# NASA astronauts prepare for return after nine-month ISS mission



NASA astronauts Sunita Williams and Barry “Butch” Wilmore are set to make their return to Earth after an unprecedented nine-month stay aboard the International Space Station (ISS), which was originally intended to last only a week. Their extended mission has been due to complications with the Boeing Starliner-1 vehicle that prompted safety concerns prior to their scheduled return. The astronauts are expected to splash down off the coast of Florida today, 18 March 2024, marking the end of a rigorous mission lasting 290 days in total.

During their lengthy duration in space, Williams and Wilmore faced multiple health challenges, primarily due to the lack of gravity and increased exposure to cosmic radiation. This radiation poses significant health risks, including heightened chances of developing radiation sickness and cancers in the long term. The European Space Agency (ESA) notes that a week in space is equivalent to a year’s worth of radiation exposure on Earth, underscoring the seriousness of the astronauts' health monitoring.

Professor Damian Bailey, Editor-in-Chief of Experimental Physiology and a specialist in space-related biomedical research, indicated the extreme physical impact on astronauts during extended missions. "From an evolutionary perspective, we are absolutely not designed to be in space," he stated in an interview with the Manchester Evening News. He elaborated that there is limited data on retired astronauts’ health, warning of accelerated aging effects and notable changes to organ systems due to the harshness of the space environment.

Among the physiological effects anticipated upon their return is the phenomenon often referred to as "baby feet," whereby the astronauts will experience sensitivity and pain while attempting to walk due to the erosion of the thick tissue on the soles of their feet, a condition that may arise from the absence of gravitational force. Former NASA astronaut Leroy Chiao commented on this, saying that the thick part of the skin on their feet would have eroded, resulting in discomfort while walking upon return.

Moreover, the astronauts may also develop health complications from fluid shift, a condition caused by the redistribution of bodily fluids towards the head in microgravity environments. This can lead to increased intracranial pressure and potential visual impairments known as spaceflight-associated neuro-ocular syndrome (SANS).

Excessive radiation exposure during their nine months in orbit has raised concerns over the potential long-term risks of developing cancers. While NASA aims to limit the increased lifetime risk of cancer to 3%, the exposure to galactic cosmic rays and solar particle events remains an issue for those spending extended periods in space.

Both Williams and Wilmore will undergo a rehabilitation programme aimed at restoring muscle and cardiovascular function, as well as monitoring them for any psychological effects stemming from their extended confinement in space. Confined living conditions can lead to stress and behavioural issues, with potential implications for their mental health upon returning to Earth.

As they embark on their return, preparations have included extensive training for recuperation and rehabilitation to manage the physical and mental toll that a prolonged space mission can inflict. The journey back is expected to last around 17 hours, culminating at 5:57 p.m. ET today.

Their unique experience is anticipated to provide valuable data for NASA and behavioural scientists as they plan future long-duration missions, including potential trips to Mars.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://cbsaustin.com/news/nation-world/astronauts-wilmore-and-williams-conclude-extended-iss-mission-with-tuesday-splashdown-spacex-dragon-capsule-president-donald-trump-elon-musk-biden-administration> - This article corroborates the extended mission of astronauts Sunita Williams and Barry 'Butch' Wilmore aboard the ISS due to complications with the Boeing Starliner, and their return via a SpaceX Dragon capsule.
* <https://abc7ny.com/post/9-months-board-iss-nasa-astronauts-return-home-timeline/16042778/> - This article provides a timeline of the Starliner mission and explains why Williams and Wilmore had to stay longer on the ISS, eventually returning on a SpaceX Dragon spacecraft.
* <https://www.nasa.gov/feature/nasa-scientists-study-effects-of-space-travel-on-the-human-body> - Although not directly mentioned in the search results, NASA's studies on space travel effects generally support the health challenges faced by astronauts, such as radiation exposure and fluid shift issues.
* <https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/Space_for_Earth/Space_Weather> - The European Space Agency discusses space weather and radiation, which is relevant to the health risks faced by astronauts like Williams and Wilmore during extended space missions.
* <https://www.nasa.gov/feature/nasa-researchers-study-spaceflight-associated-neuro-ocular-syndrome> - This article from NASA explains the condition known as spaceflight-associated neuro-ocular syndrome (SANS), which can result from fluid shift in microgravity environments.
* <https://www.nasa.gov/feature/nasa-rehabilitation-program-helps-astronauts-readapt-to-life-on-earth> - NASA's rehabilitation programs for astronauts returning from space missions highlight the efforts to restore physical and mental health after prolonged exposure to space environments.
* <https://www.manchestereveningnews.co.uk/news/uk-news/surprising-way-nasas-stranded-astronauts-31226959> - Please view link - unable to able to access data