



BUILDING A MARS HABITAT

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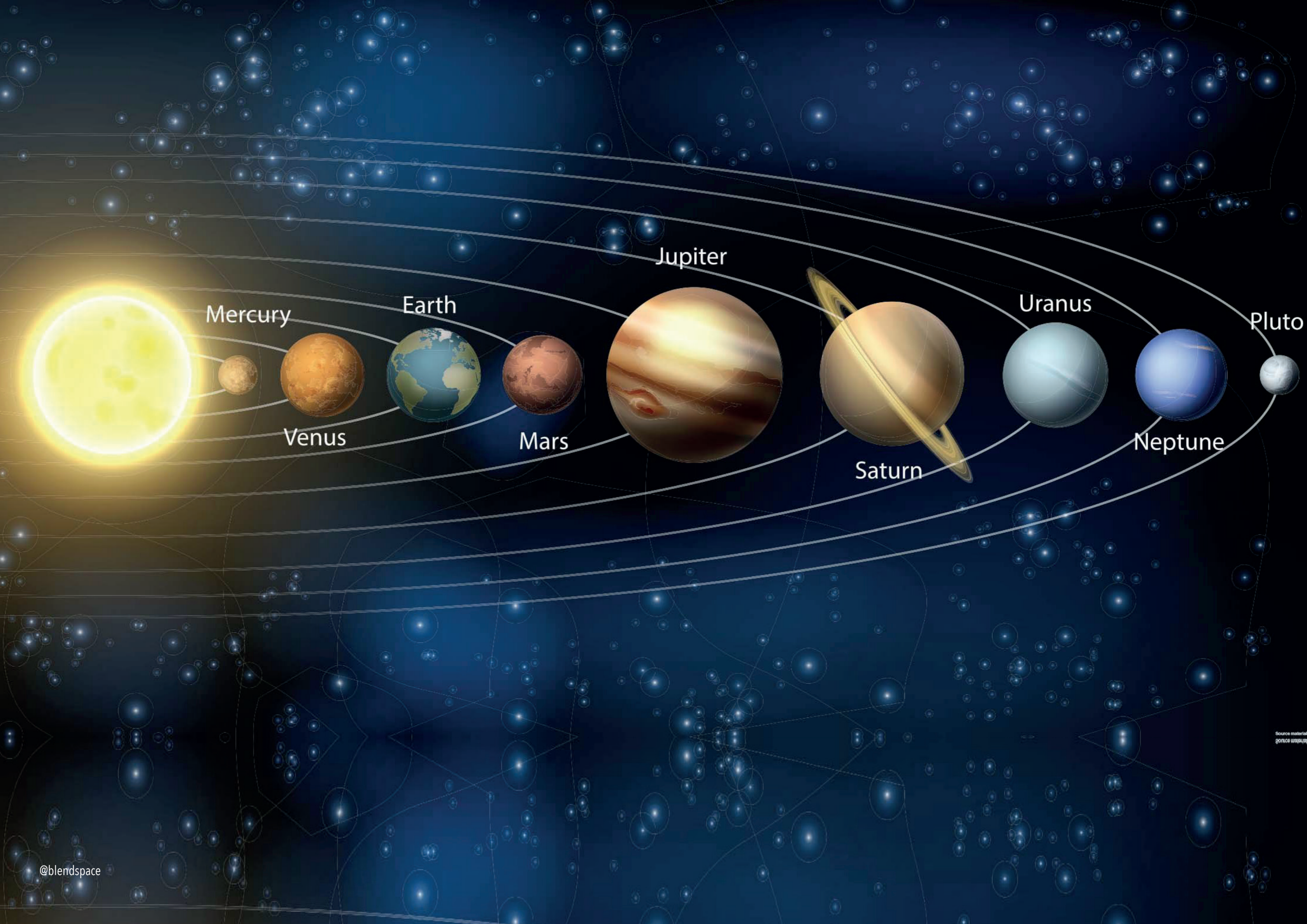
C O N T E N T

Research

Design process

Design

Fragments



Mercury



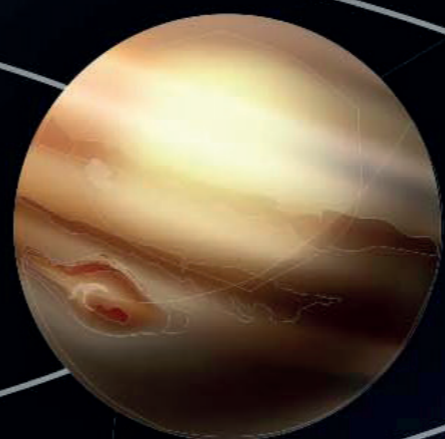
Venus



Earth



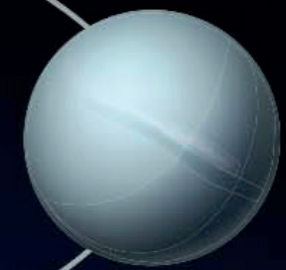
Mars



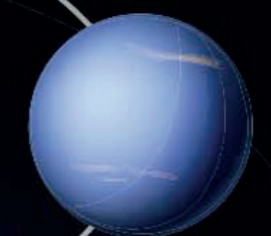
Jupiter



Saturn



Uranus

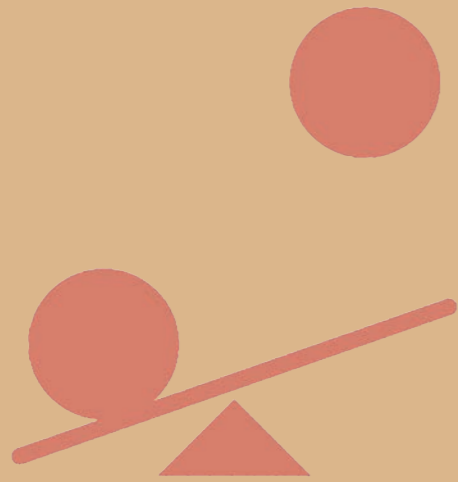


Neptune

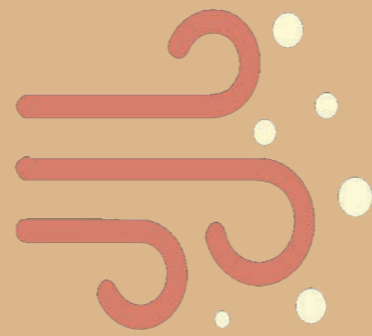


Pluto

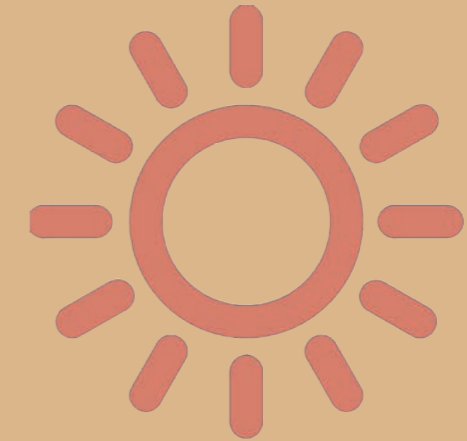
FACTS ABOUT MARS



Martian surface gravity is only 37% of the Earth's



Mars has the largest dust storms in the solar system. They can last for months and cover the entire planet. The seasons are extreme because its elliptical (oval-shaped) orbital path around the Sun is more elongated than most other planets in the solar system.



On Mars the Sun appears about half the size as it does on Earth.

At the closest point to the Sun, the Martian southern hemisphere leans towards the Sun, causing a short, intensely hot summer, while the northern hemisphere endures a brief, cold winter: at its farthest point from the Sun.

High temperature 20 c

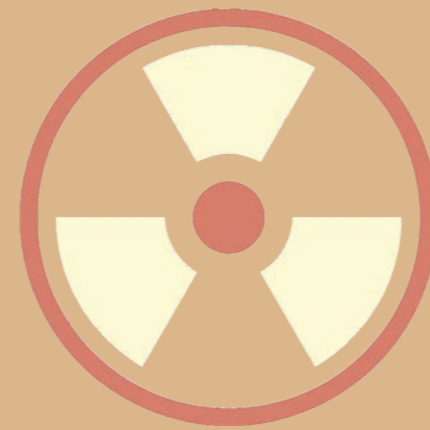
Low temperature -153 c

But seasons are twice as long as on the earth



There are signs of liquid water on Mars.

For years Mars has been known to have water in the form of ice.



Radiations

Natural Radiation on Mars is much higher compared with Earth. The thin atmosphere provides only a small shielding effect against cosmic radiation. It provides moderate protection against solar radiation. Mars also lacks the magnetosphere that protects Earth. The average natural radiation level on Mars is 24-30 rads or 240-300 mSv per year[1][2]. This is about 40-50 times the average on Earth.



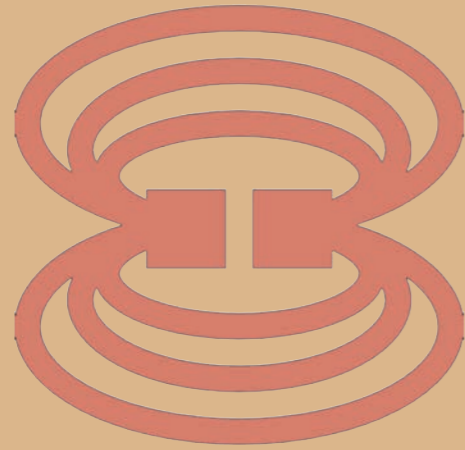
Protection against radiations

Long term habitats should be equipped with a radiation shielding, thick enough to reduce the radiation to a level equal to Earth, that is, almost zero. Best protection may be achieved with houses built in natural caves or set into cliffs or hillsides.

Any matter placed between a person (or radiation-sensitive equipment) and a radiation source reduces the amount of radiation they absorb.

Mars One's solution is a thick layer of regolith on top of the settlement modules.

An effective shield will require at least several hundred grams of regolith per square centimeter, according to one study.[2] Using a **regolith** density estimate of 1.4 g/cm³[3], this means the regolith layer would need to be **over 2 meters deep**. For **concrete** with an average density of 2.4 g/cm³ the required thickness should be about **40% less**.



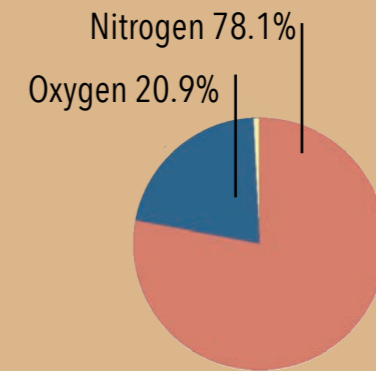
Magnetosphere

Mars has no global magnetic field today, but areas of the Martian crust in the southern hemisphere are highly magnetized, indicating traces of a magnetic field from 4 billion years ago.



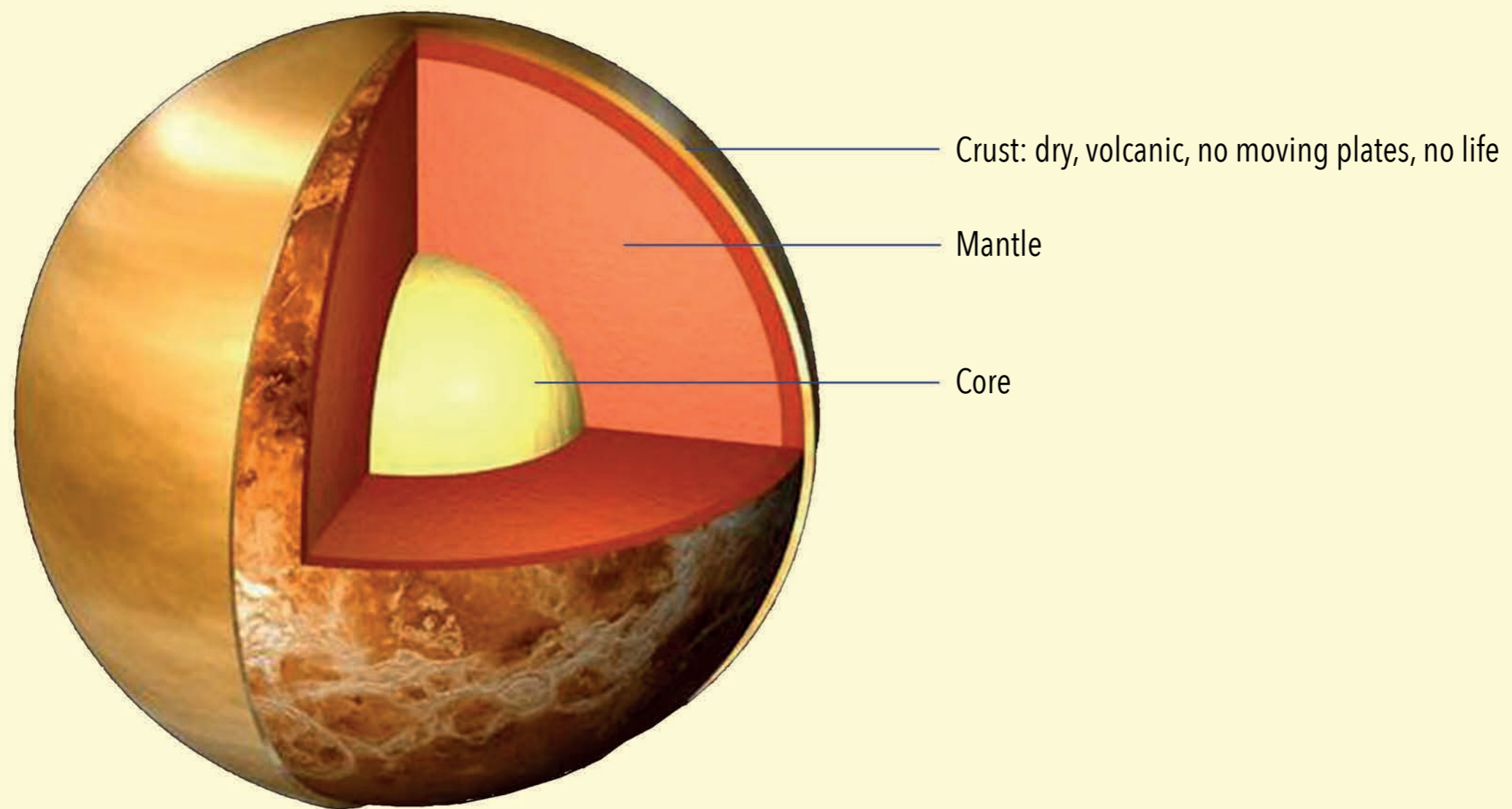
Atmosphere of mars composition

Carbon Dioxide 95.0%
Nitrogen 3.0%
Argon 1.6%

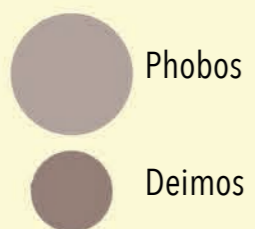


While on Earth

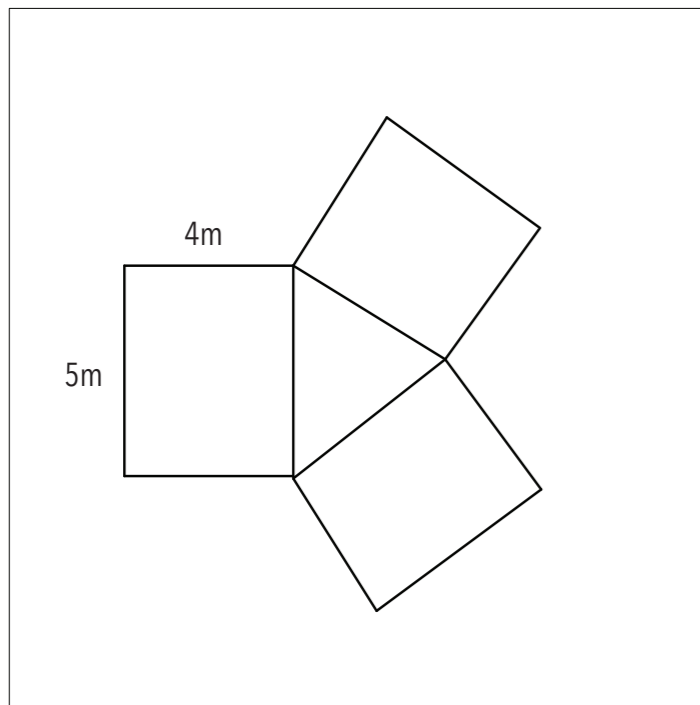
Oxygen 20.9%
Nitrogen 78.1%



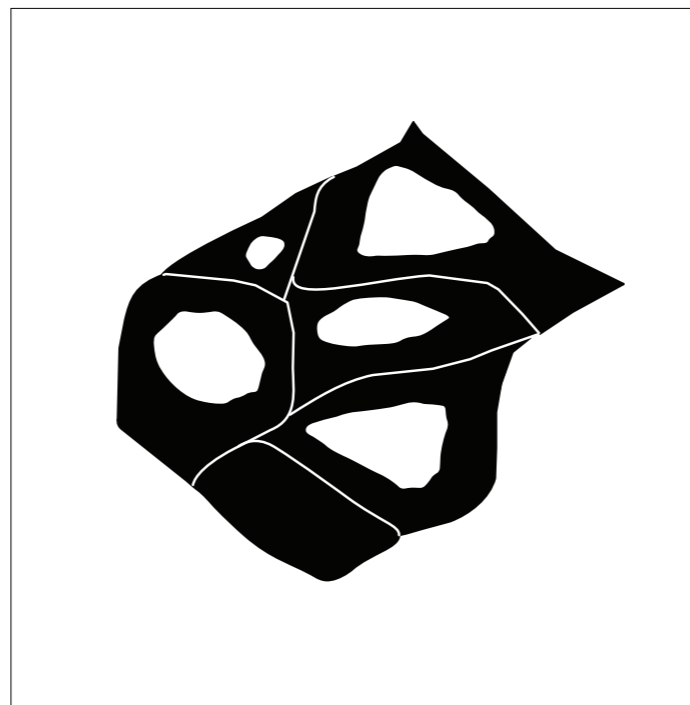
Two moons



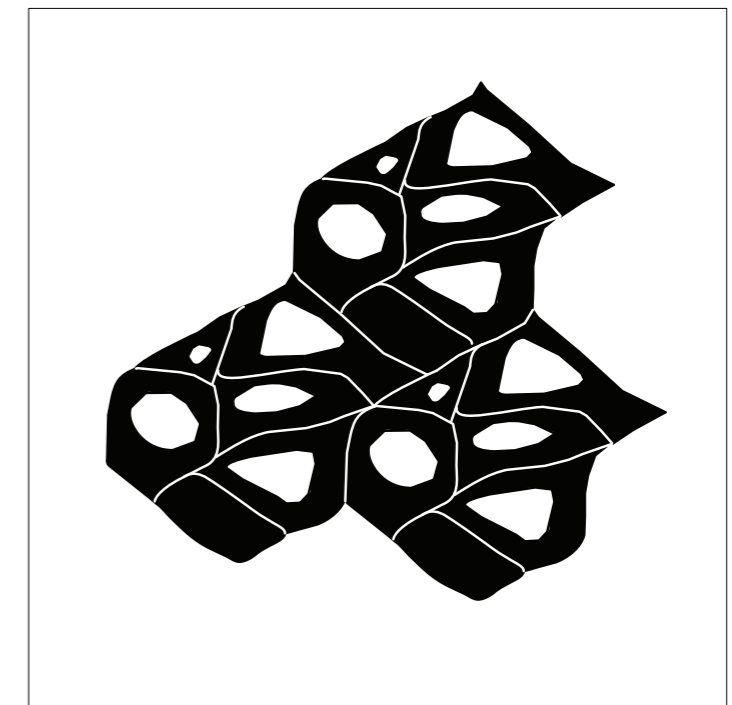
Design process



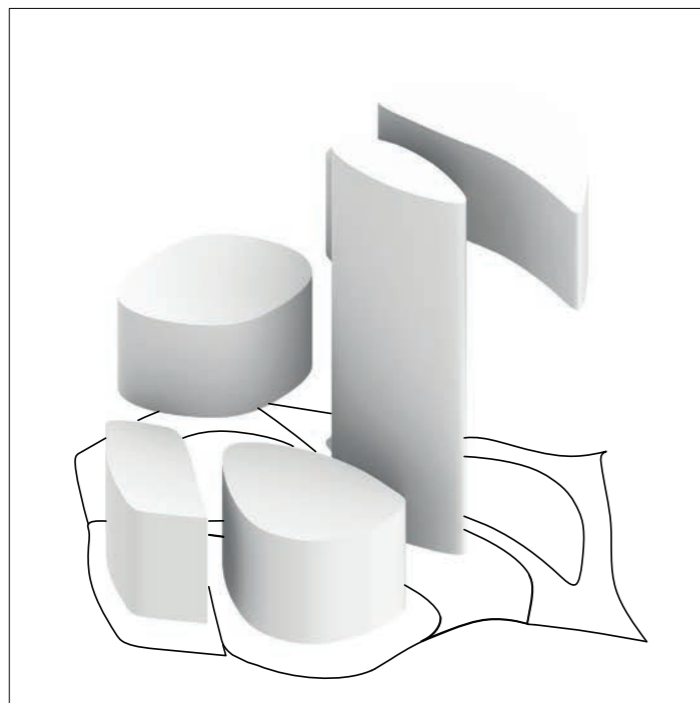
01. A conceptual form that can be multiplied.
The Rectangles are imagined as functional spaces and the triangle is a core.



02. Translational of the form into organic form
while imagining the walls to be thicker



03. A cluster of units that can grow as a
community



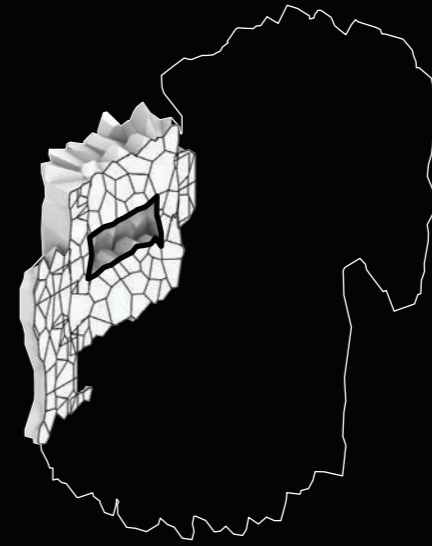
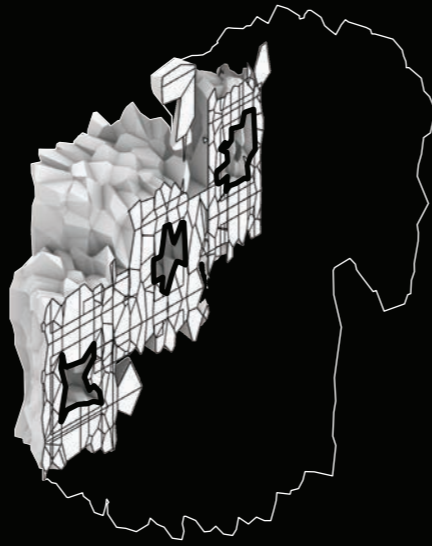
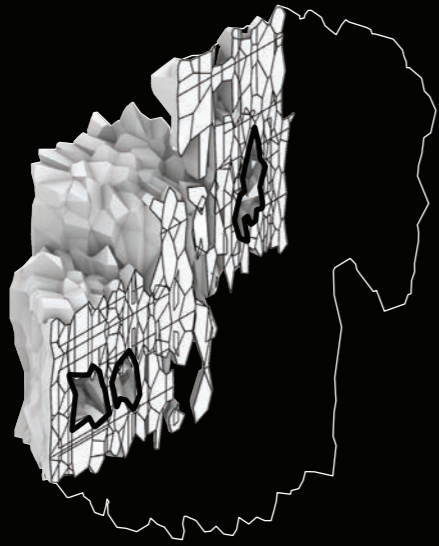
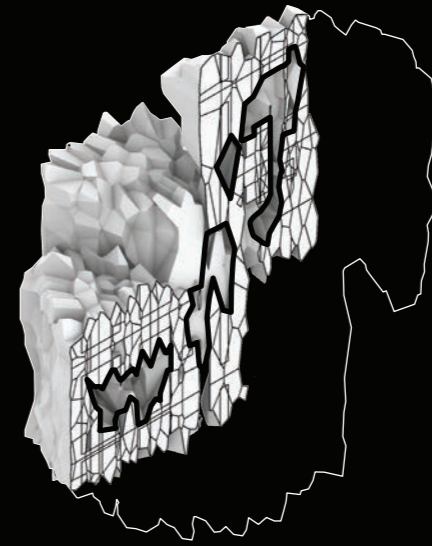
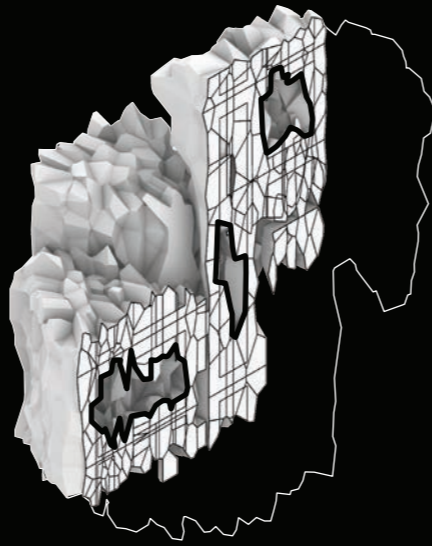
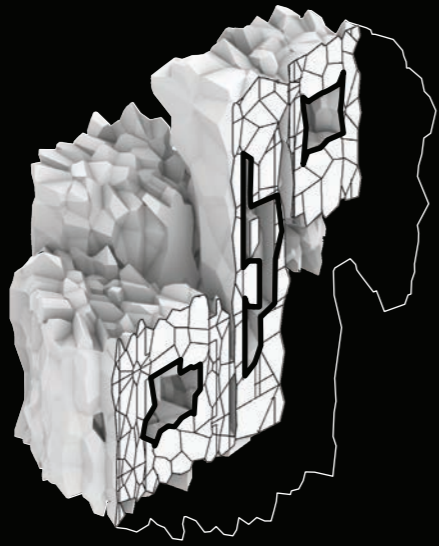
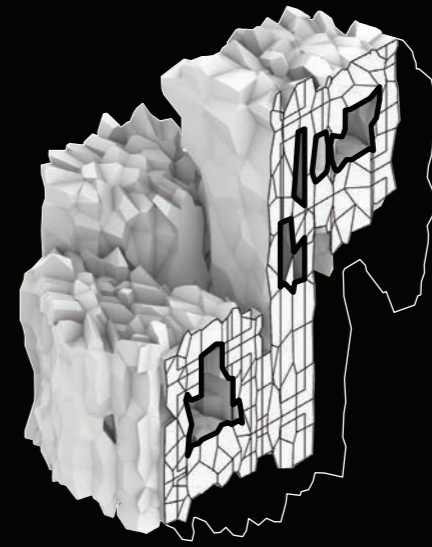
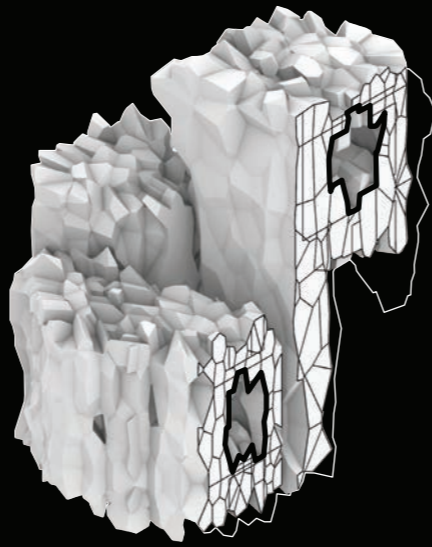
04. Arrangement of internal functional spaces

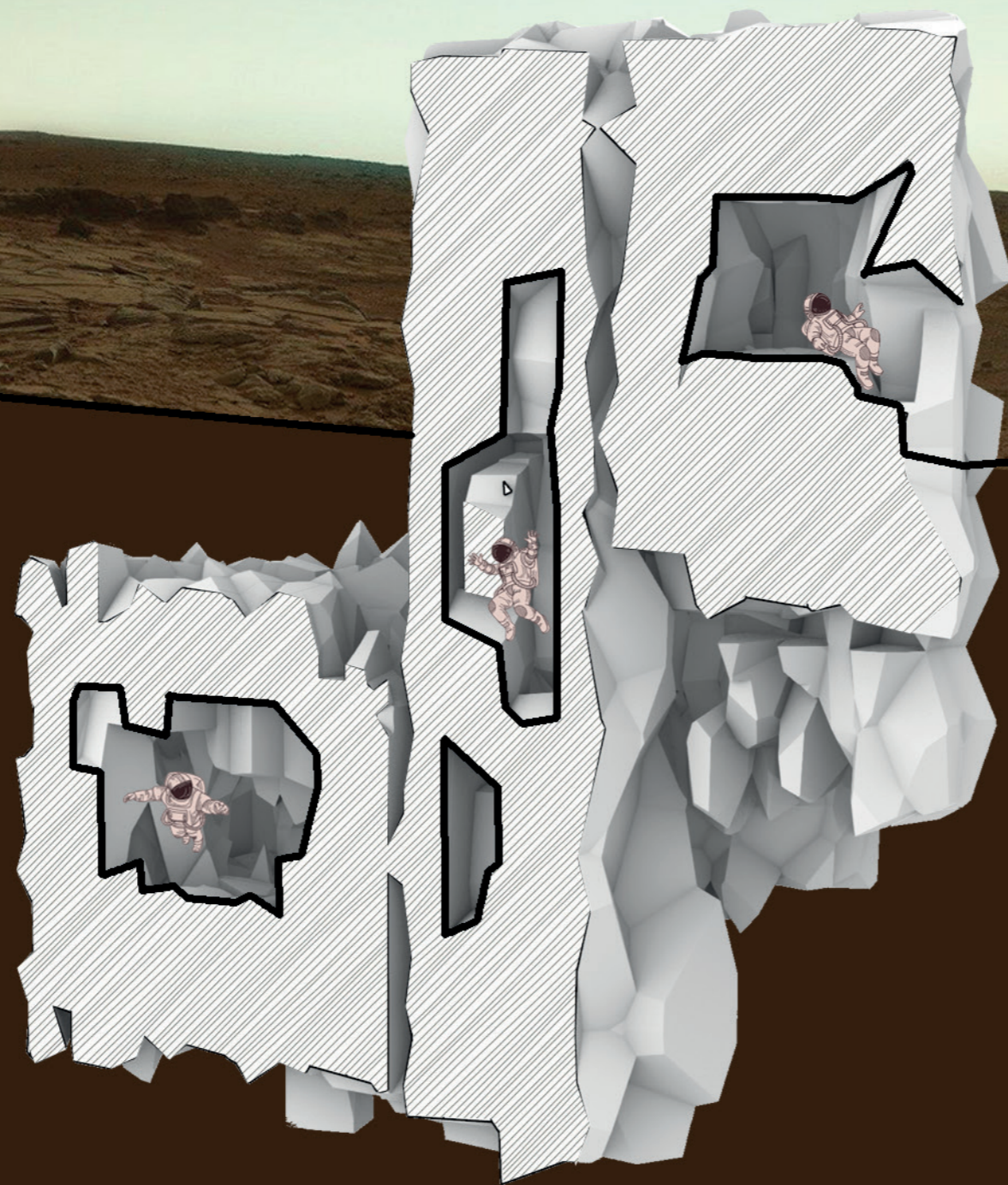
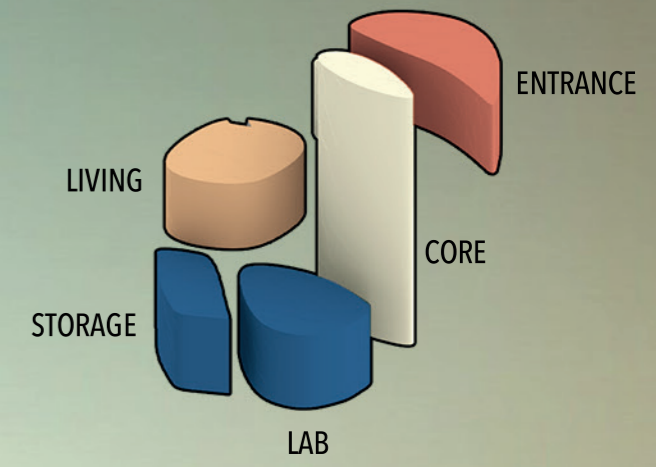


05. Thicker walls to create habituable
internal spaces



06. The proposal after Voronoi assimilation





SECTION

