Station Crew Conducts Physics Experiments; Robotic Tests Wrap Up

Published by Klaus Schmidt on Fri Jan 25, 2013 10:21 pm via: NASA

The six Expedition 34 crew members focused on physics experiments and upgrades to their orbital home Friday, wrapping up a busy week of scientific research and robotics aboard the International Space Station.

Following the crew's daily planning conference with flight control centers around the world, NASA astronaut and Expedition 34 Commander Kevin Ford kicked off another session with the InSPACE-3 experiment, which examines the physical property changes in fluids containing ellipsoid-shaped particles when a magnetic field is applied. These colloidal fluids are classified as smart materials, transitioning to a solid-like state in the presence of a magnetic field, and this technology may lead to the design of bridges and buildings that can better withstand earthquakes.

Ford then replaced a manifold bottle in the Combustion Integrated Rack. This facility, which includes an optics bench, combustion chamber, fuel and oxidizer control, and five different cameras, allows a variety of combustion experiments to be performed safely aboard the station.

After a break for lunch and more work with InSpace-3, Ford joined Flight Engineer Tom Marshburn of NASA for a televised educational event with students gathered at the Putnam Museum of History & Natural Science in Davenport, Iowa. The two astronauts answered questions from the curious students about the work going on aboard the station and the challenges of living in space.

Marshburn also worked with the Japanese Kibo module's Exposed Facility, often referred to as the station's "back porch" because it allows astronauts to transfer experiments and hardware to the exterior of the station via an airlock and robotic arm system.

Marshburn spent most of his afternoon working in the U.S. Destiny lab routing High Rate Communications System cable inside module. When fully installed and operational, this system will provide substantially faster uplink and downlink speeds, improved bandwidth, two extra voice communication loops and two additional video downlink channels.

Inside the Quest airlock, Flight Engineer Chris Hadfield of the Canadian Space Agency wrapped up an extensive, multi-day effort to remove and replace the Service and Performance Checkout Unit Heat Exchanger in support of future spacewalks. Hadfield also retrieved some bubble detectors for the RaDI-N experiment, which seeks to characterize the neutron radiation environment of the station.

Flight Engineers Oleg Novitskiy and Roman Romanenko began their day performing the Coulomb Crystal experiment, gathering data about charged particles in a weightless environment. Fellow cosmonaut Evgeny Tarelkin, also a flight engineer, meanwhile conducted a session with the Uragan experiment. Named for the Russian word for hurricane, Uragan seeks to document and predict the development of natural and man-made disasters on Earth.

Tarelkin later assisted Romanenko with the Bar experiment, which looks at methods and instruments for detecting the location of an air leak from one of the station's modules.

Meanwhile out on the station's starboard truss, the ground-commanded Robotic Refueling Mission (RRM) wrapped up its latest round of tests Friday morning. Using Dextre, the Canadian Space Agency's twin-armed robotic "handyman," the RRM team demonstrated and tested tools, technologies and techniques needed to robotically service and refuel satellites in space, especially satellites not originally designed to be serviced.

Flight controllers then commanded Canadarm2, the station's 57.7-foot robotic arm, to perform video surveys of the Alpha Magnetic Spectrometer-02 (AMS-02) and a test bed of materials being exposed to the harsh environment of space. AMS-02 is a state-of-the-art particle physics detector, collecting information from cosmic sources emanating from stars and galaxies millions of light years beyond the Milky Way.

http://spacefellowship.com/news/art31909/station-crew-conducts-physics-experiments-robotic-tests-wrap-up.html