Continuously Open Research Announcement

soliciting for proposals for ESA's

Ground-Based Facilities

ESA-CORA-GBF
1 INTRODUCTION

ESA’s “Science in Space Environment” (SciSpacE) programme – which is part of ESA’s overall European Exploration Envelope (E3P) programme – includes scientific activities on research platforms such as ground-based space analogues (e.g. bedrest studies, research on Antarctic stations, radiation facilities, drop tower, sounding rockets, parabolic flights), as well as an ambitious research programme on-board the International Space Station (ISS).

The SciSpacE programme activities cover science in the domains of Human Research, Biology (including Astrobiology) and Physical Sciences, with an emphasis on scientific excellence, space research- and exploration-relevance, innovation and timely delivery. Its research results will advance Europe’s knowledge base, support its economy and help prepare future human and robotic space exploration. In addition to gaining fundamental knowledge, the research carried out within ESA’s SciSpacE programme is helping to deliver solutions to problems back on Earth, e.g. developing innovative materials to manufacture products, removing pollutants from water, improving engine efficiency, testing new medical techniques and support equipment for the elderly and disabled.

To further enhance and promote ESA’s strong non-ISS research programme, ESA’s Continuously Open Research Announcement scheme has been expanded to offer dedicated opportunities for research on ESA’s non-ISS research platforms.

This document provides an overview on the research opportunity offered within this Continuously Open Research Announcement as well as on the sequence of events starting from submission of the research proposal to selection and implementation of successful proposals.

2 OBJECTIVES OF THE ESA-CORA-GBF

Through the Continuously Open Research Announcement Opportunity for GBF (ESA-CORA-GBF), ESA will provide scientists with an opportunity to conduct research necessary to advance knowledge relevant to the effects of space on humans and/or biological life in general as well as on physical systems, aiming to enable space exploration and planetary colonization. Proposals shall address these research questions through ground-based experimental studies making use of the facilities listed in Annex 2. The data obtained shall improve the current knowledge in the areas of interest, e.g. to develop diagnosis tools and countermeasure protocols for humans in space, to gain insights on the effect of space conditions on microbes or to develop new shielding techniques to protect equipment from space radiation. In addition to supporting the needs of human space exploration missions the information obtained is relevant to improve Earth-based technologies and/or medical protocols.

Scientists are strongly invited to address one (or more) of these topics with their proposed experiments.

ESA will support selected proposals with a maximum of 50K€ to cover the access costs to the facility. Please be aware that ESA shall not pay for consumables, travel/accommodation costs and for subsistence for the experimenter(s).

Experiment costs exceeding the above-mentioned threshold shall be the responsibility of the Coordinator and his/her partners. Personnel costs will not be covered through this programme.
### 3 FACILITIES PARTICIPATING TO OPPORTUNITY

The facilities within the ESA’s GBF programmes

**Table 1. List of Ground Based Facilities**

<table>
<thead>
<tr>
<th>Institute</th>
<th>Facilities</th>
<th>Websites</th>
<th>Point of Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLR (Cologne - Germany)</td>
<td>Clinostats, Random Positioning Machine, Envifuge, Vertical Treadmill Facility (VTF)</td>
<td><a href="https://www.dlr.de/me/en/desktopdefault.aspx/tabid-10716/">https://www.dlr.de/me/en/desktopdefault.aspx/tabid-10716/</a></td>
<td><a href="mailto:ruth.hemmersbach@dlr.de">ruth.hemmersbach@dlr.de</a></td>
</tr>
<tr>
<td>ESA/ESTEC (Noordwijk – The Netherlands)</td>
<td>Large Diameter Centrifuge (LDC)</td>
<td><a href="https://www.esa.int/Education/Spin_Your_Thesis/The_Large_Diameter_Centrifuge2">https://www.esa.int/Education/Spin_Your_Thesis/The_Large_Diameter_Centrifuge2</a></td>
<td><a href="mailto:j.vanloon@vumc.nl">j.vanloon@vumc.nl</a></td>
</tr>
<tr>
<td>ESA/EAC (Cologne - Germany)</td>
<td>Neutral Buoyancy Pool</td>
<td><a href="https://www.esa.int/spaceinimages/Keywords/Description/Buoyancy_training_pool">https://www.esa.int/spaceinimages/Keywords/Description/Buoyancy_training_pool</a></td>
<td><a href="mailto:Victor.Demaria@esa.int">Victor.Demaria@esa.int</a></td>
</tr>
<tr>
<td>Planetary Space Simulator (DLR)</td>
<td>PSI 1 LEO (Low Earth Orbit Simulation), PSI 2 Solar System, PSI 3 DeepSpace 1, PSI 5 Planetary Environment (PlanE), PSI 6 DeepSpace 2, PSI 7 MaSimKa, PSI 9 Deep Space 3 -Long Duration Facility</td>
<td><a href="https://www.dlr.de/Spacesim">https://www.dlr.de/Spacesim</a></td>
<td><a href="mailto:Elke.Rabbow@dlr.de">Elke.Rabbow@dlr.de</a></td>
</tr>
</tbody>
</table>
Adding facilities to the programme
Additional facilities matching all of the below criteria can be included in ESA’s GBF programme:
Criterion 1: the facility enables investigations in a space relevant research domain,
Criterion 2: because of specific equipment and know-how, the facility constitutes a unique experimental testbed of its kind in Europe,
Criterion 3: the current rules of access to the facility are compatible with granting the access of external scientists to it by way of Research Announcements at European level.
To this end, a description of the facility and its capabilities shall be submitted to ESA and will be included in the programme after positive assessment by ESA’s Scientific Advisory Structure.

4 APPLICATION PROCESS

4.1 Who can apply
Scientists from the member states participating to ESA’s SciSpace programme may apply to the programme. Participating countries are Austria, Belgium, Canada, Czech Republic, Denmark, France, Germany, Greece, Ireland, Italy, The Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom. Scientists from other ESA member states may participate in proposals as team members.
Scientists who belong to one of the facilities listed in table 1 are not eligible to submit proposals using their own facility. In addition, a science team can only implement one proposal at any given time.

4.2 Preparing and submitting the proposal
The document "ESA-CORA-GBF submission template" shall be used for submission of the proposal. The proposal shall include a clear description of proposed experiment as well as information on the total funding requested. It is highly recommended to coordinate beforehand with the facility to be used for the proposed project for suitability, feasibility and availability of the facility, a list of local points of contacts is provided in the Annex.
The proposals shall be submitted electronically as one single file to:

cora-gbf@esa.int

An acknowledgement of receipt will be sent to the submitting proposer upon receipt and confirmation of completeness of the proposal.
4.3 Evaluation of proposals

ESA will make use of independent experts for the evaluation of proposals. The proposal coordinator will receive information on the outcome of the review, typically within 2 months. The evaluation criteria that will be applied for evaluation of the proposals are:

- **Significance (30%)**: Does this study address an important problem? If the aims of the application are achieved, how will scientific knowledge or technology be advanced? What will be the effect of these studies on the concepts, methods, or products that drive this field?
- **Approach (25%)**: Are the conceptual framework, design, methods, and analyses adequately developed, well integrated, and appropriate to the aims of the project? Does a flight proposal build upon a successful foundation of ground studies? Is the proposed approach likely to yield the desired results? Does the applicant acknowledge potential problem areas and consider alternative tactics?
- **Innovation (20%)**: Does the project employ novel concepts, approaches, or methods? Are the aims original and innovative? Does the project challenge existing paradigms or develop new methodologies or technologies?
- **Personnel (15%)**: Does the scientific team have the appropriate level of experience, are sufficient & appropriate personnel dedicated to the project. Is there evidence of the science team's satisfactory productivity?
- **Environment (10%)**: Does the scientific environment in which the work will be performed contribute to the probability of success? Do the proposed experiments take advantage of the scientific environment or employ useful collaborative arrangements? Is there evidence of institutional support?

5 IMPLEMENTATION OF THE SELECTED PROPOSALS

After positive selection of peer-reviewed proposal, the scientific coordinator of the experiment will be notified and he/she will be required to confirm the availability of resources and of the selected facility. ESA will place a contract with the proposed facility (i.e. not with individual science teams) to cover the costs of experiment implementation.

Please take note that the acceptance of a proposal is not a guarantee for implementation. Implementation will be subject to a technical feasibility review carried out by the selected facility after selection.

6 DATA RIGHTS

6.1 General

The general data policies of ESA’s Directorate for Human and Robotic Exploration Programmes will apply to all data resulting from the experiments in the context of this Continuously Open Research Announcement.
Final results of the study shall be made available by the scientific teams to the scientific community through publication in appropriate journals or other established channels as soon as practicable and consistent with good scientific practice. In the event such reports or publications are copyrighted, ESA shall have a royalty-free right under the copyright to reproduce, distribute, and use such copyrighted work for their purposes.

6.2 The Erasmus Experiment Archive (EEA)

The EEA covers both physical and life sciences, and can be found at the following URL: [http://eea.spaceflight.esa.int](http://eea.spaceflight.esa.int) The EEA is an ESA service to the international scientific community. Abstracts, from all European microgravity experiments performed to date are collected in this database. Experimenters sponsored by ESA have the obligation to provide these abstracts themselves. Special emphasis is placed on the completeness of the list of references of articles where the experiment results can be found.

Scientists in Europe who have performed experiments, be it in orbiting or ground-based facilities are encouraged to either provide an abstract on each of their experiments, or to provide information enabling the updating of their existing abstracts, in particular the list of articles published.
ANNEX 1: SCISPACE ROADMAPS

The Science Department of ESA's Human Spaceflight and Exploration Directorate recently undertook an extensive exercise to create a new strategy, focusing on a set of newly defined goals to help to positively shape the future research programme of the Directorate and maximize research potential.

Figure 1 gives a graphical overview of ESA's Science Roadmap questions, the detailed roadmaps can be found at: "https://www.esa.int/Our_Activities/Human_Spaceflight/Research/Research_Announcements" on ESA's Research Announcement website.

Submitting proposers are strongly invited to address one of the topics outlined above with their research proposal.