

**A ONE TIME ONLY OPPORTUNITY FOR A COORDINATED INTERNATIONAL
EFFORT TO UNDERSTAND THE LUNAR SURFACE ENVIRONMENT AND ITS
TRANSFORMATION THROUGH EXPLORATION**



FORUM HANDBOOK
14-15 OCTOBER, 2026
BEIJING, CHINA

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ISSI-BJ INTRODUCTION

The International Space Science Institute in Beijing (ISSI-BJ) was jointly established by the National Space Science Center (NSSC) and the International Space Science Institute (ISSI) with the support of the International Cooperation Bureau and the Space Science Strategic Project of the Chinese Academy of Sciences (CAS). ISSI-BJ is a close cooperation partner of ISSI in Bern. The two institutes share the same Science Committee, the same study tools, and other information of mutual relevance and interest. However, both use independent operational methods and different funding sources.

ISSI-BJ is a non-profit research institute. Our main mission is to contribute to the achievement of a deeper scientific and technological understanding of future space missions as well as of the scientific results from current and past missions through multidisciplinary research, possibly involving, whenever felt appropriate, ground-based observations, modelling, numerical simulations and laboratory experiments, using the same tools as ISSI, i.e. Forums, International Teams, Workshops, Working Groups or individual Visiting Scientists. The Program of ISSI-BJ covers a widespread spectrum of space science disciplines, including astrophysics, solar and space physics, planetary science, astrobiology, microgravity science and Earth observation from space.

FORUM INTRODUCTION

Context

This Forum proposes to unite international experts to identify and coordinate scientific investigations focused on the Moon's pristine surface environment.

With renewed global interest in lunar exploration, multiple missions are being deployed within this decade. ESA's Terrae Novae, Artemis, Chang'e, Chandrayaan, and international commercial ventures are converging on the Moon's surface. This growth in human activity on the Moon will change the fragile environment, and most likely already has.

Humanity has a one-time only opportunity to coordinate efforts and make measurements of the lunar environment while it remains pristine. ISSI-BJ's platform is uniquely suited to bring together scientific experts from across the world to align priorities, share strategies, and define a collaborative path forward.

The Forum's interdisciplinary model will foster cross-pollination of insights and methodologies, generating integrated science goals and operational recommendations. By aligning data collection efforts across space agencies and mission timelines, we can achieve a holistic understanding of the Moon's changing environment.

Objectives

- ✧ Explore opportunities for coordinated multi-mission observations to enable synergistic science that individual missions cannot achieve alone, for instance by using distributed lunar surface assets to observe global environmental phenomena or as an in-situ Earth magnetospheric observatory.
- ✧ Define the measurements needed to characterize the lunar near-surface environment, including plasma, ambient (E, B) fields, dust, radiation, micrometeoroids and the exosphere including the relationship with polar cold trapped volatiles.
- ✧ Determine priority measurement areas of interests and locations (e.g, polar regions, permanently shaded areas, mare or highland regions, lunar swirls, the terminators lunar wake, solar wind, magnetosheath, lobes, magnetotail) to capture environmental spatial and temporal variabilities.
- ✧ Understand the influence of this environment on exploration systems performances degradation and lifetime as well as human health.
- ✧ Assess how ongoing and future exploration activities are modifying lunar conditions (e.g. rocket exhaust gasses, tanks venting, structures outgassing, regolith redistribution etc..).

Convenors

Stas Barabash	Swedish Institute of Space Physics, Sweden
James Carpenter	European Space Agency
Fabrice Cipriani	European Space Agency
Jingnan Guo	University of Science and Technology of China, China
Yang Liu	National Space Science Center, CAS, China
Chi Wang	National Space Science Center, CAS, China

Program

Day 1, 14 October 2026

Zoom Meeting ID: 876 2199 8428

Zoom Meeting Password: 451515

Opening Session

Chaired by James Carpenter and Yang Liu

09:00-09:10	Welcome and Introduction	James Carpenter Yang Liu
09:10-09:30	Context and Approach to the Forum and Introductions of Participants	James Carpenter Yang Liu
09:30-09:45	Overview of Plasma, Surface Charging and Dust - State of the Art and Major Science Questions	Stas Barabash
09:45-10:00	Lunar Electric Fields for Dust Transport	Hui Zhang
10:00-10:15	Overview of the Solar Wind - Moon Interaction	Lianghai Xie
10:15-10:30	Discussion	
10:30-10:45	<i>Coffee Break at ISSI-BJ Office A0421</i>	

Environment Effects of Lunar Exploration

Chaired by Stas Barabash

10:45-10:50	Introduction to the Session - Scope and Objectives Content per Talk ✓ Field Overview ✓ Impacts of upcoming exploration and exploitation ✓ Key scientific gaps ✓ Critical measurements & mission requirements for characterizing current status ✓ Critical measurements and mission	Stas Barabash
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requirements for monitoring changes		
10:50-11:10	Impacts of Exploration Activities on the Lunar Exosphere	Audrey Vorburger
11:10-11:25	Discussion	
11:25-11:45	How Exploration Changes Volatile Reservoirs, Their Provenance, Redistribution, and Scientific Record	Mahesh Anand (online)
11:45-12:00	Discussion	
12:00-12:20	Impacts of Exploration Activities on Lunar Regolith Physical and Chemical Properties	Thomas Maynadie
12:20-12:35	Discussion	
12:35-12:50	Round-Up Discussion	Stas Barabash
	✓ Main alterations to the lunar environment by lunar exploration	
	✓ Implications for future scientific discovery and exploration activities	
	✓ Most time - critical measurements and key research areas	
12:50-13:00	<i>Group Photo at 1F Building A</i>	
13:00-14:00	<i>Lunch at -1F Building A</i>	
Hazards of the Lunar Environment for Exploration (I) Chaired by Fabrice Cipriani		
14:00-14:05	Introduction to the Session - Scope and Objectives	Fabrice Cipriani
14:05-14:20	Radiation as a Constraint for Lunar Exploration	Jingnan Guo
14:20-14:35	Discussion	
14:35-14:50	<i>Coffee Break at ISSI-BJ Office A0421</i>	
	Charging Mechanism and Motion	
14:50-15:10	Characteristics of Lunar Dust Under Engine Plume Impingement	Zun Zhang
15:10-15:25	Discussion	
15:25-15:45	Lunar Space Environment Information	Yanxue Wu

	Extracted from Sample Analysis	
15:45-16:00	Discussion	
Planetary Protection		
Chaired by James Carpenter		
16:00-16:05	Introduction to the Session - Scope and Objectives	James Carpenter
16:05-16:25	Lunar Planetary Protection - Status, Needs and Future Approaches	Silvio Sinibaldi (online)
16:25-16:50	Discussion ✓ Priorities for planetary protection of the lunar environment ✓ Roles of scientific observations	James Carpenter
16:50-17:00	Close Remarks	James Carpenter
18:00	<i>Social Dinner at Amber 6, 2F Park Plaza Hotel</i>	

Day 2, 15 October 2026

Zoom Meeting ID: 839 5318 0112

Zoom Meeting Password: 186859

Hazards of the Lunar Environment for Exploration (II)		
Chaired by Fabrice Cipriani		
09:00-09:10	Introduction to the Session - Scope and Objectives	Fabrice Cipriani
09:10-09:30	Low Velocity Dust and Impactors as Hazards for Exploration	Yanwei Li
09:30-09:45	Discussion	
	Round-Up Discussion	
09:45-10:00	✓ Major environmental hazards for lunar exploration ✓ Key unknowns and uncertainties; critical research and measurements ✓ Importance of coupling between environmental parameters (e.g. plasma and dust) and associated unknowns	Fabrice Cipriani

Environmental Measurement Planning and Data Coordination		
Chaired by Jingnan Guo		
10:00-10:05	Introduction to the Session - Scope and Objectives	Jingnan Guo
10:05-10:25	ESA Lunar Environment Measurements and Instruments	Fabrice Cipriani
10:25-10:45	Lunar Surface Environmental Measurement Payloads and Exploration Program	Chao Liu
10:45-11:00	Coffee Break at ISSI-BJ Office A0421	
11:00-11:20	Japanese Lunar Environment Measurements and Instruments	Yoshifumi Saito (online)
11:20-12:00	Lunar Environment Measurements and Instruments: A Global Perspective	Yoshifumi Futaana
12:00-12:30	Discussion ✓ Other instruments and mission plans identification ✓ Coordination of existing missions and measurements for scientific needs ✓ Remaining required measurements and long-term vision for lunar environmental measurements	Jingnan Guo
12:30-13:30	Lunch at -1F Building A	
Formulation of Findings and Conclusions		
Chaired by Iannis Dandouras		
13:30-15:00	Presentation of Draft Findings from the Meeting, Discussion and Finalisation	Iannis Dandouras
15:00-15:20	Coffee Break at ISSI-BJ Office A0421	
15:20-16:00	Planning for Report Preparation and Subsequent Steps	Iannis Dandouras
16:00	Close Remarks - End of Meeting	

PRACTICAL INFORMATION

Venue

The forum will be held in the Saturn Hall (A0418), 4th Floor, Building A, National Space Science Center (NSSC, CAS).

Address: No. 1 Nanertiao, Zhongguancun, Haidian District, Beijing, 100190

北京市海淀区中关村南二条一号

中国科学院国家空间科学中心 A 座九章大厦 4 层土星厅

Lunches

Lunches for all participants of the ISSI-BJ forum will be available at the canteen on the -1 floor of the NSSC Building A.

Coffee Breaks

Coffee breaks will be provided by ISSI-BJ and held in the ISSI-BJ Office (A0421), opposite the Saturn Hall (A0418).

14 October Dinner

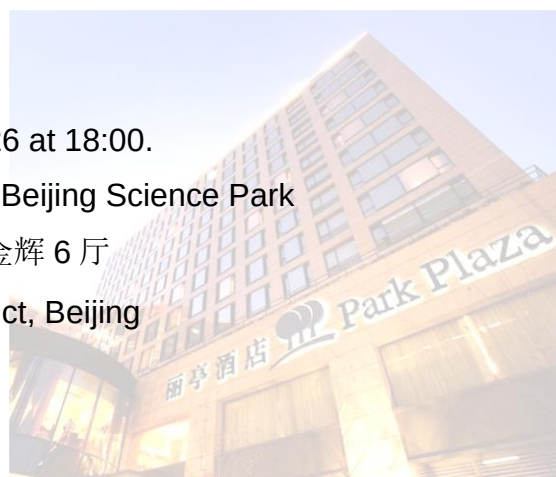
Dinner offered by ISSI-BJ on 14 October, 2026 at 18:00.

Restaurant: Amber 6, 2nd Floor of Park Plaza Beijing Science Park

北京市海淀区丽亭华苑酒店 2 层金辉 6 厅

Address: No. 25 Zhichun Road, Haidian District, Beijing

北京市海淀区知春路 25 号



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Accommodation

ISSI-BJ covers three-night accommodation, including breakfast for one non-local participant. Please kindly note that all the other expenses in hotel will be deducted from your check-in deposit.

Park Plaza Hotel Beijing Science Park

No. 25, Zhichun Road, Haidian District, 100083, Beijing, China

北京市海淀区知春路 25 号

Directions: Turn right when going out of Park Plaza Hotel and walk straight for 3 minutes, there is road “DAYUNCUN LU” (大运村路) in front of the Exit F of ZHICHUNLU (知春路) subway station, then keep going north along “DAYUNCUNLU” (大运村路) for 7-8 minutes, there is JINGZHANG RAILWAY PARK (京张铁路遗址公园) on your left, pass by the football field in the park, and follow the sign (down below) towards the National Microgravity Laboratory Tower, then cross the path, NSSC (国家空间科学中心) is located at the end of the path.



PARTICIPANTS LIST

No.	Name	Affiliation
1	Stas Barabash	Swedish Institute of Space Physics, Sweden
2	Michel Blanc	Shandong University, China
3	Fabrice Cipriani	European Space Agency
4	James Carpenter	European Space Agency
5	Iannis Dandouras	Institute of Research in Astrophysics and Planetology, France
6	Yoshifumi Futaana	Swedish Institute of Space Physics, Sweden
7	Jingnan Guo	University of Science and Technology of China, China
8	Yanwei Li	Institute of Space Systems (IRS), University of Stuttgart, Germany
9	Chao Liu	National Space Science Center, CAS, China
10	Yang Liu	National Space Science Center, CAS, China
11	Thomas Maynadie	Swedish Institute of Space Physics, Sweden
12	Quanqi Shi	Shandong University, China
13	Audrey Vorburger	University of Bern, Switzerland
14	Lianghai Xie	National Space Science Center, CAS, China
15	Chi Wang	National Space Science Center, CAS, China
16	Yanxue Wu	Macau University of Science and Technology, China
17	Yazhou Yang	National Space Science Center, CAS, China
18	Hui Zhang	Institute of Geology and Geophysics, CAS, China
19	Zun Zhang	Beihang University, China
Online Participants		
20	Mahesh Anand	The Open University, UK
21	Yoshifumi Saito	Japan Aerospace Exploration Agency, Japan
22	Silvio Sinibaldi	European Space Agency

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