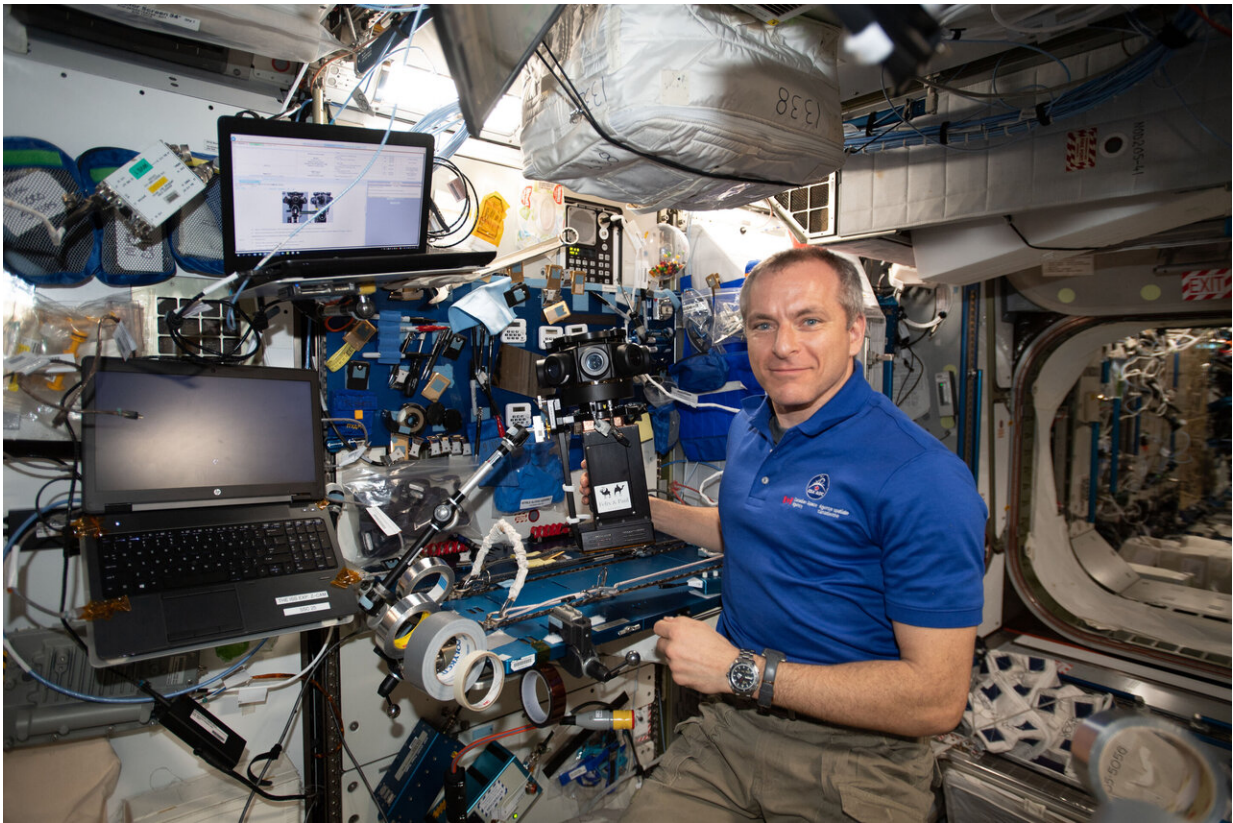


# A virtual reality camera captures life and science aboard the space station

November 13 2019, by Erin Winick

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A view of Canadian Space Agency (CSA) astronaut David Saint-Jacques setting up the Z-CAM V1 Pro Cinematic camera for the ISS Experience payload. The International Space Station Experience (ISS Experience) creates a virtual reality film documenting daily life aboard the space station. Credit: NASA

With only minutes until sunrise aboard the International Space Station

(ISS), astronaut Nick Hague rushed to shut off the lights in the Japanese Experiment Module (JEM). Traveling 17,500 miles per hour, the space station orbits Earth 16 times in 24 hours, so every 90 minutes, the space station experiences a sunrise. For this sunrise, though, the speed of their approach was putting a time crunch on Hague. To capture this moment, timing was everything as he worked diligently to set up the perfect camera shot.

With moments to spare, the [camera](#) was ready, the module was dark, and Hague positioned at the window of the JEM. The first orange light shot into the orbiting laboratory. Within a minute, the module of the [space station](#) was bright again, this time from the natural light of the sun.

Only a few humans ever get to experience this unique vantage point. The [virtual reality](#) (VR) project Hague was filming for, Space Explorers: The ISS Experience (ISS Experience), attempts to bring this perspective back to Earth for the rest of us.

Partnering with the ISS National Lab and Time, a team from Felix and Paul Studios launched a high quality 360 degree camera to [space](#) to help tell the story of science and life aboard the orbiting laboratory. The project, currently in the process of being filmed, serves as an outreach project as well a [technology demonstration](#), testing the limits of filming in the harsh environment of space.

The idea for the project came about after the studio worked on episodes of a virtual reality series called Space Explorers that showed astronauts training on Earth.



A 360 image of the Cupola of the International Space Station taken as a part of the ISS Experience. Credit: Felix & Paul Studios / Time

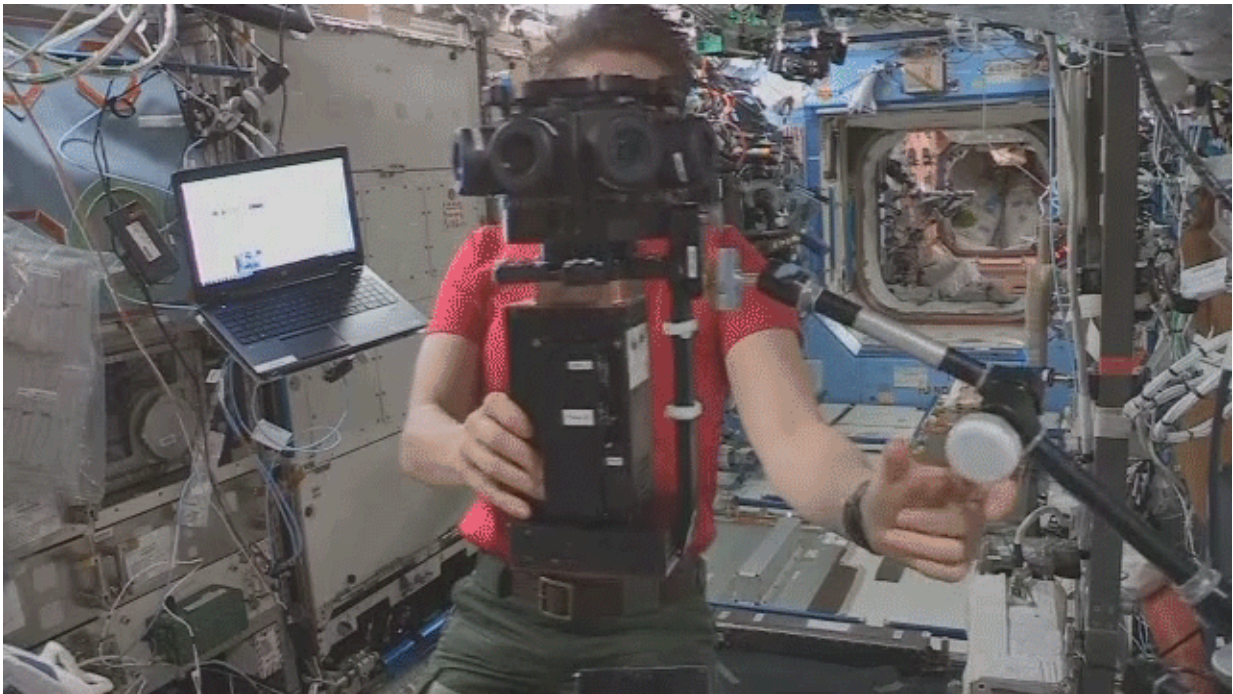
"The natural next step was to actually take the viewer to space," says Felix and Paul Studios co-founder and creative director Félix Lajeunesse. "We wanted to bring the viewer to the International Space Station to be alongside astronauts to experience the reality and challenges of life in microgravity and be part of the journey of learning to live and do science in space."

That step required the team to start from scratch when it came to the camera. The studio had experience creating virtual reality films, but their typical camera was the size and shape of a four-foot-tall tree. That was not going to work in the tight confines of the space station. Instead, they collaborated with camera company Z-Cam to develop a new virtual reality camera system much smaller in size.

The resulting device launched on the 16th SpaceX commercial resupply services mission in December 2018 along with a number of other scientific experiments. Since then, the team has recorded many moments, including a jam session among the astronauts, crew meals and the arrival of new astronauts. The team is recording a few hours a week to document life in space. One of Felix and Paul's primary concentrations is filming science on station.

"Our focus has been thinking about and finding science experiments that when you see them, you're immersed in them," says Lajeunesse. "Your mind can start spinning, thinking about what technologies are going to come next and how that research leads to a future path."

The experiments filmed for ISS Experience so far include the SPHERES robots as they are flying around the station, as well as the growing and harvesting of vegetables.



NASA astronaut Anne McClain works on setting up the ISS Experience camera aboard the International Space Station. Credit: NASA

"The science is ultimately the most important thing we are doing on the space station," says Dylan Mathis, NASA's communications manager for the International Space Station Program. "We are conducting science every day and it is science we can't do anywhere else. VR allows us to show people that in a different way."

The astronauts are the main subjects of the film, but since they are the sole residents of the space station, they are also the videographers behind the camera. That meant learning the basics of filming for virtual reality.

By the time each astronaut nears the end of their mission, most have become experts at setting up and using the camera, sometimes choosing to film moments on their own. This ease is what enabled Hague to capture the sunrise with only moments to spare.

So far, the footage coming back seems to be achieving the goal of immersing audiences in life aboard the space station. NASA astronaut Sunita Williams, who lived on the space station during Expedition 14/15 and Expedition 32/33, got the chance to watch some of the initial footage.

"It was like I was back there in and on the International Space Station," says Williams. "You forget you have [a VR headset] on your head, and you just keep looking around. It gives a huge appreciation to all that is inside the space station and how people live and work."



A 360 photo of NASA astronaut Anne McClain performing her daily training sessions. Daily exercise in space is crucial for astronauts to prevent muscle loss. Credit: Felix & Paul Studios / Time

While most of the filming has been completed, the biggest technical challenge is yet to come: capturing a spacewalk in virtual reality. This task requires an entirely new camera that Felix and Paul have been developing alongside their partner, Nanoracks. The team expects to launch the camera and begin production of spacewalk filming in 2020. Since they have no solid end dates for filming, the team has yet to announce a release date for the series.

The footage is being shot not only as entertainment and outreach but also as a test of virtual reality technologies as a means of documenting space travel and camera operations in space. Lajeunesse anticipates future spacecraft being equipped with virtual reality technology.

"I think it is inevitable that VR is going to be the default way to document space exploration moving forwards. It is a perfect match between medium and story," he says. "Space exploration is something that you want to live. You want to be there. You want to experience it. Everything we're doing on [station](#) right now is a demonstration for the spaceflight industry and the entertainment industry of how we can use this medium moving forward in the space world."

Provided by NASA

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