Being a part of the WISE mission will always be a highlight in my career," said Larry Naes, recently retired Lockheed Martin WISE cryostat program manager. "From the very beginning of the program, our colleagues at the Jet Propulsion Laboratory assembled the best of the best to implement this mission, with a singular team focus to optimize the science and produce data that will contribute greatly to our understanding of the infrared universe."

The WISE mission will build on the heritage of NASA's very successful Infrared Astronomical Satellite (IRAS) launched in 1983. WISE, however, will have hundreds of times greater sensitivity and will uncover objects never before seen, including the coolest stars and the most luminous galaxies in the universe. The vast catalogs of infrared objects generated by WISE will help answer fundamental questions about the origins of planets, stars and galaxies, and provide astronomers a treasure trove of data that will be accessed for decades.

It is near-Earth objects, both asteroids and comets with orbits that come close to crossing Earth's path that will be the closest of WISE's discoveries. It is expected that WISE will find hundreds of these, and hundreds of thousands of additional asteroids in the main asteroid belt between Mars and Jupiter. By measuring the objects' infrared light, astronomers will get the first good estimate of the size distribution of the asteroid population. This information will reveal approximately how often Earth can expect an encounter with a potentially hazardous asteroid.

WISE will orbit Earth at an altitude of 326 miles, circling pole to pole about 15 times each day. A scan mirror within the WISE instrument will stabilize the line of sight so that snapshots can be taken every 11 seconds over the entire sky. Each position on the sky will be imaged a minimum of eight times, and some areas near the poles will be imaged more than 1,000 times. About 7,500 images will be taken every day at four different infrared wavelengths.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Wide-field Infrared Survey Explorer for NASA's Science Mission Directorate. The mission's principal investigator, Edward L. (Ned) Wright, is at UCLA. The mission was competitively selected in 2002 under NASA's Explorers Program managed by the Goddard Space Flight Center, Greenbelt, Md. The science instrument was built by the Space Dynamics Laboratory, Logan, Utah, and the spacecraft was built by Ball Aerospace & Technologies Corp, Boulder, Colo. Science operations and data processing will take place at the Infrared Processing and Analysis Center at the California Institute of Technology in Pasadena. Caltech manages JPL for NASA. The mission's education and public outreach office is based at the University of California, Berkeley.

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 and develops, tests, manufactures and operates a full spectrum of advanced-technology systems for national security and military, civil government 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; ballistic missiles; missile defense systems; and nanotechnology research and development.

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