National Aeronautics and Space Administration

International Space Station

[MISSION SUMMARY]

EXPEDITION 37 begins Sept. 11 and ends Nov. 10. This expedition will include many research projects focusing on human health and human physiology, as well as student experiments in areas such as antibacterial resistance, hydroponics and cellular division. There is one Russian spacewalk planned for Oleg Kotov and Sergey Ryazanskiy.

THE **CREW:**

Soyuz 35 TMA-09M • Launch: May 28, 2013 • Landing: Nov. 10, 2013

Karen L. Nyberg (NASA) – Flight Engineer

Born: Vining, Minn.
Interests: Running marathons and sewing
Spaceflights: STS-124, Exp. 36/37
Twitter: @AstroKarenN
Astronaut Bio

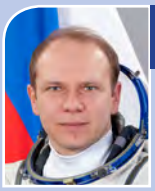
Fyodor Yurchikhin (Roscosmos) - Commander
(fee-YOH-dur yur-CHEE-kihn)

Born: Batumi, Georgia
Interests: Collecting stamps and space logos, sports, history of cosmonautics, reading
Spaceflights: STS-112, Exp. 15, Exp. 24/25, Exp. 36/37
Cosmonaut Bio

Luca Parmitano (ESA) - Flight Engineer
(LU-ka par-muh-TAN-oh)

Born: Paternò, Italy
Interests: Scuba diving, snowboarding, skydiving, weight training, swimming, reading, and music
Spaceflights: Exp. 36/37 is his first mission
Twitter: @astro_luca
Astronaut Bio

Soyuz 36 TMA-10M • Launch: Sept. 25, 2013 • Landing: March 12, 2014



Oleg Kotov (Roscosmos) – Flight Engineer
(AH'-leg KO'-tuff)

Born: Simferopol, Ukraine
Interests: Scuba diver
Spaceflights: Exp. 15, Exp. 22/23
Cosmonaut Bio

Sergey Ryazanskiy (Roscosmos) – Flight Engineer
(Sir-gey Rih-ZAN-skee)

Born: Moscow, Russia
Interests: Numismatics, playing guitar, tourism, sports
Spaceflights: Exp. 37/38 will be his first mission
Cosmonaut Bio

Mike Hopkins (NASA) – Flight Engineer

Born: Lebanon, Mo.
Interests: Backpacking, camping, snow skiing, weight lifting, running, hockey, football
Spaceflights: Exp. 37/38 will be his first mission
Twitter: @Astrolllini
Facebook: facebook.com/trainastronaut
Astronaut Bio

THE **SCIENCE:**

What's the crew working on?

Expedition 37 includes a variety of research, but several new investigations will focus on human health and human physiology. The crew also will perform experiments that cover technology demonstration, Earth and space science, and biology and biotechnology. The crew also will engage in educational activities. Eleven new experiments were designed by the Student Spaceflight Experiments Program.

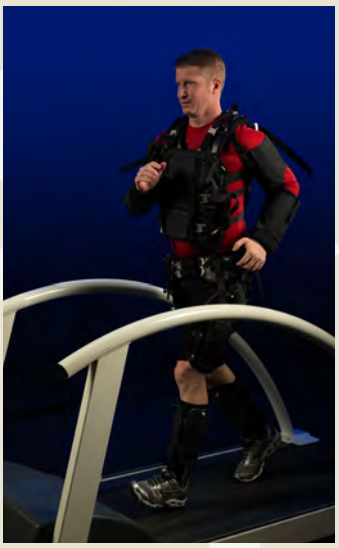
Salivary Markers

The Salivary Markers investigation involves the collection of blood, saliva, urine and a health assessment on six subjects preflight, in-flight and postflight to determine if immune system impairment caused by spaceflight increases the possibility for infection or poses a significant health risk to crewmembers aboard the International Space Station. The investigation is designed to determine the effects of long-term exposure to microgravity on a host of salivary antimicrobial proteins, hidden viruses that may reactivate, antibacterial properties of saliva, and blood markers associated with the cells and mechanisms that defend the immune system.

This is an example of a kit used to collect saliva samples. The rolled gauze is displayed in the upper left-hand corner of the picture, which is placed into the mouth to absorb saliva. (NASA)

Biochemical Profile

Blood and urine are commonly used to assess an astronaut's health as well as conduct research in physiological disciplines by measuring key physical characteristics in these fluids that may reflect illness or disease. In support of research studies, this project will collect, process and store blood and urine samples obtained during the preflight, in-flight and postflight phases of International Space Station missions and maintain a database of results from the analysis of these samples. This database will offer supporting evidence to scientists by providing metabolic profiles of the effects of spaceflight on human physiology.



Dr. Jeff Ryder, NASA, performs an altered strength to body weight ratio study in the Exercise Physiology and Counter Measures Project, similar to the Body Measures investigation to be conducted aboard the International Space Station. (NASA)

Body Measures

Currently, NASA does not have sufficient in-flight human body measurement data gathered to assess the impact of physical body shape and size changes on spacesuit sizing. This study will involve collecting body measurement data using digital still and video imagery and a tape measure to measure segmental length, height, depth, and circumference data for all body segments - chest, waist, hip, arms, legs, etc. - from astronauts for preflight, in-flight and postflight conditions.

NanoRacks Experiments

Eleven experiments are from the Student Spaceflight Experiments Program, part of the National Center for Earth and Space Science Education. Student teams from across the United States designed their own experiments using flight approved fluids and materials. Research areas include antibacterial resistance, hydroponics, cellular division, combining substances with oxygen in microgravity, seed growth, photosynthesis and the food making process in microgravity.

THE MISSION **PATCH:**

Leonardo da Vinci's Vitruvian Man, created some 525 years ago as a blend of art and science and a symbol of the medical profession, is depicted amongst the orbits of a variety of satellites circling the Earth at great speed. Da Vinci's drawing, based on the proportions of man as described by the Roman architect Vitruvius, is often used as a symbol of symmetry of the human body and the universe as a whole. Almost perfect in symmetry as well, the International Space Station, with its solar wings spread out and illuminated by the first rays of dawn, is pictured as a mighty beacon arcing upwards across our night skies, the ultimate symbol of science and technology of our age. Six stars represent the six members of Expedition 37 crew, which includes two cosmonauts with a medical background, as well as a native of Da Vinci's Italy.

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