

In-Orbit Demonstration & Validation Service (IOD/IOV)

Horizon Europe – Cluster 4, Space

DG DEFIS B2 – Innovation, Start-ups and Economics

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Horizon Europe,
a programme of the
European Union

In-Orbit Demonstration and Validation (IOD/IOV)

New technological developments and innovations tested in orbit

- Validating concepts and testing innovative technologies in real conditions **accelerates their entry into the market**
- In-orbit testing is a costly and complex endeavour resulting in the infamous “**valley of death**” for many innovators
- This is why the EU started the **IOD/IOV initiative** enabling new technologies to be tested in orbit
- **1st call 2018, 2nd call 2022**
 - 100+ proposals from various European entities
 - Technology innovation for EO, PNT, SatCom, STM and more
 - The first selected IOD/IOV experiment **UPMSat-2** was launched incl. six innovative payloads



Ensure the global competitiveness by allowing technologies to be effectively tested in orbit



Provide cost-effective services based on EU solutions



Prepare a generation of European engineers with hands-on experience



UPMSat-2

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IOD/IOV Service in Horizon Europe

Expected outcomes:

- To contribute to **reduce the time to market** or **operational use** of new technologies, products, concepts, architectures, and operations techniques;
- To provide a **cost-effective service** for regular aggregation (if needed), launch and operations in orbit for IOD/IOV experiments, based on **EU solutions both for the spacecraft and for the launch services**;
- To have at least **one opportunity every year** during the Horizon Europe implementation period.

Implementation of all procurement activities is **entrusted to ESA** on behalf of the European Commission

IOD/IOV Service – an overview

- The IOD/IOV service is **broadly open** to experiment providers from academia, research organisations, SMEs and large industrial companies, space agencies, etc.;
- **IOD/IOV experiments** are defined as innovative technologies, products, concepts, architectures, and operations techniques that require in orbit demonstration/validation. Experiments may be instrument, equipment, technologies, system experiment, missions, industrial payloads, etc.;
- Experiments may be **accommodated on IOD/IOV Spacecraft(s)** or be provided as **complete system(s)**;
- Selected IOD/IOV experiments will have free of charge **IOD/IOV services** that include:
 - aggregation** of the experiment on a carrier (if needed),
 - launch services,**
 - operations.**

IOD/IOV Service – Process & Schedule

March – May 2022

- Call for Expression of Interest (Eoi) for IOD/IOV experiments – **closed on 31/05/2022**

June – July 2022

- **Analysis** of received applications by independent experts and ESA experts

Aug – Sept 2022

- Preliminary **accommodation analysis by ESA** to identify possible configurations of IOD/IOV missions (cubesat/ smallsat) and **confirm the experiment pre-selection**

Q3 2022 – Q1
2023

- ESA **tendering** and **contracting** for procurement of platform and aggregation services.

2023 – 2024

- Procurement of launch services for IOD/IOV missions

2023 – 2025

- Launch of IOD/IOV missions and complete systems

For reference

Constraints and requirements for IOD/IOV experiments *(Call 2022)*

- Candidate IOD/IOV experiments shall preferably have **technology readiness level (TRL 5/6)**;
- For experiments needing aggregation, **compliance with resources and interfaces** compatible with small satellites/ cubesat missions;
- For experiments in the form of complete systems (i.e. ready to fly IOD/IOV satellites), **compatibility with EU manufactured launcher solutions**;
- Be **compliant with the overall planning** regarding flight model delivery and launch as indicated in the Call for Expression of Interest;
- All experiment providers shall provide a Declaration of “**Commitment of Flight Model delivery**” as part of the application package.

IOD/IOV Experiment – Selection process

1. Analysis of received applications:
 - a. Done by independent experts and ESA experts on the basis of criteria specified in the Call for EoI linked to **technical fit**, **programmatic fit** and **innovation**;
2. Experiment pre-selection:
 - a. IOD/IOV experiments needing aggregation will undergo an **accommodation analysis** with a view to allocating the highest number of experiments to IOD/IOV mission(s);
 - b. Considering available resources, a list of pre-selected IOD/IOV experiments will be established.
3. Final selection of IOD/IOV experiments:
 - a. For experiments needing aggregation, the final selection will be confirmed by the European Commission after the **System Design Review** (SDR) that will validate the feasibility of the relevant IOD/IOV mission;
 - b. The final selection of the IOD/IOV experiments in the form of complete systems will be confirmed based on flight availability.

IOD/IOV Service – New Opportunities

- New opportunities with continuously open calls for Expression of Interest, with multiple cut-off dates for:
 - **IOD/IOV Experiments needing aggregation** → by COM;
 - **Ready to Fly IOD/IOV Satellites** (i.e. complete systems) → fast track joint scheme by COM/ESA with co-funding mechanism;
- All information available on **DG DEFIS Europa [website](#)**
- For more info please write to DEFIS-IOD-IOV@ec.europa.eu

Starting from Q1 2023

IOD/IOV Service – EIC Beneficiaries

- EIC WP 2023 – EIC Space Challenge: “Companies supported under this Challenge will have the opportunity to **benefit from the in-orbit demonstration and validation services** supported by Horizon Europe, Cluster 4 Space”;
- All experiment providers need to **submit an application form** and provide the necessary information specified in the Call text;
- During the analysis, the applications that meet the **threshold for each criterion** will pass to the pre-selection and selection phases;
- IOD/IOV experiments will be given **priority** if the proposed innovation has been developed and/or funded in the frame of Union programmes, including from the European Innovation Council.

**For more
information visit**

https://defence-industry-space.ec.europa.eu/eu-space-policy/eu-space-research_en



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