Call for Membership in the Target Identification and Comet Environment Working Groups for the Comet Interceptor mission

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1. INTRODUCTION

Comet Interceptor (CI) is an ESA mission in cooperation with the Japan Aerospace Exploration Agency (JAXA). It aims to characterise a long period comet, which could potentially be a dynamically new comet, or an interstellar object. The mission was adopted by the Science Programme Committee in June 2022 as the first "F" mission in the Science Programme.

A Science Working Team (SWT), appointed by ESA in coordination with JAXA, advises ESA on all aspects of the mission potentially affecting its scientific performance. The composition of the SWT is defined in the Science Management Plan (SMP). The SWT is supported by Working Groups (WGs), in specific scientific and/or science operation areas, relevant for the mission.

The present call solicits applications for members of two WGs:

1) Target Identification Working Group;

2) Comet Environment Working Group.

2. PURPOSE OF THE PRESENT CALL

Through the present Call, the ESA Director of Science, in coordination with JAXA, invites scientists based in ESA Member States and Japan to apply for membership of two Comet Interceptor WGs: 1) Target Identification Working Group; 2) Comet Environment Working Group; they will support the activities of the SWT during the mission implementation and operation.

The schedule for this Call is given in Table 1.

Table 1: Schedule and deadlines for this Call

Date	Event
3 October 2022	Release of this Call
7 November 2022 at 12:00 hrs (noon) CET	Proposals due
December 2022	Appointment of WGs' members

2.1. Background documentation and information

[AO-D1] Comet Interceptor Science Management Plan

[AO-D2] Comet Interceptor Definition Study Report

2.2. Tasks of Working Group members

The specific tasks of the Target Identification WG are:

- Coordinate earth- and space-based observations of comets relevant to the Comet Interceptor mission; this will imply:
    - Perform observations of long-period comets to be considered as candidate targets for Comet Interceptor;
    - Perform observations of other long-period comets that may support the target selection process, e.g., by improving the predictability of the activity evolution with heliocentric distance;
    - Perform observations of short-period comets to be considered as potential backup targets of Comet Interceptor;
    - A specific task will be to interface with the Vera C. Rubin observatory, provide inputs on the survey strategy, and monitor the progress of the survey;
- Among the observed comets, identify best candidate targets for Comet Interceptor, also considering accessibility for the Comet Interceptor spacecraft, based on comet activity, flight dynamic and navigation aspects;
- Provide elements to the ESA Project Team and the SWT for the ranking of the candidate target comets, based on scientific and science operation criteria;
- On request of the ESA Project Team and/or the SWT, perform other specific target observation, characterisation, and analysis tasks, relevant for the mission definition and operation and for the achievement of the mission scientific objectives, including:
    - Assessment of the probability to identify a suitable mission target;
    - Target trajectory and orbit analysis;
    - Comet activity / brightness modelling.
- Liaise with the other Working Groups, in particular the Comet Environment Working Group.

The specific tasks of the Comet Environment WG are:

- Develop and provide results from scientific models addressing questions relevant to the implementation and operation of the mission and to achieve its scientific objectives. Some specific topics of interest are:
    - Simulation of observable properties that distinguish dynamically new

comets from other comets that have visited the inner solar system multiple times;

- Models of the activity evolution of long-period comets;
- Models in preparation of multi-instrument observations and data analysis with Comet Interceptor mission scientific payload;

- The group will be organised in three sub-groups, relevant for the following areas:
  a) Comet Nucleus;
  b) Near-environment (inner dust and gas coma);
  c) Far-environment (outer dust and gas coma and tails);
- Support the ESA Project Team with developing and providing results from engineering comet nucleus and environment models that will allow decisions in the spacecraft and mission definition and operations;
- Support the ESA Project Team and/or the SWT in trade-off analyses, relevant for the mission definition and operation and for the achievement of the mission scientific objectives;
- Liaise with the other Working Groups, in particular the Target Identification Working Group on key observational parameters to be fed into the scientific models.

The activities of the WGs are expected to be conducted through a mixture of physical and on-line meetings.

The WGs will generally be chaired by a SWT member.

3. ELIGIBILITY AND APPOINTMENT CONDITIONS

This call is open to scientists based in ESA Member States and Japan. Lead Scientists and Co-Lead Scientists of the Comet Interceptor instruments, other scientists leading or involved in the (programmatic, scientific, or technical) management of the Comet Interceptor instruments or being responsible for hardware or software development and procurement activities, as well as other SWT members, are not eligible, while Co-Is of instrument teams may apply to become members of the WGs.

Early career scientists are specifically encouraged to apply.

The successful candidates will be appointed for a period of three years, renewable. The WG member appointment is *ad personam*.

Each selected WG member will be required to submit short annual reports of his/her Comet Interceptor related activities to ESA.

Should WG member positions become vacant, they will be filled through new competitive calls.

4. FORMAT AND CONTENTS OF THE APPLICATION

Applications for membership of the Comet Interceptor Working Groups should consist of four parts:

1. A cover page (that should include the applicant's contact information);
2. A curriculum vitae (maximum 2 pages);
3. The actual application (maximum 4 pages);
4. Letter(s) of endorsement and financial support from funding institution(s).

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

The application should clearly indicate the WG (and sub-group for the Comet Environment WG) for which the candidate intends to apply (see Section 2.2).

The application should explain why the applicant considers himself/herself suited for membership of one of the Working Groups, the applicant's areas of expertise relevant to the Working Group, 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. These might be specific publications the applicant has authored, responsibility in scientific missions and/or instruments and/or research projects, etc.

The application should also include an explicit mention of the time commitment to the proposed activities (the expected commitment should be not less than 0.2 FTE) and the endorsement and financial support from the head of the applicant's institution and/or the respective funding institution to the application.

Applicants will have to guarantee their participation in the SWT meetings (on average two meetings per year are expected) and in any other activity associated with the WG member appointment.

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

5. EVALUATION CRITERIA

The following criteria will be used (in no particular order) in assessing and evaluating individual proposals:

- Candidate's competence and experience relative to the Comet Interceptor science objectives and, in particular, in the areas relevant for the Working Group chosen by the applicant;
- The scientific value of the proposal and the level to which the proposal identifies specific competences in the areas relevant for the Working Group chosen by the applicant;
- Adequacy of the time that the candidate intends to devote to activities related to the Working Group member role;
- Adequacy of resources available to the candidate to carry out activities related to the Working Group member role.

6. PROPOSAL SUBMISSION

Applications 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/comet-interceptor-wgs-2022

and must be received not later than the date indicated in Table 1. Proposers will receive confirmation upon successful receipt of their proposals.

Applications received after the deadline will not be considered. Applications that exceed the page limit or that do not respect the structure described in Section 4 will not be considered.

Requests for further information should be addressed to:

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