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At Home in the Cosmos

# Astronauts Open Up About Depression and Isolation in Space

Astronauts can face critical threats to their health and well-being.

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Astronauts must cope with a stressful and dangerous environment in space, away from family and friends, by working together, said two astronauts at the opening of a new exhibit on space health. “The problem you develop here is that everything is a little bit the same every day. It can be depressing sometimes if you're not careful,” said Canadian astronaut David Saint-Jacques through a livestreamed broadcast from the International Space Station, as he joined the opening of [Health in Space: Daring to Explore](#). Saint-Jacques’ candid discussion of the psychological challenges of living in space is in stark contrast to the heroic “Right Stuff” image of the 1960s that NASA used to portray of American astronauts, downplaying the stresses experienced by the earliest spacefarers. The Canadian Space Agency wants the public to understand the impact of living in space on both mental and physical health, so it partnered with the Ottawa-based Canadian Aviation and Space Museum on this permanent exhibit, which launched on February 7, 2019.



Canadian Space Agency astronaut David Saint-Jacques works on International Space Station (ISS).  
Source: NASA

Space exploration takes a toll on the human mind and body. Recent research shows that [space missions cause the brain's gray matter to deteriorate](#) in a manner reminiscent of aging, but much faster. “The nature of weightlessness, ionizing radiation, and psychological isolation need to be better understood in order to make spaceflight safer for astronauts of the future when we venture off to the Moon, to Mars, and beyond,” said former Canadian astronaut Robert Thrisk at the exhibit launch. “Experience has taught me that whenever astronauts voyage to different places in space or perform new tasks, we can expect new healthcare concerns to arise,” he added in a statement. “As

humans venture further into the solar system in the coming decades, the risks of space travel will multiply. This new exhibition describes the medical consequences of space travel and explains how the research of Canadian scientists is helping to make spaceflight safer.”



In addition to focusing on the medical challenges of living in a microgravity environment and averting the dangers of intense radiation while not protected by Earth’s magnetic field, the exhibit focuses on a key psychological challenge of extended space missions: [isolation](#). “You're very, very far away from the people you love on Earth and that can make you sad perhaps,” said Saint-Jacques. Though astronauts are separated from significant others on their home world, they never have any time alone

challenge.”



Saint-Jacques plays his flute on the NEEMO 15 mission to Aquarius, an underwater laboratory, in October 2011.

Source: NASA/public domain

To get ready, astronauts go on other long-duration missions on Earth to learn how to cope with others in confined environments. “We prepare a lot for this as astronauts,” said Saint-Jacques. “We go on expeditions on Earth with fellow astronauts for long durations before to get used to this notion that the most important people right now are the few people who are here with me, and I must get along with them.” Saint-Jacques’ training included a stint with the NASA Extreme Environment Mission Operations, or NEEMO, a space analogue mission that took him to Aquarius, the world’s only undersea research station. The experience provided additional lessons about the importance of open communication and teamwork for long-duration missions. “That is the key to our success, because we can't function well of course if we're not happy, and you cannot be happy if you're not getting along with people around you,” he added.

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## Space Plumber

A week before Saint-Jacques called into the opening of the exhibit live from the International Space Station (ISS), he had an unexpected break from cutting-edge scientific research to take on a much more mundane task: fixing a leaky toilet. Highly trained astronauts are ultimately responsible for all that happens aboard the ISS, so they need to deal with immediate emergencies while maintaining and upgrading the station for future astronauts. After mopping up more than two gallons of water and reconnecting a broken water line to the toilet, he and fellow astronaut Anne McClain installed an enclosure that will house a new toilet system to be delivered to the ISS in 2020, providing increased privacy.

### Space Plumber



**Mars** will need 25 cubic meters of space per person. “That’s roughly the interior of a 17-foot-long moving truck,” Dorit Donoviel, director of the Translational Research Institute for Space Health, told *Psychology Today*. To identify solutions for designing livable interiors in the spacecraft that will take astronauts to Mars, Donoviel and colleagues organized the workshop [Spaces in Space: Optimizing Behavioral Health and Cognitive Performance in Confined Environments](#), held on February 6 and 7, 2019 at the MIT Media Lab in Cambridge, Massachusetts.

*Health in Space: Daring to Explore* explains some of the critical threats to the safety and well-being of astronauts as they attempt to survive and even thrive on future missions, which will take them farther from Earth than any voyages humanity has undertaken to date. Visitors to the exhibit will find numerous videos and interactive activities, with an area devoted to Saint-Jacques that details the scientific experiments he is conducting on the International Space Station. The exhibit contains objects that have flown in space, as well as first-person accounts of living in space from past and present astronauts. At the exhibit launch, speakers demonstrated exercises that help astronauts stay fit in space, and they emphasized the importance of [education](#) in becoming an astronaut. Saint-Jacques is a role model for committed students seeking to become astronauts, having earned his Ph.D. in astrophysics from Cambridge University in the UK and his M.D. from Université Laval in Canada.

## Overview Effect



Earthrise as seen during the Apollo 8 mission on December 24, 1968.  
Source: Bill Anders/NASA

Despite the [perils of loneliness during space exploration](#), life orbiting Earth is not all stress and duress. Astronauts have long reported an “[Overview Effect](#),” in which looking at the world from afar provides a critical [new perspective that can transform their lives](#). The most famous example is the Earthrise photograph taken by NASA astronaut Bill Anders, as he orbited the Moon during the Apollo 8 mission in 1968. When Saint-Jacques was asked about the hardest thing to describe about being in space, he replied, “I think it’s that view out of the window ... the unbelievable beauty of planet Earth.... It’s just quietly spinning in the black velvet of space with this kind of bright blue halo surrounding it. That’s the air that protects us from space and that harbors all the life and the pattern of clouds and thunder. It’s just alive. You can see it’s almost breathing. It’s so beautiful. It just changes my perspective on life to have seen that.”

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LIVE – David Saint-Jacques participates in the unveiling of a ne...

