

# The APL News

The Johns Hopkins University • Applied Physics Laboratory

December 2006

## STEREO Off to a Bright Start

by Kristi Marren

With a thunderous roar and a bright orange-and-white plume illuminating a star-filled nighttime sky, the Delta II rocket carrying the twin APL-built STEREO spacecraft lifted off from Pad 17-B at Cape Canaveral Air Force Station, Fla., on Oct. 25 at 8:52 p.m. EDT, on its way to becoming the first mission to photograph the sun in 3-D.

Since launch, the APL-based mission operations team has placed the spacecraft in flight mode, checked out all spacecraft subsystems, and begun turning on and checking out instruments in preparation for data collection.

At press time, the twin observatories were in the third of four phasing orbits (flying from a point close to Earth to one that extends just beyond our moon) prior to the first lunar swingby on Dec. 15. This maneuver will use the moon's gravity to propel one spacecraft into its orbit slightly ahead of Earth. The second spacecraft will be placed into an orbit trailing Earth on Jan. 21, 2007. STEREO (Solar TERrestrial RElations Observatory) is the first mission to use lunar swingbys for multiple spacecraft launched aboard a single rocket.

After the lunar swingbys, the observatories will be in position to capture the first 3-D images of coronal mass ejections – powerful solar eruptions that can hurtle billions of tons of solar particles toward Earth at breakneck speeds, often triggering severe magnetic storms. Such storms can potentially cause power outages and damage communications satellites, and pose a hazard to astronauts working in space.

Just as the slight offset between our eyes provides us with depth perception, STEREO's orbits opposite each other will enable them to obtain 3-D images and particle measurements of the sun.

### Launch Operations

Following launch, crews at APL's mission operations center and the Florida-based Astrotech Spacecraft Processing Facility worked through the night to closely monitor spacecraft operations. The teams anxiously awaited the first signal from the twin observatories 63 minutes after launch as they passed over NASA's Deep Space Network antennas in Canberra, Australia.

"We all cheered and breathed a collective sigh of relief when data confirmed deployment of each spacecraft's solar arrays and the pre-programmed detumbling maneuvers executed as planned," says Mission Operations Manager John Eichstedt, of the Space Department.



"Watching the launch data feeds was exciting, but it was nothing short of fantastic when we made first contact with the spacecraft and realized they were healthy," says Annette Dolbow, of the Space Department, who served as integration and test lead for the "B" observatory.

"Our team has worked very hard and done a terrific job tackling the many challenges associated with designing, building, testing and launching two nearly identical observatories," says Ed Reynolds, APL's STEREO project manager. "Without the hard work and diligence of such a great team, it wouldn't be possible to explore this new frontier in solar research."

The first images from the observatories are expected in mid-December and the first 3-D images are expected in late March 2007.

STEREO is NASA's third Solar Terrestrial Probes mission and is managed by NASA's Goddard Space Flight Center. For more information, visit [stereo.jhuapl.edu](http://stereo.jhuapl.edu). ■