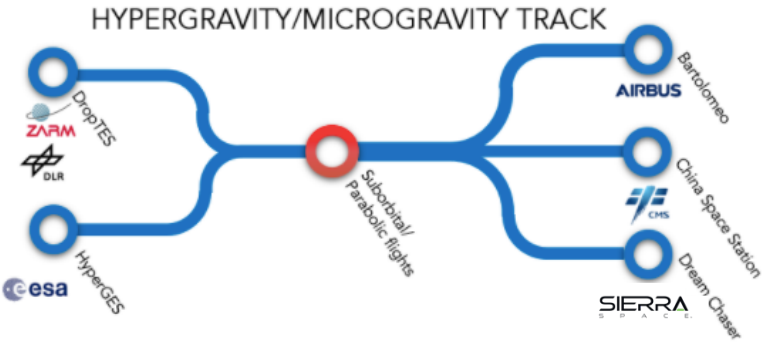
UNOOSA Webinar Series on Hypergravity/Microgravity

March 2021 (Updated June 15 2021)

Under the Access to Space for All Initiative, the United Nations Office for Outer Space Affairs (UNOOSA) and its partners provide hands on opportunities to develop capacity to access space. The initiative is run over a collection of partnerships that are in turn divided into different tracks, categorized by type of space-related activities. In the Hypergravity/Microgravity Track, we provide opportunities to conduct experiments in hypergravity and microgravity environments through a range of programmes, including; DropTES with the Center of Applied Space Technology and Microgravity (ZARM) and the German Aerospace Center (DLR) Space Administration utilizing the Bremen Drop Tower; HyperGES with the European Space Agency (ESA) utilizing the Large Diameter Centrifuge Facility; Bartolomeo with Airbus utilizing the Columbus module Bartolomeo external platform of the International Space Station (ISS); China Space Station with the China Manned Space Agency (CMSA) utilizing both internal and external platforms of the to-be-built China Space Station; and the Dream Chaser® with Sierra Space utilizing the Dream Chaser® space vehicle.



UNOOSA, along with its partners, has organized a series of webinars, where we will focus on promoting and building capacity to develop and test various experiments in these special modified gravity environments. The event will give participants technical insights and knowledge on where to begin/who to contact and how to further their endeavors for R&D in this exciting field.

Hypergravity (where the force of gravity exceeds that on the surface of the Earth) and microgravity (very small gravity forces, like on the ISS) conditions can be used to advance research in biology, medicine, material science and fluid dynamics. Conducting experiments in a hypergravity or microgravity environment represents an achievable entry point to acquire new knowledge and technology. Various tests can be conducted in many different research fields such as biology, physiology, pharmacology, material science, fluid dynamics, technology demonstration, the list goes on.

In this series of webinars, we will invite global experts in this field who will introduce and answer your questions about;

- the fundamentals, special characteristics, and advantages of Hypergravity/Microgravity environment
- overview of what type or research can be done in Hypergravity/Microgravity and its applications
- overview of available modified gravity platforms: areas of application and benefits
- how to develop an experiment to be conducted in Hypergravity/Microgravity (including needed tests, procedures)
- overview of the available experiment opportunities and existing networks/experts

Details of the webinar series:

1. The schedule and contents of the webinars are as attached in the Annex. Details are subject to change and all information will be updated to the UNOOSA website.
2. The webinars will be conducted on Microsoft Teams. They will be recorded and posted on the UNOOSA website along with the presentation material.
3. To reach different time zones, we will have 2 sessions of each webinar, one from 10:30 CEST and one from 16:30 CEST. Speakers will differ in each session.
4. Please register before **17:00CEST of the day before the session** you want to attend or the link will not be sent on time. If you have already registered once, **you do not need to register again**. The link for the webinars are the SAME for ALL WEBINARS. If you have received the link once, you can use it repeatedly.
5. The target audience of the webinars are students, professors, researchers, scientists and engineers from various fields who are interested in R&D in hypergravity/microgravity environments and also to representatives of countries who are interested in promoting these opportunities, information and knowledge to their respective countries/regions.

We look forward to having many people join in and engage with us at these interactive webinars to unpack the exciting world of scientific endeavors in the field of space!

Annex

The speakers will be our partners in the Access to Space for All Initiative, governmental partners that have expressed interest in contributing to the Initiative, and experts in the field of Hypergravity/Microgravity research.

Webinar Title	**Learners will be able to**	**Duration & Speaker**	**Date**
Series of Webinars for the Hypergravity/Microgravity Track (1) Introduction to Hypergravity/Microgravity and Overview of Activities of the Existing Networks - ELGRA/ASGSR/JASMA and their student branches	- Understand what the Access to Space for All Initiative is and why the Hypergravity/Microgravity Track is organized and what kind of opportunities are provided by the Office.	15min UNOOSA	Wednesday 21 April, 2021 10:30CEST/ 16:30CEST
	- Understand what Hypergravity/Microgravity is, what type or research can be done and its possible applications	20-30min 10:30CEST: Jack Van Loon, Cooperate Scientist, ESA-ESTEC-TEC-MMG Lab, European Space Agency (ESA) 16:30CEST: Sirisha Bandla, Vice President, Government Affairs, Virgin Galactic	
	- Understand what kind of associations and organizations exist, their various activities - Reach out to the network for information/advice/collaboration	<u>15min each</u> Gale Allen & Elizabeth Talburt, American Society for Gravitational and Space Research (ASGSR) Ricard González-Cinca & Jérémy Rabineau, European Low Gravity Research Association (ELGRA) Osamu Fujita, Japan Society of Microgravity Application (JASMA)	

Series of Webinars for the Hypergravity/Microgravity Track (2) Life Science Part 1: Biology	- Understand what type of biology research and development can be conducted in Hypergravity/Microgravity environments and its applications and examples	5min UNOOSA <u>45min- Professional Talk</u> 10:30CEST: Mian LONG, Professor, Institute of Mechanics, Chinese Academy of Sciences (IMCAS) 16:30CEST: Sharmila Bhattacharya, Program Scientist for Space Biology, Biological and Physical Sciences Division, Science Mission Directorate, NASA <u>15min- Student Talk</u> 10:30CEST: *10 min x 2 talks: Miguel Ferreira, Department of Mechanical, Aerospace and Civil Engineering, School	Wednesday 28 April, 2021 10:30CEST/ 16:30CEST

		of Engineering, Faculty of Science and Engineering, The University of Manchester/Ferreira de Silva Miranda Silvana & Eline Radstake, Belgian Nucelar Research Center 16:30CEST: Kyle Morgenstein, University of Texas at Austin	
Series of Webinars for the Hypergravity/Microgravity Track (3) Life Science Part 2: Physiology	- Understand what type of physiology research and development can be conducted in Hypergravity/Microgravity environments and its applications and examples	5min UNOOSA <u>45min- Professional Talk</u> 10:30CEST: Elisa Ferre, Senior Lecturer, Department of Psychology, University of London 16:30CEST: Dr. Karen Ocorr, SBP Medical Discovery Institute <u>15min- Student Talk</u> 10:30CEST: Jérémy Rabineau, Labratory of Physics and Physiology, Université libre de Bruxelles 16:30CEST: Amalia Luthens, University of Colorado Boulder	Wednesday 5 May, 2021 10:30CEST/ 16:30CEST
Series of Webinars for the Hypergravity/Microgravity Track (4) Life Science Part 3: Pharmacology	- Understand what type of pharmacology research and development can be conducted in Hypergravity/Microgravity environments and its applications and examples	5min UNOOSA <u>45min- Professional Talk</u> 10:30CEST: Li Shean Toh, MPharm PhD FHEA, Division of Pharmacy Practice and Policy, School of Pharmacy University of Nottingham 16:30CEST: Anjali Gupta, PhD, Axiom Space <u>15min- Student Talk</u> 10:30CEST: Audrey Derobertmasure, Assitance Publique hopitaux de Paris, Universite de Paris 16:30CEST: Tejasvi Shivakumar, PhD student, Astromedicine and Astropharmacy, School of Pharmacy, University of Nottingham	Wednesday 12 May, 2021 10:30CEST/ 16:30CEST
Series of Webinars for the Hypergravity/Microgravity Track (5) Physical Science Part 1: Material Science	- Understand what type of material science research and development can be conducted in Hypergravity/Microgravity	5min UNOOSA <u>45min- Professional Talk</u> 10:30CEST: Yoshinori Furukawa, Professor, Hokkaido University &	Wednesday 19 May, 2021 10:30CEST/ 16:30CEST

	environments and its applications and examples	Masahito Watanabe, Professor, Gakushuin University 16:30CEST: David Browne, Professor, School of Mechanical & Materials Engineering, University College Dublin <u>15min- Student Talk</u> 10:30CEST: Malica Schmidt, University College London, Guest Researcher at DLR 16:30CEST *10 min x 2 talks: Jannatun Nawer, Tufts University Quentin Champdoizeau, Advanced Materials and Processing Laboratory, University of Alberta	
Series of Webinars for the Hypergravity/Microgravity Track (6) Physical Science Part 2: Fluid Dynamics	- Understand what type of fluid dynamics research and development can be conducted in Hypergravity/Microgravity environments and its applications and examples	5min UNOOSA <u>45min- Professional Talk</u> 10:30CEST: Ryoji Imai, Professor, Muroran Institute of Technology & Masato Mikami, Professor, Yamaguchi University 16:30CEST: Divya Panchanathan, PhD, Axiom Space <u>15min- Student Talk</u> 10:30CEST: Antonio José García Salecedo, Politecnico de Milano 16:30CEST: Álvaro Romero Calvo, University of Colorado Boulder	Wednesday 26 May, 2021 10:30CEST/ 16:30CEST
Series of Webinars for the Hypergravity/Microgravity Track (7) Technology Demonstration	- Understand what type of technology demonstration (3D printing, robotics etc.) research and development can be conducted in Hypergravity/Microgravity environments and its applications and examples	5min UNOOSA <u>45min- Professional Talk</u> 10:30CEST: Xuzong CHEN, Professor, Director of Institute of Quantum Electronics, Peking University 16:30CEST: Hilde Stenuit, Space Applications Services, ICE Cubes Service <u>15min- Student Talk</u> 10:30CEST: Olfa D'Angelo, Institute of Material Science in Space, DLR 16:30CEST: *10 min x 2 talks: Álvaro Romero Calvo,	Wednesday 2 June, 2021 10:30CEST/ 16:30CEST

		University of Colorado Boulder Jaroslav Hruby, Quantum Photonics Laboratory, Hasselt University	
Series of Webinars for the Hypergravity/Microgravity Track (8) Ground and Orbit Opportunities provided by OOSA +**Dedicated Q&A for DropTES 8th round** (after the main session)	- Understand what type of research can be done in DropTES, HyperGES, Bartolomeo, China Space Station(CSS) and Dream Chaser® and its applications - Understand the benefits of testing at the Bremen Drop Tower, Large Diameter Centrifuge Facility, the ISS Bartolomeo platform, China Space Station and Dream Chaser ® space vehicle. - Understand the technical requirements to take part in DropTES, HyperGES, Bartolomeo, China Space Station and Dream Chaser ® and its applications	5min UNOOSA 15min per programme DropTES- Thorben Könemann, Center of Applied Space Technology and Microgravity (ZARM) HyperGES- Jack Van Loon, Cooperate Scientist, ESA-ESTEC-TEC-MMG Lab, European Space Agency (ESA) Bartolomeo- (10:30CEST) Yannick Jégo, Bartolomeo Business Development and Sales Manager (16:30CEST) Per-Christian Steimle, Bartolomeo Programme Manager Airbus Defence and Space, Bremen CSS- Yang YANG, Director of International Cooperation Center, Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences(CSU,CAS) Dream Chaser ®- Christopher Allison, Senior System Engineer, Mission Management, Sierra Space	Wednesday 9 June, 2021 10:30CEST/ 16:30CEST
	- Understand the detailed information needed to apply to the 8th round of DropTES (open until 30 June!)	15min: Details about Announcement of Opportunity and Application Form: UNOOSA Q&A	
Series of Webinars for the Hypergravity/Microgravity Track (9) Other Opportunities and Regional Activities	- Understand the different Hypergravity/Microgravity research and activities conducted in each region	15min per speaker from space agency/non-governmental organization/industry Jia Zhouxia, Senior Engineer in Engineering Thermophysics, Beijing Institute of Structure & Environment Engineering Rajeev Senan, Associate Director, Space	Wednesday 16 June, 2021 10:30CEST/ 16:30CEST

		Infrastructure, Indian Space Research Organization (ISRO) Masaki Shirakawa, JEM Utilization Center, Human Spaceflight Mission Directorate, Japan Aerospace Exploration Agency (JAXA) Gunnar Florin, Science Services BDD, Swedish Space Corporation JD Polk, Chief Health and Medical Officer, NASA	