



**United Nations/Mohammed Bin Rashid Space Centre Cooperation Programme
on Payload Hosting Initiative or “PHI”
First Round**

Announcement of Opportunity

25 January 2022

- 1. Thematic Area:** Access to Space for All – Satellite Development Track
- 2. Title:** United Nations/Mohammed Bin Rashid Space Centre Cooperation Programme on Payload Hosting Initiative or “PHI”
- 3. Implementing Organizations:** United Nations Office for Outer Space Affairs (OOSA) and Mohammed Bin Rashid Space Centre (MBRSC)
- 4. Deadline for Applications:** Fully completed application forms must be submitted to the United Nations Office for Outer Space Affairs 17 April 2022. Applicants will be notified of the outcome of their application by July 2022.
- 5. Number of Opportunities for Hosting a Payload:** For each AO, a maximum volume of 5U is available. Depending on the size and configuration of the proposals, more than one payload can be selected.
- 6. Language of the Programme:** English
- 7. Brief Programme Description:**

The United Nations Office for Outer Space Affairs (OOSA) promotes international cooperation and capacity-building in the area of space technology and its applications in the world, especially in developing countries, within the framework of the United Nations Programme on Space Applications.

OOSA launched the Basic Space Technology Initiative (BSTI) in 2009 with the mission of enhancing access to space application tools for sustainable development through building capacity in basic space technology, and in 2010 OOSA launched the Human Space Technology Initiative (HSTI) with the objective to promote international cooperation in human spaceflight and space exploration-related activities. In 2018, OOSA launched the Access to Space for All Initiative aiming at building capacity through hands on opportunities in space technology and research such as micro- and hypergravity experiments, space missions, and human spaceflight-related activities.

The Mohammed Bin Rashid Space Centre, founded in 2006, is home to the UAE National Space Programme. The Centre builds and operates earth observation satellites, offering imaging and data analysis services to clients around the world. It has launched the DubaiSat-1, DubaiSat-2 and the KhalifaSat, which was developed 100% in the UAE by a team of highly qualified Emirati engineers. The Centre also launched the Emirates Mars Mission “Hope Probe”, which became the first Arab interplanetary mission to reach the Martian orbit on 9 February 2021. The Hope Probe will gather key scientific data about Mars’ atmosphere. Recently, the Centre announced the launch of the Emirates Lunar Mission, the first Emirati and Arab mission to explore the Moon and plans to develop MBZ-SAT, the most advanced commercial satellite in

the region in the field of high-resolution satellite imagery. Furthermore, MBRSC hosted the 72nd edition of the International Astronautical Congress (IAC) 2021, the world’s premier space event, in Dubai. The UAE is the first Arab nation to host the IAC since its establishment in 1950. The Centre is also responsible for the UAE Astronaut Programme, which saw the launch of Hazzaa AlMansoori, the first Emirati Astronaut, to the International Space Station on a scientific mission on 25th September 2019, and the development of the Mars 2117 Programme to build a human colony on Mars.

MBRSC launched the Payload Hosting Initiative (PHI) in 2021. This initiative provides a 12U modular satellite platform that foster innovation in space technologies sector and ensure the experience exchange between governmental entities, universities and start-up companies. It will consist of a yearly launch of 1 to 2 satellite missions in which MBRSC will call for these entities to load their innovative systems and payload and launch them on these satellites. PHI considered as the first payload hosting initiative managed by MBRSC. It started with the goal to design and build a modular cost-effective platform for small satellites that can host multi-purpose innovative payloads in short period of time. MBRSC kicked off the PHI-demo programme in early 2022 by giving the opportunity for start-up companies to host their innovative technologies. PHI-demo is a technology demonstration programme where MBRSC aims to demonstrate a new modular bus that designed in-house by MBRSC engineers. PHI-demo is hosting IoT communication payload using 5G technology. The data will be shared and demonstrated to different entities in ground. Also, PHI-demo is hosting a water-fueled propulsion system, a new technology expected to be safe, green and efficient for small satellites. Building upon the experience gained with PHI-demo, planned to be launched end of 2022 (depending on launcher availability), PHI-1 is now offered through the Access to Space for All initiative of OOSA.

Both OOSA and MBRSC are pleased to announce a joint cooperation programme that provides the opportunity to host payloads through PHI. In line with the mission and objectives of Access to Space for All Initiative, and MBRSC demonstrated commitment to promoting space science and technology in developing countries, this cooperation programme entitled PHI is intended to contribute to broadening space activities and applications and to capacity-building in space science and technology.

8. Scope of Opportunity for Hosting a Payload:

Through this Announcement of Opportunity, OOSA and MBRSC undertake to provide the opportunity of hosting a payload on PHI-1 mission and select the hosted payloads. MBRSC will provide 12U spacecraft platform, launch and ground station for PHI-1 mission. On the other hand, the selected entities will provide tested payloads to MBRSC ready for integration with the spacecraft and participate with MBRSC in Flight Model Assembly, Integration and Testing (FM AIT) activities. A **maximum volume of 5U** is available through this opportunity. Depending on the size and configuration of the proposals, more than one payload can be selected

The payloads should demonstrate technologies that are at Technology Readiness Level 6 (TRL 6) and above.

9. Programme Schedule and Milestone

(A) Programme Schedule

Application Submission	17 April 2022
Selection and notification of shortlisted applicants	15 May 2022
Assessment of additional information and selection (if needed)	12 June 2022

Selection and notification of awardee(s)	July 2022 (T ₀)
Handover	May 2023
Launch	Approximately T ₀ +13 months

It must be noted that;

- UNOOSA and MBRSC may ask for further information on the applications submitted in writing or other means. The applicants must cooperate with UNOOSA and MBRSC on this matter.

The handover of the Payload to MBRSC must be completed by May 2023. MBRSC might terminate the contract if the selected team(s) is not able to meet the handover date.

(B) Programme Milestone

1) Webinars

- MBRSC and UNOOSA may organize a webinar to provide indications to participants for the preparation of the application form and to guide the development process.
- Participation in the preparatory webinars is recommended.

2) Selection of successful applicants and signing of an agreement (contract)

- The number of the proposals pre-selected will depend on the volume occupied (a maximum volume of 5U is offered by this opportunity). The “short listed entity(ies)” will be notified by 15 May 2022
- The shortlisted entities should submit additional documentation by 31 May 2022.
- Signing of legal arrangements between MBRSC and the Selected Entity(ies).
- The Selected Entity(ies) among the short-listed entities will be notified by July 2022.

3) Technical coordination

- Technical coordination in preparation of the mission between MBRSC and the selected entities.

4) Technical milestones

- MBRSC will include detailed project schedule in the contract that will be signed with the selected entities.
- The developer of the payload will follow the spirit of the project development cycle and reviews defined by NASA Systems Engineering Handbook Revision 2, NASA/SP-2007-6105, deviations need to be agreed with MBRSC during development ([NASA Systems Engineering Handbook Revision 2 | NASA](#)). The following table provides the reviews and indicative schedule:

Review Name	By
Kick-Off Meeting	T ₀ + 0.5 months
Preliminary Design Review (PDR)	T ₀ + 3.5 months
Critical Design Review (CDR)	T ₀ + 6 months

Pre-Shipment Review (PSR)	T ₀ + 10 months
Launch	T ₀ + 13 months

- The materials for each review shall be provided at least 1 week prior to the date of the review. Documents that are usually checked during the reviews (depending on the payload and its complexity are):
 - Payload Interface document
 - Payload operation document
 - Payload mechanical 3D/2D design and analysis
 - Payload thermal analysis
 - Payload functional test results (Engineering Model /Flight Model)
 - Payload flatsat/Assembly, Integration and Test procedures
 - Payload qualification test results
 - Thermal vacuum (TVAC) test results
 - Random vibration test results
 - Payload Failure Modes, Effects and Criticality Analysis (ECSS-Q-ST-30-02C)
 - Reliability Analysis

5) Compatibility review

- MBRSC and the Selected Entity(ies) will review the compatibility of the payload with the interfaces, such as the mechanical, electrical, and thermal interfaces between the payload and the bus.
- The selected payload team(s) will work together with MBRSC technical team and conduct regular meetings to finalize the design and ensure the compatibility between the spacecraft and payloads. To be agreed with MBRSC upon selection.

6) Transport and delivery of the Payload

- The Selected Entity(ies) will bear the cost of their payload(s) shipments from their countries or the manufacturers to MBRSC.
- MBRSC will handle all the shipments related to the satellite from MBRSC to the environmental test facilities and launch site.
- The payload will be transported upon successful completion of the pre-shipment review.

7) Launch

- Launch of the satellite will be organized and handled by MBRSC.

8) Registration of the space object

- MBRSC will handle the registration of the satellite, which will be done under the United Arab Emirates in accordance with the Convention on Registration of Objects Launched into Outer Space. In case of request by MBRSC on information needed for registration purposes,

the Selected Entity(ies) shall provide all necessary information.

9) Operation of the space object

- MBRSC will conduct satellite operation.

10) Reporting the results

- All reports will be submitted to OOSA and MBRSC by the Selected Entity(ies).
- A first briefing report on the operational results shall be submitted no later than 3 months after the launch.
- A semi-annual report on the payload mission, related activities and on any publications regarding the participation in this Programme by the Selected Entity(ies) must be submitted.
- A final report on the results of the mission shall be submitted no later than 3 months after the end of the mission. It should include educational and promotional activities related the payload hosting mission.

10. Requirements for Participation

(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:

- Heads of research institutes, universities, other public organizations and NGOs;
- Private companies satisfying criteria in footnote¹; and
- Entities located in countries which do not have satellites in orbit at the time of the opening of this application (according to the information on the United Nations Register of Objects Launched into Outer Space) are particularly encouraged to apply.

To assess eligibility, OOSA and MBRSC 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 organizations:

https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2021_FullReport.pdf

Entities applying for this Opportunity are responsible for the development of their payload including the design, manufacturing, test and verification of their payload, as well as the coordination for operations and utilization after the launch. Therefore, to be eligible for this Opportunity, applying entities must have sufficient capability in the following areas, as demonstrated in their application materials upon submission:

- Payload design, manufacture, testing and coordination for operation
- Ability to transport the payload to MBRSC (planning, budget, export/import control etc.)
- Preparation of reviews (submission of associated reports, records, etc.)
- Letter of endorsement from the head of the entity

¹ For the purpose of this Announcement of Opportunity the following definition has been agreed between OOSA and MBRSC for the eligibility of private companies for this opportunity: “Private companies with an annual turnover, in U.S. dollar terms, of between 10 and 1000 times the mean per capita gross national income, at purchasing power parity, of the country in which it operates are eligible.”

A diverse and balanced participation of different genders in teams as well as supervising positions is encouraged. Participation of persons with disabilities in the teams are also encouraged.

(B) Selection Criteria

The Selection Board consists of members nominated by OOSA and MBRSC and will review the incoming applications according to the following criteria:

- Completeness of application form;
- Scientific and technical value of the Payload to be deployed under this Opportunity, as determined by either:
 - (a) The Payload expected contribution to social and economic development and to developing human knowledge and capacity to undertake activities in the field of space science and technology in the applying entity's home country or abroad; or
 - (b) The Payload expected contribution to enhancing research and development through the technology development and demonstration.
- Novelty of the mission (with respect to previous developments in applying institutions, if any)
- Capability of meeting or exceeding the minimum technical requirements as outlined by OOSA and MBRSC;
- Compliance with the Programme Schedule;
- Communication and dissemination plan;
- In case of proposals with the same score, the gender composition in the teams will be compared and the proposal with a relatively more diverse and balanced gender composition will rank higher.);
- Demonstrating that the applying entity itself and the intended design and function of the payload are consistent with peaceful exploration and use of outer space, and are not intended solely for commercial, political or religious purposes; and
- Link between the payload in the Sustainable Development Goals.

For private companies, applications from private companies located on developing countries and economies in transition, are given priority.

(C) Technical Requirements

Applicants shall incorporate the milestones and schedule described in section 9 (B) in the proposal and any proposed deviations for assessment.

The PHI Platform User Guide made available together with the Announcement of Opportunity and Application Form is applicable.

11. Roles and Responsibilities

The Selected Entity(ies) will conduct the following activities:

- Submit the overall schedule/timeline for the payload development and its mission to MBRSC.
- Design, analyze, manufacture and test the payload and its supporting systems including verification of the compatibility with the technical requirements.

- Conduct all radio frequency related matters in full compliance with the applicable International Telecommunication Union radio regulations (if required by the payload).
- Implement and prepare the reviews defined in the contract with MBRSC (indication of milestones is provided in section 9B of this document. The Selected Entity(ies) shall prepare the materials and operations required for the review.
- Attend the technical coordination meeting(s) which is(are) to be arranged by MBRSC.
- Deliver the payload to the location specified by MBRSC.
- Cooperate with the public relations and promotion activities of OOSA and MBRSC including responding to press inquiries about the payload and preparing information materials upon request from OOSA and MBRSC.

Please note that any cost associated with the activities above, including employment costs, travel expenses and transportation fees shall be borne by the Selected Entity(ies).

The Selected Entity(ies) shall include in their application whether or not, they are willing to allow UNOOSA to publish the application documentation in the UNOOSA website. The aim of publishing this information is to further extend the knowledge of development of payload to other institutions.

UNOOSA and MBRSC will consider publishing the telemetry (e.g. pictures or other data), subject to consultation with MBRSC and the Selected Entity(ies).

For any publication (journals or conferences) concerning the payload hosted through this opportunity, the applicants agree to include the following sentence as part of the acknowledgement:

“The authors would like to thank the United Nations Office for Outer Space Affairs and the Mohammed Bin Rashid Space Centre. This project has been made possible thanks to PHI, the programme on Payload Hosting Initiative”

12. Terms and Conditions:

By submitting a completed Application, the applicant agrees to the following:

- The Selected Entity(ies) will enter into an arrangement (contract) with MBRSC to resolve any and all practical, logistical, technical and/or legal issues related to the deployment of the hosting of the payload that may arise between MBRSC and the Selected Entity(ies). The arrangement (contract) will contain terms to define, *inter alia*, scope of work, the necessary conditions for the deployment, allocation of costs, compliance rules, handling of technical information and test results, confidentiality, security issues of MBRSC facilities, declarations of immunity and hold harmless on the part of MBRSC, cross-waivers of liability for damages sustained by either party, third party liability claims and apportionment of other responsibilities arising under United Nations treaties on outer space, and dispute resolution procedures.
- MBRSC will not cover any insurance related to the payloads. MBRSC will cover only the third-party liability of this mission.
- MBRSC does not in any way guarantee the launch date, the launch success or operational success, nor will MBRSC be in any way responsible for the overall success of the mission. The specific date of the launch will be fixed by negotiation between MBRSC with the Selected Entity(ies) after assignment of the launch.
- MBRSC may terminate the provision of the payload hosting opportunity at any time, should the Selected Entity(ies) violate the terms and conditions as described in this Announcement of

Opportunity and/or the separate arrangement (contract) and/or when the Selected Entity(ies) cannot meet the Programme Schedule.

13. Application Submission

The **fully completed application documents of the letter of endorsement from the head of the entity** (Document 1), **Payload Hosting Application** (Document 2) and **due diligence document²** (Document 3) must be submitted to OOSA by 17 April 2022 by email to the following address:

unoosa-access-to-space@un.org

In the email, applying entities are requested to attach scanned copies of the Document 1 and the cover page of Document 2 as pdf-file (.pdf) and complete versions of the Document 2 and Document 3 in pdf. Please note that the OOSA email account only accepts emails with a size limit of up to 10 M bytes. Submission of all necessary documents (Document 1, Document 2) is mandatory and in the case of private companies Document 3 is also required.

After receipt, OOSA and MBRSC will proceed to evaluate each application. At OOSA's or MBRSC's sole discretion, additional information may be requested from applicants, if necessary, to assist in the evaluation of the application. The Selected Entity(ies) will then be notified with the results of the selection process. All awards are final, are made at the sole discretion of OOSA and MBRSC, and not subject to challenge or review.

14. Additional Information

The latest information on PHI will be made available on the website of OOSA at:

https://www.unoosa.org/oosa/en/ourwork/access2space4all/PHI/PHI_Index.html

For further information regarding PHI and applications, please contact

unoosa-access-to-space@un.org

² Only for private companies.