AMADEE-27 Announcement of Opportunity

Portuguese National Experiments Complement

Introduction / Scope

Between 04-18Apr2027, the Austrian Space Forum will conduct its next major international Mars analog mission in the Monsaraz region in Portugal. The field mission will be carried out in a Martian terrestrial analog and directed by a dedicated Mission Support Center in Austria. A small field crew of highly trained analog astronauts with spacesuit simulators will conduct experiments preparing for future human and robotic Mars exploration missions.

An initial announcement of opportunity (AO) for **international** experiments was completed in March 2026.

The scope of this **Portuguese National Experiments Complement AO** is to invite the **Portuguese** scientific community to submit experiment proposals in the fields of geosciences, engineering & robotics, planetary surface operations, and life sciences, including astrobiology and human factors. **This call is open to PIs, researchers, and young students from universities, research centers, industry, and other entities. International collaborations are possible, as long as the PI is affiliated with a Portuguese entity.**

+INFO: https://oewf.org/en/amadee-27/

Timeline / Major milestones

Portuguese National Experiments Complement AO Milestones:

- AO Publication – 29.07.2026
- Full proposal submission – 06.09.2026
- Announcement of AO results – 21.09.2026

AMADEE-27 Milestones:

- AMADEE-27 MoU Signing Ceremony – Oct/Nov 2026
- AMADEE-27 Mission – 4-18 April 2027
- AMADEE-27-27 Science Workshop - June 2027

The AMADEE-27 mission

The location of the AMADEE-27 is the Monsaraz region in Portugal, a test site next to the Alqueva Lake observatory. This entails a preliminay site analysis comparable to what can be expected from Mars precursor missions pertinent to future crewed expeditions, including remote sensing data (and derived GIS data products) and environmental conditions.

Mission Support Center (MSC)

The A-27 mission comprises the “ground segment”, a Mission Support Center, operated by flight controllers, healthcare professionals, engineers and a ground support team, as well as the “space segment”, operated by a six-person “flight crew”. The flight crew is supported by the “Ground Operations and Support Team” (GOST), responsible for safety and security, as well as technical/logistical support.

Field habitat

The **Monsaraz region**, specifically around the **Observatory of Lago Alqueva (OLA)**, serves as a medium-fidelity Mars analog due to its unique combination of ancient geological substrates and a barren, semi-arid landscape. The setting is dominated by the Hesperian Massif, featuring weathered metamorphic and igneous rocks, including granites and schists. These terrains are often covered by reddish, iron-rich soils (regolith) that mimic the oxidation processes responsible for the iconic Martian "Red Planet" hue.

The local features are comparable for several Martian surface processes:

- **Abrasive Regolith:** The dry, rocky terrain around the Alqueva reservoir resembles the "barren and broken" landscapes of Martian plains, providing a testing ground for rover mobility and suit durability against dust and sharp rock fragments.
- **Geochemical Signatures:** Serpentinized rocks offer a similarity to hydrothermal signatures on Mars that may have once supported microbial life.
- **Lacustrine Geomorphology:** The proximity to the Alqueva lakebed allows for the study of playa-like environments and shoreline features, serving as an analog for ancient Martian paleolakes and the sedimentary layers found in craters like Gale or Jezero.

The habitat near Monsaraz is embedded in a dark sky reserve, the host country provides a habitat to accommodate a six-person crew for the duration of two weeks. The crew will follow a carefully designed Flight Plan, monitored by a dedicated Flight Control Team at

the MSC. They will live in the habitat in isolation and conduct suited extra-vehicular activities (EVA). The habitat will host the experiment hardware, living quarters, power, limited electronics and mechanical workshop capabilities.

Bridgehead phase (days 01-03)

During the initial preparatory activities and the establishment of an operational base camp as well as the local infrastructure in-situ, this period offers an opportunity for guest researchers to be present on site on a case-to-case basis. Instruments which cannot be operated by the OeWF field crew (e.g. due to the experiment sensitivity, operator training requirements etc.) may be operated by the researchers in the field. Selected pilot & calibration measurements may be conducted.

Media & Access phase (days 04-05)

Experiment teams can continue to work in the field, however, with media interactions – there is a significant media echo to be expected.

Isolation phase (days 06-19)

After the preparatory phase, research teams leave the site, the Mission Support Center (MSC) will now direct the crew limited to six crewmembers who will conduct experiments according to a flight plan. The analog astronauts are supported by the GOST team, performing activities necessary for the simulation, but not available on Mars (e.g. Safety, managing local W-LAN infrastructure etc). GOST will not directly interact with the analog astronauts. A 10 minute time-delay between “Earth” and “Mars” mimics the signal travel time between Earth and Mars.

The following infrastructure will be available:

- General logistics (housing @ GOST station, water/food/medical care, basic hygiene, security)
- Broadband internet access and 230V/50Hz electrical power
- A basic mechanical and electrical workshop (including 3d-printer) & basic mobility (tbc)
- Remote Science Support team

Experiment selection process

The AMADEE-27 National Steering Committee (NSC) encourages potential Principal Investigators to contact the **NSC leadership** before submitting a proposal to discuss opportunities and challenges to the experiment.

1. The submissions of proposals MUST reach the AMADEE-27 National Steering Committee no later than **06 September 2026, 23:59 CET** in electronic form.
2. This proposal shall contain
    a. Name, affiliation and contact coordinates of the principal investigator
    b. a <500 word description of the scientific or engineering proposal
3. All proposals will undergo a peer-review process following these criteria:
    a. Scientific, technical or operational merits. The experiment selection committee may contact PI's for a clarification teleconference during stage-2 selection.
    b. Detailed plan of the research that clearly states that:
        i. Feasibility of the proposed project, including the potential for data fusion with other experiments and alignment with the aims of the OEWF research program.
        ii. Experiment needs versus resources available, ability to assess and mitigate programmatic, engineering and safety risks ("*Can it work reliably and safe*?")
        iii. Ability to process, analyze, share and publish the experiment data in a timely manner, as indicated in the project timeline.
4. Given the already selected (international) experiments, crew time inside the habitat is heavily restricted. As such, **experiments either focusing on EVA (Extra-vehicular activities) or requiring little or no crew time, inside the habitat will be given a higher priority**.
5. **Experiments in the fields of geosciences and life sciences are encouraged**. Experiments in the other fields will nonetheless be considered and evaluated based on scientific merit.
6. The experiments will have to be self-funded, but the scientific and logistics infrastructure will be provided by the Austrian Space Forum. Also, the option for tele-operated experiments is available.
7. Depending on the outcome of the selection board's recommendations, experiments will either be selected "as is", "with a request for modifications" (where the Principal Investigator has still the option to decline), or "not selected".

8. Acknowledging the short timeframe for submitting and processing proposals to national funding institutions, experiments can also be submitted as “subject to funding decisions”. In this case, the OeWF and the principal investigator will agree on a deadline (ca October 2026) at which the funding decision will have to be consolidated to continue the experiment in the AMADEE-27 framework.
9. The experiments will be selected by a jury comprising **OeWF (Austrian Space Forum)** staff and researchers, the **AMADEE-27 National Steering Committee Core Team**, and invited researchers from the mission's **National Scientific Commission**.

Exploration Cascade

The AMADEE-27 expedition will focus on the interplay of the respective instruments and experiments relevant for human-robotic Mars missions. Based upon the research question of how to identify biomarkers, which in turn is traditionally based upon the characterization of the (paleo-)geoscientific environment, the experiments will be selected to reflect a realistic sequence of activities.

This strategy is based upon the “exploration cascade”, an algorithm defining an efficient deployment sequence, providing the framework for the question: “which instrument needs to be active where and when, leading to what kind of data sets, leading to what kind of knowledge, leading to which type of input for the tactical flight planning”.

As suggested by Neveu et al. (2018) life-detection measurements must be sensitive, contamination-free regarding the absence of interfering signals, and reproducible; one or more features must be detectable, preserved, reliable, and compatible with life on Earth. Experiments will be scheduled according to a flight plan defining the resources, location and timing as well as considering the processing pipeline between data acquisition in the field, data transfer and integrity checks and the subsequent near-real time interpretation to formulate a hypothesis. This than translates into a scientific input into the tactical flight planning for the field crew.

For details we refer to the academic thesis of Stefanie Garnitschnig from 2018 on the Exploration Cascade (available via www.oewf.org → Research → Academic theses).

Engineering experiments: Robotics, operations research and material science

Besides the search for life and the preceding characterization of the (sub)surface and aeolian environment, robotic elements such as copters, rovers or human-operated tools are considered as an enabler to perform the science. Therefore, robotic experiments are

selected according to their enabling potential (such as mapping, carrying an instrument or rock sample), and not on their engineering maturity or engineering demonstration alone.

Hence, proposals capable of demonstrating the following are preferred:

- **Fast turn-around times for a first data processing** leading to hypothesis building (Good example: In-situ Raman spectroscopy vs (Bad:) multi-month laboratory analysis back on "Earth"; or (Good:) near-real time robotic terrain mapping vs (Bad:) post-mission 3d-data generation).
- **Ability to provide input into hypothesis forming** (Good example: identifying water layers within 48 hrs of receiving georadar data triggering a subsurface sampling experiment vs (Bad:) stand-alone tech-demonstration of a new instrument measuring local UV-radiation).
- **Experiments that cooperate with other experiments**, where data synergies allow for additional research questions to be addressed, or to cross-validate a hypothesis. (Good example: mineralogical spectrometry verifying hydrated minerals previously identified by orbital hyperspectral imaging vs. (Bad:) isolated measurement of a rock weathering).

Human factors: Medical & Psychological Research

AMADEE-27 also allows for human factors experiments utilizing the crew (and potentially also the GOST and MSC team members as comparison group). However, ethics commission approval must be obtained before a final acceptance can be provided, by no later than July 2026. As astronaut time is a very limited resource during missions, there needs to be a careful balance between crew time usage and expected scientific output.

This does not apply to man-in-the-loop experiments where the focus is purely engineering-oriented. The Medical Team of the Austrian Space Forum might require ethics commission approval.

If you are unsure, if your experiment might fit into the exploration cascade or has a high potential w.r.t. human factors research, feel free to contact the Austrian Space Forum.

Useful references

- Groemer, G. et al. (2016): The AMADEE-15 Mars Simulation, Acta Astronautica, Vol 129, pp 277–290
- Zanardini, L. et al. (2018): Training for Analog Mars Simulations, Proc. of the 2018 SpaceOps Conference, 28 May - 1 June 2018, 2018, Marseille, France. 10.2514/6.2018-2449
- Neveu, M. et al. (2018): The Ladder of Life Detection. In: Astrobiology. DOI: 10.1089/ast.2017.1773
- Garnitschnig, S. (2018): Development of a supportive method for the detection of biomarkers during future human-robotic Mars missions, BSc thesis, University of Innsbruck.
- Sejkora, N., et al. (2018): Geodata workflow for the AMADEE-18 Mars analog mission, In EPSC Abstracts Vol. 12, EPSC2018-442, European Planetary Science Congress 2018
- Groemer, G. et al. (2018): AMADEE-18 Mission Report, online at: https://oewf.org/en/download/14445/

Administrative aspects

Media activities

A major global media attention is expected for the mission, as it was the case in previous simulations. The Austrian Space Forum as project owner will coordinate and manage all media activities to ensure a professional media campaign.

Experiment funding

Experiments must be self-funded, including the development of the hardware, documentation, transport of hardware and personnel to and from Austria. The hardware transfer between Innsbruck to the test site and back to Austria will be organized and funded by the OeWF. For experiment team that need to have personnel in the field, the expenses for infrastructure and consumables will be distributed amongst the experiments. (Ca. € 600 /field person-week, tbd).

Note: While dditional national funding won't be available for this specific call from the Portuguese Space Agency, applicants are encouraged to explore existing national or European funding channels.

Legal Disclaimer

Although unlikely, the Austrian Space Forum reserves the right to cancel the field mission. Hence, teams submitting a research proposal do so at their own discretion, expenses, and risks without guarantee of success.

Next steps after selection

Upon selection, representatives of the OeWF Remote Science Support and the Flight Planning team will get in touch with the experiments' Principal Investigators, discussing the experiment implementation, training requirements for the field crews, logistics, bandwidth and power topics, as well as experiment specific hazards and risks. These deliberations lead to the creation of the Standard Experiment Information Form (to be compiled by the PI) which is the basis for the operational and contingency procedures.

Format for experiment proposals

Title, Summary & Contact details	An informative title so that, by reading the title, a person can understand the goal of the proposed investigation, plus a one-word name or acronym for the proposal.	Cover page ≤ 1 page
	The full contact coordinates of the proposing team (name, affiliation, postal address, email, telephone) of at least 2 persons.	
Team Expertise	A brief outline of the expertise of the team and how each investigator will contribute to the proposed investigation.	1 page
A-27 Compliance form	Signed checklist for experiment submissions, stating your ability and willingness to comply with mission requirements	1-page form, signed
Scientific description *This part of the proposal is to demonstrate that the proposed work is scientifically/technically sound and feasible.*	A detailed description of the experiment should follow the standard outline of a scientific proposal: • **Research rationale:** why it is important to perform your experiment, including a brief literature review. • Scientific, engineering or operational **hypothesis** (articulate a testable statement, hypothesis or	≤3 pages

	research question), including a suggested methodology and expected results • What kind of experiment hypothesis can be expected in near real-time (<24h) to be used by the flight planning team? • A **publication plan** (likely choice of journals or conferences)	
Technical and logistics description	The scientific, technical and management implementation description, including instrument heritage and maturity, where applicable. This section should include: • Duration of experiment in the field (e.g. 10 x 2 hrs total), analog astronaut time requested (projected training and actual test time) • Power requirements (if >100 W: e.g. 1500 W, 4 hrs per day) Communication (if >500 kB/s: for how long/day?) • Do you have any other special needs? (e.g. legal/IPR issues, ITAR-restrictions, ethics approval required, special frequency licenses needed, safety-relevant information (eg such as explosives or hazardous chemicals), etc.)	≤ 2 pages

The proposal shall be sent as a PDF file to **amadee27@oewf.org** no later than **September 6, 2026, 23:59 CET**. A confirmation will be sent, triggering the review process.

Once the experiment is selected, each experiment will receive a formal confirmation.

Contact for Further Information

Austrian Space Forum / Spacesuit Laboratory
Dr. Gernot Groemer, gernot.groemer@oewf.org, +43 676 616 8336
Etrichgasse 18, 6020 Innsbruck, Austria

Centre for Robotics and Autonomous Systems / INESC TEC
Dr. Ana Pires, ana.c.pires@inesctec.pt, +351 919624237
[LSA-ISEP] INESC TEC (Polo ISEP)
Rua Dr. António Bernardino de Almeida, 431
4249-015 Porto, Portugal

Core Team Contacts

(AMADEE27 NSC - National Steering Committee Leadership)

- Eng. Leonel Godinho (Observatório Lago-Alqueva): leonelgodinho@gmail.com
- Doctor Rosa Doran (NUCLIO – Núcleo Interativo de Astronomia e Inovação em Educação): rosa.doran@nuclio.org
- Doctor Ana Pires (Center for Robotics and Autonomous Systems at INESC TEC): ana.c.pires@inesctec.pt
- Eng. João Lousada (ISS Operations Lead, ESA - Human Spaceflight and Operations): Joao.Lousada@oewf.org

APPENDIX

A-27 proposals compliance form

We kindly ask you to carefully check each item before submission and then confirm by signature. You can copy-paste this form and include it in the proposal PDF.

	Compliance item	Signature of PI
1	Our research team is able to fulfill the requirements put forward in this Announcement of Opportunity, including a strict commitment to deadlines and required documentation. We are aware that failure to do so (including failure to pay the experiment charge) might result in removal from the list of experiments for the AMADEE-27 mission.	SIGNATURE
2	We are committed to having at least one team member physically present at the Mission Support Center for the duration of the mission.	SIGNATURE
3	We are open to sharing data for data fusion and joint experiments on a case-by-case basis. We understand the importance of the Exploration Cascade as a tool to synergize between experiments and operational workflows, and agree to our data being used in this context.	SIGNATURE
4	We can cover the funding for our experiment (including the experiment charge), deliver the experiment hardware in time to and from Austria, and cover documentation and customs clearances. We can also cover the travel and accommodation costs for our team members to be present in Austria. If we rely on an external funding agency, we shall commit to a deadline at which the experiment funding is secured, or the experiment will automatically be withdrawn.	SIGNATURE
5	We are committed to participating in the preparatory teleconferences and training workshops as well as two Dress Rehearsals. Also, we are committed to participate in the post-mission science workshop in 2027.	SIGNATURE
6	Our research team is willing and able to process, analyze, and publish the results of our experiment within six months after the end of the field campaign.	SIGNATURE
7	Our team is willing to proactively participate in the media activities of the AMADEE-27 mission, adhere to the mission-wide media rules and milestones, including social media.	SIGNATURE