National Aeronautics and Space Administration

NASAfacts

STS-125 (5th Hubble Servicing Mission)

Atlantis

Pad 39A:

126th shuttle mission
30th flight of OV-104
53rd landing at Edwards Air Force Base

Crew:

Scott Altman, commander (4th shuttle flight)
Gregory C. Johnson, pilot (1st)
Michael Good, mission specialist (1st)
Megan McArthur, mission specialist (1st)
John Grunsfeld, mission specialist (5th)
Mike Massimino, mission specialist (2nd)
Andrew Feustel, mission specialist (1st)

Orbiter Preps:

Into OPF – 02/20/2008
Rollover to VAB – 08/22/2008
Rollout to pad – 09/04/2008
Rollback to VAB – 10/20/2008
Rollout to pad – 03/31/09

Launch:

May 11, 2009 at 2:01 p.m. EDT. A flawless liftoff began Atlantis' 13-day mission on the final Hubble Space Telescope Servicing mission. Atlantis was first scheduled to launch in October but was delayed to February when a system that transfers science data from the orbiting observatory to Earth malfunctioned. NASA managers decided to postpone the launch again to May in order to wait for a second data handling unit for the telescope.

For this launch, both in October and in May, two shuttles were on the pads at the same time. Space shuttle Endeavour was designated to stand by at Launch Pad 39B in the unlikely event that a rescue mission was necessary during the mission.

Landing:

May 24, 2009 at 11:39 a.m. EDT. Landing opportunities on May 22, May 23 and May 24 were waved off due to weather concerns at Kennedy. Atlantis landed May 24 on orbit 197 on Runway 22 at Edwards Air Force Base in California. Main gear touchdown was 11:39:05 a.m. EDT. Nose gear touchdown was at 11:39:15 a.m. Wheel stop was at 11:40:15 a.m. Mission elapsed time was 12 days, 21 hours, 37 minutes and 9 seconds, covering 5.3 million miles and 13 days.

On June 2, Atlantis arrived back at Kennedy piggyback on the Shuttle Carrier Aircraft, landing on the Shuttle Landing Facility at 6:53 p.m. EDT after a 2-day trip from Edwards AFB.

Mission Highlights:

During five spacewalks, crew members installed two new instruments on NASA's Hubble Space Telescope and repaired two others, bringing them back to life, replaced gyroscopes and batteries, and added new thermal insulation panels to protect the

orbiting observatory. The result is six working, complementary science instruments with capabilities beyond what was available in 1990 and an extended operational lifespan until at least 2014.

Before the rendezvous with Hubble, the crew performed a thorough inspection of the shuttle's heat shield. Commander Scott Altman, Pilot Gregory C. Johnson and Mission Specialists Michael Good, Megan McArthur and Mike Massimino all used the shuttle's 50-foot orbiter boom sensor sytem attached to the 49-foot robotic arm to get a close look at the surface of the shuttle's belly and its wing-leading edges and nose cap. The data was sent to the ground for analysis. During the inspection, mission managers noted an area of damage on the forward part of Atlantis where the wing blends into the fuselage. Although it appeared to be minor, standard expert analysis was conducted. Ultimately, mission managers declared Atlantis' thermal protection tiles safe for reentry.

Commander Scott Altman guided Atlantis within 50 feet of Hubble and Mission Specialist Megan McArthur grappled the observatory at 1:14 p.m. EDT while the shuttle orbited 340 miles above Western Australia. McArthur then maneuvered Hubble onto a Flight Support System maintenance platform in Atlantis' payload bay. The platform provided power for thermal control while the telescope was serviced. Five spacewalks followed that completed all of the mission objectives.

The spacewalking astronauts set two long-duration records of 7 hours, 56 minutes (eighth longest) and 8 hours, 2 minutes (sixth longest).

EVA No. 1 — May 14: 7 hours, 20 minutes.

Mission Specialists John Grunsfeld and Andrew Feustel installed Wide Field Camera 3 and replaced the Science Instrument Command and Data Handling Unit. Grunsfeld installed the soft capture mechanism for future service missions and Feustel installed two Latch Over Center Kits to ease opening and closing Hubble's large access doors on the remaining spacewalks.

EVA No. 2 — May 15: 7 hours, 56 minutes.

Mission Specialists Michael Good and Mike Massimino replaced three rate sensing units containing two gyroscopes each (one of the three originals would not fit so a spare was used), and replaced a battery module from Bay 2 of the telescope.

EVA No. 3 — May 16: 6 hours, 36 minutes.

Grunsfeld and Feustel removed the Corrective Optics Space Telescope Axial Replacement and installed the new Cosmic Origins Spectrograph to allow Hubble to peer farther into the universe than ever before in the near- and far-ultraviolet ranges. Then the two astronauts repaired the Advanced Camera for Surveys, removing 32 screws from an access panel to replace the camera's four circuit boards and install a new power supply.

EVA No. 4 — May 17: 8 hours, 2 minutes.

Massimino and Good repaired the Space Telescope Imaging Spectrograph by replacing a power supply board. A handrail obstructed the path of a fastener capture place and a stripped bolt prevented it from coming free. Under guidance from Goddard Space Flight Center, Massimino bent and broke the handrail free to install the capture plate. The astronauts were unable to install a New Outer Blanket Layer on the outside of Hubble's Bay 8. The task was delayed to the fifth and final spacewalk.

EVA No. 5 — May 18: 7 hours, 2 minutes.

Feustel and Grunsfeld swapped a battery module from Bay 3 with a fresh one and removed and replaced the Fine Guidance Sensor 2. They then installed the New Outer Blanket Layer on three bays outside the telescope.

To complete the mission, McArthur used the shuttle's robotic arm to grab Hubble, lift it out of Atlantis' payload bay and release.

Atlantis made a final separation maneuver from the telescope and the berthing mechanism to which Hubble had been attached during the mission was stored back in the payload bay.

Another inspection of Atlantis' heat shield searched for any possible damage from orbital debris.

The next day, the crew stowed gear, checked the reaction control system thrushters and flight control systems for reentry and descent through the atmosphere.

On May 21, the crew testified before the Senate Appropriations Committee, Subcommittee on Commerce, Justice, Science and Related Agencies, chaired by Sen. Barbara Mikulski of Maryland. She and former astronaut Sen. Bill Nelson of Florida talked with the crew. The STS-125 crew is the first to testify live from space in a Senate hearing.

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