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STS-134: Endeavour's Final Flight

Mission: ISS Flight ULF6

Orbiter: Endeavour

Launch Pad: 39A

Launch: May 16, 8:56 amEDT

Landing: 14 days later

Orbit Altitude: 225 miles

Orbit Inclination: 51.60°

Crew:

Mark E. Kelly - Commander

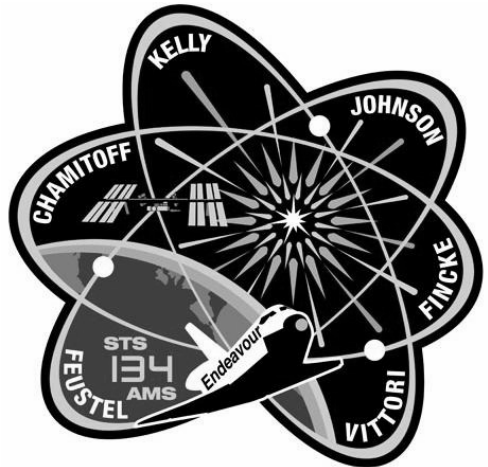
Gregory H. Johnson - Pilot

Michael Fincke - Ms 1

Roberto Vittori, ESA - MS 2

Andrew J. Feustel - MS 3

Gregory Chamitoff - MS 4



The design of the STS-134 crew patch highlights research on the International Space Station (ISS) focusing on the fundamental physics of the universe. On this mission, the crew of Space Shuttle Endeavour will install the Alpha Magnetic Spectrometer (AMS) experiment - a cosmic particle detector. By studying sub-atomic particles in the background cosmic radiation, and searching for anti-matter and dark-matter, it will help scientists better understand the evolution and properties of our universe. The shape of the patch is inspired by the international atomic symbol, and represents the atom with orbiting electrons around the nucleus. The burst near the center refers to the big-bang theory and the origin of the universe. The Space Shuttle Endeavour and ISS fly together into the sunrise over the limb of Earth, representing the dawn of a new age, understanding the nature of the universe.

STS-134 Payload Overview

The Alpha Magnetic Spectrometer-2 (AMS) is a state-of-the-art particle physics detector to be delivered to the International Space Station. Using a large magnet to create a magnetic field that will bend the path of the charged cosmic particles already traveling through space, eight different instruments will provide information on those particles as they make their way through the magnet. Armed with that information, hundreds of scientists from 16 countries are hoping to determine what the universe is made of and how it began, as the AMS searches for clues on the origin of dark matter and the existence of antimatter and strangelets.

The Earth's atmosphere protects us from the vast majority of the cosmic particles moving through the universe. Sitting on the ground at Kennedy Space Center, the AMS measured an average of 400 particles per second. In space, it is expected to see 25,000 particles per second.

Space shuttle Endeavour's payload includes the ExPRESS Logistics Carrier (ELC) 3 and other experiments as well. The total payload weight, not counting the middeck, is 29,323 pounds. The space shuttle will carry on its middeck a variety of experiments and supplies. The Orbiter Boom Sensor System (OBSS) will go up on the space shuttle, but will be stored on the truss structure on the International Space Station.



Local Radio Stations

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WMMB 1240 & 1350 AM

WIXC 1060 AM

WMFE 90.7 FM

K4GCC 146.940 MHz (Ham)

Watching the Countdown

by Robert Osband

The countdown is actually the world's most complex "check-list". It starts at T-45 Hours four days before the launch (pronounced "T Minus 45" - that's "T" as in Time To Launch). That's *much* longer than 45 hours away, but there are many built-in "holds" in the count when things can be fixed, and still allow an on-time launch.

When you leave for your viewing site, turn on the radio for the news at the top of the hour, and see if they stopped "tanking". If they have not completed (or even started) filling the fuel tanks with liquid hydrogen fuel and liquid oxygen oxidizer, then you may as well turn around and head for the "Attractions", because there will be no launch today.

During the T-20 minute built-in hold, they will poll the Managers who will give their "Go" or "No-Go" report (usually "go"). It's during the hold at T-9 minutes when things get critical. The ones to listen for are "Weather" (who may not like the way the clouds are moving) and SRO.

The Superintendent of Range Operations (SRO) is the person responsible to watch for ships or aircraft traveling through the projected path of the Space Shuttle, or its jettisoned equipment. If the SRO is happy, then *everyone* is happy.

They can hold the count at T-5 minutes, and still launch ("Weather" likes to call for these), but at T-5 minutes, they call "Go for APU Start". When they start the Auxiliary Power Units to provide hydraulic power for gimbaling (turning) the engines, and the rudder, they actually start consuming fuel. If they start the APU's, they actually plan to launch the shuttle.

That's not to say that the Ground Launch Sequencer computer handling the launch since the T-9 minute mark can't find a reason to stop the launch, or that the 4 on-board computers that take over at T-31 Seconds will not find a reason to shut down the launch - right up to the last half-second before Zero in the count. But chances are real good that they're going to "light the candle", and let the astronauts "take a ride up-hill".

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Details at <http://SpaceLaunchInfo.Com/holds>

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Meet The Crew of STS-134



Pictured clockwise are NASA astronauts Mark Kelly (bottom center), commander; Gregory H. Johnson, pilot; Michael Fincke, Greg Chamitoff, Andrew Feustel and European Space Agency's Roberto Vittori, all mission specialists

Mark E. Kelly - Commander. Veteran astronaut and a captain in the U.S. Navy, Mark Kelly will lead STS-134 and its crew. In his role as commander, he has overall responsibility for the safety and execution of the mission, orbiter systems operations and flight operations, including landing.

Gregory H. Johnson - Pilot . A retired colonel in the U.S. Air Force, will be making his second trip into space as pilot on STS-134. He will be responsible for orbiter systems operations, will assist Kelly with rendezvous and will fly Endeavour during undocking and the fly around. Following initial astronaut training,

Michael Fincke, a colonel in the U.S. Air Force, will serve as a mission specialist on STS-134. Fincke was a member of the Crew Test Support Team in Russia and served as the International Space Station crew procedures team lead. He is qualified to fly as a left-seat flight engineer (co-pilot) on the Russian Soyuz spacecraft.

Roberto Vittori, a colonel in the Italian Air Force, he was selected as an astronaut by the Italian Space Agency (ASI), in cooperation with the European Space Agency (ESA), and later joined the European Astronaut Corps.

Andrew J. Feustel, is making his second trip into space. Feustel flew on the fifth and final Hubble servicing mission, STS-125, and accumulated nearly 13 days in space and more than 20 hours of EVA time in three spacewalks.

Greg Chamitoff, will serve as a mission specialist on STS-134. Chamitoff developed software applications for spacecraft attitude control monitoring, prediction, analysis and maneuver optimization. One of these applications is the 3D "big screen" display of the station and shuttle used by Mission Control.

Mission status reports on your phone's web browser:
<http://S.PH2.Mobi> - Choice 8

Meet The Crew of ISS Expedition 27



The Expedition 27 crew members, from left, are Russian cosmonaut Dmitry Kondratyev, commander; Russian cosmonaut Andrey Borisenko, NASA astronaut Catherine Coleman, Russian cosmonaut Alexander Samokutyayev, European Space Agency (ESA) astronaut Paolo Nespoli and NASA astronaut Ron Garan, all flight engineers.

Air Force Colonel **Catherine Coleman** flew aboard the Soyuz TMA-20 spacecraft to serve as a flight engineer for Expeditions 26 and 27. A veteran of two shuttle missions, Coleman's last spaceflight was in July 1999 as the lead mission specialist for STS-93 aboard Columbia. *Twitter ID: astro_cady*

As commander of Soyuz TMA-20, cosmonaut **Dmitry Kondratyev** traveled to the International Space Station to serve as an Expedition 26 flight engineer and Expedition 27 commander. A colonel in the Russian air force, Kondratyev qualified as a test-cosmonaut in 2000.

European Space Agency astronaut **Paolo Nespoli** traveled to the ISS aboard the Soyuz TMA-20 spacecraft and serves as a flight engineer for Expeditions 26 and 27. In 2007, Nespoli visited the station as a member of the STS-120 crew aboard space shuttle Discovery to deliver the Italian-built Harmony node. *Twitter ID: Astro_Paolo* (tweets in Italian)

Selected as a cosmonaut candidate in May 2003, **Andrey Borisenko** arrived at the International Space Station aboard the Soyuz TMA-21 to serve as an Expedition 27 flight engineer and as the Expedition 28 commander. This is Borisenko's first spaceflight.

NASA Astronaut **Ron Garan** arrived at the International Space Station aboard the Soyuz TMA-21 spacecraft to serve as a flight engineer for Expeditions 27 and 28. Garan previously visited the station as an STS-124 mission specialist aboard space shuttle Discovery in June 2008.

A lieutenant colonel in the Russian air force, **Alexander Samokutyayev** arrived at the International Space Station aboard the Soyuz TMA-21 spacecraft to serve as a flight engineer for Expeditions 27 and 28. This is his first journey into space.

The International Space Station

Metaphorically speaking, the ISS (International Space Station) is a “Port Of Call” in the vast ocean of space. It’s a place where six astronaut/cosmonaut/scientists live, and research in the micro-gravity of space. Crew members of Expedition 27 are from Russia, the US and Italy. Crews rotate about once every six months. They travel in three man Soyuz capsules launched from Kazakhstan. There are two Soyuz capsules attached to the ISS as transportation back to Earth.



Each tour of duty is known as an “expedition”, quite similar in nature to research expeditions to other hard to reach, and live in environments, such as the South Pole, and underwater research stations. In fact, part of training for a tour on board the ISS includes living in a NOAA (National Oceanographic and Atmospheric Administration) research station 30 feet below the ocean surface in the Florida Keys. Many astronauts have remarked how similar the environments are in the way the individual is cut off from civilization, with a large support team available by radio.

In 2005, Congress declared that the Destiny Laboratory aboard the ISS would join the ranks of the great National Laboratories, such as those at Oak Ridge, Fermilab, the National Institutes of Health, and others. It was meant to open up the lab to other federal research work, which those labs accomplish, as well as being an inspiration to researchers far and wide.

The station is very large, and can be seen with the naked eye as it passes over the earth, appearing as a “moving star” under certain conditions. First, if you can’t see stars, you can’t see Earth orbiting satellites, so if it’s cloudy when a “pass” is scheduled, you may as well go back indoors.

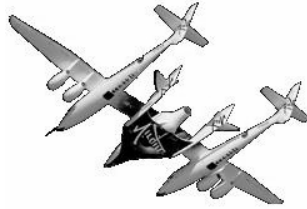
Next, you have to be in darkness while the satellite is still in sunlight (while it’s not in the Earth’s shadow). Therefore, you can only see satellites before dawn, or after dusk. To find out when these conditions are right for you, visit **Heavens-Above.Com**, run by DLR, a space research company in Germany that does work for the European Space Agency. Be sure to set your watch accurately! www.Time.Gov is set to the atomic clocks of the National Institute of Standards & Technology as well as the US Naval Observatory Master Clock.

The web links you want are at **SpaceLaunchInfo.Com**

Are YOU ready for Space Travel? Then make a reservation!



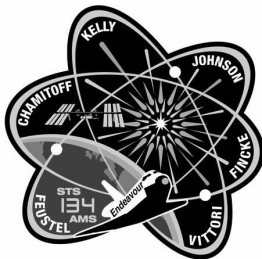
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