

2016 JACQUES ROUGERIE FOUNDATION "INNOVATION AND ARCHITECTURE FOR SPACE" AWARD

NAME OF THE PROJECT

ARCHITECTURE ON THE MOON:
SPACE TOURISM AND SCIENTIFIC RESEARCH HABITAT

DESCRIPTION

ARCHITECTURE BEYOND EARTH

THE BUILDING HABITABILITY

The space under the sphere is a transitional space, used to place the rovers and equipment that need to be outside the habitat.

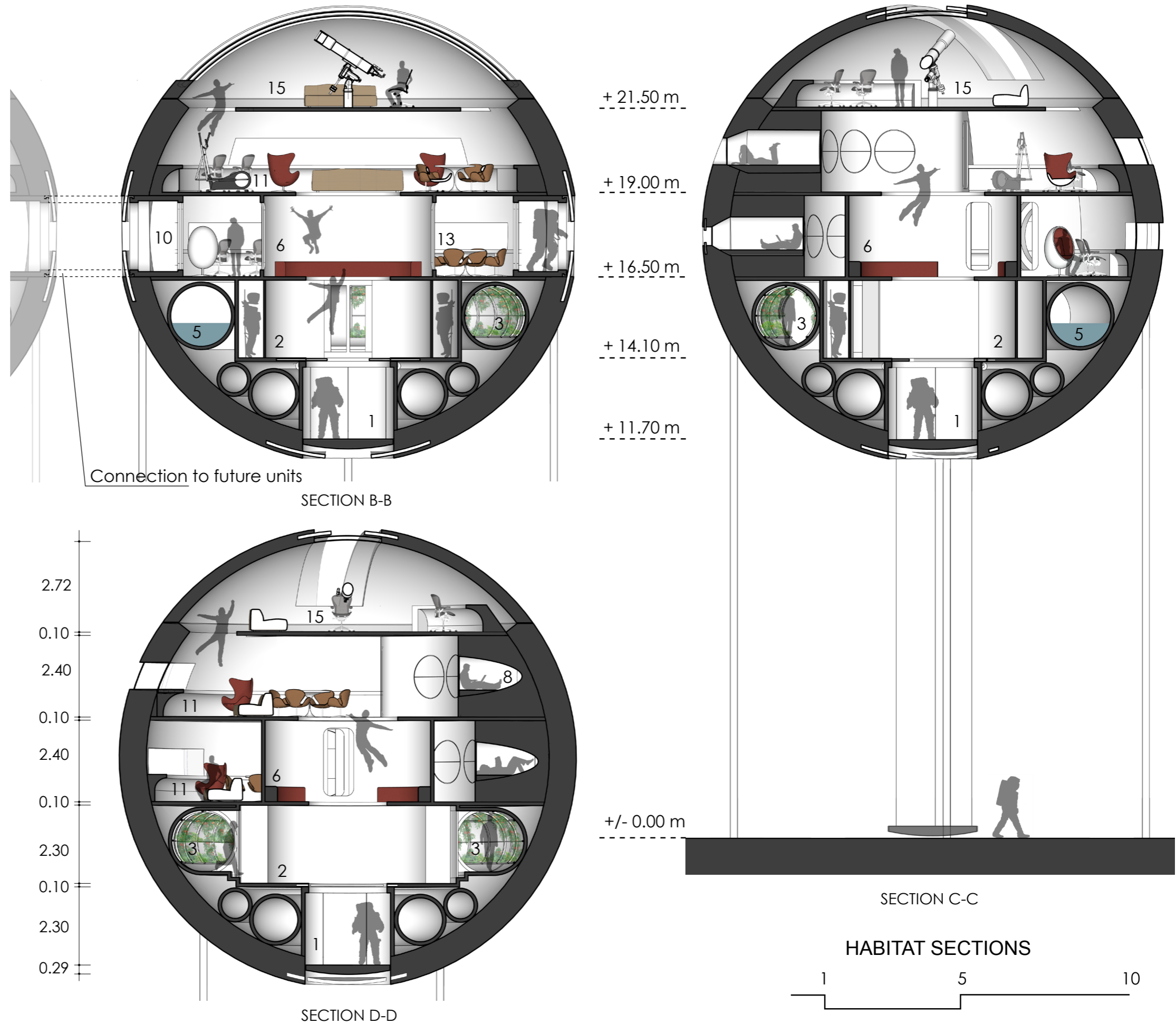
To access the habitat, the bottom airlock door is opened and it is displayed an elevator, that goes down and takes the astronauts to the entrance, the elevator enters the airlock, once it has been pressurized, a horizontal door is opened, the elevator goes up to the crew lock floor, a space for equipment, machinery zone, and resources storage. The next level, the crew meeting room, is an articulator space, from where scientists can access to their zone, and tourists to their own, it is also the space in which the crew can meet with the tourists. The next level is the tourists' zone, with a mezzanine, the observatory, from where space can be explored with the telescope, specially the Earth.

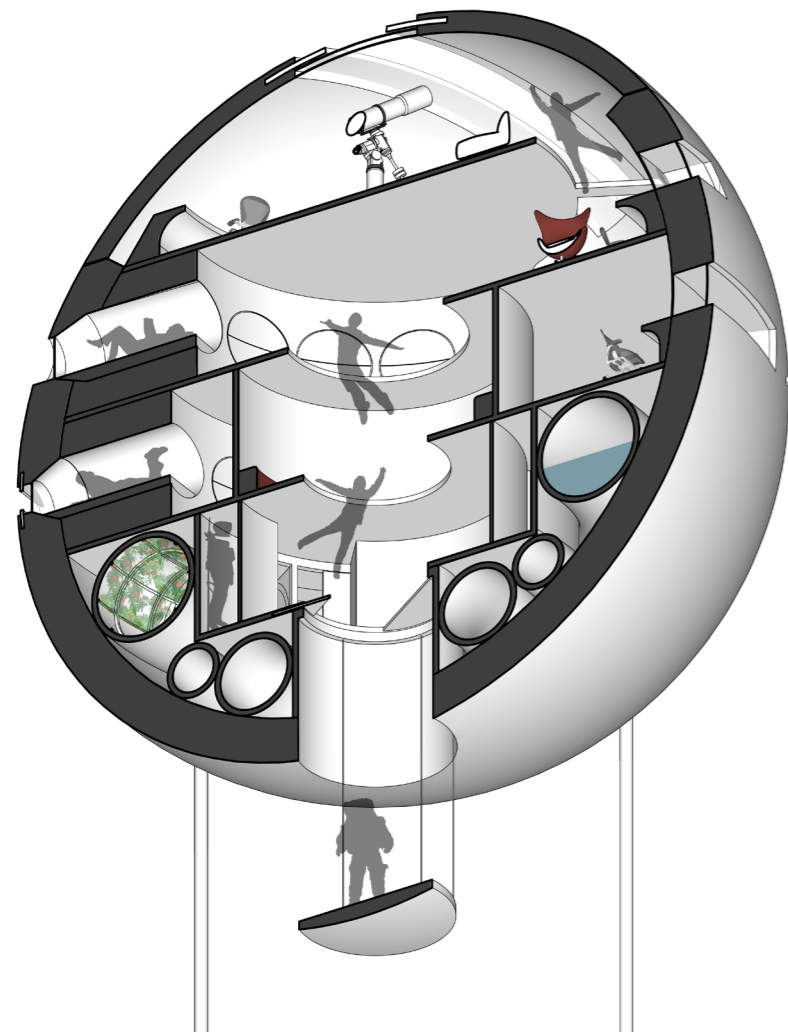
MOVEMENT

To move through the floors, no stairs are required, due to Moon's gravity (0.17g) and the atmospheric pressure in the habitat, people jump to reach the upper floor through an open section. Architecture without stairs, also retractable ladders can be used if needed.

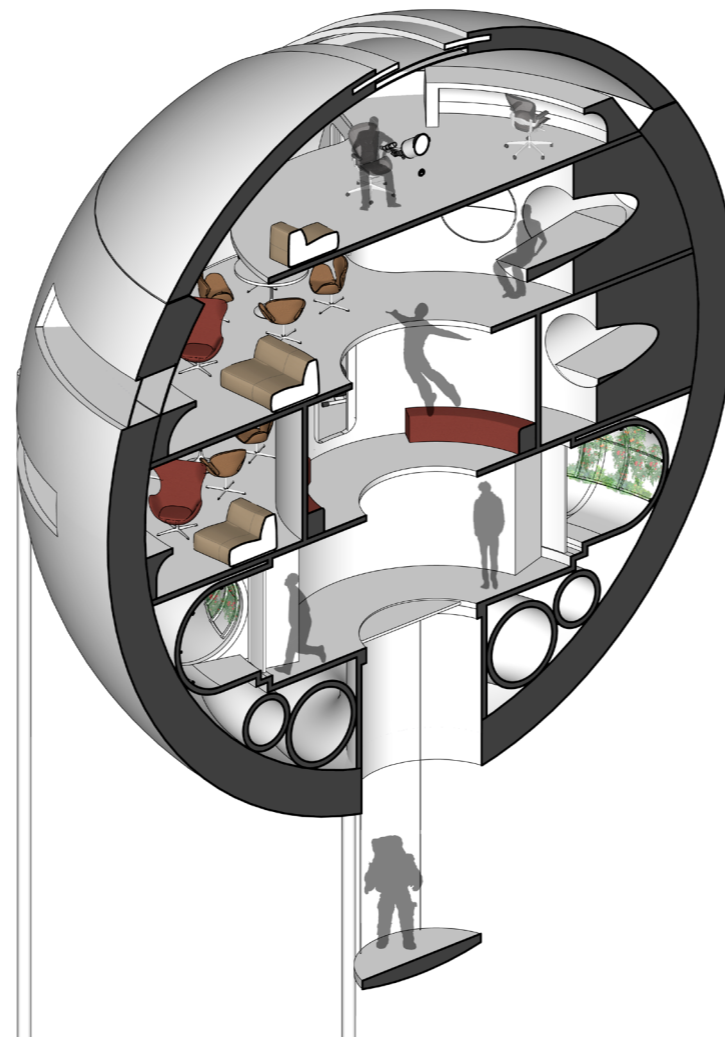
Ascending to the habitat is like entering into a mysterious object, and descending is like feeling the same excitement of the first landing, also panoramic views of the lunar landscape can be appreciated while ascending.

- 1 Airlock
- 2 Crew lock
- 3 Greenhouse
- 5 Water tank
- 6 Crew meeting room
- 8 Sleeping capsule
- 10 Docking port airlock
- 11 Living zone
- 13 Kitchenette - dining zone
- 15 Observatory

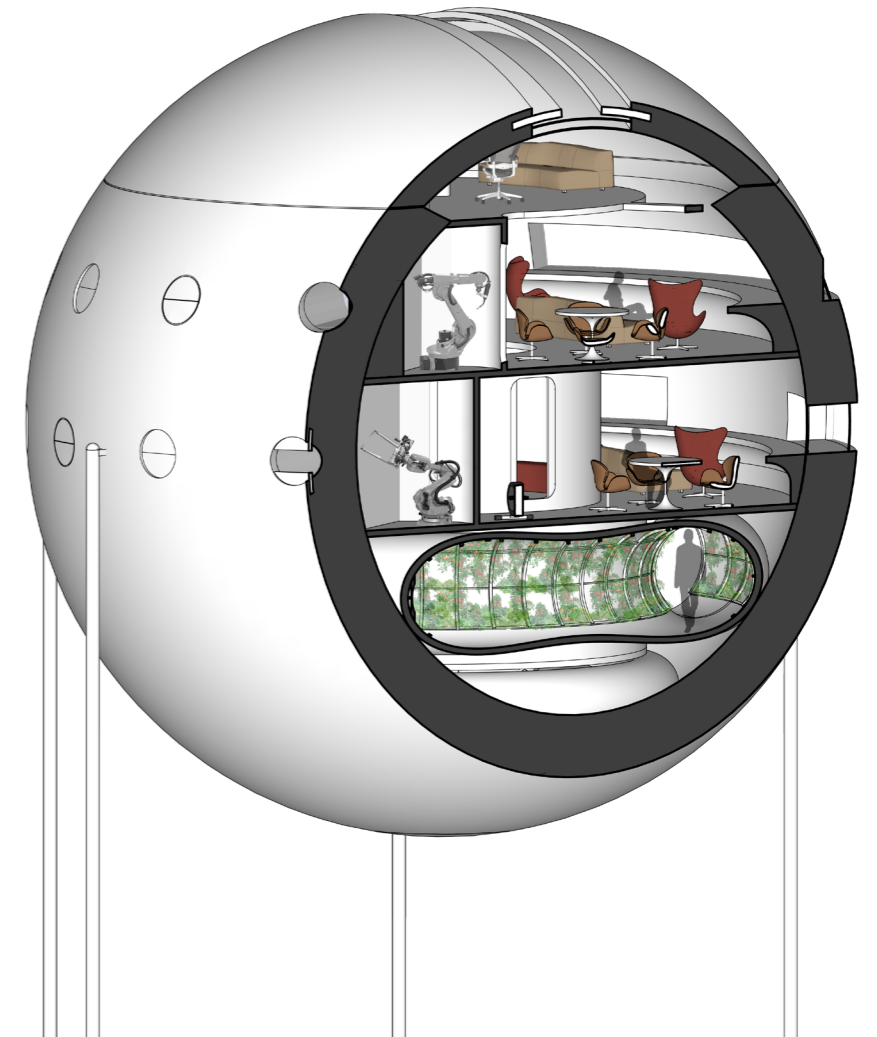




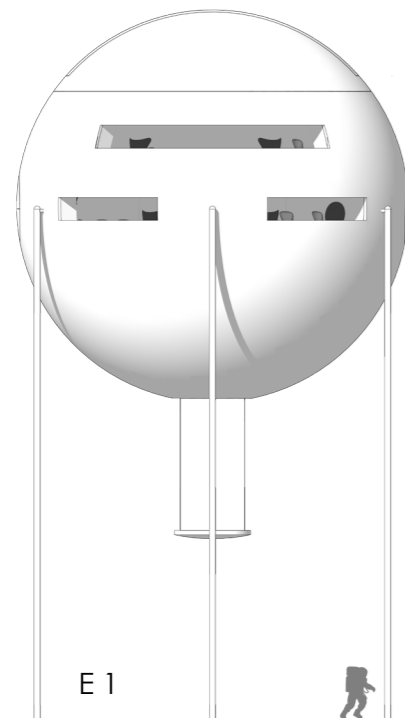
3D SECTION A - A



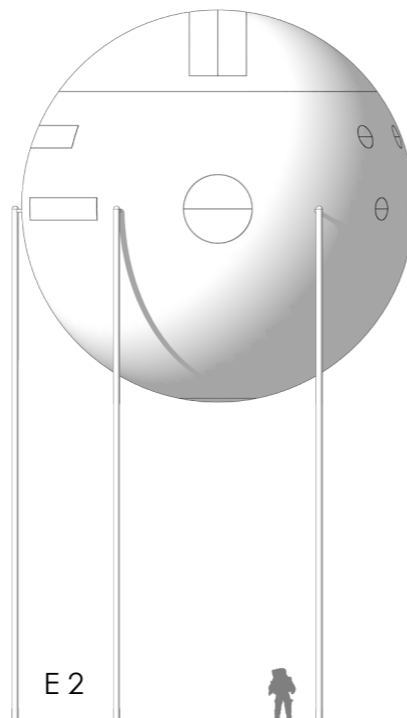
3D SECTION D - D
PERSPECTIVE SECTIONS



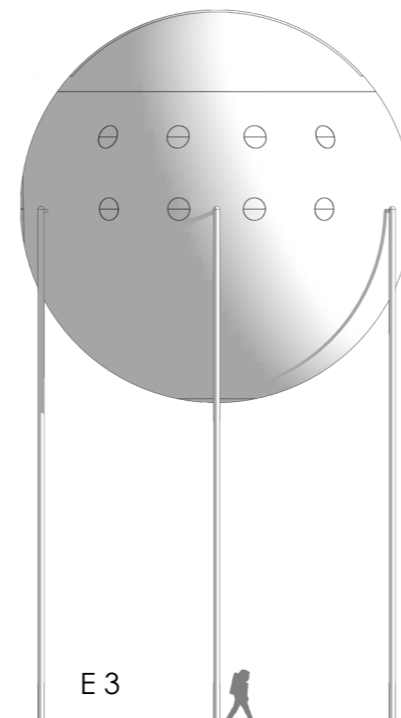
3D SECTION E - E



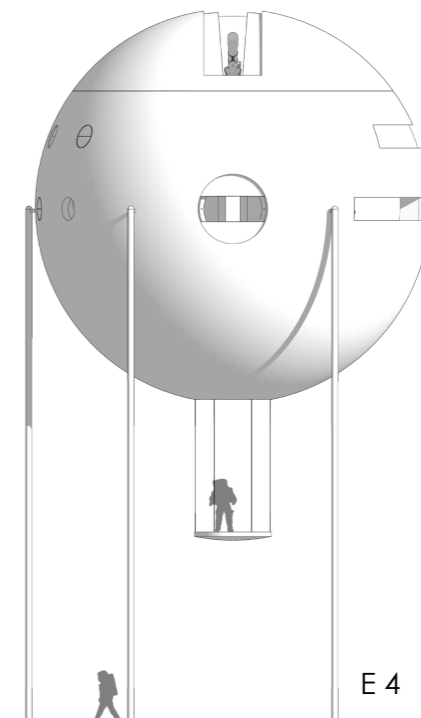
E 1



E 2



E 3



E 4

ELEVATIONS

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BUILDING TECHNOLOGY

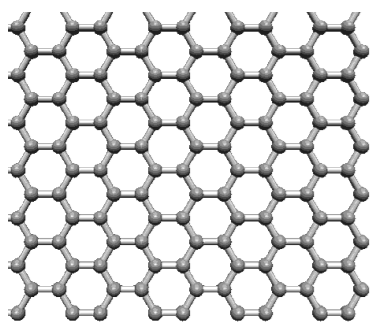
The building technology is 3D printing through robotic arms and specialized robots that build layer by layer all the building from slabs and walls to furniture and little objects.

BUILDING PROCESS

The structure of the building would be dropped by the lunar module, the pillars and an inflatable scaffold membrane, first the pillars are fixed in the ground, then the membrane would be inflated with air from the ship and finally taking the sphere shape, the elevator would be displayed, and the robots would start the 3d printing process of the radiation protection middle layer, and the exterior layer. In the interior of the inflatable membrane, the robots would complete the intern complements, slabs, walls, furniture, etc.

MATERIALS

The habitat is made out of graphene, carbon nanotubes and polymers.

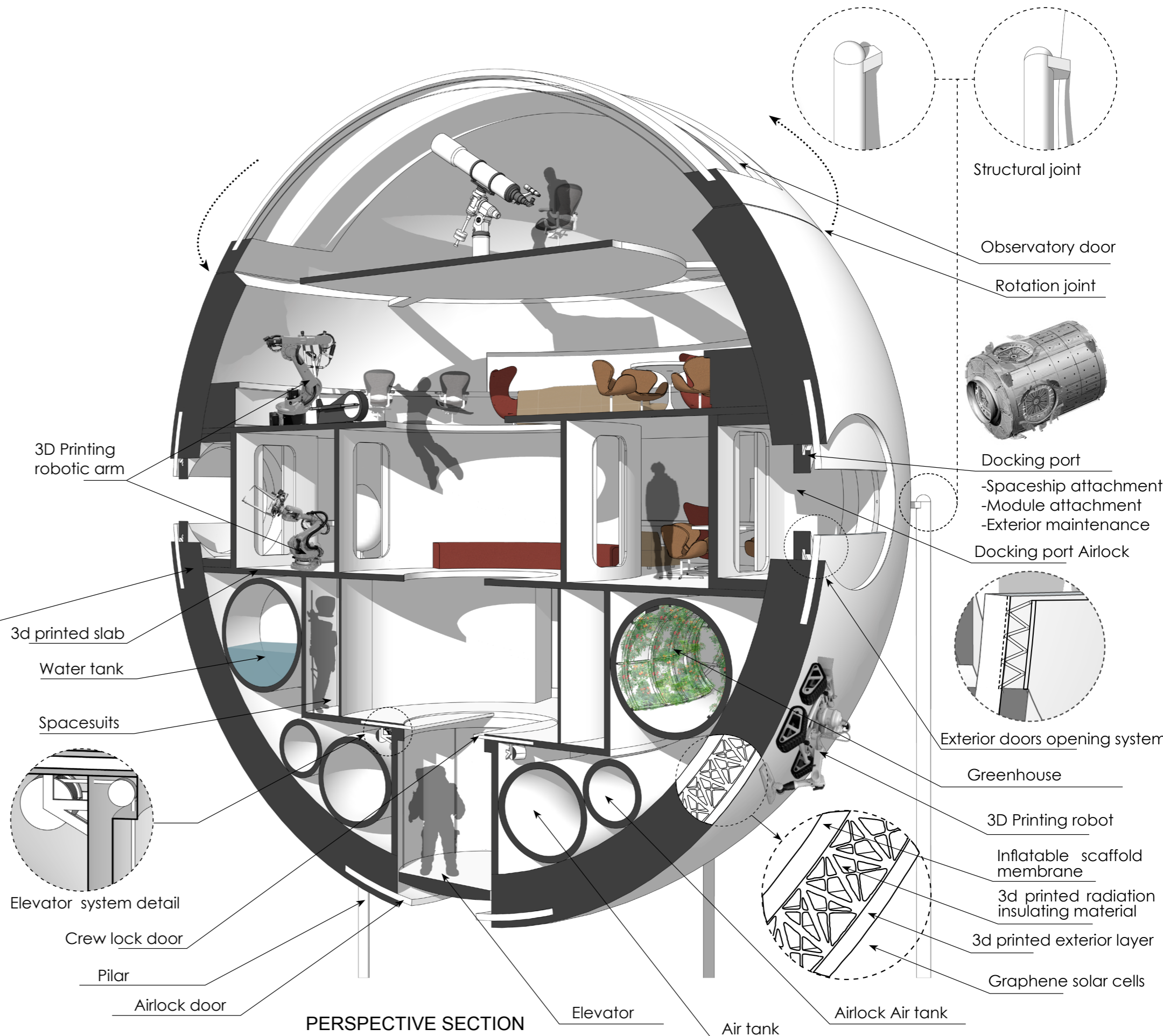


Graphene

SUSTENTABILITY – LIFE SUPPORTING MICRO ECOSYSTEM.

The waste is recycled, and is integrated with a lunar greenhouse with hydroponic plants, which produces food for people. The greenhouse's plants would use the CO₂ produced by people and transform it into oxygen, and resend it to circulate again, the aim is to create a life supporting micro ecosystem that would make possible to spend more time on the moon.

The energy would be obtained from the sun, through graphene solar cells on the exterior surface of the habitat.



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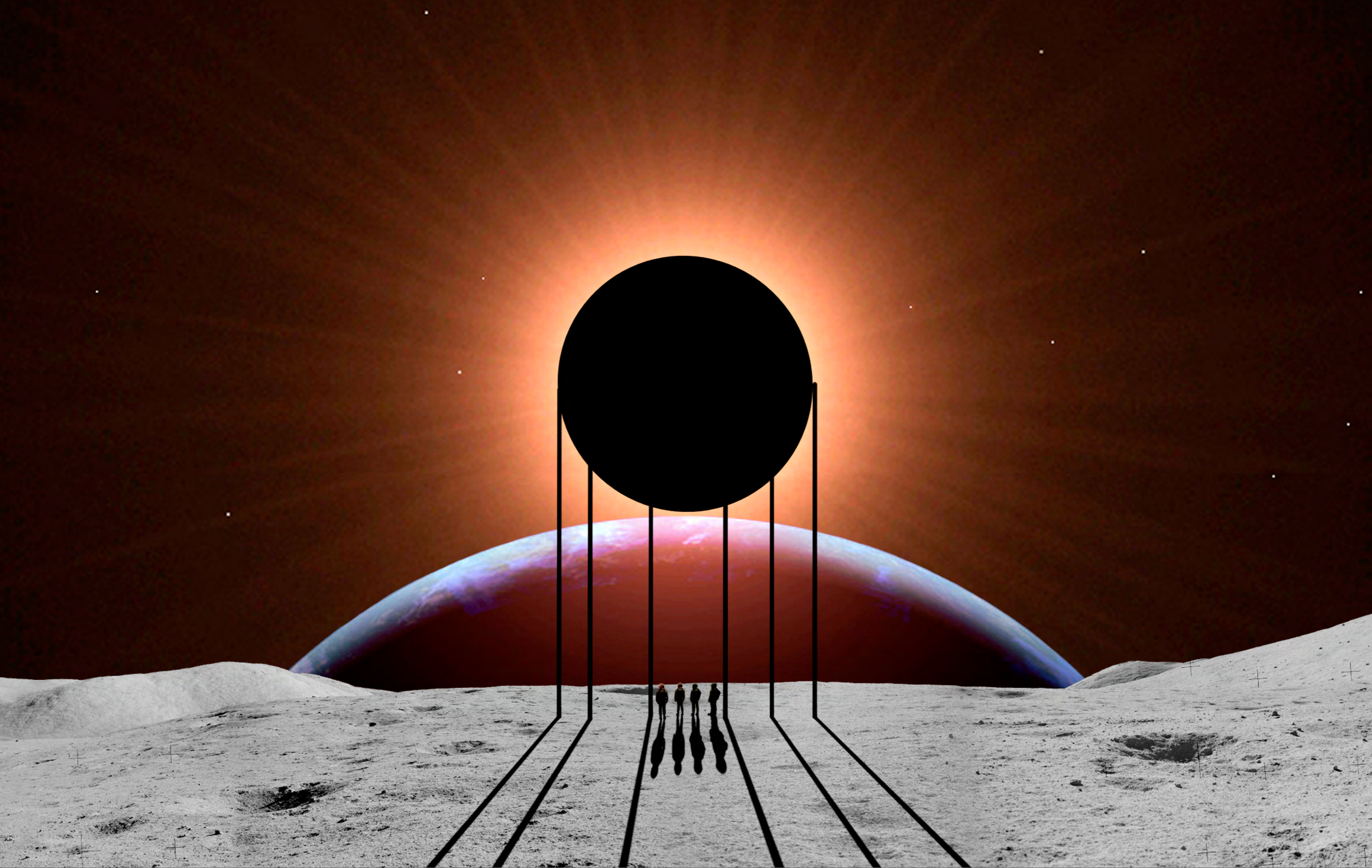
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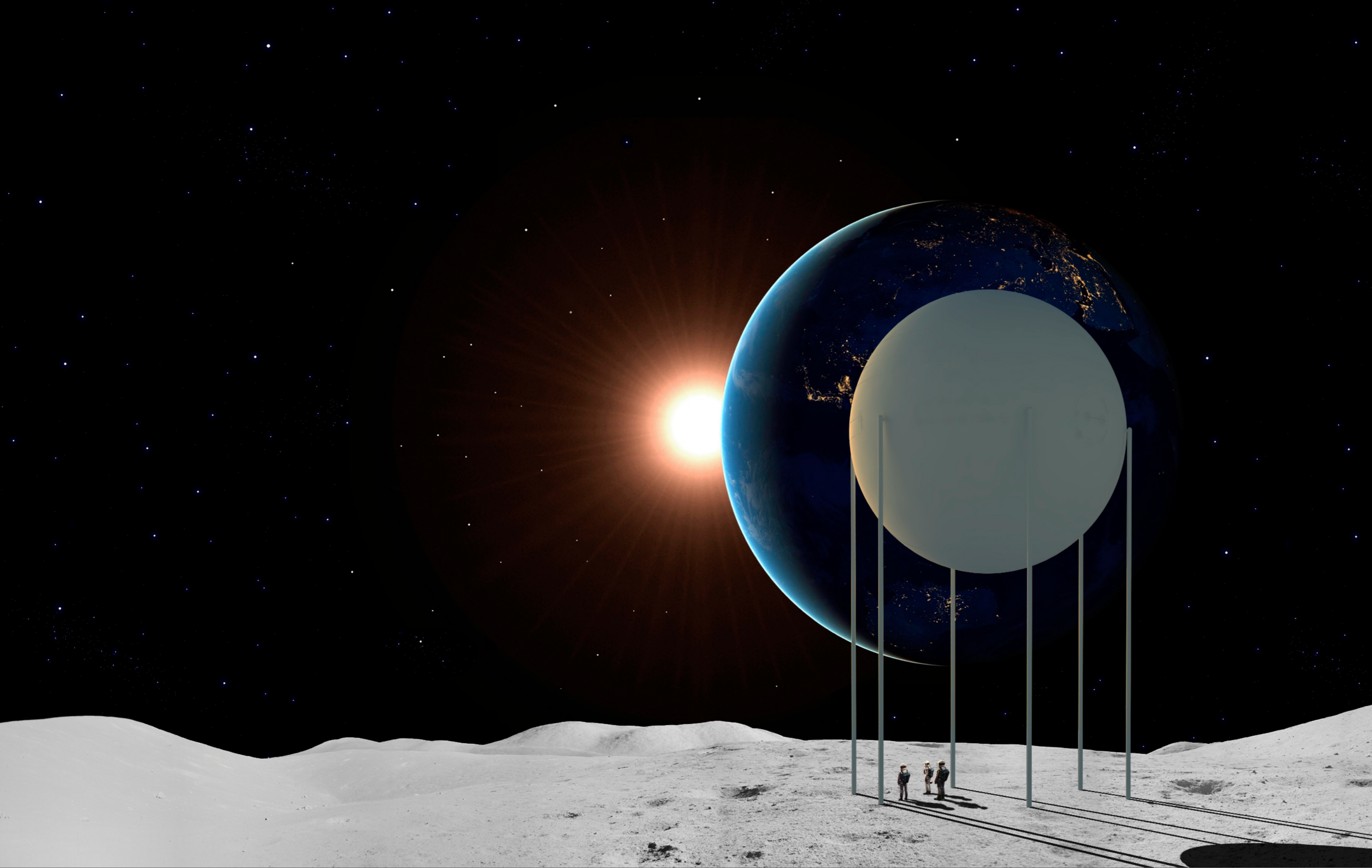
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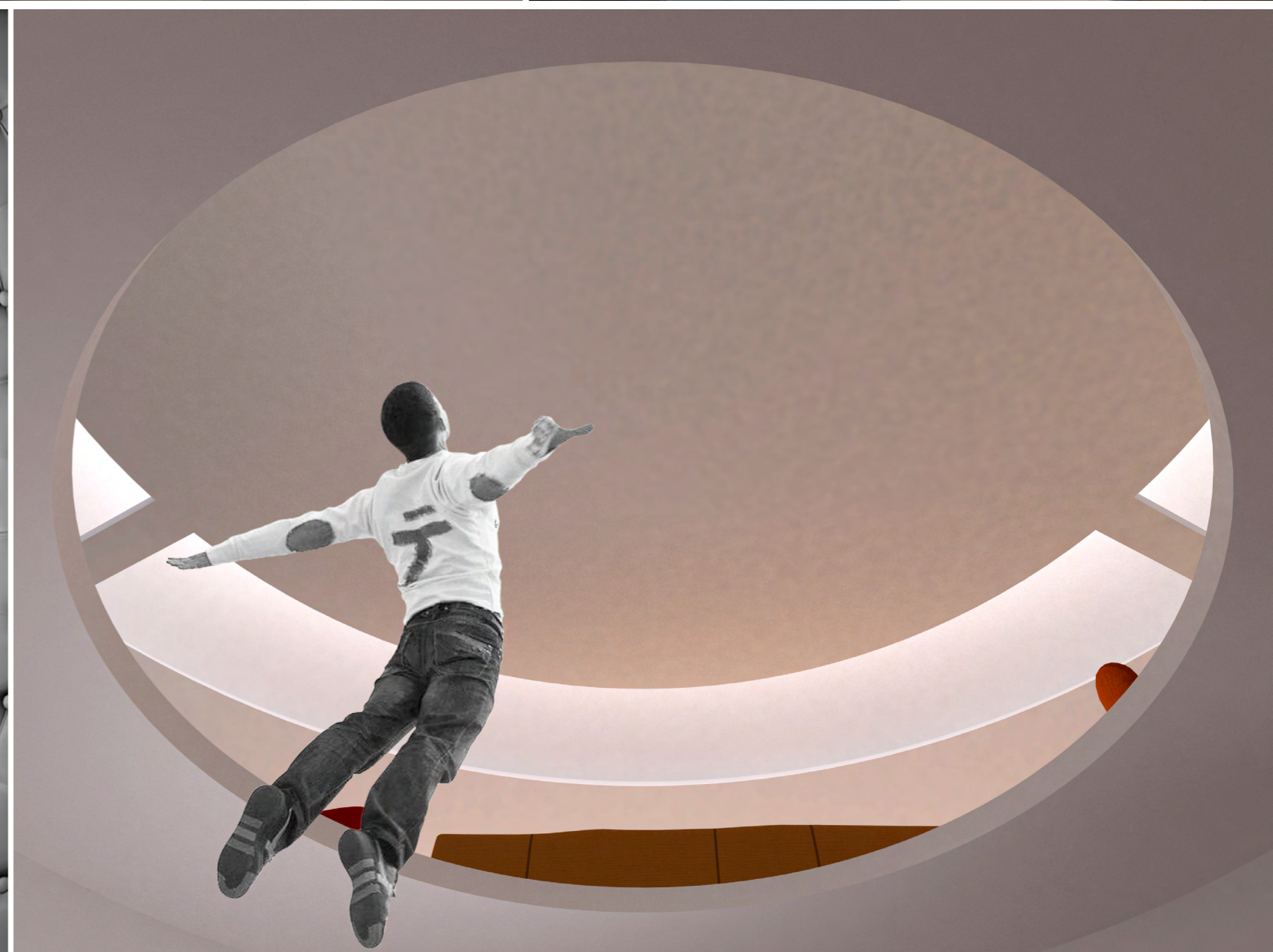
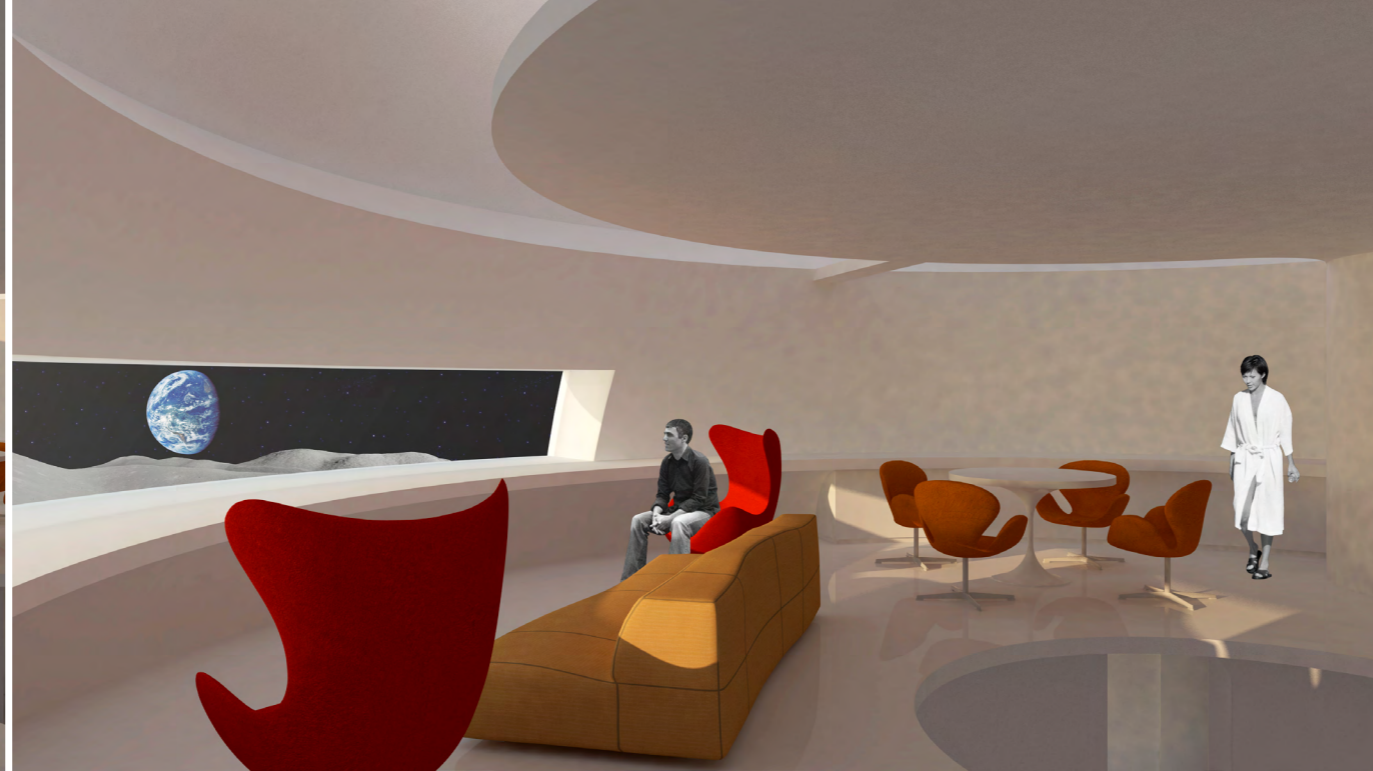
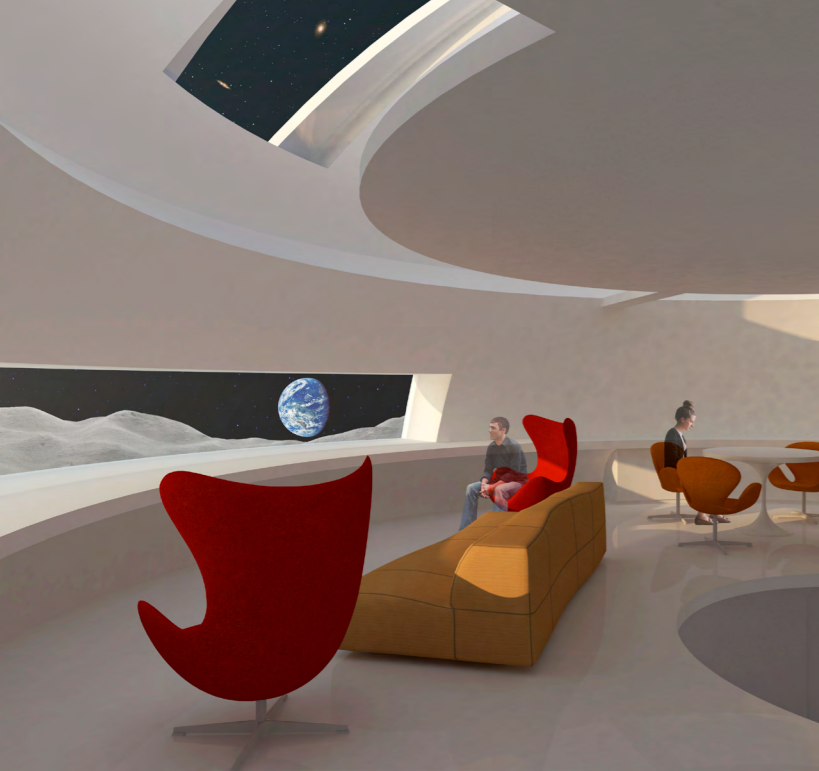
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