



Announcement of Opportunity

United Nations Access to Space for All initiative

United Nations/European Space Agency Fellowship Programme on the Large Diameter Centrifuge Hypergravity Experiment Series (HyperGES)

31 May 2023

- 1. Thematic area:** Access to Space for All -Hypergravity/Microgravity Track
- 2. Title:** United Nations/European Space Agency Fellowship Programme on the Large Diameter Centrifuge Hypergravity Experiment Series (HyperGES)
- 3. Subject:** Realization of a scientific and/or technological experiment in hypergravity conditions at the Large Diameter Centrifuge facility at the European Space Agency Research and Technology Centre (ESA-ESTEC) in the Netherlands.
- 4. Implementation:** HyperGES is being supported by European Space Agency (ESA), located at the European Space Research and Technology Centre (ESTEC), executed by the United Nations Office for Outer Space Affairs (UNOOSA), and implemented through strong collaboration among UNOOSA, ESA, potential applicants, and their organisations from Member States of the United Nations.
- 5. Duration:** May 2023 – January 2025
- 6. Deadline for Applications:** Completed application forms must be submitted to UNOOSA by **12 November 2023 at 23:59 Central European Time (CET, UTC+1)**. Applicants will be notified of the outcome of their applications after selection by February 2024.
- 7. Expected Profile of Applicants:** Government organisations, research institutes, universities, and other public and non-for-profit organisations.
- 8. Number of Selected Applicants:** One team leader and up to three team members who are from Member States of the United Nations. The team may be larger, however, the financial support listed in Section 14 is limited to one team leader and three team members.
- 9. Language of the Programme:** English
- 10. Brief Programme Description:**

The HyperGES fellowship programme, provided under the Access to Space for All initiative, is contributing to the promotion of space education and research in hypergravity, particularly for the enhancement of relevant capacity-building activities in developing countries. HyperGES aims at providing opportunities up to two weeks at ESA's largest centre ESTEC in Noordwijk, the Netherlands to conduct on-site experiment integration and perform hypergravity experiment series on the Large Diameter Centrifuge (LDC) facility. The LDC allows samples to be exposed to acceleration forces of 1-20 times Earth's gravity. The required actual duration for the selected team to stay in Noordwijk depends on the complexity of the experiment, the proposed experiment schedule, and what the negotiation with ESTEC experts can propose.

ESA developed the LDC facility to further understand and describe the influence of gravity in systems, with a broad gravity spectrum from 1g to 20 g (where g is the gravitational acceleration at the surface of the Earth). It is part of the Life and Physical Sciences Instrumentation and Life Support Laboratory (LIS) at ESTEC, dedicated to serve the science and technology user communities throughout Europe, and now open to all Member States of the United Nations through this fellowship programme.

The diameter of the LDC is eight metres. The LDC has four arms, each of which can support two gondolas with a maximum payload of 80 kg per gondola. In practice, however, up to six gondolas can be used for an experiment plus one additional gondola in the centre for control or reference purposes. The hypergravity field inside the gondolas is simulated by the centripetal forces due to rotation. The LDC facility can provide a hypergravity environment for cells, plants, small animals, physical science and technological experiments. Biology, biochemistry, microbiology, optical physics, material sciences, fluid dynamics, geology and plasma physics investigations can be undertaken in this facility. The LDC is flexible in terms of experiment scenarios, duration and possible equipment to use. This means that the system can execute and manage experiments that last from one minute up to six months, without stopping.

11. Schedule of the HyperGES Fellowship Programme

One round of the fellowship programme comprises the following phases: application, selection, preparation, experiment execution, outreach, and reporting.

Application Phase: May 2023- November 2023

- Following this Announcement of Opportunity (AO), applicants will prepare their application package, including the application form.
- UNOOSA and ESA will conduct technical consultation sessions online to provide feedback and advice on experiment ideas. Applicants interested in technical consultation sessions should submit the Expression of Interest form containing a summary of their experiment idea by **30 July 2023 23:59 Central European Summer Time (CEST, UTC+2)**. The duration of the technical consultation sessions will be 30 minutes per applying team and will be held in August 2023. **Please note that submitting an Expression of Interest is not mandatory for selection, and technical consultations are optional.**
- Applicants to submit their completed application by **12 November 2023 23:59 Central European Time (CET, UTC+1)**.

Selection Phase: November 2023- February 2024

- Selection of the awardee by the Selection Board.
- UNOOSA to announce the results and notify the awardee and non-selected applicants of their selection results.

- Awardee to confirm their participation in the fellowship programme to UNOOSA.

Preparation Phase: March 2024-4th Quarter 2024

- UNOOSA and ESA invite awardee to kick-off meeting.
- Awardee to prepare their experiment in close cooperation with ESA.
- Awardee to submit their first Experiment Progress Report to ESA and UNOOSA in May 2024, at the latest.
- Awardee, ESA, and UNOOSA to conduct the critical design review.
- Awardee to submit their second Experiment Progress Report to ESA and UNOOSA in September 2024, at the latest.
- Awardee to transfer the experiment and relevant equipment to ESTEC in Noordwijk, the Netherlands.

Experiment Phase: 4th Quarter 2024

- One week of experiment integration at the LDC facility prior to the experiment series.
- One week of hypergravity experiments at LDC facility. The final dates of the experiment series will be decided together with the awardee, ESA, and UNOOSA.

Reporting Phase: until 31 January 2025

- Awardee will submit a final experiment report.

Outreach and Publication Phase

- Awardee to conduct outreach activities to promote capacity-building and STEM education.
- Awardee to publish experiment results in journals, proceedings, conferences, workshops, Bachelor, Master and PhD theses, etc., if possible.

12. Eligibility Criteria

This Opportunity is open to entities located in developing economies and economies in transition that are Member States of the United Nations. Government organisations, research institutes, universities, other public and non-for-profit organisations are eligible to apply for this Opportunity.

To assess eligibility, UNOOSA and ESA will use the country classification list of developing economies and economies in transition indicated in the joint report, *World Economic and Situation Prospects* published by United Nations Department of Economic and Social Affairs and other related organisations: <https://desapublications.un.org/file/1098/download>

Entities located in countries that have not conducted research under space conditions at the time of the opening of this application are particularly encouraged to apply. Priority will be given to teams that have not previously participated in an experiment series and/or research projects that have never been conducted at the LDC facility.

Each team should consist of a team leader and up to three team members. The team leader must belong to the same entity as at least one of the team members. All team members must be from entities that are eligible to participate, and all participating entities must submit the Letter of Endorsement from their

entities' directors. The team leader shall be responsible for all matters related to the application and bear responsibility for the execution of the experiment. The teams could consist of several entities, with one leading entity that takes responsibility.

The teams may be larger, however, the financial support listed in Section 14 is applicable to one team leader and three team members only. The final number of team members who will participate in the experiment on site at the LDC facility depends on the requirements of the experiment and is subject to approval by the Selection Board of the HyperGES Fellowship Programme. The Board reserves the right to limit the team size if it deems necessary.

Changes to the composition of the team are NOT allowed once the application has been submitted. If, for exceptional reasons, changes are necessary, they will be subject to the approval of the Selection Board.

Teams are allowed and encouraged to partner with external entities that can support their development, even if those entities are not eligible themselves. These partnerships should be clearly written as "External Support" in the Application Form and external partners shall not be included in the team.

13. Selection Criteria

The Selection Board will consist of members nominated by UNOOSA and ESA. The Board will assess all applications against the following criteria:

- (i) Experiment Content:
The educational, scientific and/or technological value of the proposed experiment and the relevance of the utilisation of the LDC facility, details of the experiments as well as the data acquisition and data analysis plan in the proposed experiment.
- (ii) Team Composition:
The skills set, organisation, and composition of the team. The team shall demonstrate competence in scientific and technological research or in education as well as in project management. The team composition of proposals with the same score will be compared and the proposal with a larger number of women will be ranked higher.
- (iii) Feasibility:
 - General feasibility of the proposed experimental design and procedure, including data acquisition and data analysis plan, the work breakdown structure, the overall schedule credibility, and risk analysis.
 - Budget plan to support the development, preparation, transportation, and shipping of the experiment, as well as the availability of funds.
- (iv) Outreach:
The communication and dissemination plan for outreach activities to promote capacity-building and STEM education, clearly linking the project with the Sustainable Development Goals of the United Nations 2030 Agenda on Sustainable Development.
For more information about the SDGs: <https://sdgs.un.org/>

The entire selection process will be performed in a single step.

14. Financial and Technical Support

- 1) *International air tickets*

The awardee will be offered the most economical round-trip air tickets for up to four persons between the participants' international airport of departure and Amsterdam (close to Noordwijk), the Netherlands. Participants are responsible for any en-route expenses or flight changes.

2) *Technical support and local accommodation*

The use of the LDC facility is sponsored by ESA. ESA will be in charge of and operate the LDC facility and support the awardee including their preparation and on-site integration. In addition, ESA will provide scientific and technical consulting, service, and support to the awardee for smoothly completing the experiment cycle.

ESA will offer local hotel rooms and meals free of charge for up to four persons during the on-site integration and experiment series in Noordwijk, the Netherlands.

3) *Experiment preparation and other costs*

UNOOSA and ESA will neither bear the expenses related to the preparation, transportation, shipping, nor the insurance of the experiment or of the team members. The awardee must cover these costs.

15. Publications

The awardee is requested to inform UNOOSA and ESA of any publications related to this experiment including PhD, Master thesis, publications in journals, and conference or workshop proceedings and presentations. The awardee is requested to include the following sentence in their peer-reviewed publications, contributions to congresses, and other forms of written dissemination:

The authors would like to thank the United Nations Office for Outer Space Affairs and the European Space Agency (ESA) for the Access to Space for All initiative: HyperGES opportunity for their support in enabling the utilization of ESA's Large Diameter Centrifuge Facility.

16. Application to the Technical Consultation Session

Applicants must email the fully completed Expression of Interest document to UNOOSA by **30 July 2023 23:59 Central European Summer Time (CEST, UTC+2)** to the following address:

unoosa-access-to-space@un.org

UNOOSA and ESA will then evaluate each expression of interest document. UNOOSA will notify applicants for the coordination of the technical consultation session.

17. Application to the Programme

Applicants must email the fully completed application documents including the Letter of Endorsement from the head of their entity (Document 1) and **HyperGES Application Form** (Document 2) to UNOOSA by **12 November 2023 23:59 Central European Time (CET, UTC+1)** to the following address:

unoosa-access-to-space@un.org

In the email, applying entities are requested to attach scanned PDF versions (.pdf) of both documents. Please note that the UNOOSA email account only accepts emails with a size limit of up to 10 megabytes. Submission of all necessary documents (Document 1 and Document 2) is mandatory.

Applicants are required to notify their country's permanent mission in Vienna ([Permanent Missions to the United Nations \(Vienna\) \(unodc.org\)](#)) of their application submission to UNOOSA. If they cannot locate the permanent mission's information in the above link, please refer to Geneva ([Member States | UN GENEVA](#)) or New York ([e-BlueBook \(unmeetings.org\)](#)).

At the discretion of UNOOSA or ESA, additional information may be requested, if necessary, to assist in evaluating the application. All award decisions are final and made at the sole discretion of UNOOSA and ESA and are not subject to challenge or review.

18. United Nations Privileges and Immunities

Nothing in or relating to this Announcement of Opportunity shall be deemed a waiver, express or implied, of any of the privileges and immunities of the United Nations, including its subsidiary organs.

19. Reference Documents

Applicants are required to refer to the following documents while preparing their applications and experiments:

1) LDC main features summary

https://esamultimedia.esa.int/docs/edu/Forms_Letters/SYT/LDC_summary.pdf

2) LDC Experimenter User Manual

https://esamultimedia.esa.int/docs/edu/LDC_Experimenter_User_manual_V.3_Rev.0_14-May-2019_ESA-TECMMG-MAN-014129.pdf

3) Technical constraints

https://www.esa.int/Education/Spin_Your_Thesis/Technical_constraints

4) Examples of past experiments

https://www.esa.int/Education/Spin_Your_Thesis/Examples_of_past_experiments

20. Additional Information

The latest information on HyperGES will be made available on the website of UNOOSA: https://www.unoosa.org/oosa/en/ourwork/access2space4all/HyperGES/HyperGES_Index.html

For further information regarding the Fellowship Programme and applications, please contact: unoosa-access-to-space@un.org