



DOCUMENT

Announcement of Opportunity for Interdisciplinary Scientists and Guest Investigators in the BepiColombo mission

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1 INTRODUCTION

1.1 Purpose and scope

This Announcement of Opportunity (AO) solicits the participation of the scientific community in the BepiColombo Mercury Planetary Orbiter (MPO) and Mercury Magnetospheric Orbiter (MMO) to augment the scientific return of the mission as a whole.

This AO addresses the participation of Interdisciplinary Scientists (IDS) and Guest Investigators (GI) and is issued jointly by ESA and JAXA.

BepiColombo is an interdisciplinary mission to the planet Mercury, carried out as a joint project between ESA and JAXA. It consists of two orbiters, the Mercury Planetary Orbiter (MPO) and the Mercury Magnetospheric Orbiter (MMO), which are dedicated to the detailed study of the planet and its magnetosphere. The MPO is a three-axis-stabilised and nadir pointing spacecraft in a low-eccentricity polar orbit (480 km x 1500 km altitude). The MMO is a spinning spacecraft in a 590 km x 11640 km altitude polar orbit. The MPO payload comprises 11 instruments/instrument packages; the MMO payload consists of 5 instruments/instrument packages. The payload complements of MPO and MMO are listed in the Annex.

The BepiColombo mission was launched on 20 October 2018. Arrival at Mercury and start of the science exploitation phase are expected in December 2025 and April 2026, respectively. The duration of the nominal science operations is 1 year.

The aim of this AO is to appoint up to six IDSs and up to eleven GIs for the BepiColombo mission. The IDSs and the GIs will be appointed for a first period of three years, renewable. ESA will not fund the activities of the IDSs or the GIs (travel costs to attend meetings, etc.) and each proposer is responsible for securing his/her own funding.

Additional calls for IDSs and/or GIs positions could be foreseen at a later stage.

The schedule for this AO cycle is given in Table 1.

Table 1: AO schedule and deadlines

| Date | Event |
|---------------------------------------|--------------------------------|
| 13 May 2019 | Release of this AO |
| 13 June 2019 at 12:00 hrs (noon) CEST | Mandatory Letter of Intent due |
| 15 July 2019 at 12:00 hrs (noon) CEST | Proposals due |
| October 2019 | Appointment of IDSs and GIs |

1.2 Background Documentation and information

[AO-D1] BepiColombo MPO Science Management Plan



[AO-D2] BepiColombo Mission - Brief description and overview

[AO-D3] BepiColombo MMO Science Management Plan

1.3 Mission summary and IDS and GI tasks

A mission summary is included in Section 2 of [AO-D1], and a more detailed description of the different elements and instruments is given in [AO-D2].

The BepiColombo Science Management Plan (SMP) [AO-D1] defines the top-level scientific management of the mission, and describes the respective roles of the parties involved, the data products, the data products delivery scheme and the data rights. It also defines modes of participation of the scientific community in the BepiColombo programme, including IDSs and GIs.

IDSs are expected to focus their efforts on scientific cross-fertilisation. Therefore, IDSs should not reflect instrument specific domains but cover science themes such as, for instance, planetary surface morphology, mineralogy, exosphere, and interior structure. IDSs are expected to be heavily involved with and/or have a leading role in the scientific activities of the mission. IDSs may also wish to undertake specific and time-limited tasks in areas such as modelling of the planet and its environment, mission and science operation planning, hazard assessment and similar activities that may be required during the course of the mission. The appointment of one or more IDSs may also be considered for the coordination of MPO-MMO science. IDSs will take part in the analysis of data from different instruments on-board one or more elements of the mission. For these analyses they have the same data rights as the members of the Principal Investigator-led instrument consortia.

The IDSs, as part of their role, will have to participate in the BepiColombo Science Working Team (SWT) activities, including attending the regular SWT meetings. Individual scientists applying for an IDS position can submit proposals as individuals, possibly supported by a team.

GIs are individual scientists wishing to make use of the data collected by one or more instruments, spacecraft sensors or tracking data, in combination with results from other missions, ground-based observations, laboratory measurements, or numerical models. The purpose of GIs is to spread the use of, and complement, BepiColombo data more widely in the planetary science community. Proposers for GI positions can include or focus on the use of data collected during the cruise phase, e.g., in relation to Venus fly-bys.

Proposers for GI positions are requested to contact and discuss their planned investigations with the Principal Investigators (PIs) of the instrument(s) they plan to use data from (see Annex).

2 ELIGIBILITY AND APPOINTMENT CONDITIONS

This call is open to scientists based in ESA Member States, Japan and USA. PIs and Co-PIs of the BepiColombo instrument teams are excluded from this call, while Co-Investigators (Co-Is) are eligible for IDS positions, but not for GI positions.



The proposals for an IDS or a GI should demonstrate the candidate's expertise in one or more of the BepiColombo core science fields [see AO-D1, AO-D2, and AO-D3] and must describe clearly the scientific case, the relevance of the contribution to the mission, and the instrument data sets needed to carry out the research programme, according to the expected role of IDSs and GIs as outlined in Section 1. The proposals 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 (as needed) from the head of the applicant's institution and/or the respective funding institution to the application. IDS applicants will have to guarantee participation in the SWT meetings (on average two meetings per year are expected¹) and in any other activity associated with the IDS appointment. GI applicants are requested to contact instrument PIs (see Annex) to agree with them the proposed work and the data needed for the proposed study.

The successful candidates will be appointed for a first period of three years, renewable. The IDS or GI appointment is *ad personam*.

Each selected IDS and GI will be required to submit short annual reports of his/her BepiColombo related activities to ESA.

Should IDS and/or GI positions become vacant, they will be filled through new competitive calls.

3 LETTER OF INTENT

Prospective proposers must submit a mandatory Letter of Intent (LoI) by the deadline indicated in Table 1. Proposals not preceded by a corresponding LoI will not be considered. LoIs are limited in length to two A4 pages (minimum font size 11 pt), and their purpose is to allow preparation for the evaluation process.

Letters of intent must be structured to contain the following information:

- Proposal title (with clear indication if the proposal is for an IDS or GI position);
- Name and contact information of proposer;
- Concise description of the scientific objectives.

It is understood that the proposal's content may evolve between submission of the LoI and submission of the actual proposal.

¹ every second year one SWT meeting is organised in Japan.



4 CONTENTS OF THE PROPOSAL

Proposals submitted in response to the AO are limited in length to 10 A4 pages (minimum font size 11 pt), and must contain the following information:

- A cover letter stating the proposal title (with clear indication if the proposal is for an IDS or GI position), proposer's name and affiliation, and explicitly mentioning the proposer's title, position, institute, address, telephone number, and e-mail address (max. 1 page);
- A brief curriculum vitae also including the 10 most relevant publications (max. 2 pages);
- A description of the scientific expertise relevant to the BepiColombo science objectives described in [AO-D1] (max. 2 pages);
- A description of the proposed scientific investigation and a statement concerning the time availability (max. 5 pages).

In addition, the proposal must include (in the same file, but in addition to the maximum 10 pages of the proposal):

- 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 IDS or GI tasks.
- For GI position applications: Letters of Endorsement, signed by the PIs of the BepiColombo science instruments that the proposer wants to work with, stating that the PI will grant access to the needed data for the proposed study.

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 BepiColombo science objectives;
- The scientific value of the proposal and the level to which the proposal identifies specific competences and its relevance to the exploitation of the BepiColombo data;
- Adequacy of the time that the candidate intends to devote to activities related to the IDS or GI role;
- Adequacy of resources available to the candidate to carry out activities related to the IDS or GI role.



6 LETTERS OF INTENT AND PROPOSALS SUBMISSION

Letters of Intent and Proposals must be submitted electronically in PDF format (file size cannot exceed 10 MB) according to the instructions on the following web page:

<https://cosmos.esa.int/web/bepicolombo-ids-gi-2019>

and according to the deadlines listed in Table 1.

Proposers will receive confirmation upon successful receipt of their Letters of Intent and Proposals.

Further queries should be addressed to:

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ACRONYMS

| | |
|-------|--|
| AO | Announcement of Opportunity |
| CEST | Central European Summer Time |
| Co-I | Co-Investigator |
| Co-PI | Co-Principal Investigator |
| ESA | European Space Agency |
| FTE | Full Time Equivalent |
| GI | Guest Investigator |
| IDS | Interdisciplinary Scientist |
| JAXA | Japan Aerospace Exploration Agency |
| LoI | Letter of Intent |
| MMO | BepiColombo Mercury Magnetospheric Orbiter |
| MPO | BepiColombo Mercury Planetary Orbiter |
| PI | Principal Investigator |
| SMP | Science Management Plan |
| SPC | Science Programme Committee |
| SWT | Science Working Team |



ANNEX

BepiColombo Scientific Payload

Mercury Planetary Orbiter (MPO)

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| Spectrometer and Imagers for MPO BepiColombo - Integrated Observatory (SIMBIO-SYS) | PI: G. Cremonese (IT) | Gabriele.Cremonese[at]inaf.it |
| BepiColombo Laser Altimeter (BELA) | Co-PIs: H. Hussmann (DE), N. Thomas (CH) | Hauke.Hussmann[at]dlr.de Nicolas.Thomas[at]space.unibe.ch |
| Italian Spring Accelerometer (ISA) | PI: V. Iafolla (IT) | Valerio.Iafolla[at]iaps.inaf.it |
| Mercury Orbiter Radio Science Experiment (MORE) | PI: L. Iess (IT) | Luciano.Iess[at]uniroma1.it |
| Magnetic Field Investigation (MPO-MAG) | PI: D. Heyner (DE) | D.Heyner[at]tu-bs.de |
| Mercury Radiometer and Thermal Imaging Spectrometer (MERTIS) | PI: H. Hiesinger (DE) | Hiesinger[at]uni-muenster.de |
| Mercury Gamma-Ray and Neutron Spectrometer (MGNS) | PI: I. Mitrofanov (Russia) | imitrofa[at]space.ru |
| Mercury Imaging X-ray Spectrometer (MIXS) | PI: E. Bunce (UK) | Emma.Bunce[at]ion.le.ac.uk |
| Solar Intensity X-ray and particle Spectrometer (SIXS) | PI: J. Huovelin (FI) | Juhani.Huovelin[at]helsinki.fi |
| Probing of Hermean Exosphere by Ultraviolet Spectroscopy (PHEBUS) | PI: E. Quémerais (FR) | Eric.Quemerais[at]latmos.ipsl.fr |
| Search for Exospheric Refilling and Emitted Neutral Abundances (SERENA) | PI: S. Orsini (IT) | Stefano.Orsini[at]iaps.inaf.it |



Mercury Magnetospheric Orbiter (MMO)

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|--|------------------------|--|
| Mercury Plasma Particle Experiment (MPPE) | PI: Y. Saito (JP) | saito[at]stp.isas.jaxa.jp |
| Plasma Wave Instrument (PWI) | PI: Y. Kasaba (JP) | kasaba[at]pat.gp.tohoku.ac.jp |
| Mercury Magnetometer (MMO-MAG) | PI: W. Baumjohann (AT) | Wolfgang.Baumjohann[at]oeaw.ac.at |
| Mercury Sodium Atmospheric Spectral Imager (MSASI) | PI: I. Yoshikawa (JP) | Yoshikawa[at]eps.s.u-tokyo.ac.jp |
| Mercury Dust Monitor (MDM) | PI: M. Kobayashi (JP) | Kobayashi.Masanori[at]it-chiba.ac.jp |