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Herschel, Planck Satellites on Track for 2008 Launch

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Europe's Herschel and Planck science satellites face several key milestones in the coming weeks but appear on track for a launch on a single Ariane 5 rocket in the summer of 2008, program managers said.

Herschel will study the formation of stars and galaxies, while Planck will attempt to map the cosmic background microwave radiation to add details about the so-called Big Bang that gave birth to the known universe.

Both satellites will use super-cooled helium to enable their instruments to measure subtle low-temperature variations. Planck in particular is designed to test the current state of the art in cryogenic technology.

Within the European Space Agency (ESA), Herschel and Planck are being studied with special interest because any significant slip in their schedules will have ripple effects on ESA's entire science program.

The total cost of the two satellites, including launch and operations, has been estimated at around 1.65 billion euros ($2.15 billion). This figure includes experiments provided by individual ESA governments. The cost to ESA alone is slightly less than 1.1 billion euros.

Thomas Passvogel, the Herschel-Planck program manager, said the program is now consuming cash at a rate of between 5.5 million and 6 million euros per month, a cost that will remain constant through launch.

ESA science officials have proposed that the agency's customary 20 million euros in annual program contingency funds be increased to 40 million euros in 2008 — just in case Herschel and Planck encounter last-minute delays and unexpected costs.

At a Feb. 1 press briefing here at Herschel and Planck prime contractor Alcatel Alenia Space, Passvogel said the late-July 2008 launch target "contains no hidden margins, but is our most reasonable and realistic launch date. As of today we are on track for that."

Alcatel Alenia Space is leading a team of 95 companies throughout Europe, and including several U.S. participants. Alcatel Alenia Space's Herschel and Planck program manager, Jean-Jacques Juillet, said "there is hardly a company working in the space industry in Europe that is not working on this program."

Like all ESA-managed programs, Herschel and Planck are managed using the geographic-return rules that distribute work to companies based on their national governments' contribution to the program.

The Planck satellite is scheduled to complete assembly by early April here. It will then be subjected to tests of its cryogenic cooler, designed to bring the instruments' temperature down to 0.1 degrees Kelvin, or minus 273 degrees Celsius.

At about the same time, the payload instruments for the Herschel satellite are scheduled to arrive at Astrium GmbH in Germany for integration.

Planck will spend the rest of this year in testing before being transferred to Liege, Belgium, for thermal-vacuum tests in an environment simulating that of space. Herschel and Planck are expected to arrive at Europe's Guiana Space Center launch base in April 2008 to begin more than three months of on-site preparations for launch.

Juillet said one of the biggest challenges in completing the satellite will be to verify on the ground how the cryogenic system will work once in orbit.

The Planck cryogenic cooling system has four separate layers that successfully cool the instruments down to the 0.1 degrees Kelvin level Planck managers say the satellite is designed to be 30 times more sensitive to background radiation than is NASA's Wilkinson Microwave Anisotropy Probe (WMAP), which was launched in 2001 and is still operating. The images of background radiation from the Big Bang will be 10 times as precise as those produced by WMAP.

George F. Smoot, co-winner of the 2006 Nobel Prize in Physics for his work on the Big Bang, said Planck's imminent arrival has "stimulated the WMAP team to work harder, to produce as much data as they can," an example of the competitive drive that is an often-overlooked motivator in science.

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