



Application Form

In response to the first Announcement of Opportunity

United Nations (UN) /European Space Agency (ESA) HyperGES Fellowship Programme

| | |
|-----------------------------------|---|
| Title of experiment project: | |
| Name of applying organization(s): | Please list in this column all names of applying organizations: 1) Name of organization 1; 2) Name of organization 2; 3) Name of organization 3. |
| Team leader name: | |
| Contact e-mail address: | |
| Contact mobile phone number: | |
| Contact fixed phone number: | |
| Contact postal address: | |
| Submission date (dd/mm/yyyy): | |

This template was provided by
United Nations Office for Outer Space Affairs
on 17 July 2019



Direction for the application form

This application form is designed for applicants to detail their experiment proposal in response to the Announcement of Opportunity (AO) under the United Nations/European Space Agency (ESA) Fellowship Programme on the Large Diameter Centrifuge (LDC) Hypergravity Experiment Series (HyperGES).

The experiment proposal should focus on the scientific and/or technology-related objectives of the project and on the technical details for the implementation of the experiment. In other words, participants are invited to explain what they intend to investigate and how they are going to implement their experiment.

Prior to completing this experiment proposal, teams should carry out some research of the scientific literature to see whether some work has already been done on the same topic or one that is similar. References to the literature are essential in order to demonstrate that teams are fully informed about the current status of research in this field.

The experiment proposal must also explain the relevance of hypergravity to the project and, more particularly, the relevance of using the Large Diameter Centrifuge as a means of achieving its objectives. It should be noted that this facility offers a range of hypergravity levels, from 1 to 20 g.

It is important that applicants explain in full detail how the proposed experiment is related to their syllabi. They should indicate which academic projects they are involved in and how their proposed experiment would be relevant to these projects. The text of the proposal should be intelligible to scientists of various fields and engineers with a general science background.

Before you submit your application, please ensure that you comply with the eligibility criteria of the programme, which is shown in the AO, and you have read the LDC Experimenter User Manual.

Please complete all the fields in this application form. Then send this document in Word and PDF format, and the Letter of Endorsements, as well as your financial support certificates to the United Nations Office for Outer Space Affairs, through the designated email requested in the AO.

Please use the standard Arial font in size of 10pt and line spacing of exact 12pt to complete this application.

Important note: Each section of this document provides detailed instructions. Applicants should refer to these instructions. Please click the formatting marks button ¶ (see below the button inside the red cycle) in the Microsoft Word ribbon “Home” tab to display or hide the instructions:



Checklist for application

Please go through these points before submitting your application

- ✓ All team members are eligible, and each section is properly filled
- ✓ Letter of Endorsement(s) from Institutions are provided
- ✓ Certificates for availability of financial resources are provided
- ✓ Signature of team leader is completed
- ✓ Send everything to UNOOSA



1. Abstract

Please summarise the whole project here, including: (1) information of the team (supervisor, student members, nationalities, universities), (2) what experiment you would like to perform, (3) the need for hypergravity, (4) the expected outcome and (5) its possible future applications. Maximum about 20 lines of text.

2. Team composition:

One applying team should consist of one academic supervisor as team leader (Prof./PhD) together with several students, who are all from Member States of the United Nations with particular attention to developing countries. This section provides 5 tables for 5 members including team leader. You could add additional members. However, only up to four team members, including supervisor, can be funded by UNOOSA and ESTEC, in which case the team leader shall indicate in the following tables the names of the four team members to be funded once their proposal is selected.

2.1 Team Leader (Team member 1)

| | |
|--|--|
| Title: | |
| Name (First, Middle, LAST): | |
| Gender: | |
| Birth date (dd/mm/yyyy): | |
| Nationality: | |
| Residence country: | |
| Email: | |
| Fixed phone number: | |
| Mobile phone number: | |
| Name of organization (university/institution name, department, city, country): | |
| Research area: | |
| To be funded by UNOOSA and ESA/ESTEC (Yes), or self-funded (No): | |

Mini-CV:

Please fill in below your brief CV (e.g., involvement in the field of space, research and/education in microgravity or hypergravity study, etc). Maximum 5 lines of text.

2.2 Student-1 (Team member 2)

| | |
|--|--|
| Name (team leader): | |
| Gender: | |
| Birth date (dd/mm/yyyy): | |
| Nationality: | |
| Residence country: | |
| Email: | |
| Fixed phone number: | |
| Mobile phone number: | |
| Studies (university Name, department, university city, country): | |
| Final degree to be obtained from current studies: | |



| | |
|--|--|
| Starting date of current studies (dd/mm/yyyy): | |
| Expected completion date of current studies (dd/mm/yyyy): | |
| Further studies after current studies: | |
| Title of studies and topic (e.g. Mechanical Engineering, Physical Sciences, etc) | |
| Subject of thesis if applicable | |
| Involvement into syllabus (How is the experiment connected to your syllabus?) | |
| To be funded by UNOOSA and ESA/ESTEC (Yes), or self-funded (No): | |

Mini-CV:

Please fill in below your brief CV (e.g. involvement in the field of space, extra-curricular activities, past diplomas, etc.). Maximum 5 lines of text.

2.3 Student-2 (Team member 3)

| | |
|--|--|
| Name (team leader): | |
| Gender: | |
| Birth date (dd/mm/yyyy): | |
| Nationality: | |
| Residence country: | |
| Email: | |
| Fixed phone number: | |
| Mobile phone number: | |
| Studies (university Name, department, university city, country): | |
| Final degree to be obtained from current studies: | |
| Starting date of current studies (dd/mm/yyyy): | |
| Expected completion date of current studies (dd/mm/yyyy): | |
| Further studies after current studies: | |
| Title of studies and topic (e.g. Mechanical Engineering, Physical Sciences, etc) | |
| Subject of thesis if applicable | |
| Involvement into syllabus (How is the experiment connected to your syllabus?) | |
| To be funded by UNOOSA and ESA/ESTEC (Yes), or self-funded (No): | |

Mini-CV

Please fill in below your brief CV (e.g. involvement in the field of space, extra-curricular activities, past diplomas, etc.). Maximum 5 lines of text.

2.4 Student-3 (Team member 4)

| | |
|--------------------------|--|
| Name (team leader): | |
| Gender: | |
| Birth date (dd/mm/yyyy): | |
| Nationality: | |



| | |
|--|--|
| Residence country: | |
| Email: | |
| Fixed phone number: | |
| Mobile phone number: | |
| Studies (university Name, department, university city, country): | |
| Final degree to be obtained from current studies: | |
| Starting date of current studies (dd/mm/yyyy): | |
| Expected completion date of current studies (dd/mm/yyyy): | |
| Further studies after current studies: | |
| Title of studies and topic (e.g. Mechanical Engineering, Physical Sciences, etc) | |
| Subject of thesis if applicable | |
| Involvement into syllabus (How is the experiment connected to your syllabus?) | |
| To be funded by UNOOSA and ESA/ESTEC (Yes), or self-funded (No): | |

Mini-CV

Please fill in below your brief CV (e.g. involvement in the field of space, extra-curricular activities, past diplomas, etc.). Maximum 5 lines of text.

2.5 Student-4 (Team member 5)

| | |
|--|--|
| Name (team leader): | |
| Gender: | |
| Birth date (dd/mm/yyyy): | |
| Nationality: | |
| Residence country: | |
| Email: | |
| Fixed phone number: | |
| Mobile phone number: | |
| Studies (university Name, department, university city, country): | |
| Final degree to be obtained from current studies: | |
| Starting date of current studies (dd/mm/yyyy): | |
| Expected completion date of current studies (dd/mm/yyyy): | |
| Further studies after current studies: | |
| Title of studies and topic (e.g. Mechanical Engineering, Physical Sciences, etc) | |
| Subject of thesis if applicable | |
| Involvement into syllabus (How is the experiment connected to your syllabus?) | |
| To be funded by UNOOSA and ESA/ESTEC (Yes), or self-funded (No): | |

Mini-CV:

Please fill in below your brief CV (e.g. involvement in the field of space, extra-curricular activities, past diplomas, etc.). Maximum 5 lines of text.



3. Scientific background and objective(s) of the project

3.1 What are the scientific objectives of your experiment?

You can use figures and tables in this section to better explain the scientific objectives. You should explain why this experiment is of importance and how it will fill the lack of literature, or how this might have industrial applications. Maximum 3 pages including figures and tables. References should be all collected in one reference list in Section 9.

3.2 Where did you get the idea for this experiment?

e.g. research programme at your university, masters or PhD thesis of team member(s), already performed similar experiment, scientific publications, books, etc. Maximum about 10 lines. References should be all collected in one reference list in Section 9.

3.3 Has this subject been investigated in hypergravity or in microgravity in the past? Is there any existing literature on this subject?

Maximum about 15 lines. References should be all collected in one reference list in Section 9.

3.4 Is any research currently going on with respect to the topic addressed? What is the state of the research activities in that field? To what extent does this project use results obtained in the past?

Maximum about 15 lines. References should be all collected in one reference list in Section 9.

3.5 Why do you need to perform your experiment in hypergravity? Is the Large Diameter Centrifuge (LDC) suitable for this?

Maximum about 15 lines of text.

3.6 Have you used or thought about using other gravity-related research systems?

e.g. other centrifuge facilities, neutral buoyancy, clinostats, magnetic levitation, parabolic flight, drop tower, sounding rocket, sub-orbital facilities, space station, etc. Maximum about 10 lines of text.

3.7 What is the timescale of the physical / biological phenomena you would like to investigate?

Maximum about 5 lines of text.

4. Experiment procedure

4.1 How are you planning to fulfil the objective(s) of your experiment?

Maximum about 15 lines of text.

4.2 What variables are there in the experiment? Which of these will you keep constant? Which of the variable(s) you will modify and how?

Maximum about 10 lines of text.

4.3 How will you measure the variables you are interested in and what type of data will this generate?

Maximum about 10 lines of text.

4.4 Estimate the minimum number of hours of hypergravity you will need to perform your experiment.

Maximum about 3 lines of text.

4.5 Which level(s) of hypergravity would you expect for your experiment series (from 1 to 20 g)?

Describe the g-levels or g-profiles you would need for your experiment. Note that, if desired, the gravity can be varied, in the course of an experiment-run in the LDC. Maximum about 5 lines of text.

4.6 Do you have any requirements for the transition from one gravity level to another?

Identify the rate of changes between g-levels, if more than one levels are required, and identify its rationale. Maximum about 5 lines of text.

4.7 What is the expected outcome of your experiment? Do you expect sufficient measurements to draw statistically valid conclusions?

Maximum about 10 lines of text.

4.8 Write a preliminary schedule for your on-site integration/preparation, experiment series using the LDC, wrap up or first analysis after utilization of the LDC, as well as special needs (if applicable).

The LDC facility is part of the Life and Physical Sciences Instrumentation and Life Support Laboratory (LIS) at ESTEC. The use of LIS facilities (Laboratory space, and equipment) other than the LDC is permitted for on-site pre-experiment and on-site post-experiment activities. In each of the sub-sections (Section 4.8.1 to Section 4.8.4) below, please give respectively your preliminary schedule for your on-site pre-experiment activities, experiment series, and on-site post-experiment activities, as well as special needs if applicable, to the best of your ability.

4.8.1 On-site integration/preparation before using the LDC.

If you need time to prepare before your actual time in the LDC, please provide your schedule for the preparation in this section. Here you will need to specify when you plan to come to ESA, and detail the actions you will need to complete, in order to be prepared for the hypergravity runs in the LDC. Please make sure your planning for integration/preparation is within working days. Please also note that this time normally is for experiment related activities. It is not meant for completing experiment hardware. Your set-up should be completed and tested before you



come to ESA. In addition, please keep in mind that you will need to follow a brief safety presentation, of about 30 minutes, on the first day you start using the LDC.

4.8.2 Experiment execution using the LDC facility

Here you will need to give your preliminary planning for your runs in the LDC. Be as specific as possible, and also try to be realistic in your planning. Note that on the first day of your time in the LDC, you will need to allocate time for the installation of your experiment in the LDC. Please also reserve some time on the last day to unload your equipment from the LDC. Also leave sufficient time for data transfer (if needed). Please provide your experiment plan and scheduling in the table below, leaving at least either a morning free on the first day or an afternoon on the last day.

| Day: | Morning (9h-13h): (What to do) | Afternoon (14h-17h): (What to do) |
|--|---|--|
| Day 1: | | |
| Day 2: | | |
| Day 3: | | |
| Day 4: (in case the 4 th day is required) | | |

4.8.3 Wrap up or first analysis after use of the LDC.

Here you will specify your schedule, after your time in the LDC. As mentioned, other LIS facilities might be available for use after your time in the LDC. If you need these facilities in order to wrap up your experiment, please provide your scheduling here. Also identify the facilities required.

4.8.4 Specific needs (if applicable).

Please state here if you have specific needs for your experiment which do not match the above schedule. This can include, for example, extra hours on the LDC or running the experiment unattended overnight. Note that their feasibility will be discussed by the Review Board during the selection process.

5. Experiment set-up

Please refer to the LDC Experimenter User Manual in order to well describe your experiment set-up.

5.1 Describe the set-up you foresee for your experiment.

Maximum 2 pages including drawings.

5.2 Estimate the dimensions and the mass of your experiment.

Make a good estimation for each subsystem. Maximum about 3 lines of text.



5.3 Are there any safety issues involved in your experiment? Please provide a short risk assessment for all hardware in your experimental set-up.

Please consider the risks to the personnel, the risks to the LDC facilities, and the risks to the success of your experiment. Include what measures you will take to minimise these risks.

Maximum 1 page.

6. Organisation of your project

6.1 How will you organise / distribute all the work associated with this project within your team? Demonstrate that your planning covers the whole life-time of the project, from the completion of this document until the actual week of the experiment.

Maximum about 10 lines of text.

6.2 Do you have regular access to a laboratory to do scientific work/preparations and do you have access to a workshop to build your experiment?

Maximum about 5 lines of text.

6.3 Do you have all the material and equipment which are needed for your experiment? If not, what are you missing and estimate the time and cost required to obtain this material/equipment.

Maximum about 5 lines of text.

6.4 Will there be another organisation (university, sponsors, others) providing financial or in-kind support to you? If yes, then how and to what extent?

Maximum about 5 lines of text.

7. Academic

7.1 Please describe below how the project relates to the university syllabus of each of the team members. Cover aspects such as master or PhD thesis, university projects, compulsory modules etc. Will any/all team members obtain any official course credits from the participation in this activity?

Maximum about 20 lines

7.2 What are the benefits of this project for each of the team members, both on a personal basis and with respect to their university work? Which of the experimental results do they expect to include in their theses/projects?

Maximum about 20 lines of text.



7.3 If the expected results are achieved and statistically valid conclusions are drawn, will the results be of sufficient significance to be published in a scientific journal or presented at a conference?

Maximum about 5 lines of text.

8. Other

If you think an extra description is necessary and this extra description does not fit in any sections above, please explain it here in more details. Please include only information that you consider essential for the Review Board to understand your proposal.

9. Literature

Please list all your literature, which you cite in the document here. Showing a good literature study is an important part of the application. Listing in alphabetic (primary) and chronological (secondary) order.

10. Endorsement and certificate

10.1 Endorsements by institutions

Please provide all the Letter of Endorsement(s) issued by the institutions of the team members, on which appropriate signatures and/or stamps/seals are required. The format of the letter can be defined by the institution. These Letter of Endorsement(s) can be combined with this document as annex(es) or in separate PDF files.

10.2 Financial support certificate

Please provide certificates demonstrating the availability of financial resources to support the development, preparation, transportation, and shipping service for your experiment. These certificates can be combined with this document as annex(es) or in separate PDF files.

10.3 Endorsement by team leader

By signing this application, I, as the Team Leader, confirmed that I agreed on the composition of the team, and all statements in our application are true, correct and complete. Once selected, our organizations(s) and team will comply with the terms and conditions stipulated in this Announcement of Opportunity, and I will take care of the development process of the team, and bear responsibility for the implementation of the experiment:



| Team Leader name in print | Team Leader Signature | Place | Date (dd-mm-yyyy) |
|------------------------------|-----------------------|-------|-------------------|
|------------------------------|-----------------------|-------|-------------------|

Annex 1: Letter of Endorsement(s)

Annex 2: Certificate(s) of Financial Supports