



**United Nations/AVIO Cooperation Programme on CubeSat Deployment**

**Announcement of Opportunity**

**8 October 2020**

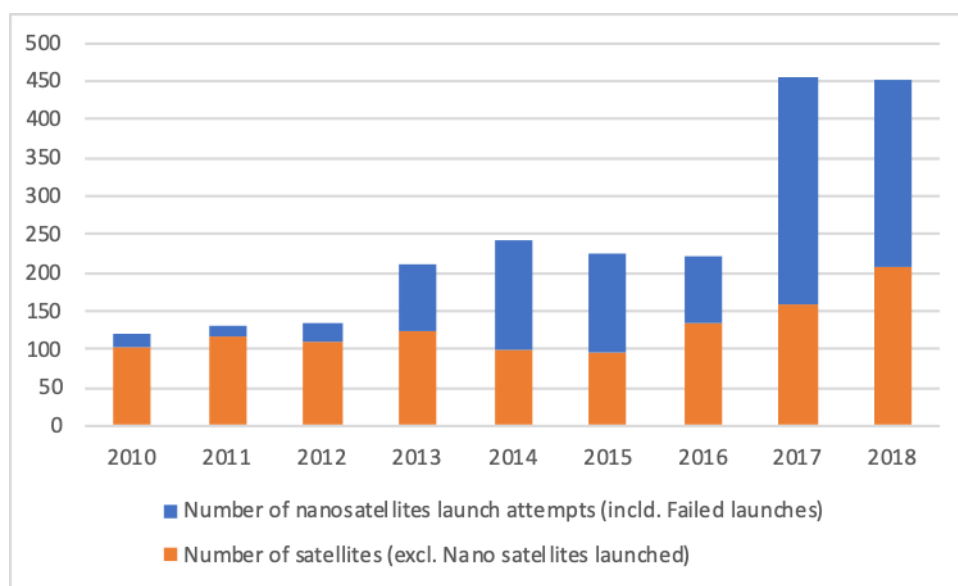
- 1. Thematic Area:** Access to Space for All Initiative
- 2. Title:** United Nations/AVIO Cooperation Programme on CubeSat Deployment
- 3. Implementing Organizations:** United Nations Office for Outer Space Affairs (UNOOSA) and AVIO
- 4. Deadline for Applications:** Fully completed application forms must be submitted to the United Nations Office for Outer Space Affairs **by 4 April 2021 23:59 CET**. Applicants will be notified of the outcome of their applications following the timeline listed in Section 9.A of the present announcement.
- 5. Number of Opportunities for Deploying CubeSat:** one
- 6. Language of the Programme:** English
- 7. Brief Programme Description:**

UNOOSA 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.

UNOOSA launched the Access to Space for All initiative in 2018. Through this initiative, UNOOSA enables communities from all over the world, with special focus on non-space faring and emerging space-faring nations to use and benefit from space technologies and their applications, with the support of space-faring nations and different stakeholders. This initiative is particularly timely, as space technologies, services and applications are instrumental to achieve and monitor the progress on the Sustainable Development Goals (SDGs), but yet millions of people lack access to even basic benefits of space technologies, which are key to modern societies today.

Avio S.p.A (hereinafter referred to as AVIO), is an established Launch System Provider. AVIO has been working in space for more than 50 years. Thanks to the Ariane and Vega programmes, AVIO has acquired know-how and expertise to design, manufacture, integrate and operate a Launch System. AVIO has also been successfully running propellant, filament wound structures and integration plants for 30 years and currently operates the Vega launch pad at Guiana Space Centre (CSG), French Guiana with a launch rate up to four launches per year.

The complexity of CubeSats is increasing. In 2018, more than 50% of the satellites launched into outer space were nanosatellites (Figure 1). The miniaturization of components, together with increase in their supply and decrease of costs, has enabled this expansion. CubeSats can be launched using the Vega C launcher, an upgraded version of the Vega launcher. Vega is operated by Arianespace at the CSG in French Guiana since 2012 from the rehabilitated launch pad ELA 1 that was originally used for Ariane 1 launch vehicle.



**Figure 1.** Evolution of the number of satellites and nanosatellites since 2010.  
Sources: online Index of Objects Launched into Outer Space and [www.nanosats.eu](http://www.nanosats.eu)

Both UNOOSA and AVIO are pleased to announce a joint cooperation programme that provides an opportunity for orbital deployment of a CubeSat or aggregates of CubeSats not exceeding 3U standard in total per launch in the framework of the Access to Space for All initiative of the United Nations.

By providing this opportunity to use available slot(s) in a Vega C launcher to put in orbit a CubeSat or aggregates of CubeSats of maximum 3U developed at educational or research institutions from developing countries which are United Nations Member States, OOSA and AVIO will both raise awareness of the role that space science and technology play in promoting sustainable development and contribute to building capacity in space science and technology.

### **8. Scope of Opportunity for Deploying a CubeSat:**

Through this Announcement of Opportunity, UNOOSA and AVIO undertake to provide one launch opportunity using a Vega C launcher for a CubeSat or aggregates of CubeSats of maximum 3U. AVIO shall bear the costs of launch of the CubeSat(s). The Selected Entity shall bear the costs of the activities identified under Section 11. This cooperation programme is subject to the availability of funds and resources of UNOOSA and AVIO.

## 9. Programme Schedule and Milestone

### (A) Programme Schedule

Application Submission	04 April 2021
Notification of shortlisted applicants	05 May 2021
Announcement of winners	Latest by 11 June 2021
Preparation period including technical coordination (as a minimum)	Not less than L-12 months with submission of the Spacecraft Interface Control Document and Phase 0 Safety Dossier (see note below)
Support to Final Mission Analysis Kick Off	L-6 months with update of Spacecraft Interface Control Document and Phase 3 Safety Dossier (see note below)
Support to Final Mission Analysis Review	L-3 months with final update of the Spacecraft Interface Control Document and submission of the complete Test Report
Deployment	L (Launch date. The launch for this opportunity will take place not earlier than the second semester of 2022)
Final Report	A final report on the CubeSat mission and related activities must be submitted to UNOOSA within 3 months following the completion of the CubeSat mission.

It must be noted that the number of opportunities and the launch and deployment schedule may change according to constraints on the Vega C's launch manifest managed by Arianespace, and constraints for any other reasons.

Note: Spacecraft Interface Control Document is an evolution of the Application Form with update of the technical content in accordance with the Spacecraft qualification status.

Note: For Safety Dossier content and phases see Payload Safety Handbook (CSG-NT-SBU-16687-CNES).

### (B) Programme Milestone

#### 1) Selection of successful applicants

- Several entities will be selected as “shortlisted entities” and notified by 05 May 2021.
- A maximum of three entities will be selected among the short-listed entities and notified by latest 11 June 2021.

#### 2) Technical coordination and signing of legal arrangements (contract(s))

- Technical coordination in preparation of the CubeSat deployment between AVIO and the selected entities.
- Signing of legal arrangements between AVIO and the selected (or entities).

- 3) Reviews (PDR, CDR, Safety Review, Compatibility Review...)
  - The materials for the reviews are to be delivered according to the following schedule:
    - At L-12 months: Spacecraft Interface Control Document and Phase 0 Safety Dossier
    - At L-6 months: Update of Spacecraft Interface Control Document and Phase 3 Safety Dossier
    - At L-3 months: Final update of the Spacecraft Interface Control Document and submission of the complete Test Report
  - Preliminary Design Review and Critical Design Reviews are expected to be handled internally by the applicant. However, UNOOSA and AVIO reserve the right to attend these reviews either in person or by teleconference or videoconference.
  - The CubeSat will be transported and delivered to either the CSG located in French Guyana (at least 5 weeks before L) or the collection facility at Brno located in Czech Republic (at least 13 weeks before L). The delivery location will be communicated to the winner at least 2 months before the delivery time.
- 4) The battery (or batteries) of the CubeSat shall be fully charged before delivery. The necessary maintenance procedures to be executed before during the integration shall be provided and be accepted by AVIO.
- 5) Transport of the CubeSat to a launch site
  - The Selected Entity will be responsible for transporting the CubeSat to the launch site or the designated collection facility.
- 6) Operational work at the launch site
  - AVIO will be responsible for the operational work at the launch site.
- 7) Launch and deployment of the CubeSat
  - Avio shall make available satellite slots on a planned launch vehicle for CubeSats or aggregates of CubeSats, in agreement with Arianespace as Vega Launch Operator and marketing and sales organization.
- 8) Registration of the CubeSat
  - The country of the Selected Entity will register the CubeSat either in accordance with the Convention on Registration of Objects Launched into Outer Space or, if the country of the Selected Entity is not a party to the Convention, in accordance with General Assembly resolution 1721B (XVI).
- 9) Operation of the CubeSat
  - The Selected Entity will conduct satellite operation, data evaluation, and decommissioning.
- 10) Reporting the results\

- The first briefing report on the operational results shall be submitted by the Selected Entity to UNOOSA no later than 3 months after the deployment of the CubeSat.
- A final report on the results of the mission shall be submitted no later than 3 months after completion of the CubeSat mission. It should include educational and promotional activities related to the CubeSat mission.

## **10. Requirements for Participation**

### **(A) Eligibility Criteria**

This Opportunity is open to institutions in United Nations Member States, in particular in developing countries, in line with the following criteria:

- Heads of research institutes, universities, and other public organizations are eligible to apply for this Opportunity. Private companies, non-governmental or non-profitable agencies are ineligible.
- Entities located in countries that have the means to transport artificial satellites into space and place them in orbit are not eligible, unless it is done in partnership and the project coordinator's entity is from a developing country (or in case of a partnership at least one of the project coordinators), taking into account the objectives of this Opportunity

UNOOSA and AVIO will use the list of developing countries 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/publication/WESP2018\\_Full\\_Web-1.pdf](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/WESP2018_Full_Web-1.pdf)

Entities applying for this Opportunity are responsible for the development of their CubeSat including the design, manufacturing, test and verification of their CubeSat, as well as its operation and utilization after the deployment. 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:

- CubeSat design, manufacture, testing and operation
- Ability to transport the CubeSat to CSG or the collection facility in Brno (planning, budget, export/import control etc.)
- Preparation of safety review (submission of safety assessment reports etc.)
- International Coordination of the CubeSat's radio frequency
- Ability to obtain a license of radio stations for CubeSat in the country
- Development of the ground station facility with radio frequency license

### **(B) Selection Criteria**

The Selection Board consists of members nominated by OOSA, with technical input and assistance from AVIO. The Selection Board will review the incoming applications according to the following criteria:

- Completeness of application form;
- Scientific and technical value of the CubeSat to be deployed under this Opportunity, as determined by either:

- (a) The CubeSat's expected contribution 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 CubeSat's expected contribution to enhancing research and development through the technological demonstration of deploying and operating the CubeSat in the applying entity's home country or abroad.
- Capability of meeting or exceeding the minimum technical requirements as outlined by UNOOSA and AVIO. Non-compliances shall be specifically mentioned in the application form;
  - Compliance with the Programme Schedule, including the deployment schedule;
  - Demonstrating that the applying entity itself and the intended design and function of the CubeSat are consistent with peaceful exploration and use of outer space, and are not intended solely for commercial, political or religious purposes.

### **(C) Technical Requirements**

Regarding the technical requirements applicable to the CubeSat, please refer to *VEGA C User's Manual, Issue 0, revision 0, Chapter 4* and the *"Auxiliary Passengers User's Manual"*.

### **11. Roles and Responsibilities**

The Selected Entity will conduct the following activities (without prejudice of the applicable actions identified under section 9):

- Submit the overall schedule/timeline for the CubeSat development and its mission in the application form. Any subsequent update shall be sent to UNOOSA and AVIO for coordination.
- Design, analyze, manufacture and test the CubeSat and its supporting systems including verification of the compatibility with the technical requirements. Applicants can make a description of the test capabilities of their choice. If necessary, AVIO can provide commercially the test capabilities for quasi-static accelerations, sine and random vibration test.
- Conduct all radio frequency related matters in full compliance with the applicable International Telecommunication Union radio regulations.
- Implement the safety assessment to verify the compliance with safety norms and prepare the materials and operations required for the review.
- Attend the technical coordination meetings (if needed).
- Deliver the CubeSat to the location specified by AVIO.
- Transport the CubeSat to the location specified by AVIO for the CubeSat handover. Conduct a visual inspection, uninstall non-flight items for the compatibility tests and the handover.
- Operate the CubeSat including tracking control and data acquisition after the deployment.
- Register the space object (the CubeSat). For more information, please refer to the following document: [http://www.unoosa.org/documents/pdf/psa/bsti/2015\\_Handout-on-Small-SatellitesE.pdf](http://www.unoosa.org/documents/pdf/psa/bsti/2015_Handout-on-Small-SatellitesE.pdf)

- Cooperate with the public relations and promotion activities of UNOOSA including responding to press inquiries about the CubeSat and preparing information materials upon request from UNOOSA.
- Ensure compliance to the Space Debris Mitigation Guidelines. The document can be found in the following url: [https://www.unoosa.org/pdf/publications/st\\_space\\_49E.pdf](https://www.unoosa.org/pdf/publications/st_space_49E.pdf)

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.

To support and follow the implementation of this project, UNOOSA requires the following documents to be submitted from the **selected entity** during the course of the development;

1. Traceability matrix to requirements. Test plan and test results.
2. Mid-term Report (Please submit with the template document on the website) after the Preliminary Design Review (PDR).
3. Final report on the operational results.

The selected entity shall include in their application whether they do not provide consent to UNOOSA to publish the application documentation in the UNOOSA website (otherwise it is understood that the consent is granted). The aim of publishing this information is to further extend the knowledge of development of CubeSat to other institutions.

UNOOSA and AVIO encourage selected entity to submit the model of their receiver using GNU Radio Companion (GRC) format for publication in the UNOOSA website. This will enable other entities to access the telemetry of the satellite and participate on this project. UNOOSA will consider publishing the telemetry (e.g. pictures or other data), subject to consultation with AVIO and the selected entity.

## **12. Terms and Conditions:**

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

- The Selected Entity will enter into an arrangement (contract) with AVIO to resolve any and all practical, logistical, technical and/or legal issues related to the deployment of the CubeSat that may arise between AVIO and the Selected Entity. 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 AVIO facilities, declarations of immunity and hold harmless, cross-waivers of liability for damages sustained by either party, 3rd party liability claims, registration of the CubeSat space object and apportionment of other responsibilities arising under United Nations treaties on outer space, and dispute resolution procedures.
- AVIO does not in any way guarantee the launch date, the launch success, the deployment date and/or the deployment success, nor will AVIO be in any way responsible for the overall success of the mission. The specific date of the launch and deployment will be fixed by negotiation between AVIO and the Selected Entity after assignment of the launch.
- AVIO may terminate the provision of the deployment opportunity at any time, should the Selected Entity violate the terms and conditions as described in this Announcement of Opportunity and/or the separate arrangement (contract).

### **13. Application Submission**

The **fully completed application documents of the letter of endorsement from the head of the entity** (Document 1) and **CubeSat Mission Application** (Document 2) must be submitted to UNOOSA by 4 April 2021 by email with the subject starting by “[CubeSat AVIO]:” to the following address:

[unoosa-access-to-space@un.org](mailto: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 the entire document of the 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.

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

### **14. Additional Information**

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

<https://www.unoosa.org/oosa/en/ourwork/psa/hsti/vegac.html>

For further information regarding this opportunity and applications, please contact oosa@un.org -- Please start the subject by “[CubeSat AVIO]:”