



MEDICAL AND PSYCHOLOGICAL TRAINING FOR ANALOGUE SPACEFLIGHT MISSIONS



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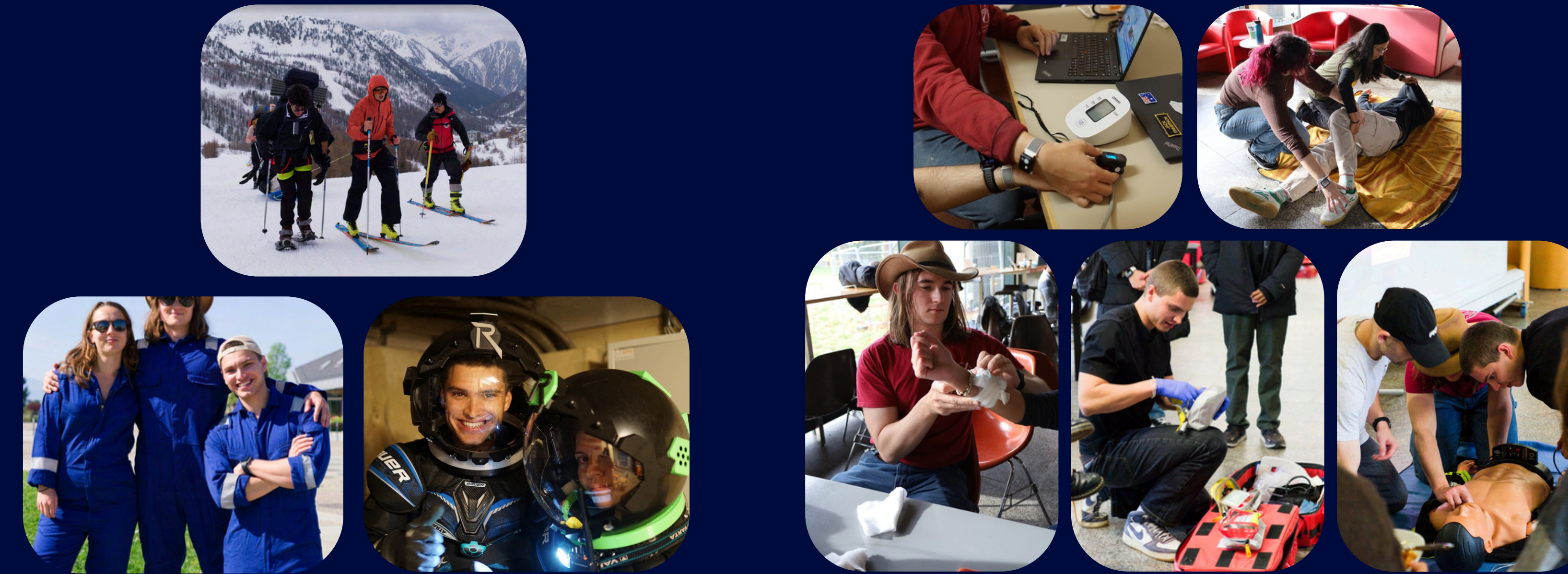


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INTRODUCTION

- Asclepios is a non-profit student led organisation based in Lausanne, Switzerland, which runs annual 2-week long analogue lunar missions in Sasso San Gottardo.
- Analogue missions provide an opportunity to develop and test crew procedures on Earth before their application to human spaceflight.
- This study presents the medical and psychological training framework implemented during Asclepios VI, from crew selection through nine months of mission preparation.



Astronaut Selection Process

PHASE A

- Evaluation of **CV** and **motivation letter**.
- Overview of experience, motivation, qualifications and potential contribution to the Asclepios mission.

PHASE B

- Selected candidates create a motivation video.
- Assessment of communication skills, creativity, motivation, commitment, and English proficiency.

PHASE C

- Intensive online exam.
- Candidates complete cognitive tests to assess problem-solving, decision-making, adaptability, and performance under pressure.

PHASE C

- Candidates participate in a rigorous in-person weekend assessment.
- Evaluation of social intelligence, crew dynamics, teamwork skills and performance in high-stress conditions.

Medical-Psychological Training Overview

BASIC

- Online training sessions
 - Space Nutrition and Exercise
 - Extreme Environment Medicine
 - Human Behavior and Performance

ADVANCED

- In-person First Response Training Day
- xABCDE, Trauma and Wound Care
- CPR, BLS, AED
- Scenario Based Practice Session
- Extreme Psychology Training

SPECIFIC

- Crew Medical Officer (CMO) Training
 - Daily medical tasks and responsibilities
 - Medical equipment and medications
 - Medical SOPs and emergency procedures
- Mission Preparation Sessions
 - Mission workout plans
 - Individualised mission meal plan
- Psychological Training and Support
 - Monthly one-to-one meetings with a dedicated Psychology Officer
 - Stress management and isolation training

MEDICAL TRAINING

- The nine-month curriculum combined online and in-person training.
- The primary aim was to equip the crew with the knowledge and skills needed to manage medical situations during the two-week isolation period in the simulated lunar base, where access to external medical assistance may be limited or unavailable.
- Training focused on first aid, trauma, and emergency-response skills, as well as topics such as hypothermia to prepare the crew for Extreme Environment Training.
- General medical training was provided to all crew members, while the two Crew Medical Officers (CMOs) received additional specialised training.

PSYCHOLOGICAL TRAINING

- The psychological preparation programme combined online and in-person training to prepare astronauts for the psychological demands of an isolated and confined mission.
- Training focused on self-awareness, coping strategies, communication, teamwork, and managing stress and workload.
- Psychological support included regular one-to-one meetings with Psychology Officers, group sessions, and reflection following practical training activities.

APPLICATIONS TO HUMAN SPACEFLIGHT

- Testing procedures:** Analogue missions allow medical, nutrition, exercise, and emergency procedures to be tested under realistic operational constraints.
- Assessing crew performance:** They provide opportunities to evaluate medical response, teamwork, communication, and psychological adaptation during isolation and confinement.
- Informing future missions:** Findings can identify weaknesses and contribute to the development of procedures for human spaceflight missions, while recognising the limitations of Earth-based analogues.

ANALOGUE ASTRONAUT SELECTION

- Before beginning their training, Asclepios analogue astronauts undergo a rigorous and selective recruitment process inspired by the astronaut selection procedures of ESA and NASA.
- More than **400 applicants** went through the selection process, with **10** analogue astronauts ultimately selected for the Asclepios VI crew.
- Four-stage selection process (January-July) assessing:
 - Qualifications and skills
 - Physical abilities
 - Teamwork and interpersonal capabilities
 - Mental readiness and ability to cope with isolation and confinement.
- Assessing psychological readiness is particularly important due to the prolonged isolation and confinement environment of the Asclepios mission.
- Therefore, the selection process aims to ensure that candidates possess the psychological resilience and stability needed to cope with the unique challenges of this environment while also enhancing the chances of mission success and the safety and well-being of the crew throughout their journey.



ASCLEPIOS VI ANALOGUE ASTRONAUTS

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