



Announcement of Opportunities for International Cooperation of the Chang'E-8 Mission

Schedule

LOI due	December 31, 2023
Primary selection	February to April, 2024
Proposals due	June 30th, 2024
Final confirmation	September, 2024

China National Space Administration

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1. Introduction of Chang'E-8 Mission

1.1 Background

The Chang'E-8 (CE-8) mission is scheduled to be launched around 2028. The probe consists of a lander, a rover, and an operation robot. After landing in the pre-selected landing area in the lunar south-pole region, the lander will deploy a multi-purpose transfer mechanism, transfer the rover and the operation robot to the designated area on lunar surface, and carry out scientific exploration, scientific experiments, and technical tests with the assistance of the operation robot. The rover will conduct roving exploration.

1.2 The scientific objectives and the planned Chinese scientific payloads

The science objectives of the CE-8 mission are:

- Investigating lunar multi-physics fields.
- Investigating lunar local geological profiles.
- Investigating Earth magnetosphere and energy balance with moon-based Earth observation.
- Analyzing in-situ lunar sample and experimenting on resource utilization.
- Experimenting on mini enclosed terrestrial ecosystem in lunar environment.

The CE-8 mission is planned to carry 14 domestic science payloads. The lander is equipped with 10 scientific payloads, including Landing Camera, Topography Cameras, Lunar Seismometer, Lunar Low-Frequency Electromagnetic Field Detector, Lunar Regolith Heat Flow Meter, Moon-based Earth Radiometer, Moon-based Earth Multispectral Imager, Soft X-Ray Telescope, Mini Terrestrial Ecological Experimental Device, and In-Situ Resource Utilization Testing Device. The rover is equipped with 4 scientific payloads, including Panoramic Cameras, Lunar Penetrating Radar, Infrared Spectrum Mineral Analyzer, and In-Situ Lunar Sample Analysis and Storage Device.

2. International Cooperation Opportunities

The cooperation opportunity is open to the international community, and international partners are welcome to carry out mission-level, system-level and payload-level cooperative projects in

the CE-8 mission. Mission-level cooperative project means that China and international partners respectively launch and operate their spacecraft and conduct spacecraft-to-spacecraft interactions and joint exploration on the lunar surface. System-level and payload-level cooperative projects refer to cooperative projects that are installed on the CE-8 lander through the CE-8 onboard opportunities to carry out exploration and research.

CE-8 lander can provide no more than 200kg (including the interface between the cooperative project and the spacecraft, separation or release devices, cables, and other adaptive components) for system-level and payload-level piggyback projects. After CE-8 reaches the lunar surface, piggyback modules may separate from the lander and work independently, i.e., system-level projects, such as lunar surface robot, rover, flight vehicle, etc. Piggyback modules may also work on the lander, i.e., payload-level projects. The detailed supporting conditions for piggyback projects (e.g., electrical/mechanical/thermal interfaces, ground test specifications, etc.) will be clarified in the follow-up technical coordination process.

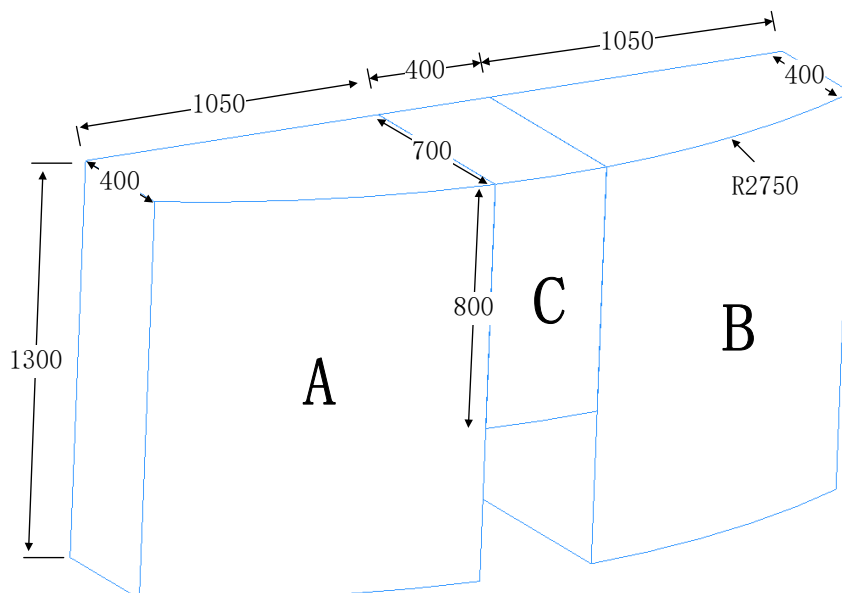
2.1 Preliminary design constraints provided by the lander

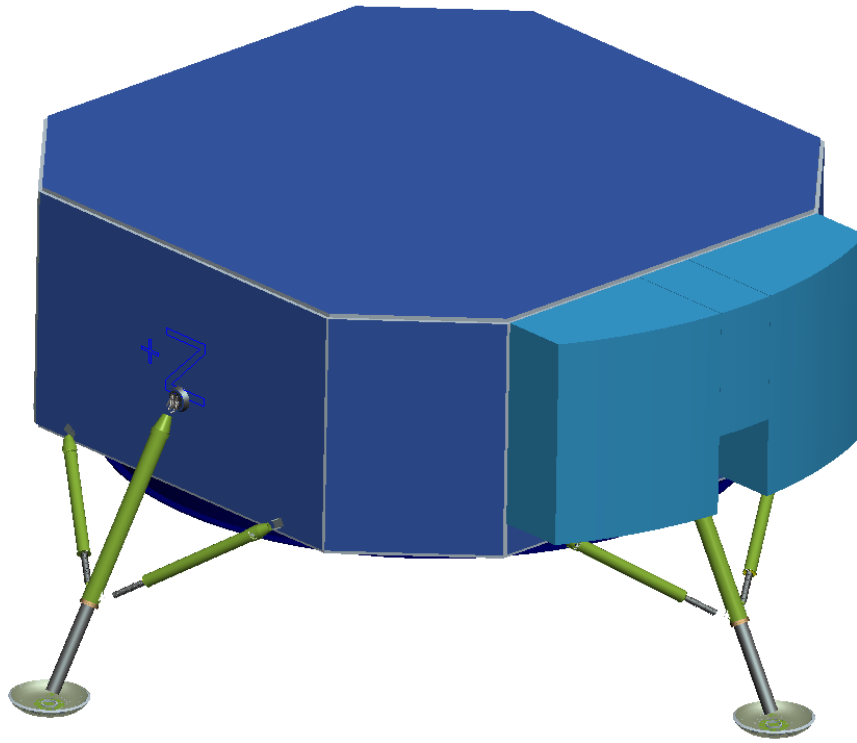
2.1.1 The total mass available is 200kg, shared by all piggyback projects. The mass of single independent module shall not exceed 100kg (including adaptive components).

2.1.2 The lander can provide a total power of 200W. For lander powered payloads, the power of single one shall not exceed 50W.

2.1.3 All piggyback modules are installed on the outside of the lander side panel, and the total size of available installation space is 2500 mm×1300 mm×700 mm, which is divided into three parts: A/B/C (as shown below).

Unit: mm





2.1.4 In principle, the lander does not provide lunar night supports, such as electrical power, heat source, etc. Cooperative modules which have the need of surviving lunar nights need to address such themselves.

2.1.5 Electrical, mechanical, thermal and communication interfaces shall adapt to spacecraft specifications and will be further coordinated in the technical coordination process.

2.2 Priority projects

- Missions capable of carrying out spacecraft-to-spacecraft interactions and joint exploration with the CE-8 mission on the lunar surface or in lunar orbit.
- Lunar robots with the capability to capture, carry and place items, shovel, and transfer lunar soil.
- Scientific payloads that meet the scientific objectives of the CE-8 mission and are complementary to the Chinese payloads.
- Other projects with advanced scientific innovation.

2.3 Delivery time of the payload project

The flight model of payload project shall be delivered by August 2027.

3. Application and Follow-up Procedures

3.1 Letter of Intent (LOI) Submission

After the release of this Announcement of Opportunities, interested organizations need to

submit an LOI to the China National Space Administration (CNSA), and the deadline for submission is December 31, 2023. An English or Chinese PDF version of the LOI should be submitted.

In LOI, the necessity and advancement of the project, project performances and technical solutions, development plan and team composition should be described (see appendix for the outline of LOI).

3.2 Preliminary selection, technical exchanges, and confirmation of cooperation intents.

Preliminary selection will be carried out to evaluate the collected LOIs. From February to April 2024, feedback on preliminary selection result will be given, and further technical coordination and confirmation of cooperation intents will be conducted with the preliminarily selected project teams.

3.3 Proposal submission and final confirmation

Before June 30, 2024, the preliminarily selected project teams shall submit the project proposal (detailed requirements will be clarified separately).

In September 2024, the final selection will be completed, and cooperative projects will be confirmed.

4. Contacts

The official website of CNSA: www.cnsa.gov.cn

Gan Yong: 86-10-88581246, gany@cnsa.gov.cn

Yang Ruihong: 86-10-88432162, clep@cnsa.gov.cn

Appendix

The Outline of The Letter of Intent for The Project

1. Abstract

Briefly describe the necessity and advancement of the project, function and performance indicators, technical solutions, project team, etc.

2. Main Body

2.1 The necessity of the cooperative project

2.1.1 Objectives: describe the scientific/engineering objectives of the joint project, the exploration mission, and the results expected to be achieved.

2.1.2 Advancement: describe the technical comparison of this project with similar international products.

2.1.3 Development basis: describe the project development basis, the team's experience, and the ability to undertake similar projects.

2.2 Project performance and technical solutions

2.2.1 Technical solution: explain the project working principle, technical solution, and working mode on lunar surface.

2.2.2 Performance indicators: lists the specific parameters of the payload, such as detection indicators, mass, power, size, work lifespan, etc.

2.2.3 Interface requirements: define the installation layout, mechanical/electrical/thermal interfaces, TT&C, remote operation and other interface requirements.

2.3 Development plan

Describe the task plan and timeline and clarify the work plan of each stage such as design, development, integrating, and testing.

2.4 Project team

Describe the main development units and the division of tasks involved in the project. The names, addresses, telephone numbers, emails and fax numbers of the declaring organization, the person in charge of the project, the contact point and the members of the team need to be specified.