

STS-125/400 Pre-Mission Summary

NWS Spaceflight Meteorology Group



[Atlantis](#) is currently scheduled to launch from [Kennedy Space Center's Launch Complex 39A](#) on May 11th, 2009 at 2:01 PM EDT (18:01 UTC). This will be the 126th space shuttle flight and the 4th and final flight to service the [Hubble Space Telescope](#) (HST). The launch inclination for STS-125 will be 28.5 degrees compared to a launch inclination of 51.6 degrees to the [International Space Station](#) (ISS). Due to the lower inclination angle, there will only be one [Transoceanic Abort Landing](#) (TAL) site which will be Moron, Spain. Landing is currently scheduled for the morning of May 22nd at Kennedy Space Center. The alternate end-of-mission landing sites are Edwards Air Force Base in California and White Sands Space Harbor in New Mexico.

Atlantis and her crew will return to the Hubble Space Telescope for one last visit before the shuttle fleet retires in 2010. Over 11 days and five spacewalks, the Atlantis crew will install two new instruments, repair two inactive ones and perform the component replacements that will keep the telescope functioning into at least 2014.

The shuttle [Discovery](#) launched Hubble in 1990, and released it into an orbit of 304 nautical miles above the Earth. Since then it's encircled the Earth more than 97,000 times and provided more than 4,000 astronomers access to the stars not possible from inside Earth's atmosphere. Hubble has helped answer some of science's key questions and provided images that have awed and inspired the world.

STS-400 is the Space Shuttle contingency support flight, which would be launched using Space Shuttle [Endeavour](#) should a major problem occur during STS-125. Due to the much lower orbital inclination of the HST compared to the ISS, the shuttle crew will be unable to use the International Space Station as a safe haven and follow the usual plan of recovering the crew with another shuttle at a later date. Instead, NASA has developed a plan to conduct a shuttle-to-shuttle rescue mission, similar to proposed missions for pre-ISS flights. This rescue mission would be launched only seven days after call up, as the maximum time the crew can remain aboard a damaged orbiter is 23 to 28 days.

Based on the climatology for an early afternoon launch attempt in May, KSC weather is favorable for launch about 72 percent of the time with crosswinds and ceilings below flight rule limits being the primary violation. Climatologically, there is about a 92 percent chance of acceptable weather at Moron. [The Spaceflight Meteorology Group](#) (SMG) will post mission forecasts to our web site starting on May 9th through the end of the mission.

SMG will also provide weather information to the Hypersonic Thermodynamic Infrared Measurements (HYTHIRM) team. An aircraft flying over the Gulf of Mexico will capture imagery of the orbiter during the reentry. The team will use imagery to analyze the boundary layer flow immediately surrounding the orbiter at high mach numbers. High altitude clouds impact the ability of the aircraft to photograph the orbiter.

SMG's ascent/entry team consists of Mark Wiley, Lead Forecaster; Brian Hoeth, Assistant Lead/TAL Forecaster; and Paul Wahner, SMG upper winds coordinator and Techniques Development Unit (TDU) Meteorologist. Tim Garner will provide Assistant Lead/TAL forecaster training oversight.

Submitted by: Mark Wiley STS-125 Lead Meteorologist