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## NEW TECHNIQUE ALLOWS 3D PRINTING IN SPACE



SCIENCE

### Researchers in China are now developing a 3D printing technology to manufacture ceramics under microgravity.

If humans are to successfully build a base on the Moon, it will be necessary for them to produce spare components in space. Moon dust is similar in composition to the raw materials used to make ceramics. However, ceramic manufacturing in the microgravity environment in space is very difficult. The filament materials currently used in space manufacturing experiments do not produce a product accurate enough for use as instrument components. The fine particles of material are difficult to control, as they float easily in a microgravity environment. Now, a team at the Technology and Engineering Center for Space Utilization of the [Chinese Academy of Sciences](#) has developed technology to allow accurate 3D printing in space.

The team first mixed fine powder into a resin to form a paste that does not float freely in microgravity. The paste can then be used in 3D printing. In experiments under microgravity, the team produced both ceramic and metal samples. The metal samples were created by first 3D-printing a ceramic mould. A special metal-casting technique was then used to create a screw and a small wrench. The team suggest that the technology could eventually be used for rapid production of semiconductors. In addition to optical parts and micro-electromechanical systems used in space exploration.

While the printers used in the trials require human operation, the team's long-term goal is to develop machines that can produce materials autonomously, on the Moon or Mars. We have seen a growing interest in space or near-space exploration in recent years. Innovations in this area have included a [solar-powered plane](#) capable of reaching the stratosphere and an Arduino-equipped [satellite](#) on which anyone can rent time for experiments. Will technology such as 3D-printing in space help to make space colonisation a reality? Or will it prove more useful for manufacturing materials to be used on Earth?

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