August 26, 2021

Call for Proposal – Scientific Experiments for Beresheet2 Lunar Mission

1. General:

SpaceIL hereby calls on the scientific community to propose scientific experiments to be performed as part of the Beresheet2 lunar mission.

2. Background:

2.1. About SpaceIL:

SpaceIL is a non-profit organization acting to promote science and scientific education. In April 2019 it led Israel to be the fourth country to land a spacecraft on the moon and became the first world-wide non-government organization to carry out a lunar mission. Despite the failure in the final stage, Beresheet's journey excited millions in Israel and abroad and is an inspiration for future generations of entrepreneurs, scientists, and dreamers. SpaceIL has recently launched the Beresheet2 program in parallel to its broad continuous educational activities.

2.2. About Beresheet2:

The Beresheet2 lunar mission raises the bar for complexity and daring substantially and was designed after in-depth investigation and study of all aspects of the Beresheet1 lunar mission.
The Beresheet2 mission involves an integrated system of 3 spacecrafts:

- **Orbiter ("Mothership"):** Intended to orbit the moon for several years and to be used for scientific experiments and educational activities with youth in Israel and around the world.
- **Two landers:** Intended to land at different sites on the moon, with the objective of deploying one lander on the near side of the moon and one on the far side.

2.3. Call for proposals:

We call the scientific community to propose experiments to be performed by the Beresheet2 mission. The experiments will be carried on either the orbiter or the landers according to the description in the following section.

3. **Characteristics of the experiments**:

3.1. Below are the specifications and requirements for the experiments:

Criterion	**Lander (two landers in project)**	**Orbiter**
Possible fields of exploration (Others may be proposed)	Lunar soil, surface condition, lunar sustainability such as production of food and water), astrobiology, Comparative data from both sides of the moon, etc'	Remote sensing of the moon, environmental conditions in lunar orbit, study of the space environment around the moon.
Experiment duration:	From release and up to 72 hours after landing	2-5 years
equipment weight:	2.5 kg including thermal protection and installation hardware (~ 2.0 kg net)	5.0 kg including thermal protection and installation hardware (~ 4.0 kg net)
Maximum Volume	3.0 liters (in a single unit). To be fitted into a space of 20X15X10 cm	6.0 liters for a set of sensors and experimental equipment (up to 3 components)
Maximum power consumption	10 W (total)	20 W (total)
Experimental Data transfer to earth	50 MB (cumulative over 72 hours)	5 MB (daily). It will be possible to store data on board and transmit it later.

3.2. Experiments carried by the landers: The payload should be activated after approximately 6-10 weeks of space travel.

3.3. Payload is required to survive the harsh environment in space, including radiation and temperatures, during space travel and mission. Thermal protection for the payload should be designed in coordination with SpaceIL.

3.4. Experiments carried by the orbiter: It is possible to expand the amount of data to be sent back to earth by adding daily communication windows

3.5. The payload should meet the environmental and safety requirements related to the launch and journey. An additional requirement of surviving the landing is added.

3.6. SpaceIL's vision is to incorporate of scientific research with public-facing educational programs. We aspire to make this possible by carrying out experiments that can be made educationally accessible to students, as per the response specifications below.

3.7. SpaceIL reserves the right to change and update the data herein as necessary.

4. Program Schedule

Activity	Completion Date
CFP published	26/08/2021
Submission deadline	15/11/2021
Scientific committee recommendation	30/11/2021
SpaceIL decision and board approval	15/12/2021
Payload interface review	01/01/2022
ICD freeze	31/01/2022
Payload PDR	31/03/2022
Payload CDR	30/09/2022
Development unit production and testing	01/04/2023
Delivery of an EM (engineering model), user manual and integration support	01/09/2023
Delivery of a FM (flying model after full qualification) and qualification support	31/12/2023
Payload final integration and ground testing	30/04/2024
Launch, technical support for payload operation throughout the mission lifespan	As required

5. Additional requirements:

5.1. Payload development and production is to be funded by the proposing team. Therefore, the team must show the availability of experiment funding.

5.2. Willingness to participate in / contribute to mission expenses should be an advantage.

5.3. The payload should meet the environmental, load, and safety requirements which will be defined by SpaceIL and the launch service provider.

5.4. The selected teams should support the mission through all stages outlined in Section 4.

5.5. The proposal should include an outline for an educational plan associated with the mission.

5.6. The experiment results should be published to the general public after their publication in scientific records. As a guideline, the data should be made available to the public as soon as possible from the time of its reception at the ground station.

5.7. SpaceIL should have the right to use of the information and data produced by the experiments for educational purposes.

6. Scientific Advisory Committee

6.1. SpaceIL has nominated a scientific advisory committee that is comprised of leading scientists from Israel academy, the Israel Space Agency, SpaceIL partners and STEM educational representatives.

6.2. The scientific advisory committee will rate the proposal based on:

6.2.1.1. Scientific value

6.2.1.2. Quality of implementation – methodology, quality and adequate for the proposed study

6.2.1.3. Assessment of the validity of the experimental results

6.2.1.4. Level of technology risk

6.3. The committee members will be able to take part in a proposal team but will not be allowed to participate in the evaluation and rating process of the proposals they are involved in.

6.4. The Advisory Committee will submit the recommendations to SpaceIL management.

7. Criteria for the proposal selection by SpaceIL management:

7.1. Scientific value, based on the scientific committee's recommendations (described in 6.)

7.2. Meeting technical requirements

7.3. Level of overall operational risk (technology, financial, schedule)

7.4. Ability to build an educational program around the scientific testing and results

7.5. Willingness to financially support the Beresheet program in addition to funding the direct cost associated with the payload development, production, and testing

8. Proposal format

8.1. Title

8.2. Brief (up to 200 words)

8.3. Team member information, background, contact person (phone and email). Attach CV of the leading team members.

8.4. Experiment objectives:

8.4.1. General description of the proposed experiment and its research goals.

8.4.2. The significance of such an experiment.

8.5. The expected publication time for a scientific paper about the experiment.

8.6. General format for the incorporation of the experiment and it's accessibility in educational programs for various age groups: university/college students, high school, junior high and younger students.

8.7. Level of compliance with the technical requirements

8.8. The readiness level of the experiment. Have such experiments been performed before?

8.9. Schedules for development and testing of the experiment's equipment.

8.10. Details of the budget (including total estimated cost and cost breakdown), availability of project financing and level of confidence.

8.11. Risk assessment and contingency plan:

8.11.1. Technological risks.

8.11.2. Financial risks.

8.11.3. Schedule risks.

8.12. Optional: proposal for funding of some of the expenses of Beresheet's lunar mission.

9. Proposals Submission

9.1. Each team can submit more than one proposal (one for each spacecraft - orbiter, lander #1, Lander #2)

9.2. Submission deadline: November 15TH 2021.

9.3. Submission by e-mail: mission@spaceil.com

9.4. Response file size: up to 10 pages (Times new roman 11 pt., line spacing – 1.5)

9.5. Team CV will be attached in a separate file.