

## THE AMADEE-18 MARS SIMULATION OMAN

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In February 2018, the Austrian Space Forum (OeWF) - in partnership with the Oman National Steering Committee for AMADEE-18 - conducted the AMADEE-18 Mars analog field simulation, a highly international research project, involving over 200 people from 25 different countries. The test site in the Dhofar region in Oman shows geological features with a strong resemblance to geological structures found on Mars (e.g. dried out river beds). Hence, the test site provided a suitable analog to the Martian environment, enabling the execution of scientific experiments under high-fidelity conditions w.r.t. surface operations on Mars. Directed by a Mission Support Center in Austria, the carefully selected and trained field crew conducted experiments from various disciplines (engineering, planetary surface operations, astrobiology, geophysics/geology, life sciences) preparing for future human Mars missions. Mars analog field research in a representative environment is an excellent tool to gain operational experience and understand the advantages and limitations of remote science operations on other planetary bodies (Beatty 2007). Through the AMADEE-18 mission, the OeWF also implemented the Vienna Statement on Analog Planetary Research (OeWF 2016), which serves to catalyse and expedite the field of analog research.

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During the AMADEE-18 Mars simulation in February 2018, a field crew of 15 trained and certified people, including 6 analog astronauts, conducted 19 experiments in the fields of engineering, planetary surface operations, astrobiology, geophysics/geology, life sciences and other. The main focus was to i) study equipment, procedures and workflows for crewed surface operations under Mars analog conditions, ii) conduct experiments in the fields of geoscience, engineering and life sciences in order to iii) use the mission as a platform for emulating the search for life on Mars and iv) to increase the visibility of planetary sciences. All experiments were further embedded in a dedicated “exploration cascade” which pre-defines the sequence of the respective deployment to optimize the search for life on Mars.

All field activities were directed by a Mission Support Center (MSC) in Innsbruck, Austria. Based upon 12 precursor Mars analog missions, the OeWF has established an MSC infrastructure with trained and certified flight controllers. The teams at the MSC were responsible for the overall mission execution, scheduling all field activities through the flight plan, coordinating the media activities and overseeing the analysis of the scientific data. The Earthcom position acted as a single point of contact between the MSC and the field crew in Oman. All communication was channelled through a 10-minute time-delayed server, which simulated the average signal travel time between Earth and Mars. Furthermore, a dedicated Flight Plan team within the MSC was responsible for the scheduling of the field crew activities. The schedules comprised the daily activities of the field crew (on a 15-min. granularity), weather updates and traverse plans, which were describing the itinerary between the base habitat and the experiment locations for the analog astronauts.

### References

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