



# International Space Station

## [ MISSION SUMMARY ]

**EXPEDITION 58** began in December 2018 and ended in March 2019. This expedition included hundreds of science investigations focused on biology, Earth science, human research, physical sciences and technology development, providing the foundation for continuing human spaceflight beyond low-Earth orbit to the Moon and Mars.

### THE CREW:

**Soyuz MS-11 Launch: Dec. 3, 2018 • Landing: June 2019**



**Anne McClain (NASA) – Flight Engineer**

**Born:** Spokane, Washington  
**Interests:** Weightlifting, rugby, golf, biking, high-intensity fitness training and running  
**Spaceflights:** First flight  
**Bio:** <https://go.nasa.gov/2s8ryrB>  
**Twitter:** @AstroAnimal



**David Saint-Jacques (CSA) – Flight Engineer**

**Born:** Saint-Lambert, Quebec  
**Interests:** Mountaineering, cycling, skiing and sailing  
**Spaceflights:** First flight  
**Bio:** <https://go.nasa.gov/2VBcqAu>  
**Twitter:** @Astro\_Davids



**Oleg Kononenko (Roscosmos) – Commander**

**Born:** Türkmenabat, Turkmenistan  
**Spaceflights:** Exp. 17, 30/31, 44/45  
**Bio:** <https://go.nasa.gov/2QviZ3S>



**Nick Hague (NASA) – Flight Engineer**

**Born:** Belleville, Kansas  
**Interests:** Exercising, flying, snow skiing and scuba  
**Spaceflights:** Soyuz MS-10  
**Bio:** <https://go.nasa.gov/2Qz3qZ1>  
**Twitter:** @AstroHague



**Christina Koch (NASA) – Flight Engineer**

**Born:** Grand Rapids, Michigan  
**Interests:** Backpacking, rock climbing, paddling and sailing  
**Spaceflights:** First flight  
**Bio:** <https://go.nasa.gov/2QCRHbX>  
**Twitter:** @Astro\_Christina



**Aleksey Ovchinin (Roscosmos) – Flight Engineer**

**Born:** Rybinsk, Russia  
**Spaceflights:** Exp. 47/48  
**Bio:** <https://go.nasa.gov/2QAQBgu>

### THE SCIENCE:

What are some of the investigations the crew operated?

During Expedition 58, researchers will test cryogenic fuel transfers, study how mixed gels form and release drugs in microgravity, analyze protein crystal formations to provide insight into Parkinson's disease and carry out other experiments ranging from physics to biological studies.

## ■ Robotic Refueling Mission-3

Cryogenic liquids are cold substances with very low boiling points. They're used to fuel rockets, propel spacecraft and cool spacecraft equipment. The Robotic Refueling Mission 3 (**RRM3**) will demonstrate technologies to store and transfer liquid methane, a type of cryogenic liquid, in space for the first time. The test will help NASA develop capabilities to service and refuel spacecraft in orbit set for long-duration flights.

## ■ Wound Healing

Hydrogels often are used for tissue regeneration purposes due to their high water content and how easily they can be customized. **Hydrogel Formation and Drug Release in Microgravity Conditions** takes advantage of reduced fluid motion in microgravity to more precisely study behavior of the gel and its potential as a wound-healing patch.

## ■ CASIS Protein Crystal Growth-16

The **CASIS PCG-16** investigation grows large crystals of an important protein, Leucine-rich repeat kinase 2 (LRRK2) in microgravity for analysis back on Earth. This protein is implicated in development of Parkinson's

disease, and defining its shape and morphology may help scientists better understand the pathology of the disease and develop treatment therapies. Crystals of LRRK2 grown in gravity are too small and too compact to study, making microgravity an essential part of this research.

## ■ Molecular Muscle

The European Space Agency's (ESA) **Molecular Muscle** investigation examines the molecular causes of muscle abnormalities from spaceflight in *C. elegans*, a roundworm and **model organism**. This study could give researchers a better understanding of why muscles deteriorate in microgravity so they can improve methods to help crew members maintain their strength in space. The research also could lead to new medical treatments for those who chronically suffer from muscle loss, such as the elderly.

## THE MISSION PATCH:

Thousands of people worldwide dedicate their lives to the human exploration of space. As one team, we strive to learn, discover and pioneer for the benefit of all mankind. The Expedition 58 patch is a crew tribute to those thousands who stand ready every day committed to supporting this mission.

Central to the patch is the compass rose—a symbol of exploration past, present and future.

The passing of the International Space Station from darkness into light suggests that we are only just peaking over the horizon, looking forward to advancing human understanding of our place in the universe.

The crew of Expedition 58 are fortunate explorers ... never alone in their journey. Among the night lights on the Earth are glints of brightness – the global team and major control facilities that keep the space station on orbit and its inhabitants on track.

And as the explorers from centuries past used stars to guide their way, so too does the crew of Expedition 58. The stars on the Expedition 58 patch are their families, one star for each member. They shine on as a beacon of strength and a guiding light home.



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