UNITED NATIONS
Office for Outer Space Affairs

Announcement of Opportunity

United Nations Access to Space for All initiative

Fellowship Programme for "Drop Tower Experiment Series (DropTES)"

14 November 2022

1. Thematic Area: Access to Space for All - Hypergravity/Microgravity Track

2. Title: Fellowship Programme for Drop Tower Experiment Series (DropTES)

3. Subject: Realization of an own scientific or technological experiment under short-term conditions of weightlessness at the Bremen Drop Tower/GraviTower Bremen Pro in Germany.

4. Hosting Institution: Center of Applied Space Technology and Microgravity (ZARM), University of Bremen, Germany

5. Supporting Agency: German Aerospace Center (DLR) - German Space Agency

6. Executing Agency: United Nations Office for Outer Space Affairs (UNOOSA)

7. Duration: November 2022 – January 2024

8. Deadline for Applications: Completed application forms must be submitted to the United Nations Office for Outer Space Affairs (UNOOSA) **by 22 January 2023 at 23:59 CET**. Applicants will be notified of the outcome of the application by February 2022.

9. Drop Tower Experiment Series: The drop tower experiment series consists of five drops or catapult launches in the Bremen Drop Tower or half-days in the GraviTower Bremen Pro in Germany within one week. Each experiment series is accompanied by an on-site experiment integration taking place one week prior to the series week.

10. Expected Profile of Applicants: Heads of government organizations, research institutes, universities, other public and non-for-profit organizations.

11. Number of Selected Applicants: One team leader with up to four team members who are from Member States of the United Nations. The teams may be larger, however the financial support listed in section 16 is applicable to the above only.

12. Language of the Programme: English

13. Brief Programme Description:

The United Nations Office for Outer Space Affairs (UNOOSA) is pleased to announce the Fellowship Programme "Drop Tower Experiment Series" as part of the Access to Space for All initiative under the United Nations Programme on Space Applications and in close cooperation with the Center of Applied Space Technology and Microgravity (ZARM) and the German Aerospace Center (DLR) - German Space Agency.

ZARM is a scientific institute at the University of Bremen in Germany with a focus on research under space conditions and questions related to space technology. With a height of 146 meters, the Bremen Drop Tower is the predominant laboratory at ZARM and also the only drop tower of its class in Europe. It has acquired international renown during the last decades for offering experiments under the condition of weightlessness of excellent quality (10-6 g0). Moreover, scientists and engineers from all over the world benefit from the longest microgravity experiment duration on Earth (9.3 seconds with ZARM's world-wide unique catapult system; alternatively 4.7 seconds with the standard drop mode) - available up to three times a day. With ZARM's new GraviTower Bremen Pro, experiments can be performed up to 960 times a day, which are not limited to microgravity (max. 2.5 seconds, < 10-4 g0). A partial-gravity option is soon available, e.g., to realize Moon and Mars gravity levels for experimenting in extraterrestrial conditions. However, the partial-gravity option is not available in the context of this Announcement of Opportunity and only microgravity experiments can be carried out.

An experimental investigation in an environment of microgravity offers the opportunity to develop new perspectives and technologies for a wide range of research fields like gravity-relevant phenomena in fundamental physics, astrophysics, and biology and also applied sciences like fluid dynamics, combustion, chemistry, and material sciences. For the preparation of a future space mission, dedicated technology tests in microgravity are often part of a drop tower experiment series as well.

The target groups are teams from Member States of the United Nations fulfilling the eligibility criteria. Please note that the DropTES Fellowship Programme is aimed at contributing to the promotion of space education and research in microgravity around the world, particularly for the enhancement of relevant capacity-building activities in developing countries.

14. Programme Outline and Schedule:

UNOOSA offers the selected research team the opportunity to conduct one drop tower experiment series at ZARM consisting of five drops or catapult launches in the Bremen Drop Tower or half-days in the GraviTower Bremen Pro to be conducted within one week.

Timeline of the Application and Selection Process:

Deadline for Application Submission: **22 January 2023 at 23:59 CET**

Selection of Applicants: **February 2023**

Timeline of the Experimentation Process:

Preparation of the Drop Tower Experiment: **March 2023 - 4th Quarter 2023**

Drop Tower Experiment Series in Bremen: **4th Quarter or earlier 2023**

(including experiment integration together with the selected research team on site)

Submission of the Final Experiment Report: **31 January 2024**

15. Requirements for Participants

A) Eligibility Criteria

This Opportunity is open to entities located in the Member States of the United Nations. The following are eligible to apply for this Opportunity:

- Government organizations, research institutes, universities, other public and non-for-profit organizations

Entities located in countries which have not conducted research under space conditions at the time of the opening of this application are particularly encouraged to apply.

Each team should consist of up to four team members who must be endorsed by the head of their institution and shall contain a team leader responsible for all matters related to the application. The teams may be larger, however the financial support listed in section 16 is applicable to the above only. The teams could consist of several entities, with one leading entity that takes responsibility.

The final number of team members who will participate in the experiment series on site at the drop tower facility depends strictly on the requirements of the experiment and is subject to approval by the Selection Board of the DropTES Fellowship Programme. The Board reserves the right to change or limit the team size if considered necessary.

Changes to the composition of the team are NOT allowed once the application has been submitted. If for exceptional reasons changes are absolutely necessary, they will be subject to the approval of the Selection Board. Priority will be given to teams that have not previously participated in an experiment series at the Bremen Drop Tower/GraviTower Bremen Pro and/or research projects that have never been conducted at the Bremen Drop Tower/GraviTower Bremen Pro.

Each team applying must be supported by a team leader, whose role will be to supervise the work of the team members. This person must belong to the same entity as at least one of the team members and will be expected to endorse the entire application and development process of the team and bear responsibility for the execution of the experiment.

Applicants must be able to show that they have their respective entities' support through a Letter of Endorsement from their entities' directors.

The balanced participation of women and men in teams as well as supervising positions is encouraged.

B) Selection Criteria

The Selection Board will consist of team members from UNOOSA, ZARM, and DLR - German Space Agency. The Board will assess all applications against the following criteria:

(i) the scientific and/or technological value of the proposed experiment,
(ii) the relevance of microgravity in the proposed experiment,
(iii) the relevance of the drop tower utilisation in the proposed experiment,
(iv) the general feasibility of the proposed experimental set-up and procedure,
(v) the organisation realising the planned research project,
(vi) the availability of financial resources to support development, preparation, transportation, and shipping experiment,
(vii) the overall presentation of the experiment proposal,
(viii) the communication and dissemination plan,
(ix) inclusiveness (e.g. in case of proposals with the same score, the shares of men and women in the teams will be compared. The proposal with higher participation of women will rank higher), and
(x) the link between the project in the Sustainable Development Goals.

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

C) Requirements for Experimentation

In terms of the experimentation and the preparation of a drop tower experiment / the experimental setup it is mandatory to refer to ZARM's Bremen Drop Tower - Payload User's Guide, which is downloadable at **https://www.zarm.uni-bremen.de/en/drop-tower/experiment-support.html.**

Further general information on the Bremen Drop Tower - e.g. "How does the drop tower work?" or "What is the catapult system?" - and a detailed overview on former drop tower experiments / projects are given at **https://www.zarm.uni-bremen.de/en/drop-tower/general-information.html.**

D) Schedule of the DropTES Fellowship Programme

February 2023:

- Selection of the awardee by the Selection Board
- ZARM expert contacts the selected research team (SRT) to initiate the experiment preparation once the team confirms its participation.

March 2023 - 4th Quarter 2023:

- Experiment preparation in close cooperation with ZARM experts
- Submission of the first Experiment Progress Report (EPR) by SRT in May at the latest
- Critical Design Review (CDR) by ZARM experts soon afterwards
- Submission of the second EPR by SRT in September at the latest

- Transfer of the experiment and further required equipment to the Bremen Drop Tower in Germany by SRT in the 4th quarter or earlier

4th Quarter 2023:

- One week of experiment integration at the Bremen Drop Tower/GraviTower Pro prior to the series week
- One week drop tower experiment series with five drops or catapult launches at the Bremen Drop Tower or hald-days at the GraviTower Pro. The final dates of the experiment series will be defined together with SRT.

31 January 2024:

- Submission of the Final Experiment Report (FER) by SRT

SRT shall update the UNOOSA and ZARM with any publication of results associated with the drop tower experiment series, including, but not limited to, PhD, Master thesis, publications in journals, proceedings and presentation of results at conferences or workshops.

16. Financial Support

The selected research team will be offered financial support exclusively for travel purposes. This may include the provision of most economical economy class round-trip air tickets between the participants' international airport of departure and Bremen. En-route expenses or any changes made to the air tickets must be the responsibility of the participants.

In this context, it has to be noted that UNOOSA will not bear the expenses for the preparation, transport and shipping as well as insurance of the experiment. Funding to cover these costs must be obtained separately, through private means or through national or international institutions. Applicants and their respective entities are therefore strongly encouraged to find additional sources of sponsorship.

The five drops or catapult launches at the Bremen Drop Tower or half-days at the GraviTower Bremen Pro are sponsored by DLR - German Space Agency. The technical support provided by ZARM is included in those sponsored drops or catapult launches at the Bremen Drop Tower or half-days at the GraviTower Bremen Pro and therefore free of charge.

For the stay of the team in Bremen, ZARM will provide free of charge its on-site apartment at the drop tower facility, which has two separate rooms with two beds in each room, a common bathroom, and a common kitchen. The ZARM apartment can accommodate up to four people.

The team leader will be accommodated in a nearby hotel, which shall be basically located in walking distance from the drop tower facility. Accommodation expenses for the stay of the team leader will be covered by UNOOSA.

17. Application to the Programme:

The **fully completed application documents of the letter of endorsement from the head of the entity** (Document 1) and **DropTES Mission Application** (Document 2) must be submitted to UNOOSA by 22 January 2023 23:59 CET by email to the following address:

unoosa-access-to-space@un.org

In the email, applying entities are requested to attach scanned copies of Document 1 and the cover page of Document 2 as pdf-file (.pdf) and the entire document of Document 2 in pdf. Please note that the UNOOSA email account only accepts emails with a size limit of up to 10 M bytes. Submission of all necessary documents (Document 1 and Document 2) is mandatory.

Applicants are required to inform of the submission of their application to UNOOSA to the permanent mission of their country in Vienna (Permanent Missions to the United Nations (Vienna) (unodc.org)), in case it is not available, please refer to Geneva (Member States | UN GENEVA) or New York (e-BlueBook (unmeetings.org)).

UNOOSA and ZARM will then proceed to evaluate each submission. At UNOOSA's, ZARM's, or DLR - German Space Agency's sole discretion, additional information may be requested from applicants, if necessary, to assist in the evaluation of an application. Selected applicants will then be notified with the results of the selection process. All awards are final and made at the sole discretion of UNOOSA, ZARM, and DLR - German Space Agency not subject to challenge or review and, are contingent on the successful applicant's agreement to the terms and conditions of the donation agreement of UNOOSA, ZARM, and DLR - German Space Agency.

18. Additional Information:

The latest information on the DropTES will be made available on the website of UNOOSA:

https://www.unoosa.org/oosa/en/ourwork/access2space4all/DropTES/DropTES_Index.html

For further information regarding the Fellowship Programme and applications, please contact:

unoosa-access-to-space@un.org