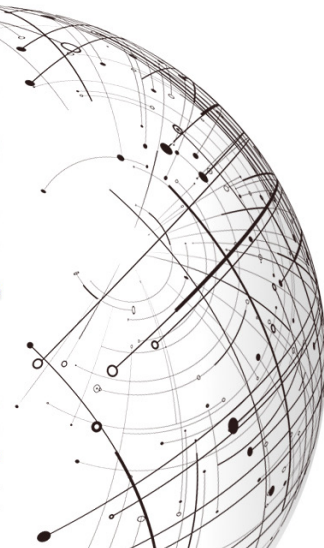




# 3D-Printed Habitat Challenge

## NASA'S 3D-PRINTED HABITAT CHALLENGE

A NASA CENTENNIAL CHALLENGE



# NASAfacts

### Objective

NASA's 3D-Printed Habitat Challenge is a Centennial Challenges Program competition that seeks to advance additive construction technology needed to create sustainable housing solutions for Earth, the Moon, Mars and beyond.

On Earth, these capabilities could be used to construct housing wherever affordable housing is needed and access to conventional building materials and skills are limited. Local indigenous materials (dirt, clay, sand, etc.) could be combined with readily available recyclable materials and used to construct semi-permanent shelters against environmental elements for human habitation.

### Prize Purse

The total available prize purse for all phases of this challenge is expected to be over \$3 million, provided by the NASA Centennial Challenges Program.

### Description

The 3D-Printed Habitat Challenge takes place in phases:

**Phase 1** of the Challenge, a design competition, was completed in 2015. Teams developed innovative habitat architectural concepts that take advantage of the unique capabilities that 3D printing offers. Teams qualified to win \$40,000 of a \$50,000 prize purse.

**Phase 2**, the Structural Member Competition, focused on the material technologies needed to manufacture structural components from a combination of indigenous materials and recyclables, or indigenous materials alone. Teams qualified to win \$701,024 of a \$1.1 million available prize purse.

**Phase 3**, the On-Site Habitat Competition, focuses on the fabrication of scaled habitat designs and systems that could use indigenous materials combined with or without recyclables, and will have a prize purse of \$1.3 million.



Photo: NASA/Joel Kowsky

A team from Pennsylvania State University places weight on a 3D-printed dome structure to test its strength at the Phase 2: Level 3 competition of NASA's 3D-Printed Habitat Challenge. The team won second place.

**Phase 4**, the Full-Scale Habitat Competition, will focus on fabrication of a full-scale habitat design. There will be a grand prize of \$1 million for this stage.

The challenge is conducted through a partnership of NASA and Bradley University in Peoria, Illinois. Bradley University also partnered with sponsors Caterpillar Inc. of Peoria, Bechtel and Brick & Mortar Ventures, both of San Francisco, to run the competition. NASA's Marshall Space Flight Center in Huntsville, Alabama, manages the Centennial Challenges program for the Space Technology Mission Directorate in Washington.

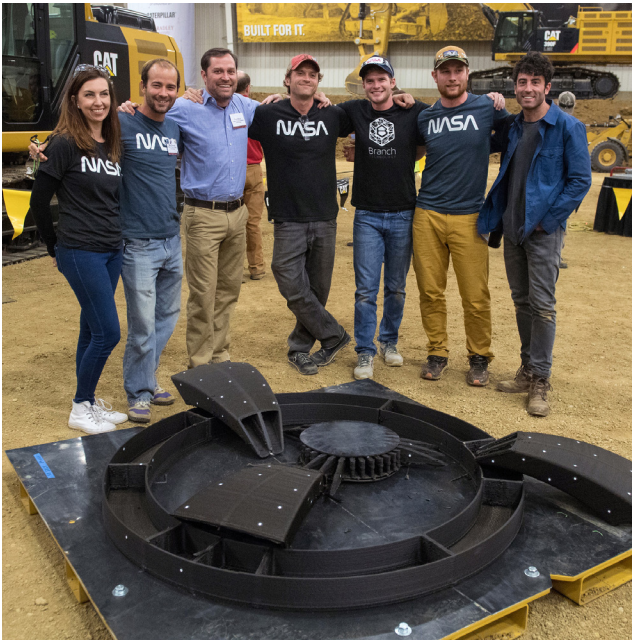


Photo: NASA/Joel Kowsky

A 3D-printed dome structure printed by team Foster + Partners | Branch Technology won first place in Phase 2: Level 3 of NASA's 3D-Printed Habitat Challenge. The dome was crush-tested to failure at the competition.

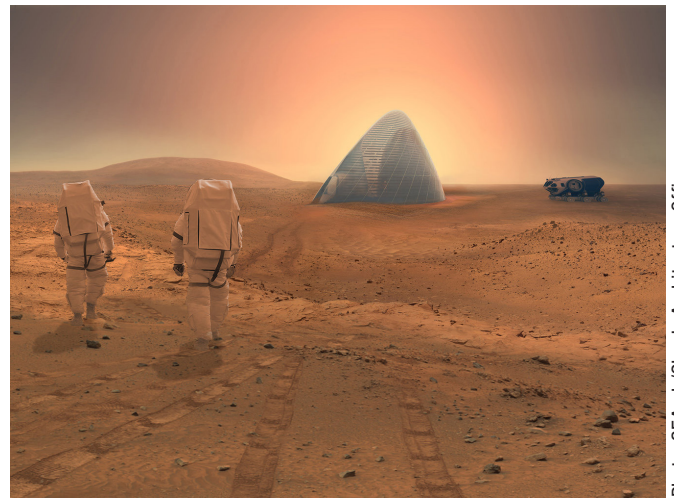


Photo: SEArch/Clouds Architecture Office

Team Space Exploration Architecture (SEArch) and Clouds Architecture Office of New York, New York, designed the above concept, called "Mars Ice House," for the 3D-Printed Habitat Challenge Design Competition. The team won first place in Phase 1 and was awarded \$25,000.

For more information on the 3D-Printed Habitat Challenge, visit:

[www.nasa.gov/3DPHab](http://www.nasa.gov/3DPHab).

For information on the Centennial Challenges program, visit:

[www.nasa.gov/winit](http://www.nasa.gov/winit)



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