

Waste Management in Space

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Dear All,

Cheers for we Indians soft landing on Moon in an unexplored area where it remains dark and is extremely cold. As you know even Russia launched a Mission on Moon for the similar area but unfortunately it has crashed recently. The garbage is lying on the Moon's Surface



Russia's Moon Plans Press Forward

MOON RUSH
THE GREAT RACE TO THE MOON
LEOPARD CUBE

MOON RUSH: THE GREAT RACE TO THE MOON
LEOPARD CUBE

Russia's mission of its first lunar lander, Luna-25, is set to launch in the next few weeks. The mission is the first of the 'Lunar-25' series of lunar landers planned for the next five years of the Russian space program. The lander is expected to land in the south polar region of the Moon, a site that has been the focus of recent international interest. The lander is expected to land in the south polar region of the Moon, a site that has been the focus of recent international interest. The lander is expected to land in the south polar region of the Moon, a site that has been the focus of recent international interest.

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Not all the Missions are successful and some of them do meet this unfortunate state. Besides, all Missions to outer Space do generate Garbage. If they are thrown in the space, they remain there forever, circling in the space. As a result, tons of garbage both organic and plastic waste are floating in space.



Similarly, Mountaineers climbing on the Mount Everest also generate a lot of Garbage and they are thrown there by the climbers.

Method of waste reduction and Management in outer Space

Astronauts can process small pieces of trash in a high-temperature reactor, which breaks the waste down into water, oxygen, and other gases which the crew can use or vent as needed. Besides the gases, the remainder of the waste is greatly reduced in size, and no longer biologically active.

Scientists have identified at least 100 million pieces of space debris—from paint chips to nonoperational zombie satellites—floating in Earth's orbit. And over 100 tons of those pieces enter Earth's atmosphere each year !



Journey into outer space and learn about the dangers of space junk collisions, how scientists track them, and how space agencies are working to develop new technologies to clean up the space junk. Along the way, you'll hear from the scientists who are working to ensure that outer space remains a safe place to travel and explore. If we don't tackle the space junk problem, it might be impossible to travel into space; it could even trap us on Earth.

While there are conscious efforts, yet there are gaps in the system which require more intense research.

Recycling in Space: Waste Handling in a Microgravity Environment is a Challenge.

Long-duration human space exploration missions to the Moon and Mars need solutions for managing trash and other waste generated by the crew. NASA's Advanced Exploration Systems logistics reduction project is developing technologies to mitigate issues with waste. Four astronauts can generate 2,500 kilograms of waste during a yearlong mission.

Trash takes up space and presents a safety risk to the crew from biological and physical hazards. Current waste disposal methods on

the International Space Station rely on astronauts manually processing trash by placing it into bags then loading it onto a designated vehicle for short term storage, which depending on the craft, returns the trash to Earth or burns up in the atmosphere. This disposal method will not be available for missions beyond low-Earth orbit.

There is deep study and understanding needed to explore and establish sustainable ways for waste disposal in space more so it is a highly environmentally sensitive area.

Lets look forward to more intnesiv3e research results as each one dwells upon complex areas as the world looks forward to.

<https://www.nytimes.com/interactive/2023/science/india-moon-landing-photos.html>

Best Regards

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