

Analog Research Efforts of the Austrian Space Forum

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Austrian Space Forum



ASE Planetary Congress 2016

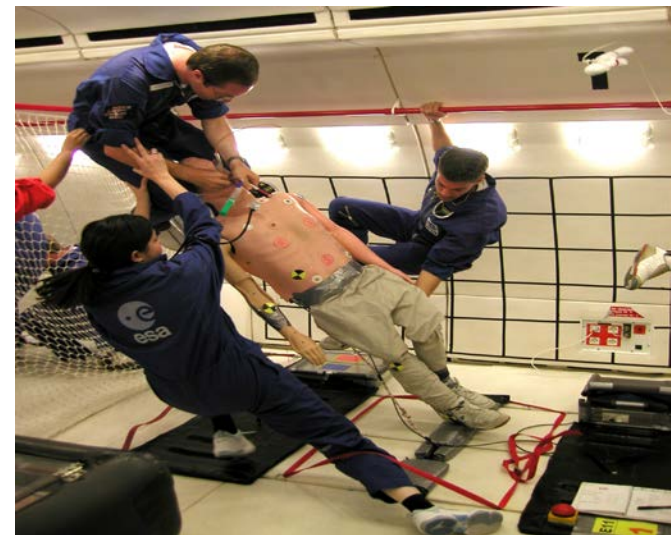




Österreichisches Weltraum Forum

Research focus

- **Hardware:**
 - Aouda.X spacesuit simulator
 - Mars analog rovers
 - Stratospheric balloons
- **Research focus**
 - Planetary surface operations
 - Planetary protection
 - Optimizing remote science support
- **Field campaigns: 11 so far**
 - E.g. Rio Tinto 2011, Dachstein 2012 (NASA/JPL, Exomars-participation, Morocco 2013), alpine glaciers,...



Aouda.X spacesuit simulator

- Based upon NASA DRM 5.0 & Aurora
- NASA Human-System Standard STD-3000 & MIL-STD-882c
- <45 kg, unpressurized, Hard-Upper Torso, custom-built OBDH and advanced human-machine-interface
- 8 analog astronauts, only standing AA corps in Europe (627 EVA hours so far)

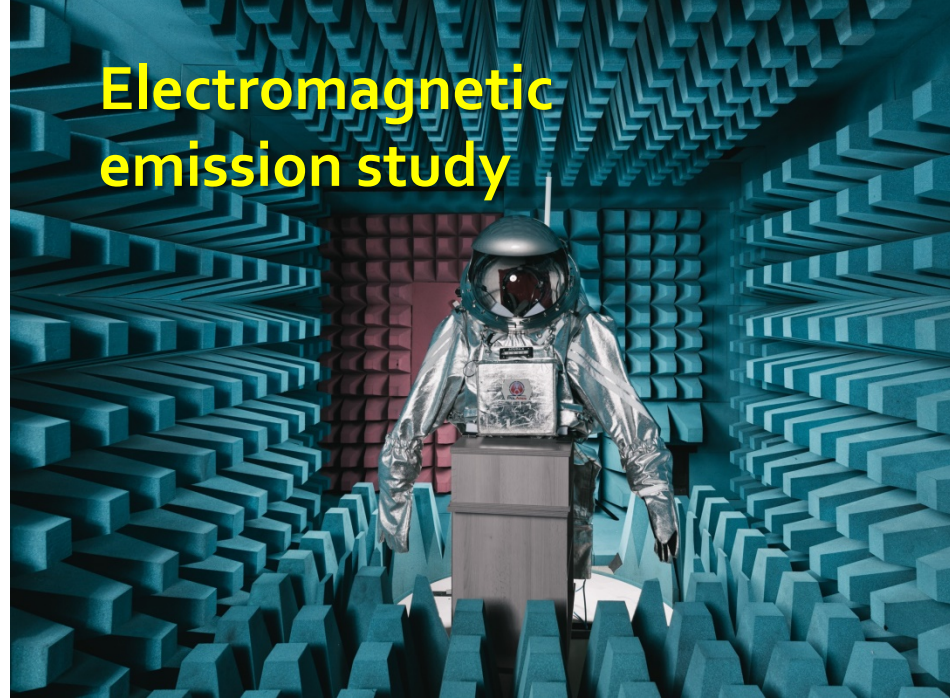
Groemer et al., 2012, *The Aouda.X space suit simulator and its applications Astrobiology*. February 2012, 12(2): 125-134.



Performance envelope test



Electromagnetic emission study



-75°C - Cryotest



6 MV discharge testing



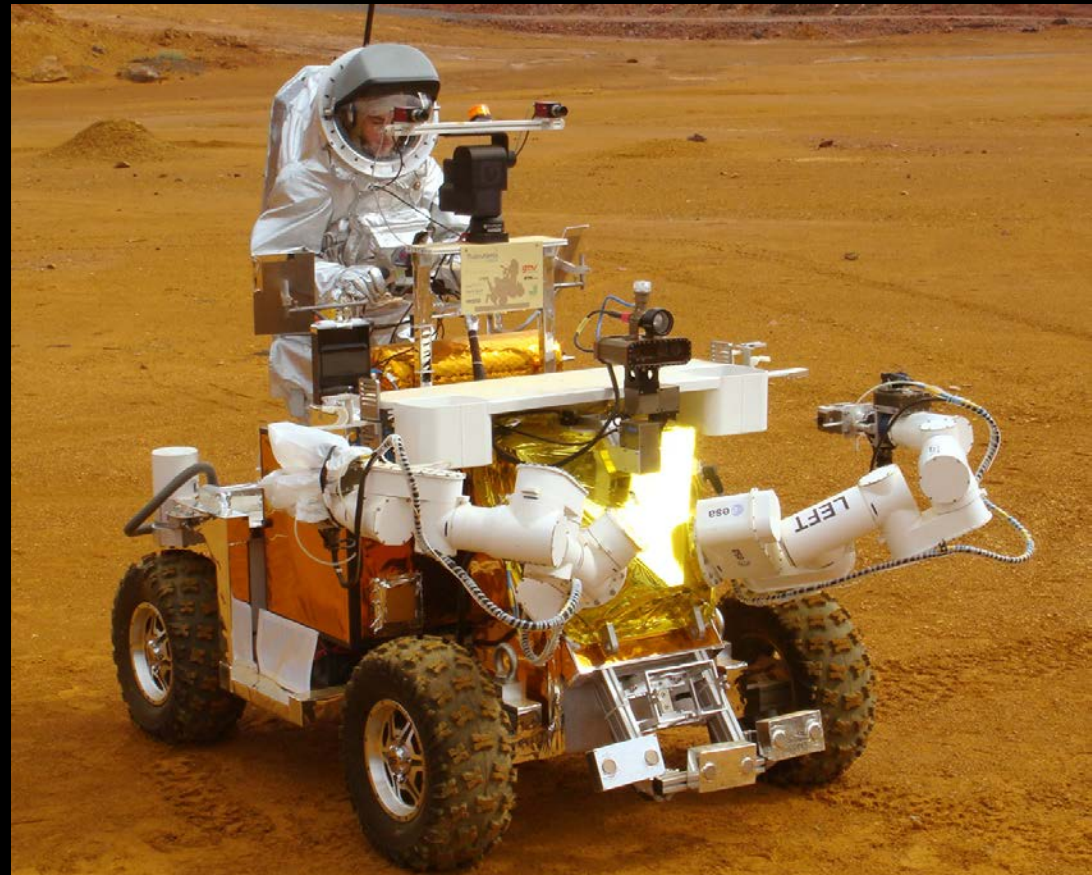


Precursor Field Tests

Rio Tinto/Spain

Focus:

- Human robotic interaction
- Geoscience & Remote Science Support



Dachstein Ice Caves

Subsurface field tests in Austria, 2012

Remote Science Support

Terrain Trafficability tests & Robotics

Contamination vector analysis

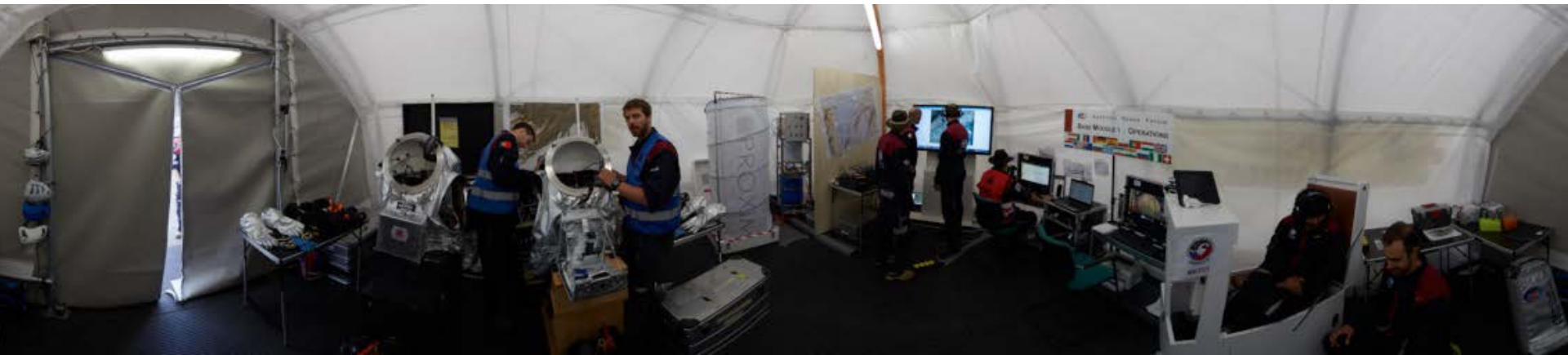
Ground validation of EXOMARS instrument

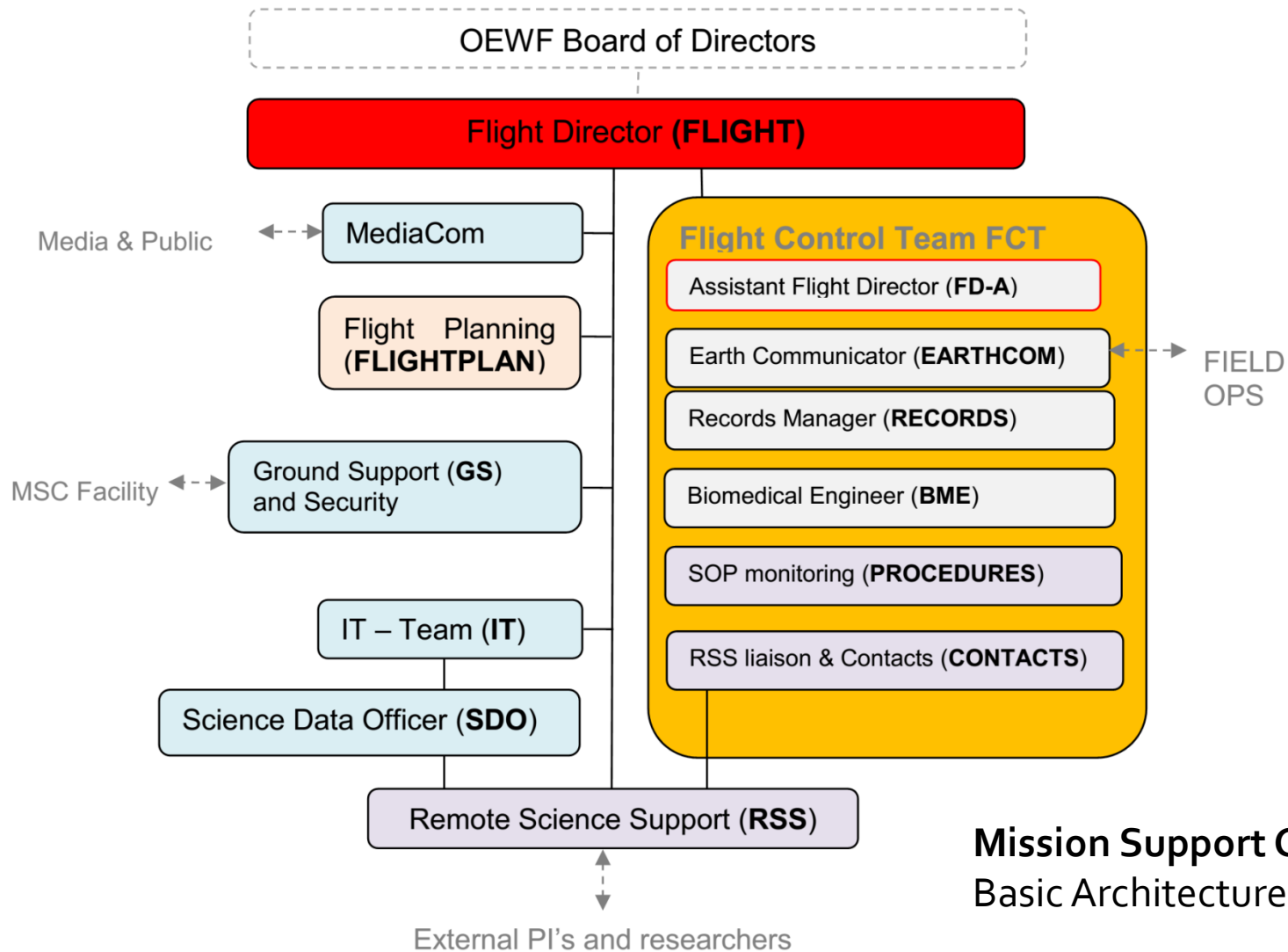






Sans Fuentes, S.A. (2012) "Human-robotic Mars science operations: target selection optimization via traverse and science planning". MSc thesis, University of Innsbruck, Innsbruck, Austria.





Mission Support Center Basic Architecture

- Virtual & MSC site training
- Dress rehearsal
- Certification & Recertification

AOUDA X-ray - Analog Space-suit - Mozilla Firefox

AOUDA X-ray - Analog Sp... x

https://mission.owf.org/archive2/bin/view/AMADEE-15/AOUDA.X

OeWF Home AMADEE-15 AOUDA.X + Add search... Barry Bishop

Navigation

- AMADEE-15
 - AOUDA Sierra - Analog Space-suit
 - AOUDA X-ray - Analog Space-suit**
 - BCC Balloon Carried Camera
 - Cliffbot Cliff Reconnaissance Vehicle
 - FOG Mobile water fog shower
 - GPRoG Ground Penetrating Radar on Glaciers
 - LICHEN Relative dating of moraines
 - LIFE Laser Induced Fluorescence Emission
 - MASE Glacier as Mars Analogue site for microbial Space Exploration
 - MaDe - Dental treatment on mars
 - Puli Rocks Rover assistance to human explorers
 - SPTSP Survey for Psychological Tools for Selection of Participants
 - VEMES Virtualization Experiment for Mars Expedition Simulations
 - AMADEE-15
 - WoRIS Weathering of Rocks at the Ice

AOUDA X-ray - Analog Space-suit

Last modified by [Rene Allerstorfer](#) on 2015/08/14 14:44

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Details

Acronym	AOUDA.X
Description	Aouda X-ray - analog astronaut space-suit
Principal Investigator (PI)	Dr. Gernot Groemer
Organisation	Austrian Space Forum, Technikerstr. 25/8, A-6020 Innsbruck, Austria

Summary


The Austrian Space Forum has developed the spacesuit simulator "Aouda" which is able to mimic border conditions a real Mars spacesuit would provide during a surface EVA, like weight, pressure, limited sensory input etc...

The suit is designed to study contamination vectors in planetary exploration analogue environments and create limitations depending on the pressure regime chosen for a simulation. An advanced human-machine interface, a set of sensors and a purpose designed software act as a local virtual assistant to the crewman. It is designed to interact with other field components like the rover and instruments.

Objectives

Aouda.X page from the multi-mission data archive

https://mission.owf.org/archive

The image shows two astronauts in full silver space suits standing on a rocky, mountainous terrain. They are holding long-handled tools, possibly simulating a Mars environment. In the foreground, a small, six-wheeled rover is visible, labeled 'XPRIZE' and 'LUNAR'. The background features rugged, dark mountains under a blue sky with scattered white clouds.

Experiment- Examples

Groemer, G., Losiak, A., Soucek, A., Plank, C., Zanardini, L.,
Sejkora, N., Sams, S., "The AMADEE-15 Mars Simulation".
Acta Astronautica, [Volume 129](#), Dec. 2016, 277–290



VERAS/VEMES Study

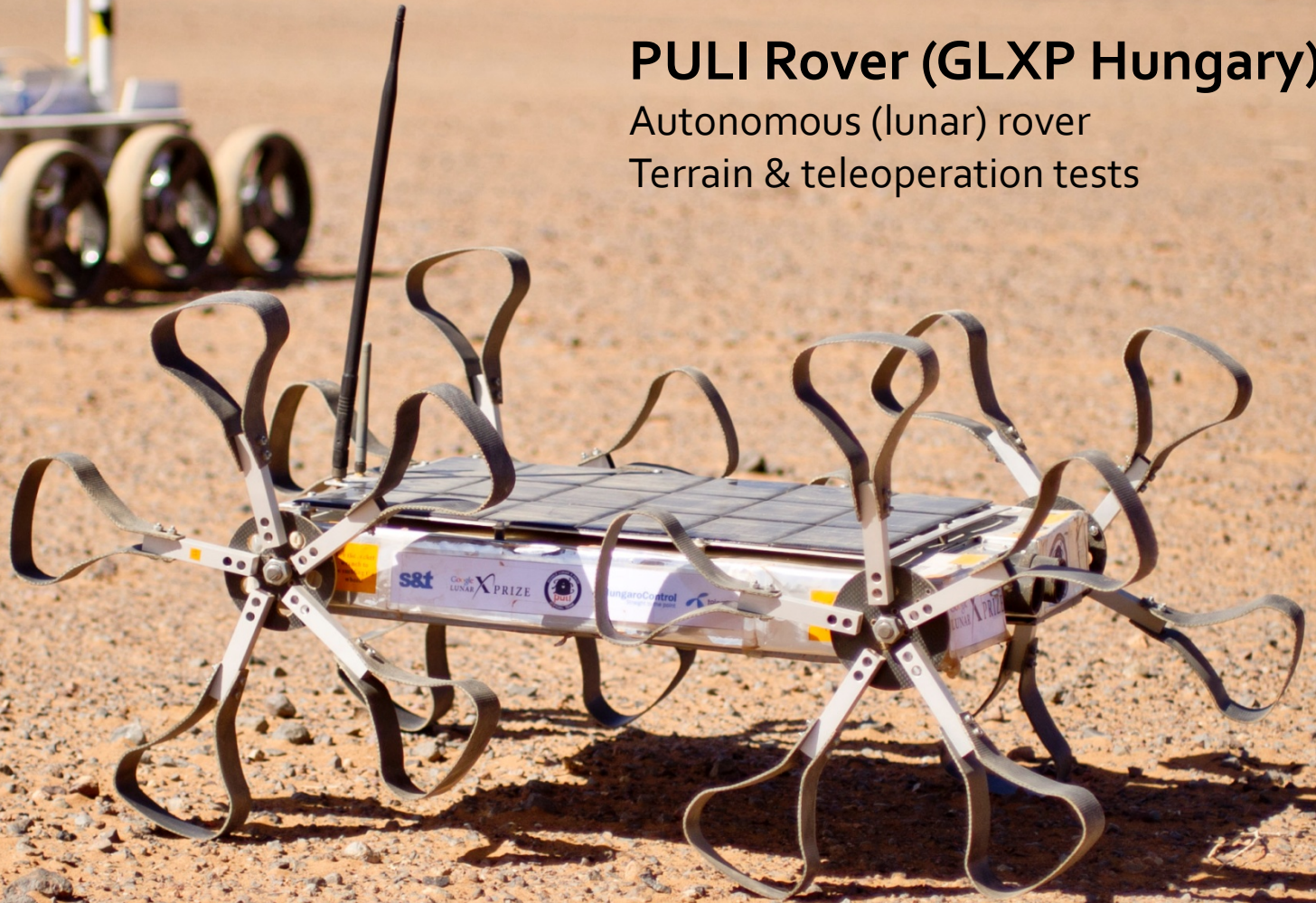




PULI Rover (GLXP Hungary)

Autonomous (lunar) rover

Terrain & teleoperation tests



Deployable Shelter (TU Vienna / OeWF)

Inflatable/pressurizable shelter
Proof-of-concept study



AMADEE 18

Desert Analog Mission / Feb. 2018

- AO in March 2017 (tbc)
- Experiment selection in July 2017

- + National analog research stimulus (students & general public)
- + Cooperation with national institutions

