



**CALL FOR EXPRESSIONS OF INTEREST TO BECOME A MEMBER OF THE  
PAYLOAD WORKING GROUP FOR THE LARGE MISSION COVERING THE  
SCIENCE THEME “MOONS OF THE GIANT PLANETS”**

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## 1. INTRODUCTION

The first scientific theme identified in the new long-term scientific plan (Voyage 2050) for the ESA Science Programme for the large mission following LISA and NewAthena is “Moons of the Giant Planets” (hereafter referred to as “L4”). The goal is to address issues such as habitability, biosignatures, and prebiotic chemistry, to be implemented through a planetary mission to one of the moons of either Jupiter or Saturn<sup>1</sup>.

In early 2022, a Science Expert Committee (EC) for L4 was competitively appointed by the ESA Director of Science to support the further definition of space mission concepts addressing the L4 science goals. The EC delivered their report in April 2024 and identified a mission to the Saturn system including a tour of several Saturn moons, the capability to sample Enceladus’ plumes, and the delivery of a surface element on Enceladus for in-situ measurements as the most suitable to achieve the L4 mission scientific objectives<sup>2</sup>. In parallel, ESA has conducted a set of preliminary Concurrent Design Facility studies to investigate potential mission concepts, by taking into account the preliminary science priorities received from the EC, and has recently started industrial concept studies for raising awareness in industry, addressing high level trade-offs, and achieving a first technical and programmatic consolidation of the overall L4 mission concept.

While the EC will continue supporting the Executive on key decisions that may impact the scientific objectives, ESA intends to form an L4 Payload Working Group (L4PWG) open to participation of science instrument experts affiliated with institutions in the ESA Member States and willing to support ESA in addressing both mature payload techniques and identifying innovative technologies with the objective to maximise the science return of the L4 mission within the available resources (mass, power and data rate/volume).

## 2. PURPOSE OF THE PRESENT CALL

Through the present Call, the ESA Director of Science invites science instrument experts affiliated with institutions in the ESA Member States to express their interest in becoming a member of the Payload Working Group (L4PWG) that will support ESA in elaborating, by mid-2026, the Strawman payload concept and technology roadmap on payload developments for the L4 mission covering the science theme “Moons of the Giant Planets”.

A key aspect to progress in better defining viable L4 mission concepts concerns the scientific payload; a preliminary outlook of it is provided in the EC report. The L4 payload should not be treated in a business-as-usual mode due to the highly constrained mission mass and power resources. Miniaturisation of some payload elements will be needed to maximize the science

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<sup>1</sup> [Voyage 2050 Senior Committee report](#)

<sup>2</sup> [L4 Expert Committee report Moons of the Giant Planets](#)

return. It is therefore crucial to efficiently use the next few years to progress on the payload definition.

The L4PWG will be tasked with supporting ESA in analysing and addressing maturity of different payload techniques and in identifying avenues for implementing innovative technologies to achieve best use of mission available resources (primarily, mass and power) and to maximise the science return of the L4 mission.

The L4PWG will be appointed with a mandate until December 2026, with the Terms of Reference spelled out in Section 2.1.

The L4PWG will comprise up to fifteen members covering the expertise coming from previous planetary missions but also new technologies with a focus on miniaturisation (see Table 1). The L4PWG will be chaired by ESA and will work in synergy with the EC that will continue supporting ESA for any scientific assessments and trade-offs.

**Table 1. Examples of expertise required**

Package	Expertise
Remote Sensing Package	Imagers / spectrometer / sounder for surface characterisation
In-Situ package	Plasma-instrumentation, Particle-Gas analyser
Geophysical package	Ice penetrating radar and gravity characterisation
Astrobiology package	Astrobiology dedicated instrumentation including sampling and sample preparation
Surface Sensor package	Physical, geophysical and chemical sensors

The appointment of the members of the L4PWG is expected to take place in January 2025, with the WG activities starting shortly thereafter. The activities are expected to be conducted through a mixture of in-person (planned three per year) and on-line meetings and might include participation to CDF studies on the payload accommodation. For in-person meetings, the travel expenses of the WG's members would be reimbursed by the Agency.

Participation to the L4PWG will not prejudice in any form later participation in any following calls concerning the mission selection addressing the “Moons of the Giant Planets” science theme.

The schedule of the L4PWG selection and activities is reported in Table 2.

**Table 2: Schedule**

Date	Event
9 December 2024	Release of Call
13 January 2025 at 12:00 (noon) CET	Expressions of Interest due
End January 2025	Appointment of L4PWG members
December 2026	Planned end of L4PWG mandate

## 2.1. L4 Payload Working Group Terms of Reference

The L4PWG will be tasked to:

- Analyse concepts and designs of instruments suitable for the achievement of the L4 mission objectives both for the orbiter and for the lander;
- Perform trade-off analyses of different instrument concepts and characteristics (including expected performance);
- Analyse technical maturity and areas of technology gaps and possible innovation to be implemented in the next five to ten years in Europe to achieve improved instrument performance and optimised resource utilisation;
- Support ESA in defining a technology roadmap targeted to miniaturisation of instruments (in particular for the lander payload complement) and resource optimisation;
- Support ESA in defining an L4 Strawman payload for the orbiter, including accommodation and operational constraints, and for the lander, including any sample acquisition and preparation and operational modes and timelines;
- Support ESA in defining the budget allocations for the Strawman payload (e.g., mass, power, data rates and volume) to be considered in future mission studies;
- Act as focus of interests to liaise with the broader technical and technology communities in Europe potentially interested to be engaged in the implementation of the L4 mission.

As starting point the L4PWG will utilise the preliminary instrument complement identified in the EC report.

### 3. FORMAT AND CONTENTS OF THE EXPRESSION OF INTEREST

Expressions of interest for membership of the L4PWG should consist of three parts:

1. A cover page (stating the applicant's name and explicitly mentioning the proposer's title, position, institute, address, and e-mail address);
2. A curriculum vitae (maximum 2 pages);
3. The actual Expression of Interest (maximum 4 pages);
4. Letters of Endorsement, signed by the proposer's Head of Institute and/or relevant funding agency/institution, with the endorsement to the proposer's application and the explicit support with respect to the proposed activities and the availability of funding, facilities, and infrastructure, as needed to the proposer for the accomplishment of the proposed tasks.

The curriculum vitae should include all information about the applicant's career that the applicant considers relevant.

The Expression of Interest should explain why the applicant considers himself/herself suited for membership of the L4PWG, the applicant's areas of expertise relevant to the L4PWG, his/her potential contributions, etc. The application should not contain a list of publications, but rather it should explicitly list the applicant's five "notable achievements" that in the applicant's opinion make him/her particularly suited for consideration.

The application should also include an explicit mention of the time commitment to the proposed activities.

Details of the personal data protection measures that apply to this Call can be found in the privacy notice on the submission website.

## 4. PROPOSAL SUBMISSION

The Expression of Interest will be accepted exclusively in PDF format, with a maximum file size of 5 MB, using the interface available at:

<https://www.cosmos.esa.int/web/l4-payload-wg>

The deadline for submission of the Expression of Interest in response to the present Call is:

**13 January 2025 at 12:00 (noon) CET**

The submission deadline will be implemented strictly and proposers are invited to submit their Expressions of Interest well in advance of the deadline. Applications received after the deadline will not be considered. Expressions of Interest that exceed the page limit or that do not respect the structure described above in Section 3 will not be considered.

## 5. FURTHER INFORMATION AND CONTACT POINTS

Requests for further information should be addressed to the:  
Director and Programme Strategy Support Office  
Directorate of Science  
European Space Agency  
Email: [L4PWG@cosmos.esa.int](mailto:L4PWG@cosmos.esa.int)