Archetype

Marsception 2024 | Νικητές Διαγωνισμού

Archetype team - 30/07/2024

International design competition platform Volume Zero Competition has announced the results of the Marsception 2024 Architecture Competition. The Marsception 2024 Architecture competition challenged participants to create a self-sustaining living space for the initial habitants, a group of five researchers, of the Red Planet. Participants envisioned a utopian tomorrow, transforming humanity into a multi-planetary species.

The participants had to select a location anywhere on the topography of Mars with interplanetary travel for humans, not a far-fetched idea and innovations made every day to make it a reality soon. Participants from over 32 countries came up with their creative and sustainable design solutions to cater to this spatially challenging Architectural problem.

Volume Zero Competition thanks all the competitors for participating in this competition and for contributing to this competition's research.

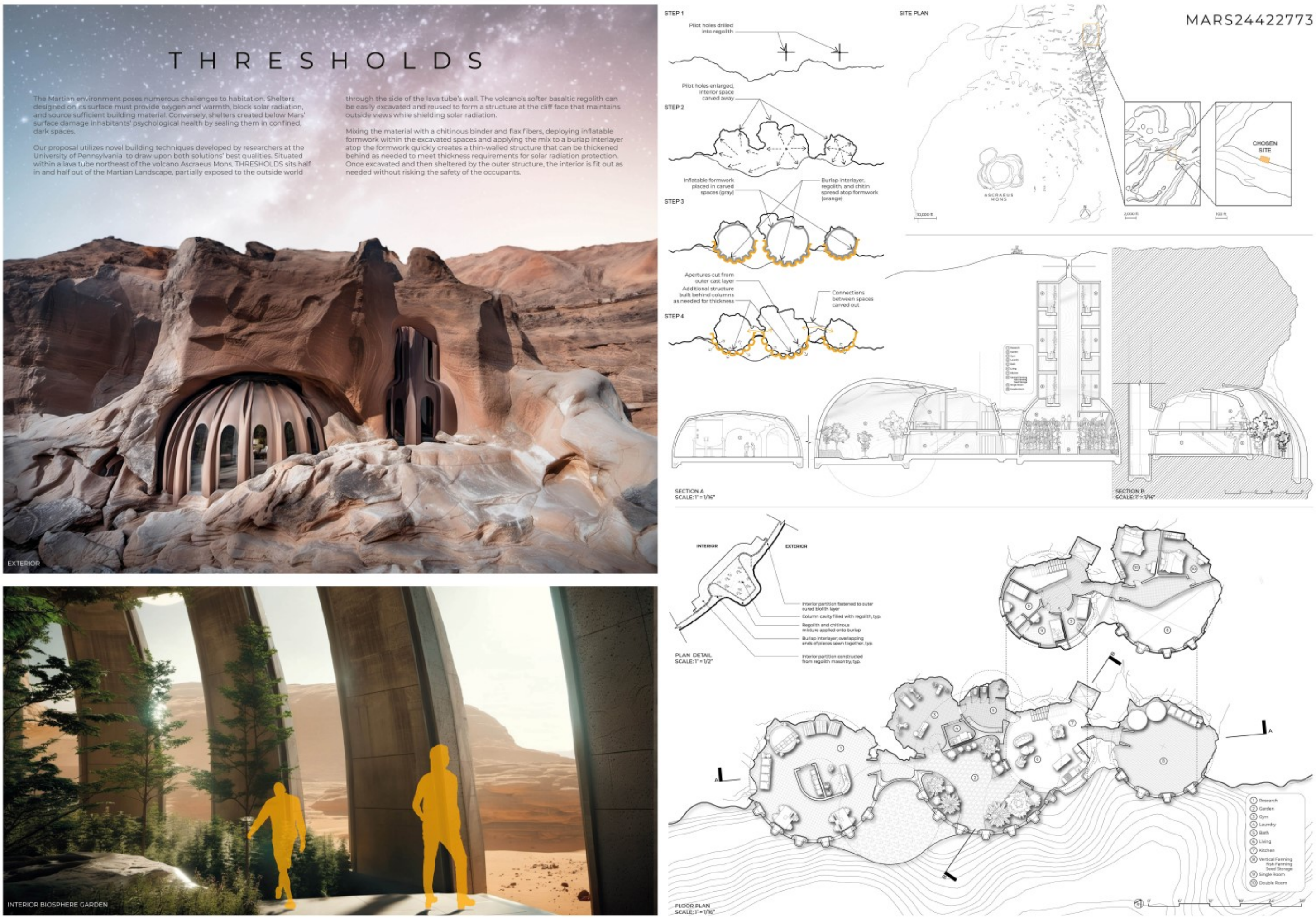
The esteemed jury for judging this competition consisted of Aroty Panyang (Studio Aro), Carsten Primdahl (Cebra Architecture), Georgi Petrov (SOM), Sushant Verma (rat[LAB] Studio), YU Ting (Wutopia Lab), Yuko Sono (Clouds Architecture Office), Edouard Cabay (Institute for Advanced Architecture of Catalonia [IAAC]), Chenchen Hu (HCCH Studio), Eva Bo Geisler (SPACON & X).

The top three winners were awarded total prize money of $4,000 while ten entries received HonorableMentions. Here are the winning entries.

FIRST PLACE

THRESHOLDS

Alec Naktin and Natalie Perri, United States



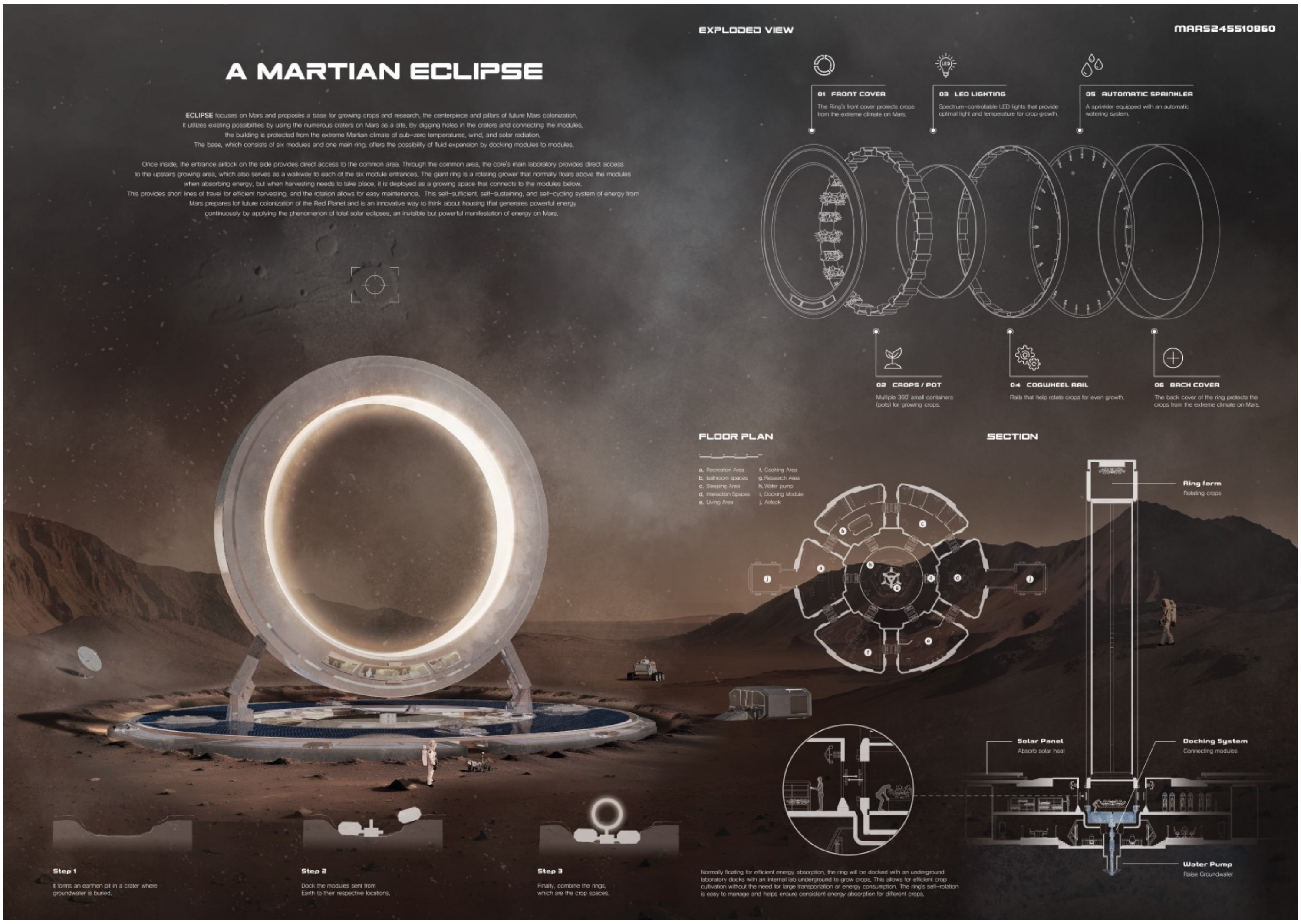
The Martian environment poses numerous challenges to habitation. Shelters designed on its surface must provide oxygen and warmth, block solar radiation, and source sufficient building material. Conversely, shelters created below Mars surface damage inhabitants psychological health by sealing them in confined, dark spaces.

Our proposal utilizes novel building techniques developed by researchers at the University of Pennsylvania to draw upon both solutions best qualities. Situated within a lava tube northeast of the volcano Ascraeus Mons, THRESHOLDS sits half in and half out of the Martian Landscape, partially exposed to the outside world through the side of the lava tube’s wall. The volcano’s softer basaltic regolith can be easily excavated and reused to form a structure at the cliff face that maintains outside views while shielding solar radiation.

SECOND PLACE

A MARTIAN ECLIPSE

Park Seo-an and Ju Yeon Hong, Korea South



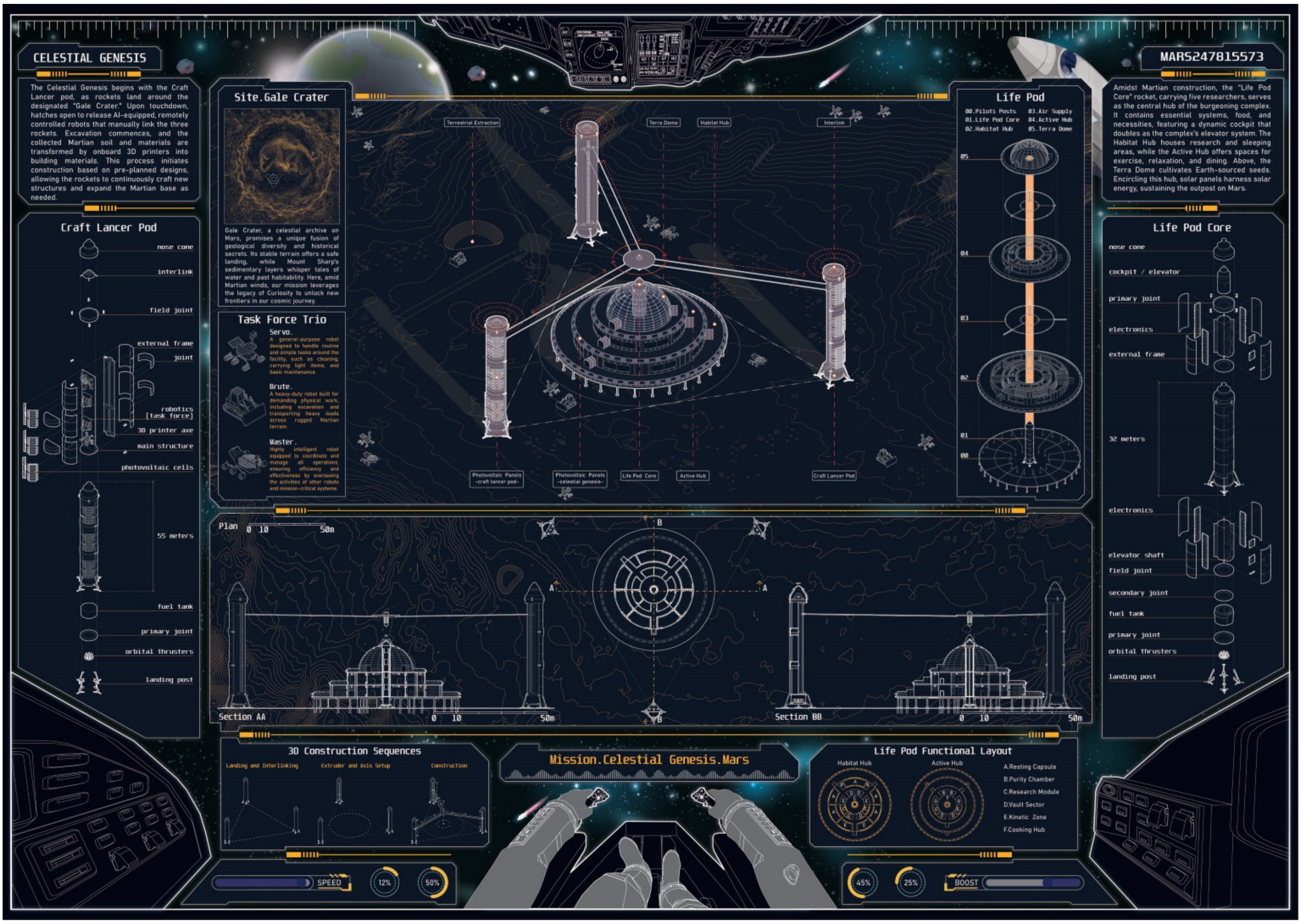
ECLIPSE focuses on Mars and proposes a base for growing crops and research, the centerpiece and pillars of future Mars colonization. It utilizes existing possibilities by using the numerous craters on Mars as a site. By digging holes in the craters and connecting the modules, the building is protected from the extreme Martian climate of sub-zero temperatures, wind, and solar radiation. The base, which consists of six modules and one main ring, offers the possibility of fluid expansion by docking modules to modules.

Once inside, the entrance airlock on the side provides direct access to the common area. Through the common area, the core’s main laboratory provides direct access to the upstairs growing area, which also serves as a walkway to each of the six module entrances. The giant ring is a rotating grower that normally floats above the modules when absorbing energy, but when harvesting need to take place, it is deployed as a growing space that connects to the modules below. This provides short lines of travel for efficient harvesting, and the rotation allows for easy maintenance. This self-sufficient, self-sustaining and self-cycling system of energy from Mars prepares for future colonization of the Red Planet and is an innovative way to think about housing that generates powerful energy continuously by applying the phenomenon of total solar eclipses, an invisible but powerful manifestation of energy on Mars.

THIRD PLACE

CELESTIAL GENESIS

Alp Arda, Italy



The Celestial Genesis begins with the Craft Lancer pod, as rockets land around the designated “Gale Crater”. Upon touchdown, hatches open to release AI-equipped, remotely controlled robots that manually link the three rockets. Excavation commences, and the collected Martian soil and materials are transformed by onboard 3D printers initiate construction based on pre-planned designs, allowing the rockets to continuously craft new structures and expand the Martian base as needed.

Amidst Martian construction, the “Life Pod Core” rocket, carrying five researchers, serves as the central hub of the burgeoning complex. It contains essential systems, food, and necessities, featuring a dynamic cockpit that doubles as the complex’s elevator system. The Habitat Hub houses research and sleeping areas, while the Active Hub offers spaces for exercise, relaxation, and dining. Above, the Terra Dome cultivates Earth-sourced seeds. Encircling this hub, solar panels harness solar energy, sustaining the outpost on Mars.

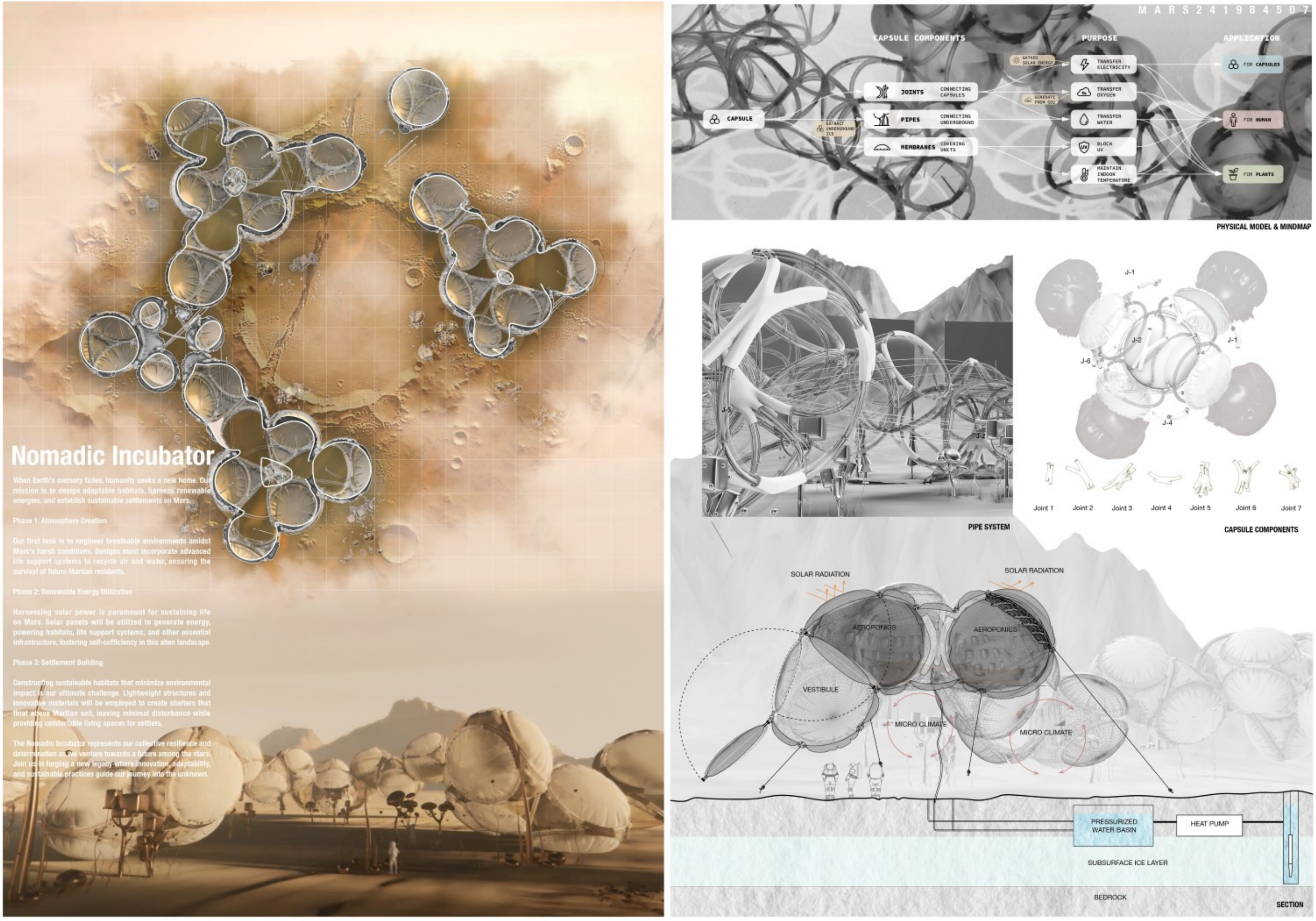
Honourable Mentions:

Honourable Mention 1: Ever-Grow

Goh Zheng Rong and Loy Xin Yi, Malaysia

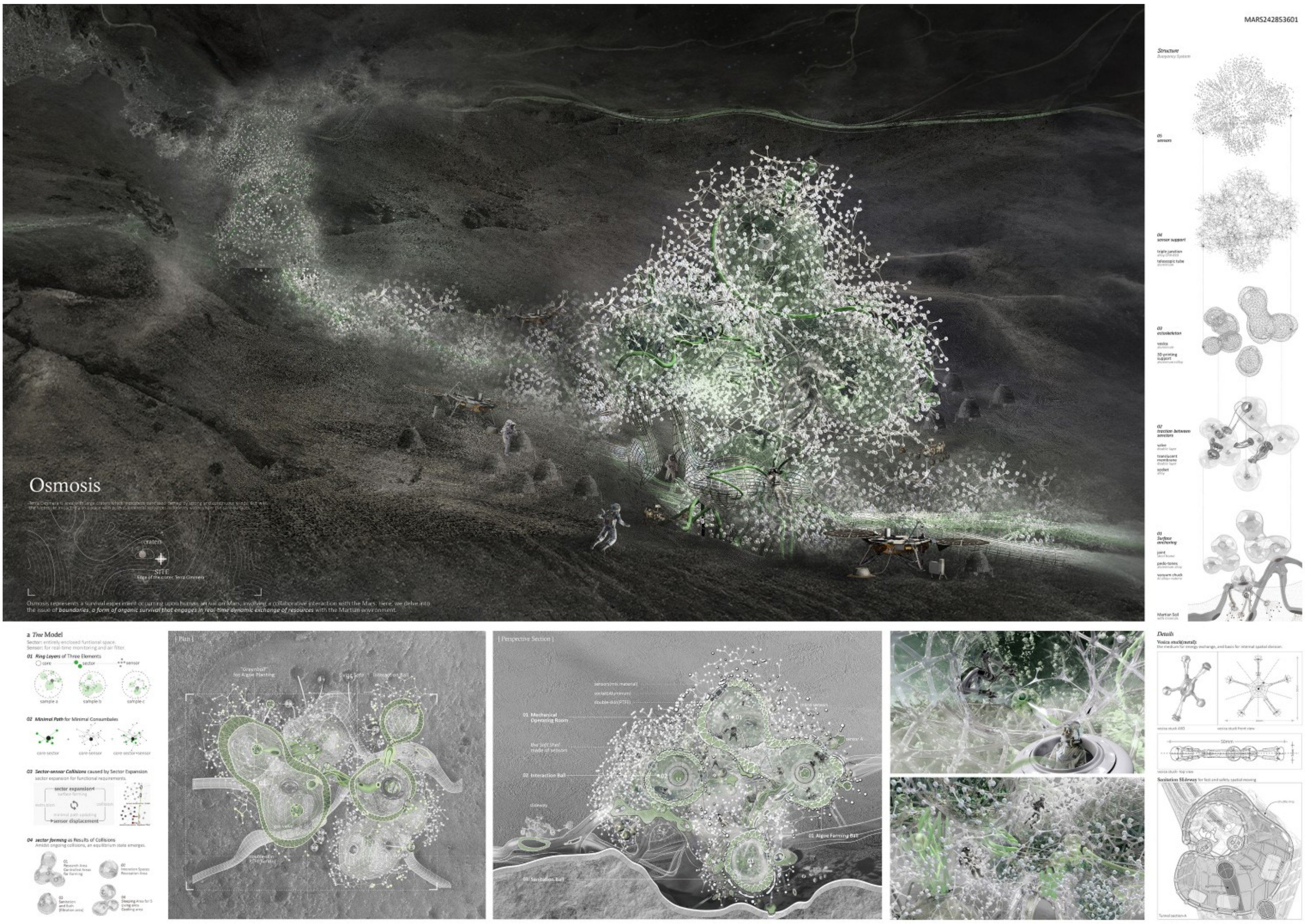
Honourable Mention 2: Nomadic Incubator

Jiaqi Kang, Jiamin Huang and Lejia Li, United States



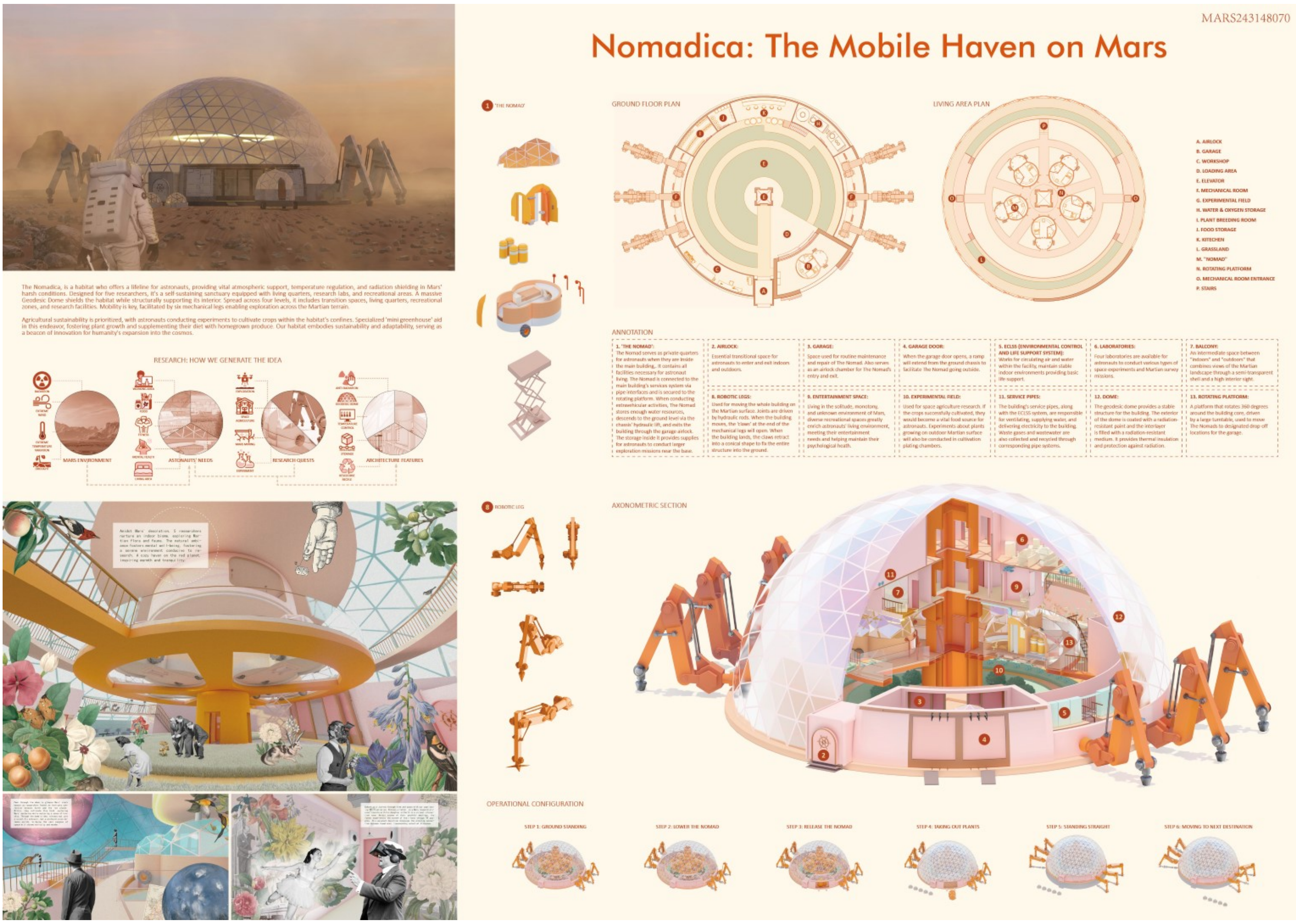
Honourable Mention 3: Osmosis

Wan Zilin and Ren Yinghui, China



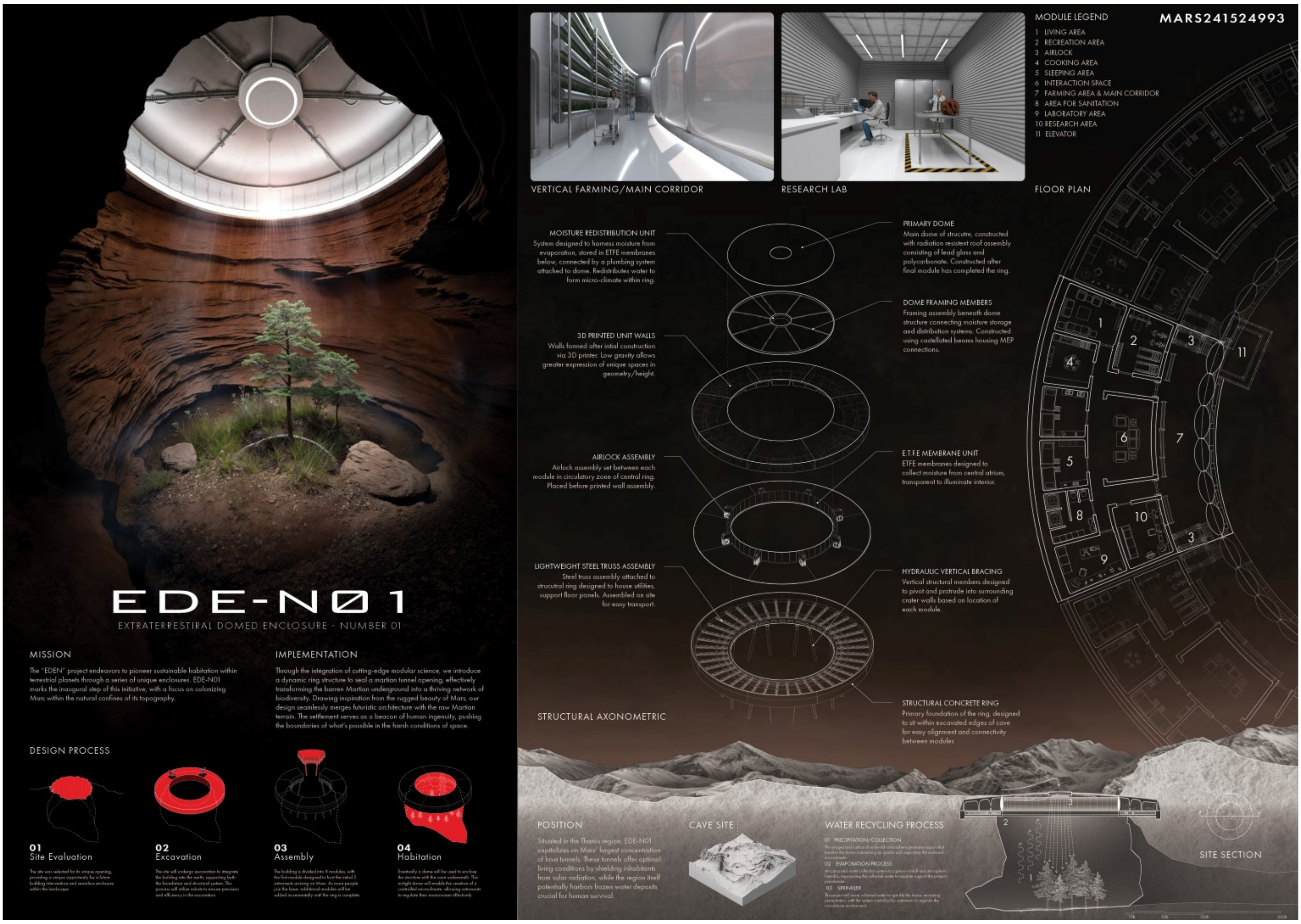
Honourable Mention 4: Nomadica: The Mobile Haven on Mars

Xueyan Wang and Jiahao Du, Australia



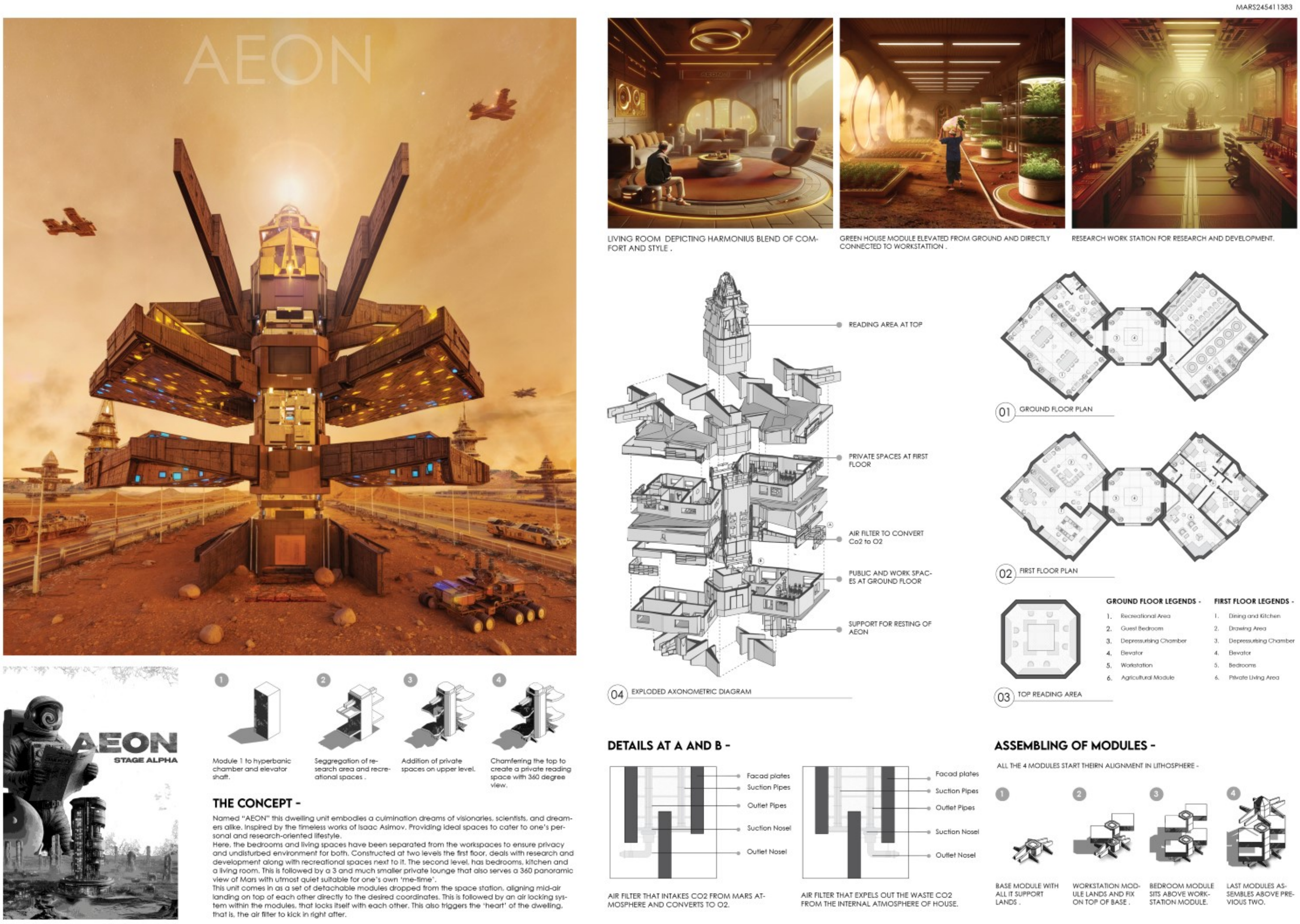
Honourable Mention 5: EDE-NO 1

Jeffery Moisant, Ian Simon and Simon Chiquito, United States



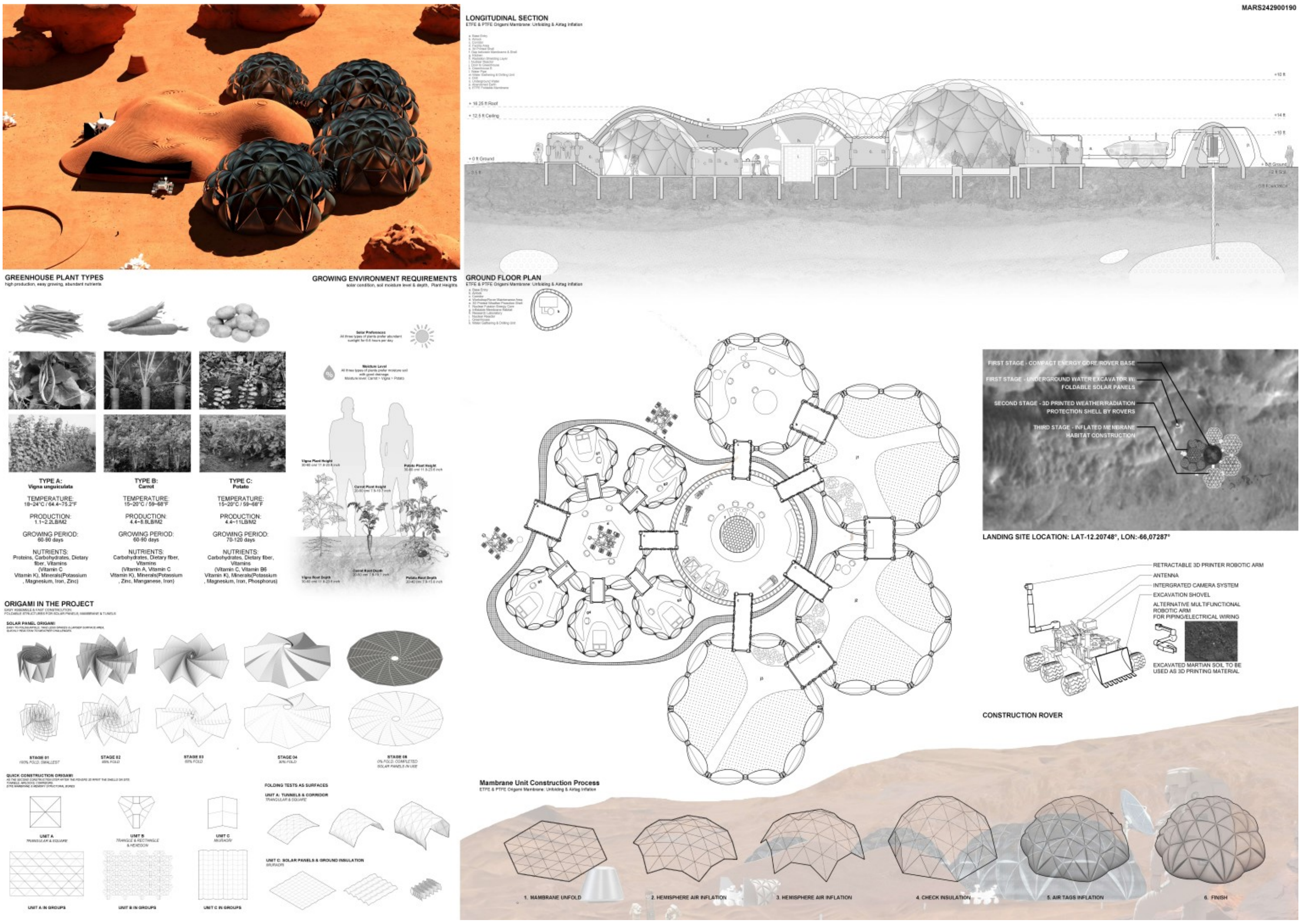
Honourable Mention 6: AEON

Kush Nitesh Bhansali, Aryan Samudre and Mohit Prakash Ingle, India



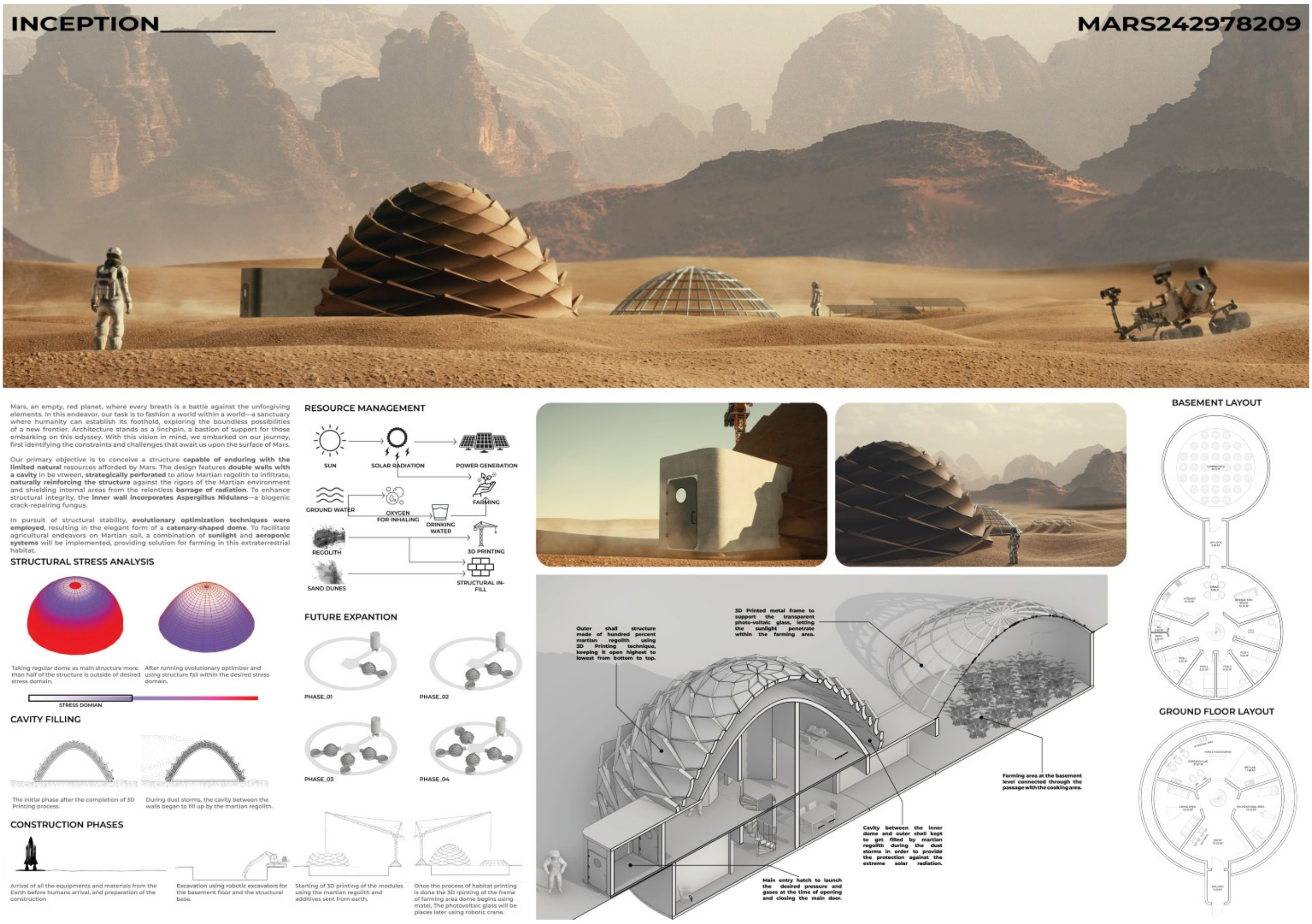
Honourable Mention 7

Muzhi Wang and Ruoxuan Hu, United States



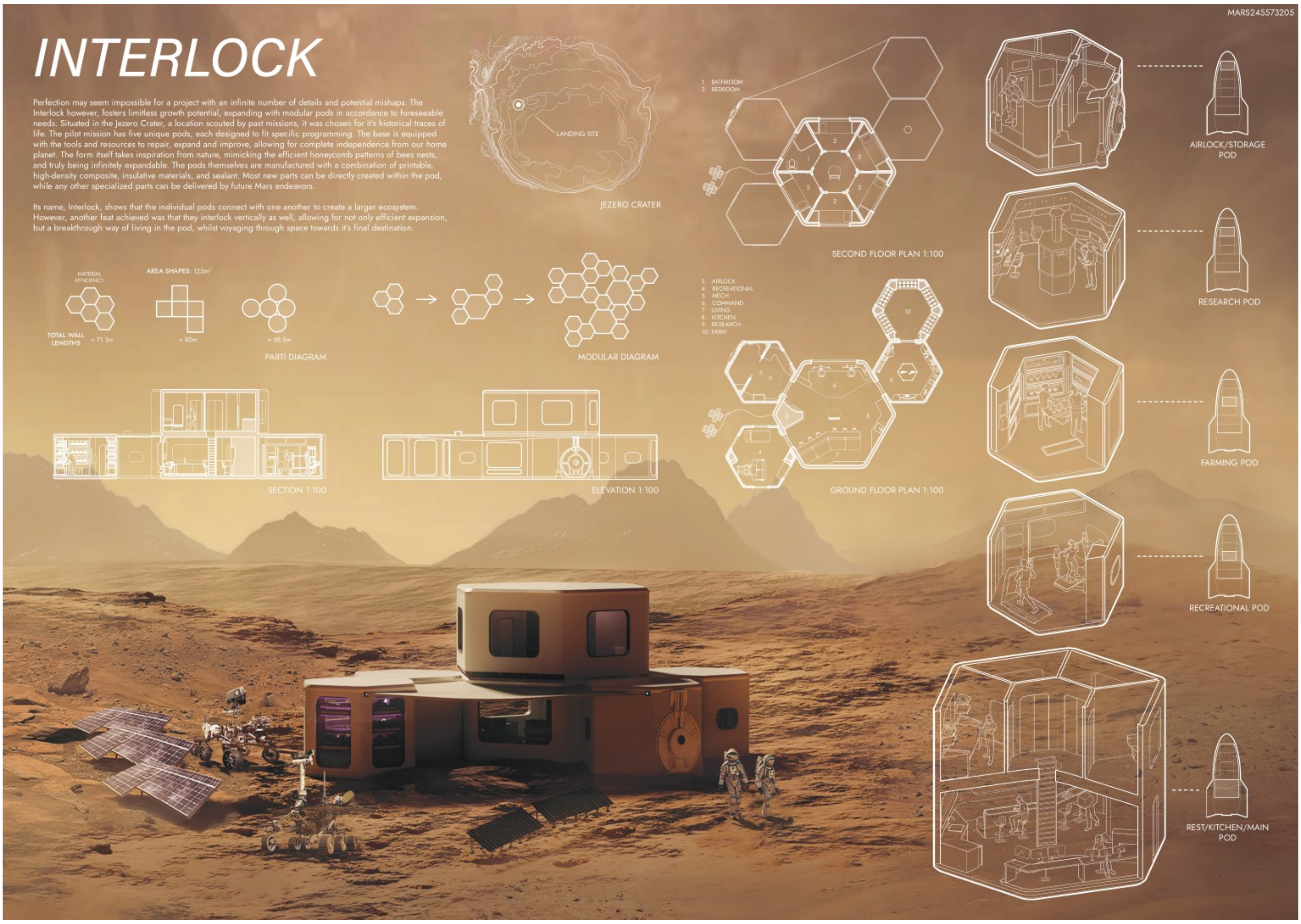
Honourable Mention 8–INCEPTION_____

Mayur Mehta, India



Honourable Mention 9–INTERLOCK

Sylvana Kam, Jayden Chan and Moxiao Guo, Canada



Honourable Mention 10–CIRCLE OF LIFE

Lorenzo Bavelloni, Italy

CIRCLE OF LIFE

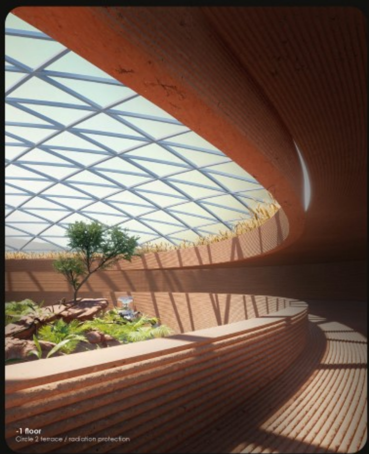
MARSCEPTION 2024

MARS246074684

The Circle of Life project on Mars harnesses large-scale 3D printing and Earthworks to craft a sustainable habitat from Martian regolith, reflecting life's perpetual cycle. This endeavor is structured around four crucial clusters: Human Sustainability, Scientific Research, Infrastructure and Technology, and Communication and Exploration, each featuring essential laboratories.

The habitat's architecture, designed with three radial arms, embodies flexibility to adapt to Mars' challenges. These arms segregate the habitat into zones for habitation, research, and agriculture, allowing efficient space utilization and operational flexibility. The underground design crucially mitigates exposure to Mars' harsh radiation, enhancing crew safety. Powered by solar panels, nuclear, and geothermal renewable resources and designed with passive features, the ecosystem operates sustainably and autonomously. The use of renewable energy sources and an inflatable dome for pressurization and thermal insulation underscores a commitment to sustainability and resilience.

The underground space, divided into concentric rings, accommodates research, living quarters, and equipment for efficiency and community well-being. On the upper floors, a sustainable farming system integrates vertical, hydroponics, farming, and insect incubation. A robotic arm tends crops, optimizing resources for sustainable food production and ecosystem balance, encapsulating the Circle of Life's commitment to a self-sustaining, harmonious existence on Mars.

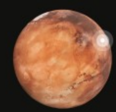


-1 floor
Circle 2 terrace / radiation protection

1. Earthworks
2. Tunnelling
3. 3D printing
4. Inflatable
5. Farm

Elysium Planitia

Elysium Planitia's flat terrain near the equator ensures ease of landing and optimal conditions for solar power generation, while its proximity to possible ancient river channels offers potential access to water resources.



-2 floor
Scale 1|325

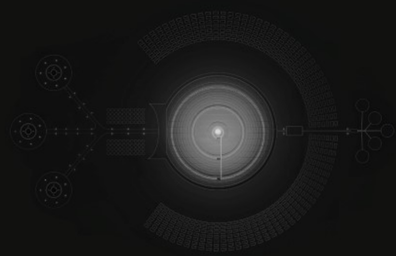
Radial Program

The underground space divided into concentric rings. It accommodates research, living quarters, and equipment for efficiency and community well-being.

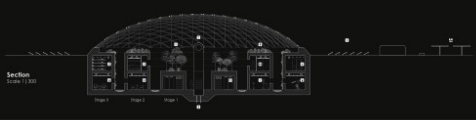
Ground floor
Scale 1|325

Radial Farm

Sustainable farming system integrates vertical, green roof, and insect incubation farming. A robotic arm tends crops, optimizing resources for sustainable food production and ecosystem balance.



Masterplan



Section
Scale 1|300

- Nuclear station
- Solar panels
- Radial robotic arm
- Geothermal
- Hydroponics
- Mechanical / server room
- Sport Center
- Radial roof farming
- Natural ecosystem
- Bedroom / cell
- Laboratory
- Kitchen / Living room
- Sanitation / Bath room
- Insect incubator