

## **Video: 3D-printing a lunar base**

November 7 2014

Could astronauts one day be printing rather than building a base on the Moon? In 2013 ESA, working with industrial partners, proved that 3D printing using lunar material was feasible in principle. Since then, work continues to investigate the technique. The shielding against radiation provided by a 3D-printed block of simulated lunar regolith was measured, providing important inputs for next-stage designs... Soon the Agency is due to investigate another lunar 3D printing method, harnessing concentrated sunlight to melt regolith rather than using a binding liquid.

But how might lunar 3D printing one day be used in practice? Foster+Partners, contributing architectural concepts for the original study, put together this outline of a hypothetical mission to 3D-print an entire a <u>lunar base</u>, illustrating the design factors that steered them in their work. The rim of Shackleton Crater at the lunar south pole was chosen for the base location. The Moon's rotation is such that the Sun only grazes its poles at low angles. The result is a near-constant 'peak of eternal light' along the rim of Shackleton Crater, beside regions of permanent shadow. Building in the vicinity of such a site would offer plentiful solar power, and relief from the extremes of heat and cold found across the rest of the Moon.

In reality any lunar base remains firmly on the drawing board, but each small step forward in research makes future lunar colonisation a little more feasible. In October 2014 more than 350 experts came together for a two-day Additive Manufacturing for Space Applications workshop at ESA's ESTEC technical centre in Noordwijk, the Netherlands. They



discussed the potential of 3D <u>printing</u> – also known as Additive Manufacturing – to transform the way the space industry operates and begin preparing common standards for its use.

Provided by European Space Agency

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