National Aeronautics and Space Administration

International Space Station

MISSION SUMMARY

EXPEDITION 35 begins March 15 and ends May 14. Chris Hadfield will become the first Canadian commander of the International Space Station. The next expedition aboard the orbiting laboratory will be exciting, as astronauts work with new experiments, including the Japan Aerospace Exploration Agency's (JAXA) Cell Mechanosensing and the Canadian Space Agency's Microflow experiment, the first miniaturized blood-cell counter in microgravity.

THE CREW:

Soyuz TMA-07M Launch: Dec. 23, 2012 Landing: May 14, 2013

Chris Hadfield – Commander (CSA)

- Born: Sarnia, Ontario, Canada, raised in Milton, Ontario, Canada
- Interests: Skiing, playing guitar, singing, running and playing volleyball
- Spaceflights: STS-74, STS-100, Exp. 34/35
- Twitter: @Cmdr_Hadfield

Roman Romanenko – Flight Engineer (Roscosmos)
(RO-man Ro-man-yenk-o)

- Born: Schelkovo, Moscow Region, Russia
- Interests: Underwater hunting and tennis
- Spaceflights: Exps. 20/21 and 34/35

Tom Marshburn – Flight Engineer (NASA)

- Born: Statesville, N.C.
- Interests: Swimming, scuba diving and snowboarding
- Spaceflights: STS-127, Exp. 34/35
- Twitter: @AstroMarshburn

Soyuz TMA-08M Launch: March 28, 2013 Landing: Sept. 11, 2013

Pavel Vinogradov – Flight Engineer (Roscosmos)
(PA-vel VIN-o-grad-ov)

- Born: Magadan, Russia
- Interests: Sports, aviation and cosmonautics history and astronomy
- Spaceflights: Mir-24, Exp. 13 & Exp. 35/36

Aleksandr Misurkin – Flight Engineer (Roscosmos)
(AL-ek-san-der MI-sur-kin)

- Born: Yershichi, Smolensk Region, Russia
- Interests: Badminton, basketball and downhill skiing
- Spaceflights: Exp. 35/36 will be his first mission

Chris Cassidy – Flight Engineer (NASA)

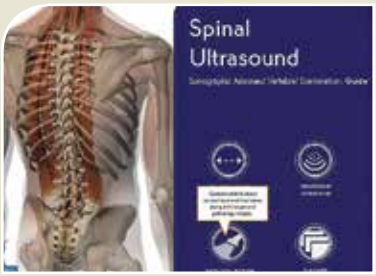
- Born: Salem, Mass., but considers York, Maine, to be his hometown
- STS-127 and Exp. 35/36

THE SCIENCE: What's the crew working on?

Expedition 35 will continue to take advantage of the space station's unique microgravity environment and expand the scope of research. The crew will perform experiments that cover human research, biological and physical sciences, technology development and Earth observations. The crew also will engage in educational activities.

Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions - 3 (InSPACE-3) (NASA)
InSPACE-3 hopes to improve engineers' ability to design structures, such as bridges and buildings, to withstand better earthquake forces. The experiment obtains data on fluids containing ellipsoid-shaped particles that change the physical properties of the fluids in response to magnetic fields. These fluids are called magnetorheological suspensions, and they are classified as smart materials that transition to a solid-like state by the formation and cross-linking of microstructures in the presence of a magnetic field. On Earth, these materials are used for vibration damping systems that can be turned on or off.

Sonographic Astronaut Vertebral Examination (Spinal Ultrasound) (NASA)
Spinal ultrasound from ground- and space-based studies will characterize spinal changes during and after spaceflight. Ground-based pre- and post-flight MRI and high fidelity ultrasound, combined with in-flight ultrasound, will help assign mission health risks to microgravity-associated spinal alterations for back pain and potential injury. This research will determine the accuracy of MRI and musculoskeletal ultrasound in identifying the anatomy of the vertebral unit and develop novel imaging and training methodologies.



A screenshot of the software used for the Spinal Ultrasound study.

Study on the Effect of Space Environment to Embryonic Stem Cells to Their Development (Stem Cells) (JAXA)
This stem cell research will gather information about space radiation's impact on the DNA repair gene response mechanism by examining the development of embryonic stem cells that have flown on the space station. The cells are launched frozen. After returning to Earth, they are microinjected into mouse-8-cell embryos to analyze the influence of the space environment on the development and growth of adult mice. It is important to understand space radiation effects to defend the human body from those influences, especially the possibility of developmental issues resulting from a long-duration spaceflight.

HICO and RAIDS Experiment Payload - Hyperspectral Imager for the Coastal Ocean (HREP-HICO) (NASA)
HREP-HICO operates a specialized visible and near-infrared camera to detect, identify and quantify coastal features from the International Space Station. The experiment retrieves coastal data including water depth and clarity, chlorophyll content and seafloor composition for civilian and naval purposes. Data retrieved from HICO have been validated with data collected from samples collected on the ground and used to develop algorithms to map indicators of water quality.

Synchronized Position Hold, Engage, Reorient, Experimental Satellites-Zero-Robotics (SPHERES-Zero-Robotics) (NASA)
The SPHERES-Zero-Robotics investigation provides an opportunity for high school students to design research for the space station. As part of a competition, students write algorithms for the SPHERES to accomplish tasks relevant to future space missions. The algorithms are tested by the SPHERES team, and the best designs are selected for the competition to operate the SPHERES satellites aboard the station.


NASA astronauts Kevin Ford (left) and Tom Marshburn (right) conduct a session of the SPHERES program in the Kibo laboratory of the space station.

EXPEDITION 35 PATCH

Emblazoned with a bold 35 for the 35th expedition to the International Space Station, this patch portrays a natural moonlit view of Earth from the space station at the moment of sunrise. It also contains glowing bands of Earth's atmosphere dispersing the sun's bright light into primary colors. Earth is depicted as it often appears from space, without recognizable coastlines or boundaries - just as the international endeavor of living and working together in space blurs technical and cultural boundaries between nations. The orbiting outpost is the unseen central figure of the image because the view is from a window aboard the space station. This perspective commemorates the full-use of the orbiting laboratory as a long-duration dwelling from which humans can develop techniques and technologies to explore further into the solar system. The crew points out, "The arc of the Earth's horizon with the sun's arrows of light imply a bow shooting the imagination to Mars and the cosmos where our species may one day thrive."

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