

**United States of America**  
**Nomination for the Fédération Aéronautique Internationale**  
**Yuri A. Gagarin Gold Medal**

**Nominee:     The Crew of Mission STS-114**

Colonel Eileen M. Collins, USAF (Retired)	Commander
Colonel James M. Kelly, USAF	Pilot
Mr. Soichi Noguchi	Mission Specialist 1
Dr. Stephen K. Robinson, Ph.D.	Mission Specialist 2
Dr. Andrew S.W. Thomas, Ph.D.	Mission Specialist 3
Captain Wendy B. Lawrence, USN	Mission Specialist 4
Dr. Charles J. Camarda, Ph.D.	Mission Specialist 5

**Affiliations:**   The crew consists of six NASA astronauts and one JAXA astronaut

**Suggested Citation:**

For the successful completion of groundbreaking work in on-orbit thermal protection system inspection and repair accomplished during mission STS-114.

**Justification:**

The crew of STS-114 was launched aboard the Space Shuttle Discovery on July 26, 2005, from the Kennedy Space Center, Florida. The 14-day mission was the first Space Shuttle flight following the loss of the Space Shuttle Columbia two-and-a-half years earlier. Following a successful launch and prior to entry into the Earth's atmosphere, the crew of STS-114 performed a multitude of tasks which were dedicated to gaining a full understanding of the condition of the Space Shuttle's thermal protection system while on-orbit. These tasks laid the groundwork which will allow all future Space Shuttle missions to accurately know the condition of their thermal protection system prior to entry.

The STS-114 crew performed new and complex thermal protection system inspection and repair tasks on an almost daily basis while on-orbit. Many of these inspection and repair tasks had never been previously performed and often involved equipment, including hardware and software, which had never flown in space. On Day One and immediately following shutdown of the Space Shuttle's main engines, the STS-114 crew obtained unprecedented hand-held video and hand-held high-resolution still photos of the external tank during a time-critical maneuver. Working as a cohesive team, the STS-114 crew maneuvered the Space Shuttle through 180 degrees of pitch in order to place the overhead windows in a position from which pictures could be recorded. While this maneuver was in progress, several crewmembers quickly unstrapped from their seats, retrieved cameras, and then expertly recorded magnificent pictures of the external tank as it promptly drifted away from the Space Shuttle. During most of Day Two, the STS-114 crew used the Space Shuttle's 50-

foot robotic arm to manipulate a sensor suite located on the end of a 50-foot boom in order to inspect the reinforced carbon-carbon which is part of the thermal protection system located on the nose and leading edges of Discovery. The data from this inspection was then downlinked to engineers who reviewed the data to ensure that the reinforced carbon-carbon had not sustained any damage during ascent. On Day Three, while approaching the International Space Station, the STS-114 crew deftly maneuvered the Space Shuttle through a 360-degree flip in order to expose the vulnerable belly of the Space Shuttle to the crew of the International Space Station. While the Space Shuttle's underside was visible to the International Space Station crew, they took a series of photos to document the condition of the delicate thermal protection system tiles which protect the Space Shuttle during entry. After completing the rendezvous and docking with the International Space Station, the crew continued inspecting the reinforced carbon-carbon with the sensor package located on the end of the 50-foot boom.

Over the next nine days, the STS-114 crew performed three spacewalks. During these spacewalks, the crew successfully tested potential methods for repairing the Space Shuttle's thermal protection system should it be damaged on subsequent flights. In addition, and as a result of the photos which were taken by the International Space Station crew during the 360-degree flip maneuver, several potentially damaging protuberances were discovered on the Discovery's belly. With input from the STS-114 crew, a plan was developed by the Mission Control team to remove the protuberances. During the third and final spacewalk, an STS-114 member was placed on the end of the International Space Station's robotic arm and maneuvered to a position where he delicately removed the protuberances, eliminating the concern that the protuberances would energize the plasma flow to an unacceptable level during Discovery's entry.

In addition to the unprecedented activities focusing on Discovery's thermal protection system, the STS-114 crew also greatly enhanced the health of the International Space Station. They replaced a failed gyro used by the International Space Station to maintain attitude. They also delivered over 12,000 pounds of needed supplies and equipment and returned over 7,000 pounds of Station material. On August 9, at 5:12 a.m. Pacific Daylight Time, STS-114 landed at Edwards Air Force Base in California.

The STS-114 crewmembers, through their flawless execution of a complicated, dynamic, and critical mission, have laid the foundation for future Space Shuttle flights in order to continue construction of the International Space Station. The STS-114 crewmembers are most highly deserving of the prestigious Yuri A Gagarin Gold Medal.