
2. Space and Women in Space

Prelims Level: Space Technology

Mains Level: GS-III Science and Technology - developments and their applications and effects in everyday life Achievements of Indians in Science & Technology; Indigenization of Technology and developing New Technology.

Context:

- NASA astronaut Christina Koch has left her footprint in history after breaking an iconic space record for womankind. Her 328-day stay surpassed the record set by Peggy Whitson on a single space-flight at 288 days.

History of Women in Space:

- In 1963, aboard Vostok 6, Soviet Cosmonaut Valentina Tereshkova became the first woman to travel into space.
- The first woman to complete a spacewalk, or extravehicular activity (EVA), was Soviet cosmonaut Svetlana Savitskaya.
- In June 1983, NASA astronaut Sally Ride became the first U.S. woman in space when she launched on the STS-7 mission of the space shuttle Challenger.
- NASA's Peggy Whitson, became the first woman to command the ISS in April 2008, she was also the first woman to command the ISS twice.

Does space affect men and women differently?

- Overall adaptation to the space environment is roughly the same for men and women but there are some differences.
- Women are more likely to feel sick when they go into space, men are more likely to get re-entry sickness when they come back to Earth.
- Men have more problems with their vision and hearing when they get back from space which women don't get.
- When women return they do have problems managing their blood pressure so they feel quite faint.
- There are some subtle differences - physiologically and psychologically and there is a little study to do with hormonal differences or more physiological changes that are occurring.
- And long-term, understanding of those differences will help us understand more about human health on Earth.

What does 'Spacewalk' mean?

- Anytime an astronaut gets out of a space vehicle, it is called an extravehicular activity, or EVA. This is also called a spacewalk.
- Russian astronaut Alexei Leonov performed the first spacewalk on March 18, 1965. The first spacewalk was 10 minutes long.
- Spacewalks allow astronauts to work outside their spacecraft while still in space.
 1. To carry out scientific experiments in space
 2. To test new equipment's or make repairs to satellites/spacecraft
- Spacesuits protect the astronauts from extreme hot and cold temperatures, harmful space dust and radiation.
- Spacesuits are pressurized to keep the fluids in the body in a liquid state.
- Once in their suits, astronauts breathe 100 percent oxygen for several hours until all the nitrogen is out of their bodies.

Nitrogen and 'the bends':

- Nitrogen in the body during a spacewalk can cause gas bubbles to form in the body. These gas bubbles can cause astronauts to feel pain in their joints, such as their shoulders, elbows, wrists and knees.
- This condition is called "the bends" because it affects the places where the body bends. The same condition can affect divers who use oxygen tanks to breathe underwater.

India and Women in Space:

GATEWAY

- Kalpana Chawla was the first woman of Indian descent to go into space.
- She was also one of the 7 member crew of the ill-fated NASA's Columbia, that disintegrated upon atmospheric entry killing the crew in 2003.
- Sunita Williams, was born to an Indian American Father in the United States of America.
- She formerly held the records for total spacewalks by a woman (seven) and most spacewalk time for a woman (50 hours, 40 minutes).
- In August 2007, she became the first person to run a marathon in space.
- Anuradha TK, a Geosat Programme Director at Indian Space Research Organisation (ISRO) Satellite Centre is an eminent scientist in this field.
- Ritu Karidhal, a scientist at ISRO has worked on multiple ISRO projects as an operations director, is famous for her contribution to Mangalyaan, India's Mars orbiter mission as the Deputy Operations Director.

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- India has come to a point where contributions of women across all fields are being celebrated and applauded. India still has a long way to go to make the historically male-dominated domains like space, as a level playing field for women. By then Indian women would be, quite literally, reaching for the stars.

