

BATTERY FROM NUCLEAR WASTE TO POWER SPACE MISSIONS

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A file photo of a warning sign is displayed in a warehouse with containers filled with spent nuclear fuel. | Photo Credit: Reuters

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Scientists working with the European Space Agency (ESA) are developing batteries made of Americium, a nuclear waste, to power space missions. The ESA expects the technology to be developed by the end of the decade to operate space missions in the dark side of the Moon or areas far-off from the Solar System where solar power is limited, according to science journal *Nature*.

Once developed, the same basic power system could be reused on any missions on which solar energy is unavailable. To ensure safety, the batteries are encapsulated in layers including a platinum alloy, which seal in the americium while allowing heat to escape, the journal noted.

So far, the ESA has relied on US or Russian partners, which have used plutonium-238 batteries to power space missions. The new tech, once developed, will allow the space agency to operate spacecrafts without relying on solar panels and equipment from international partners.

Americium, which will be used to make new batteries, is a by-product of plutonium decay and has never been used as a fuel. It can be extracted from reprocessed nuclear fuel used in civil power plants and made into fuel pellets, which form the core of the batteries.

Americium's advantage over plutonium-238 is that it is cheaper and more abundant. It has a longer half-life than plutonium-238, so it lasts longer. It is also more readily available and costs less to produce than plutonium-238 which has been in short supply over the past decade, *Nature* reported.

European Ministers recently approved a funding of \$30-million to build the battery system. ESA

plans to launch americium-based power sources in its moon missions, scheduled to happen in early 2030. It aims to conduct studies on the lunar surface and support astronauts working there.

After that, the agency also aims a space mission to the ice giants Uranus and Neptune, in the 2040s. American space agency NASA also considers americium very interesting for its Artemis programme, which aims to establish a long-term presence on the Moon, *Nature* noted.

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