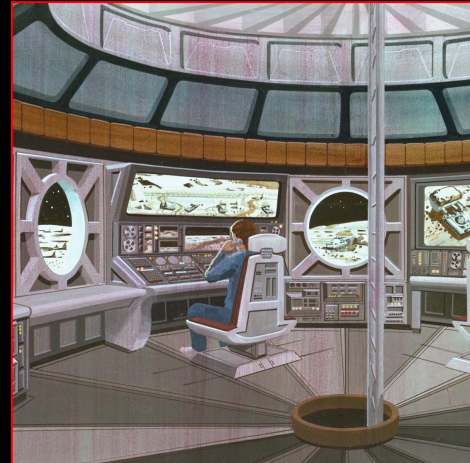




Base Design Project

This semester's project aims at designing a 3D model for the base used by the astronauts during the mission, from a predefined base in Sasso San Gottardo.

Laboratory:	GCM
Number of students:	1
Section:	ENAC
Status:	Available



Global description of the mission

Asclepios aims at organizing a simulated space mission. For this purpose, the association rents existing infrastructure and builds its base inside. Therefore, by design, the mission will take place on Earth, where many parameters are different than on other celestial bodies. However, the analog astronauts will live together in close contact during the two weeks of the mission to experience the constraints of extraterrestrial environments during the Earth-based simulation. This project aims at optimizing their environment to make their mission as realistic and as comfortable as possible.

Project goal

Trained astronauts will live together in a space base for long periods of time without the opportunity of leaving. This will have an influence on the psychological state of the astronauts and therefore the mission's success. The conception of an optimized lunar base is therefore crucial for the mission's success and realism.

The goal is to implant into an existing base the spatial interior design optimization. The project would investigate the optimal interior design for an analog lunar base. A 3D model, from the measures and volumes of the real location of the mission (Sasso San Gottardo), must be provided. The design plan must consider the psychological, architectural, and constructional challenges, and specify rooms' location, equipment, and appropriate materials in order to optimize space, insulation and comfort. The 3D plan will be tested in future missions.

Description of the student's work and mission:

1. Investigate the state of the art for lunar base design.
2. Consider adapted materials for the lunar environment.
3. Find solutions to save materials, optimize the volumes and adapt to external/internal constraints of the base.
4. Organize space inside the base to oversee the smooth running of the mission.
5. Justify the use of dedicated rooms for the different activities (kitchen, sport, experiment, meeting, etc.) from the Sasso base's layout.
6. Find solutions to allow insulation of the base with the exterior environment with a minimal energy loss.
7. Realization of a 3D model of the interior base design, including material choices and furniture placement.
8. Clear description of implementation choices described in a report.

In order to conduct this project, the student will need to know about architectural design, be curious and autonomous, and be able to work in a team.

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