

Press release

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Foster + Partners California | Branch Technology win first-prize in Level 1 of NASA Centennial 3D-Printed Habitat Challenge

Foster + Partners California | Branch Technology has been awarded first-place in the NASA 3D-Printed Habitat Challenge, Phase 2: Level 1 Competition organized by NASA and Bradley University. The competition envisions a future where autonomous machines will help construct extra-terrestrial shelters for human habitation. This will also aid the development of technologies that advance fabrication capabilities on Earth.

While the final shelter will be a complex assembly of smaller building elements, the focus through the various stages of the challenge is to design and test individual prototypical building elements that can help demonstrate the suitability of the entire process from manufacture to construction and structural performance.

As part of this stage of the competition, teams were asked to use recycled mission materials and indigenous Martian regolith (soil) together to 3D-print a truncated cone and a cylinder, which were then subjected to compression testing to assess their suitability as structural components. Foster + Partners has been looking at the engineering geometry of the structures, while Branch Technology have brought their expertise with 3D-printing materials and methods to the project.

For further information
please contact Katy Harris at
Foster + Partners,
T +44 (0)20 7738 0455
F +44 (0)20 7738 1107
E press@fosterandpartners.com

Developing optimized solutions that are specifically designed for the complexities of space travel, each of the proposals balances cost, weight, and structural performance against the stringent requirements of the long-term goal of extra-terrestrial habitation.

Having successfully completed Level 1, the team will now work toward the Level 2 Competition submission at the end of May, in which a beam will be printed to test spanning structures.

- In 2015, Foster + Partners competed in Phase 1 of the competition, securing second-place for their proposal that used an array of semi-autonomous robots to 3D-print habitats for human occupation.
- Foster + Partners and Branch Technology have come together to further refine the original concept, with the 3D-printed Habitat Challenge providing a platform for collaboration at a new level.
- Phase 2 of the competition is broken down into three levels, each focusing on a different structural challenge.
- Teams were awarded higher points for proposals that maximize the use of local resources/mission waste and marked down for proposals that rely on water and imported construction materials.
- Foster + Partners | Branch Technology's Level 1-cylinder design combined 30% recycled mission plastics and 70% Martian regolith (soil) to achieve a maximum compressive load of 62,530lbs /28,363kg.
- Read more about the challenge

at: https://www.nasa.gov/directorates/spacetech/centennial_challenges/3DPHab/phase-2-level-1-awards