

Astronauts get in shuttle, ready to go to Hubble

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The sun sets on the space shuttle Atlantis Sunday May 10, 2009 at the Kennedy Space Center in Cape Canaveral, Fla. With a forecast of near-perfect weather, NASA's Hubble Space Telescope scientists and managers were euphoric as they awaited Monday's planned launch of shuttle Atlantis on the final trip to the orbiting observatory. (AP Photo/Chris O'Meara)

(AP) -- Astronauts strapped into space shuttle Atlantis on Monday for one last flight to the Hubble Space Telescope, an extraordinarily ambitious mission that NASA hopes will lift the celebrated observatory to new scientific heights.

The six men and one woman who will attempt the complicated, riskier than usual job shouted, waved and raised their fists as they headed out to the pad, eager to get going after waiting seven months to fly. Their flight

was delayed last fall, two weeks before the scheduled launch, after the orbiting telescope broke down.

"Let's go!" commander Scott Altman said. "Yeah!"

Near perfect weather was forecast for the afternoon liftoff. [NASA](#) also was keeping an eye on the [weather](#) at the [emergency landing](#) strip in Spain, where there was a slight chance of rain.

The astronauts climbed aboard Atlantis late Monday morning. A mile away on the other pad stood shuttle Endeavour, primed for a rescue in case Atlantis is battered by launch debris or space junk.

Many of the expected 30,000 onlookers began gathering at Kennedy Space Center for the launch - scheduled for just after 2 p.m. EDT - including space center workers and guests. The Hubble scientists and managers were euphoric to finally be so close to liftoff.

The 19-year-old Hubble, last visited by astronauts seven years ago, is way overdue for a tuneup.

On this fifth and final repair mission, two spacewalking teams will replace Hubble's batteries and [gyroscopes](#), install two new cameras and take a crack at fixing two broken science instruments, something never before attempted. Those instruments, loaded with bolts and fasteners, were not designed to be tinkered with in space.

The astronauts also will remove the science data-handling unit that failed in September and had to be revived, and put in a spare that was hustled into operation. Fresh insulating covers will be added to the outside of the telescope, and a new fine guidance sensor for pointing will be hooked up.

Five spacewalks will be needed to accomplish everything.

All told, it's a \$1 billion mission. The space telescope, over the decades, represents a \$10 billion investment. It was launched amid considerable hoopla in 1990, but quickly found to be nearsighted because of a flawed mirror. Corrective lenses were installed in 1993 during what NASA's science mission chief, Ed Weiler, calls "the miracle in space mission."

With all the newest pieces, NASA hopes to keep Hubble churning out breathtaking views of the universe for another five to 10 years. The new cameras should enable the observatory to peer deeper into the cosmos and collect an unprecedented amount of data.

"I personally believe the stakes for science are very high," senior project scientist David Leckrone said on the eve of the [launch](#). "It's a very complex, very ambitious mission, and it makes the difference between an observatory that's kind of limping along scientifically and an observatory that's the best ever."

The 11-day mission, led by Altman, a former Navy fighter pilot, comes with a higher risk than usual.

Atlantis will be flying in an unusually high orbit for a space shuttle - 350 miles up. Space is more littered there with spacecraft parts, and the odds of a catastrophic strike are greater. In addition, there's always the chance the shuttle could be damaged during liftoff by a piece of fuel-tank insulating foam or other debris, which doomed Columbia in 2003.

NASA canceled this last Hubble mission in 2004, saying it was too dangerous. It was reinstated two years later by the space agency's new boss, but only after shuttle flights had resumed and repair techniques had been developed. As an added precaution, another shuttle was ordered to be on standby, in case Atlantis suffered irreparable damage.

Endeavour, the rescue ship, is ready to lift off within a week to save Atlantis' crew.

On the Net:

NASA: <http://www.nasa.gov/mission-pages/hubble/main/index.html>

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