Announcement of Opportunity (AO) for Orbital platform

An avenue for in-orbit scientific experiments

Indian Space Research Organisation

Bangalore- 560 231

Announcement of Opportunity (AO) for in-orbit scientific experiments on Orbital Platform (PS4-OP)

ISRO solicits proposals in response to this Announcement of Opportunity call for payloads on PS4-Orbital Platform.

Objective

PS4-Orbital Platform (PS4-OP) refers to a novel idea formulated by ISRO to use the spent PS4 stage (fourth stage of PSLV) to carry out in-orbit scientific experiments for an extended duration of 1-6 months. The advantage being the stage has standard interfaces & packages for power generation, telemetry, tele-command, stabilisation, orbit keeping & orbit manoeuvring. The scientific community/ research organisations can design the experiment and utilise the OP interfaces for powering, data management & specific experimental requirements. In short, ISRO is extending its expertise in space technology to the scientific community as a platform to design, develop & validate their experiments in an effective manner.

Background

Polar Satellite Launch Vehicle (PSLV) is a four stage launch vehicle primarily designed to inject satellites in to Polar orbits (SSPO). PSLV has completed 48 missions and has successfully injected 356 satellites, till date. During this period, PSLV has emerged as a versatile vehicle having capability to undertake a variety of missions including Low Earth Orbit missions, Sun Synchronous Orbit missions, transfer orbits to Geostationary/ Planetary/ Lunar missions. The capability of providing power, telemetry & data downlink for the payloads housed in OP has been demonstrated in previous missions.

Payload avenues

- Microgravity experiments
- Robotic arm/ Smart Space robot technology demonstration
- Rendezvous & docking experiments
- Small satellites technology development
- Laser communication technology development
- Low cost platform for testing Inflatable systems

Platform capability (for each payload)

- Mass : 10kg (max)
- Volume: 1U/2U/3U
- Power: 10W (max)
- Period: 1-6 months

Purpose of this AO

Proposals are solicited from National/International Scientific Community for novel space based experiments to be configured in PS4-Orbital Platform. The AO has a specific objective to invite important payloads for inclusion in the OP mission to strengthen / complement the space based research activities taking place in industries/ academia.

Each proposal shall clearly identify a Principal Investigator (PI) and a Lead Funding Agency (LFA) for the proposed payload. Proposals will clearly need to spell out the objective and requirements from the platform.

Proposers are expected to be currently involved in space based research / validation of specific experiments in micro gravity conditions/ development of payloads for space based applications/ or any competent team willing to develop space worthy experiments and have access to associated facilities for payload testing. The Principal Investigator of the proposal should be capable of

(i) Providing necessary details of the payload which can address proposed objective.

(ii) Assembling a capable team and lead the team to deliver a space-qualified payload.

(iii) Ensuring that payload/ instrument meet the Qualification specified as per ISRO standards. (Guidelines given in **Annexure I** to be followed).

The proposers are strongly encouraged for sharing of payload data, analysis results and publications with ISRO team. It assumes there will be no exchange of funds under this activity between ISRO and proposing teams.

All proposals should be submitted to SIPO/ ISRO HQ through the respective agencies (Space agency/ Academic Institutions/Research Laboratories) and must be signed by an official authorised to certify, support and sponsor the investigation as well as the manage the financial aspects, on behalf of the Space agency/Institution/Research Laboratories.

The Proposal in both word and pdf formats are to be submitted by speed post and email to:

Director,
Space Infrastructure Programme Office
ISRO HQ, Antariksh Bhavan,
New BEL Road,
Bangalore-560 231
Email: sipo@isro.gov.in

The confirmation upon the receipt of the proposal will be sent by e-mail. Questions and clarifications may be send to the address above.

Selection process

ISRO will constitute a 'Selection Committee' to screen the proposals and select them based on scientific benefits, relevance and technical content. Proposers who satisfy the eligibility criteria and whose proposal is recommended for further consideration by the Selection Committee will be contacted by email.

Special Notes

1. There will be no exchange of funds between ISRO and the Proposer.
2. The launch schedule of selected payloads will be intimated to the proposers by ISRO.
3. For details on (1) Guidelines for development of payload and (2) Proposal preparation format please visit www.isro.gov.in
4. Additional changes / modifications (if any) in the proposal submission process (prior to submission deadline) will be made visible on the ISRO website. Proposing teams are expected to regularly check ISRO website (www.isro.gov.in) for additional details and updates.
5. ISRO reserves the right to select or not to select any payload under this program and shall not be held liable.

Last Date

The last date for receiving the proposal is 31st December 2019.

The format for preparation of proposal document is given in Annexure-II

Annexure-I

Guidelines for development of instrument/ payload

1 Payload to be configured as a functionally standalone system. Mass & volume is to be limited to 10kg and standard 1U/2U/3U dimensions. Any waiver for mechanical interface/ mass is to be obtained from ISRO prior to design finalisation.

2. Payload should be able to operate using 28V power bus (RAW power) provided from PS4-OP.

3. Payload to contain only MIL grade components. Use of commercial/industrial grade components is subject to satisfactory completion of specified acceptance tests.

4. RF payload frequency/ power & sensitivity to be finalised after payload interference study with the existing RF elements in PS4-OP/ passenger payloads.

5. D-Type/ Circular MIL grade connectors to be used for electrical interface.

6. Payload should be capable of re-configuring itself into intended configuration, in case of an unexpected power interruption during OP Phase.

7. Electrical interface & mechanical interface (signed by competent authority) reviewed and cleared by Selection committee to be made available 3 months prior to the targeted launch date, to initiate interface preparation at the launch vehicle side. Further changes in the interface details are not allowed.

8. Dummy mass/ balancing with identical mass & footprint to be made available in case of non-readiness of the system (after the realisation of vehicle interfaces) for launch.

9. Payloads to be qualified / acceptance tested to the environmental test levels specified for PSLV.

10. Signed copy of compliance certificate is to be provided by the Principal Investigator.

Annexure-II

Format for preparation of proposal document

1. Cover Page should include the following:
    a) Complete Title of the Proposal
    b) Name and address of Principal Investigator including e-mail, telephone and fax numbers
    c) Name of Co-PIs, their address, e-mails etc.
    d) Original signed hard copy of the cover page should be submitted
2. Executive Summary of the proposal (~Two A4 size pages in 12 point font)
3. (A brief description of the proposal stating the broad scientific objectives and specific aims of the proposed experiment is to be provided. It should include a concise description of payload design and methods for realising the hardware and software components)
4. Payload objectives
5. Basic concept and description of the payload (include line diagrams or
6. schematic) with interface details & data downlink requirements.
7. Description of heritage and past experience in payload development, if any.
8. Broad specifications of the payload/experiment including dimensions, weight, power, parameters to be measured (including measurement accuracies), data rates, TM, TC etc.
9. Anticipated new technology development to realise the payload and back up strategies in the event of non availability of the expected technology.
10. Design approach and specifications, development process, test, evaluation and calibration procedures.
11. Development strategy i.e., stages of qualification model, engineering model, flight model etc.
12. Definition of success criteria of the payload.
13. Plans for data processing, management and archival.
14. Description of required post-launch ground operation support.

15. Any special requirement of payload interfaces from the Orbital platform.
16. Realisation plan & schedule of delivery with QA clearance certificates.
17. Procedure to monitor and review the progress of the development as per schedule and the quality assurance aspects.
18. Mode of participation in the final integration, testing, calibration and checkout.
19. Complete list of names, with affiliation and e-mail addresses of the Co-PIs with specific mention of their expertise and roles in the Payload development