

# ESA ANNOUNCEMENT OF OPPORTUNITY FOR NASA MARS 2020 RETURNED SAMPLE SCIENCE PARTICIPATING SCIENTIST

**NOTICE:** This Announcement of Opportunity (AO) requires a Letter of Intent (LOI). Proposals that are not preceded by the mandatory LOI will be returned without review. No feedback will be provided in response to the LOI.

1. Scope of the AO
  - 1.1 Introduction and Tasks

The preparation of a cache of martian rock and regolith samples for possible return to Earth via a future mission is a central objective of the NASA Mars 2020 mission.

This Returned Sample Science Participating Scientist (RSS PS) AO of ESA seeks individuals whose addition to the mission's science team will enhance the value of the samples to be selected, characterized, and cached by the NASA Mars 2020 Rover. The selected investigators should anticipate the needs of future investigators who may analyse these samples for a very diverse range of studies in Earth-based laboratories. Selected RSS PSs are expected to contribute collaboratively to any and all aspects of the surface science mission.

Specifically, RSS PSs are sought to contribute to the following NASA Mars 2020 science team tasks:

- a) Identify, articulate and prioritize the scientific questions that may potentially be addressed through analysis of returned samples cached by the Mars 2020 Rover at its selected landing site.
- b) Using the rover's instruments, characterize the geology of the landing site and its past habitability and potential for preservation of biosignatures.
- c) Informed by the observations in b), identify individual samples and suites of samples that can best meet the priorities identified in a).
- d) Prepare detailed "field notes" that document both the geologic context and the rationale used for sample selection to a level that justifies return of samples to Earth.
- e) Participate in Science Team meetings and training events.
- f) Regularly contribute to daily rover operations during the surface mission, including serving in at least one operational role.

Returned Sample Science will be organized in a fashion parallel to the mission's existing investigations associated with each of the rover's seven science instruments.

NASA already issued a call for Returned Sample Science Participating Scientist (RSS PS) in 2018. Ten proposals were selected for funding in September 2019. RSS PSs selected through this AO will join the already selected RSS PS Team and become members of the NASA Mars 2020 Science Team. Two members of the RSS PSs Team will represent the team in the science leadership of the NASA Mars 2020 mission, namely the Project Science Group.

The timing of this AO is designed to permit selection and training of RSS PSs in time to contribute fully to both pre-landing activities and to science operations immediately upon arrival at Mars.

## 1.2 Eligibility and Desired Skills

To complement the existing NASA Mars 2020 Science Team and its expertise in orbital and *in-situ* Mars exploration, this AO seeks internationally-recognized sample scientists in ESA member states (excluding Canada) – individuals who develop or apply techniques for the analysis of rock or soil samples, or who have relevant experience in collecting such samples in the field prior to laboratory analysis.

Further information on Mars sample return objectives can be found in the iMOST report (can be downloaded from the AO).

Because the intention of this AO is to enhance and broaden the scientific return of the NASA Mars 2020 mission, proposals submitted by NASA Mars 2020 Instrument PIs, Deputy PIs, and Instrument Co-Investigators (Co-Is) will not be considered. Members of the former NASA Mars 2020 Returned Sample Science Board are eligible to apply.

ESA encourages proposals from people in ESA member states who have not previously participated in Mars missions or Mars research, but have expertise in the areas above.

**Proposals are limited to only one individual, the PI.** Team proposals are not permitted.

## 1.3 Proposal Information Package

The Proposal Information Package (PIP) for the Mars 2020 RSS PS AO provides more details about the spacecraft, its science payload and other useful information about the Mars 2020 mission and the science team. The NASA Mars 2020 PIP can be downloaded from the AO.

## 2. Proposal Submission

A Letter of Intent (LOI) is mandatory for this AO. LOIs must be submitted by the deadline, and late LOIs will not be accepted. Any proposal that is not preceded by an LOI will be returned without review. Changes of the PI and title between LOI and proposal are not permitted.

### 2.1 Proposal Guidelines

Applicants must submit a proposal that will allow ESA to assess the qualifications and capabilities of the candidate with respect to the Mars sample return science objectives. Successful proposals will explain how the proposer can substantively contribute to objectives a, b, c, and d listed in Section 1, with specific reference to the NASA Mars 2020 landing site - Jezero Crater. Proposers to this AO should consider: What are the key returned sample science questions that the proposer's participation enables? What rocks (or rock types) are required to be sampled and returned to address these questions? What *in-situ* geologic characterization is required? How can *in-situ* observations best be organized and documented to support selection of samples to cache for the envisioned Earth-based investigations? Can the Mars 2020 caching system store and return samples in an appropriate condition for the anticipated Earth-based analysis?

### 2.2 Operational Roles

Since proposers will be participating in operations, they should be prepared to obtain the necessary training for operational positions and they should be prepared to staff operational roles on a regular basis. If selected, the Project will assist in determining the operations roles that are most suitable and

recommended location(s) for training. See also Section 3.2 for additional information regarding participation in other mission activities.

### 2.3 Sources of Information and Data Used in the Proposal

All information and data used in the proposal pertaining to the NASA Mars 2020 mission, the NASA Mars 2020 science instruments (or testbeds or engineering models belonging to the NASA Mars 2020 instrument teams), and NASA Mars 2020 science data (from instruments, testbeds, or engineering models belonging to the NASA Mars 2020 instrument teams) must be publicly available. If data are not available, then the proposal will not be considered for selection.

### 2.4 Termination of Award

Any alteration of the NASA Mars 2020 mission, or any of its instruments, that renders the Participating Scientist unable to accomplish all of the proposed science tasks (e.g., spacecraft or instrument failure) may be cause for award termination. In such a case, ESA reserves the right to terminate the award after a suitable closeout period is negotiated with the PI.

## 3. Programmatic Information

### 3.1 Award Duration

Participation is expected to begin in summer of 2020 and extend through the end of the prime mission (currently June 2023) plus a 3-month wrap up period. For purposes of this proposal the end date should be considered September 2023.

Proposers should be prepared (and should budget for) a **commitment of a minimum of 18% time** through this period. Because we are seeking the expertise of proposing individuals, **no supporting personnel and no other team members are allowed.**

### 3.2 Budget Information

The budget must include funding for any training and data analysis to support the proposed science investigation, all page charges for publication and reprints, attendance at conferences, all travel, and all other necessary expenses.

Proposers should include adequate funds for the PI to travel to Pasadena, CA, USA to participate in one Operations Readiness Test (ORT) during Phase E (after launch but before landing on Mars, July 2020-February 2021), and science team meetings (one week per calendar year from 2020-2023). In addition, proposers should budget travel for a **90-day period of Science Team co-location in Pasadena, CA** post-landing during calendar year 2021.

The proposal must include a **Letter of Endorsement (LoE)** from its funding institution (e.g. national space agency) with an explicit statement that the financial support for all proposed activities will be made available within 6 weeks of selection notification by ESA. ESA will not fund proposals submitted for this AO.

### 3.3 Evaluation Criteria

The evaluation criteria are intrinsic merit, relevance, and cost realism/reasonableness. In addition to the factors for each criterion given there, this AO specifically includes the following two factors in the evaluation of intrinsic merit:

- a) Demonstrated understanding of the key questions that motivate Mars sample return and how they can be addressed through appropriate selection and documentation of samples on Mars and,
- b) Demonstrated experience developing and implementing state-of-the-art terrestrial laboratory methods for analysing samples.

Relevance is defined as the extent to which the proposal meets the objectives of the Mars 2020 Return Sample Science Participating Scientist AO in Section 1.

Although left up to the proposer, it may be advantageous to call out the anticipated contributions listed in Section 1.1 in separate sections within the proposal.

Programmatic factors that may affect selection of proposals include the degree to which the proposed work broadens participation and expertise in the mission and the ability of the mission to accommodate the proposed work in light of spacecraft and instrument capabilities, schedule, and resources.

### 3.4 Progress Reports and Deliverables

The Participating Scientist shall provide annual reports to the NASA Mars 2020 Project Scientist, the NASA Headquarters Mars 2020 Program Scientist, and the ESA MSR Program Scientist that include: accomplishments over the past year, plans for the next year, issues, concerns, schedule performance, financial performance, recovery plans, and status of publications and other deliverables.

## 4. Summary of Key Information

Number of selections, pending adequate proposals of merit	5
Eligibility to submit proposals	Scientists with the relevant expertise and their main duty station in one of the ESA member states (excluding Canada)
Minimum time-commitment for proposer	18% of full-time-equivalent
Deadline for mandatory LOI submission	15 April 2020
Deadline for proposal submission, including letter of endorsement of financial support	30 April 2020
Notification of selection	29 May 2020
Planned start of activities	July 2020
Planned completion of activities	September 2023
Address for LOI and proposal submission	esa-m2020rssps@esa.int
ESA point of contact concerning this AO	Gerhard Kminek European Space Agency MSR Program Scientist (interim) Email: gerhard.kminek@esa.int

