International Space Station status report: SS07-23

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HOUSTON - The Expedition 15 crew aboard the International Space Station completed its first week of station orientation as the crew worked with experiments and hardware maintenance.Commander Fyodor Yurchikhin and flight engineers Oleg Kotov and Suni Williams began the week with a couple light duty days after the busy handover operations with the former crew. Expedition 14 Commander Michael Lopez-Alegria and Russian crewmate Mikhail Tyurin, accompanied by spaceflight participant Charles Simonyi, returned to Earth on Saturday, April 21, and are at the Gagarin Cosmonaut Training Center in Star City, Russia, for several weeks of post-mission debriefing and rehabilitation.This week, the station crew members participated in several drills to maintain their medical and emergency proficiency. Yurchikhin and Kotov began sessions throughout the first two weeks of their residence to orient themselves with the station's operating systems. Williams, who served as an Expedition 14 crew member, is aiding Expedition 15 with their station orientation.On Thursday, Williams was told that she will return to Earth aboard space shuttle Atlantis, targeted for launch June 8. That shuttle mission, STS-117, will carry astronaut Clay Anderson to the station to join Expedition 15 in progress. This rotation originally was planned for STS-118, targeted for launch Aug. 8.
NASA managers approved the crew rotation after a more detailed review determined it would not impact station operations or future shuttle mission objectives. Since an earlier crew rotation was possible, they decided it would be prudent to return Williams and deliver Anderson sooner rather than later. Upon Williams' return, she will have accumulated more time in space than any other woman. Williams spent some of her off-duty time completing additional test runs for the Capillary Flow Experiment. Capillary flow is the key process used to move fluids in a microgravity environment. It uses the low-gravity environment aboard the station to understand the special dynamics of capillary flow and will aid in the design of fluid transport systems on future spacecraft.On Monday, Williams set up cameras for the Earth Knowledge Acquired by Middle School Students, or EarthKAM, education experiment. Middle school students program a digital camera on the station to photograph a variety of geographical targets from the unique vantage point of space. Undergraduate teams at the University of California at San Diego manage the images and post them on the Internet for the public and participating classrooms around the world to view. Nearly 4,000 students from 66 schools in seven countries are participating in this run.On Friday, Williams performed a series of test flights with small free-flying satellites. The Synchronized Position Hold, Engage, Reorient, Experimental Satellites (SPHERES) experiment uses 8-inch diameter spherical satellites that fly within the station cabin. The satellites test the basics of formation flight and autonomous docking that could be used in future spacecraft. The battery-powered satellites use carbon dioxide to fuel 12 thrusters as they fly in the cabin.In addition to general station orientation, Yurchikhin and Kotov also performed maintenance work on life support hardware in the Russian segment. The water separator in the air conditioning system was replaced. The separator dispositions condensate water and air collected from the station's atmosphere that forms through the air conditioner, maintaining optimum humidity levels onboard. Flight controllers and mission managers test fired the two main engines on the Zvezda Service Module in a Wednesday reboost, raising the station's altitude. It was the first time the engines were fired since initial arrival of Zvezda in 2000. Another reboost using International Space Station Progress 24 engines is scheduled for Saturday to finish placing the station in its correct position for the arrival of the International Space Station Progress 25 cargo vehicle May 15 and the space shuttle Atlantis in June.