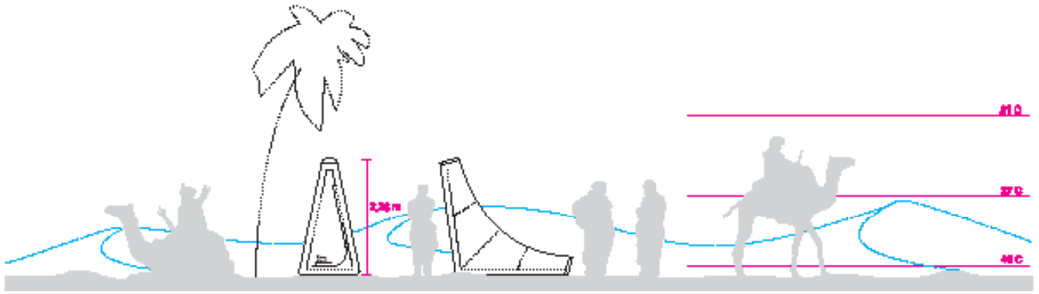
ARCHITECTURE AND VISION
DESERT SEAL

Desert Seal is an inflatable one-person tent designed for use in extreme climates. The design takes advantage of the considerable temperature difference that exists between the air at ground level and a couple of meters off the ground in hot arid climates. Many desert animals employ this to their advantage, such as the camel, with its long legs and its nose situated as high as possible off the ground. An electric ventilator powered by a flexible solar panel incorporated in the outer skin of the tent drives cool air from the highest point of the structure through the interior of the tent. The tent consists of an inflatable structure of yellow polythene fabric. The outer layer is a tough aluminized fabric that reflects the heat and protects the tent form direct sunlight. The form of the tent has arisen from aerodynamic analysis and also enables the user to enter upright. The beauty of the structure derives from its functionality and efficiency, particularly in relation to the use of natural energies such as the sun and the wind.

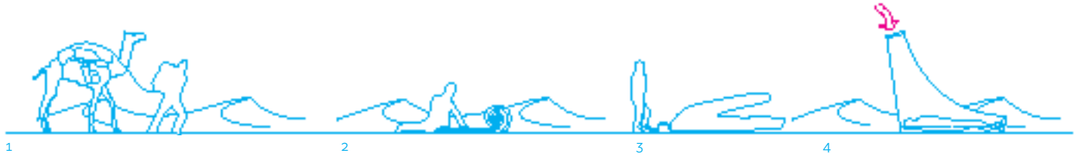
Inspired by aerospace technology, the design uses natural resources and is extremely lightweight, making it highly transportable. Importantly, the tent is also easy and fast to assemble. The “feet on the ground” concept of the design derives from technology used currently in space investigation. The critical characteristics of space shuttles are their small transport volume, large usable volume and lightweight construction. For this reason inflatables have always played an important role in space technology and are considered a viable option for the inhabitation of the Moon and Mars, where the temperature conditions are somewhat more extreme than those to be found on Earth. The use of in-situ energies in the Desert Seal represents a significant reduction in the transportation mass of the item. The energy necessary to charge the small electric battery is generated by a small flexible solar panel, another technology tested in space exploration.

Thermal control is a key point in the design of structures for outer space. Desert Seal exploits further concepts developed in aerospace research. The aluminized fabric used in the outer layer of the tent, for example, is very similar to the multilayer insulation used in space applications.

Design: Architecture and Vision
Design team: Arturo Vittori, Andreas Vogler
Prototype: Aero Sekur
Model: Self Group
Financing and collaborators: Lille3000, Roberto Vittori, European Astronaut Corps, VHF-Technologies SA, Technology Transfer Office of the ESA, Museum of Modern Art in New York, The Museum of Science and Industry Chicago
Photographs: Mauro Mattioli & Céline Laurière



1. Transport
2. Unroll and anchor
3. Erect
4. Operation

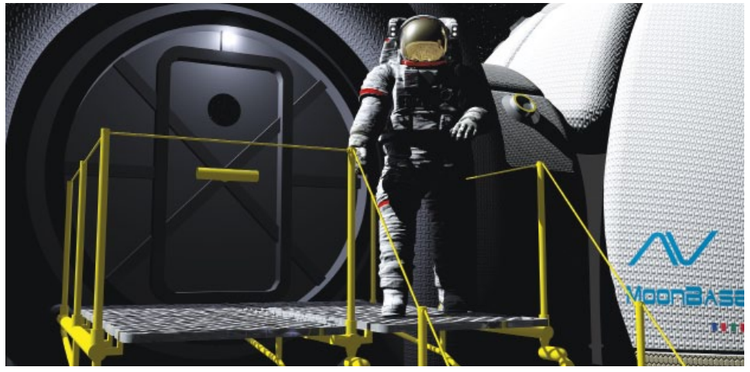


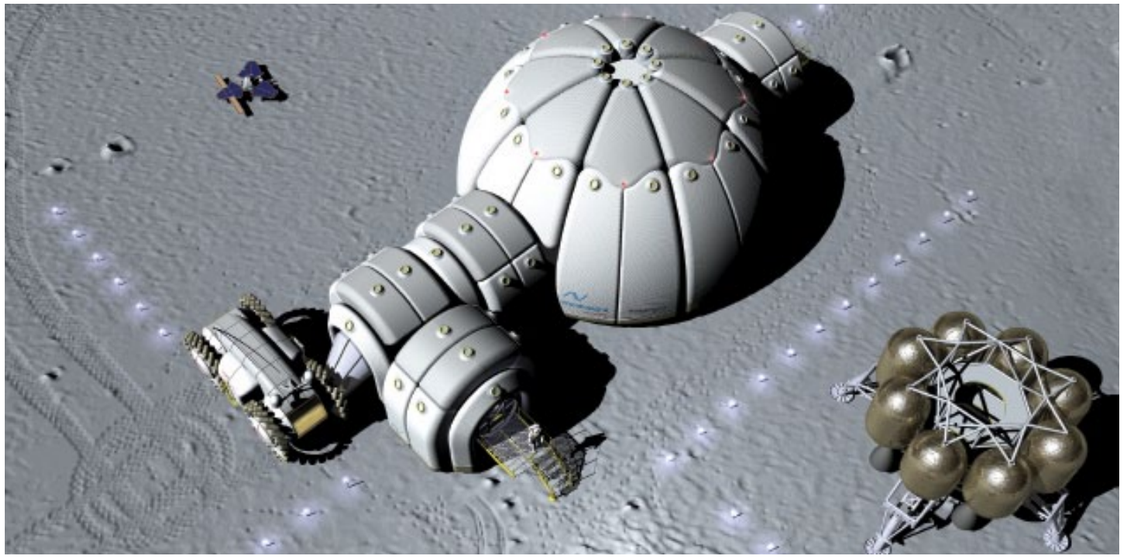
ARCHITECTURE AND VISION
MOONBASE TWO

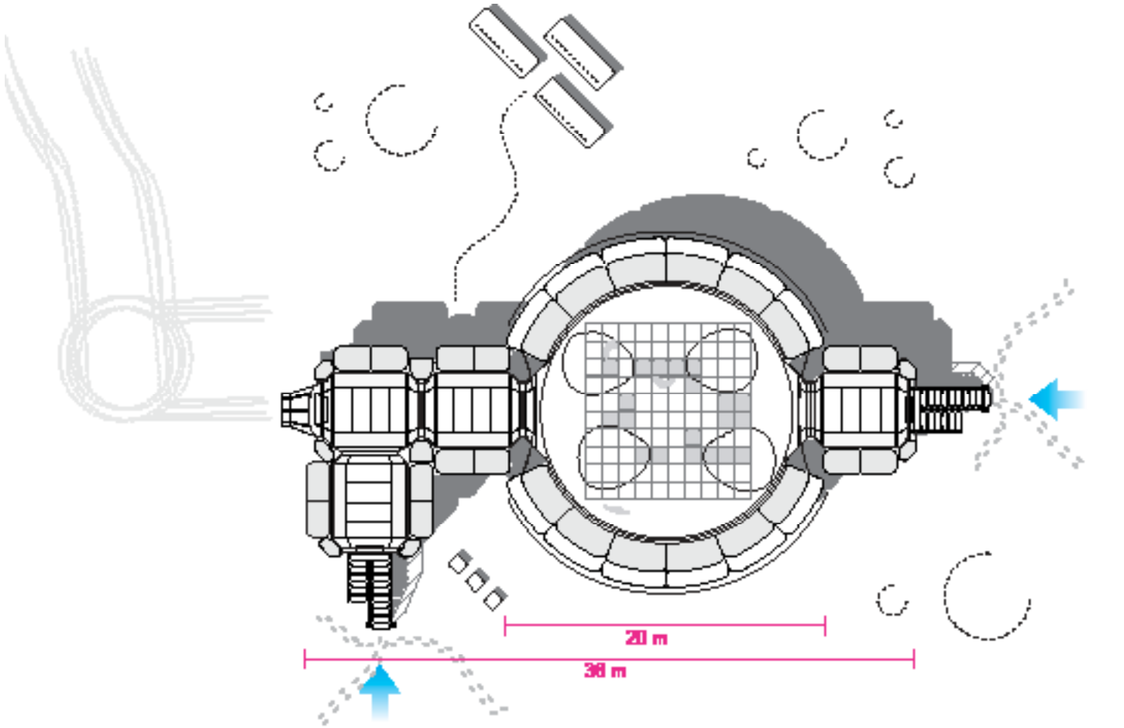
The futuristic "MoonBase Two" is a further development of the inflatable laboratory "MoonBase One", a design proposal completed in 1999, also by Architecture and Vision. Conceived as a long-term base for conducting in situ moon research and exploring the surrounding environment, it will also help in the study of possible permanent human settlements on planets far from the Earth. It has been designed to be transported to orbit and launched by the Ares V rocket, a heavy-launch vehicle that will accompany the crew vehicle Ares I on NASA's next planned moon trip in 2019. The igloo-like inflatable station automatically deploys after landing, to be ready to accommodate the world's first lunar inhabitants.

The Moonbase's dome shape responds to the need to maximize surface area to capture the sun's rays, both for heat and energy-harvesting. The most external of the three layers that make up the surface of the base is filled with regolith (lunar dust) to provide protection from falling meteorites. The inside of the station is divided vertically according to the different functions. On the lower level are the technical installations, in the center the communal area and the top section houses the astronauts' sleeping quarters. Since there can be no portholes allowing views outside of the dome from the inside, a lighting system is used that changes in intensity to simulate the passing of a terrestrial day. Moonbase Two is equipped to allow up to four astronauts to stay for a total of six months.

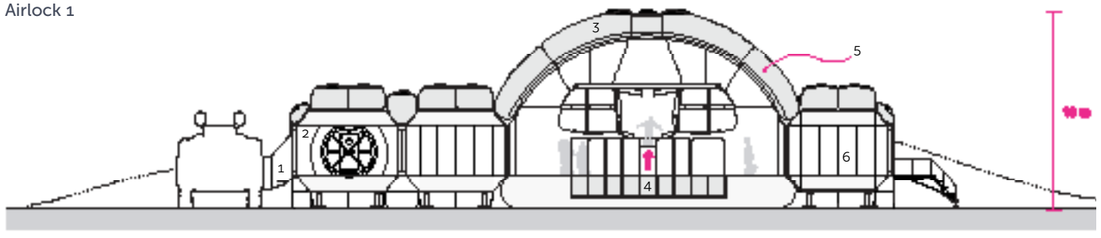
Design: Architecture and Vision
Design Team: Andreas Vogler, Arturo Vittori
Consultant: Thales Alenia Space (Maria-Antonietta Perino, Massimiliano Bottacini)
Model: Self Group

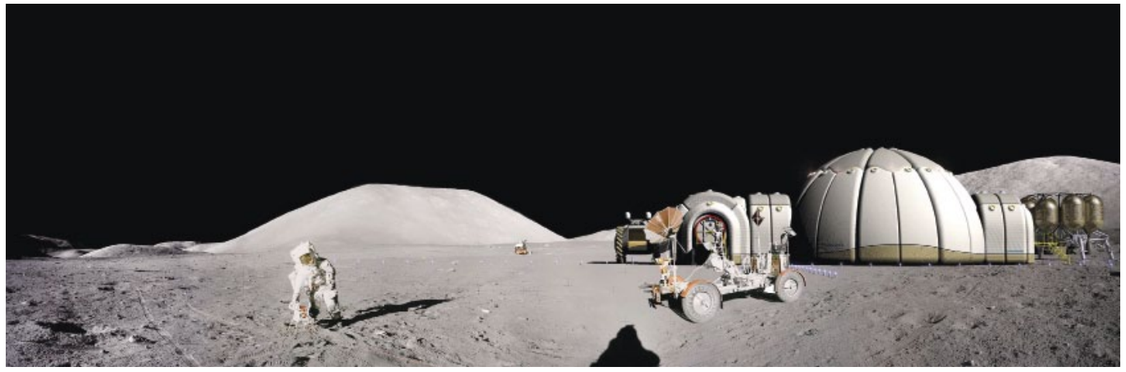






1. Rover docking port
2. Node 1
3. Regolith fill-in
4. Life support systems
5. Regolith radiation protection
6. Airlock 1





1. Galley area
2. Kitchen rack
3. Retractable table
4. Inflatable chairs
5. Briefing relaxation area
6. Inflatable sofa
7. Deployable workstation
8. Hard floor
9. Soft floor
10. Briefing service rack

1. Door up element
2. Door-platform element
3. Door structural band
4. Membrane sandwich
5. Exhaust air duct
6. Rope in polyester jacket
7. Structural band

8. Principal duct
9. Main oxygen duct
10. Airgrill
11. Pneumatic cells
12. Stowage rack
13. Bed
14. Deployable workstation