

Astronomical Institutes' Scientific Seminar, 12 March 2025

Lunar Governance: The Role of International Cooperation in Future Moon Exploration

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Chair of the Scientific and Technical Subcommittee of the UN Committee on the Peaceful
Uses of Outer Space, 2024-2026

Co-Chair of the UN COPUOS Action Team on Lunar Activities Consultations (ATLAC), 2025-
2028

ICI Bucharest / Romanian Space Agency



iss072e186870 (Nov. 13, 2024) -- A waxing gibbous moon rises over the blue glow of Earth's horizon as the International Space Station orbited 264 miles above the Indian Ocean.

<https://images.nasa.gov/details/iss072e186870>

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01

The Need for Lunar Governance

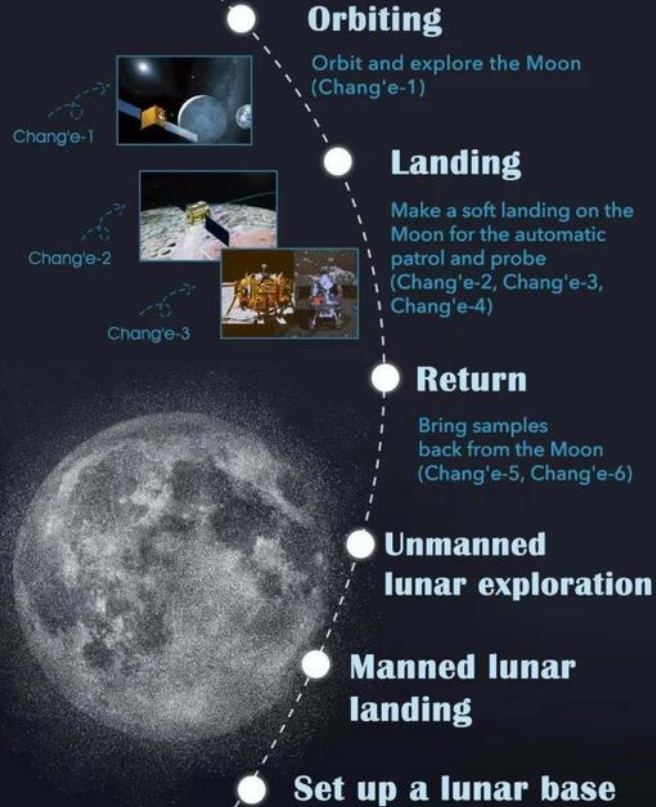
The resurgence of lunar exploration
Key governance challenges: resource utilization,
site coordination, environmental protection

China on the Moon in **2029?**



China's blueprint for lunar exploration

CGTN



(Source: CASC)

Chang'e-6 Moon mission

The Chinese lunar probe successfully took off from the far side of the Moon on June 4 carrying samples to be taken back to Earth.

Landing point

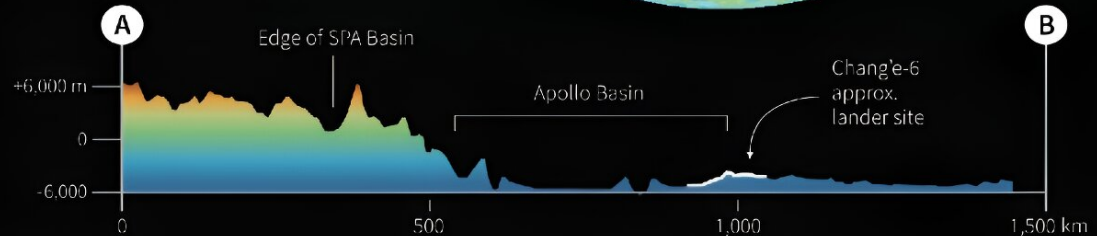
On June 2, the probe performed a fully autonomous landing in the South Pole-Aitken (SPA) Basin, a huge 2,500-kilometer-wide crater

Scientists believe this region holds unique geological clues due to its distinct composition compared to the rest of the lunar surface

The Moon's topography

This image of the Moon's far side shows its different elevations as captured by the NASA LRO camera

Elevation cross section (metres)

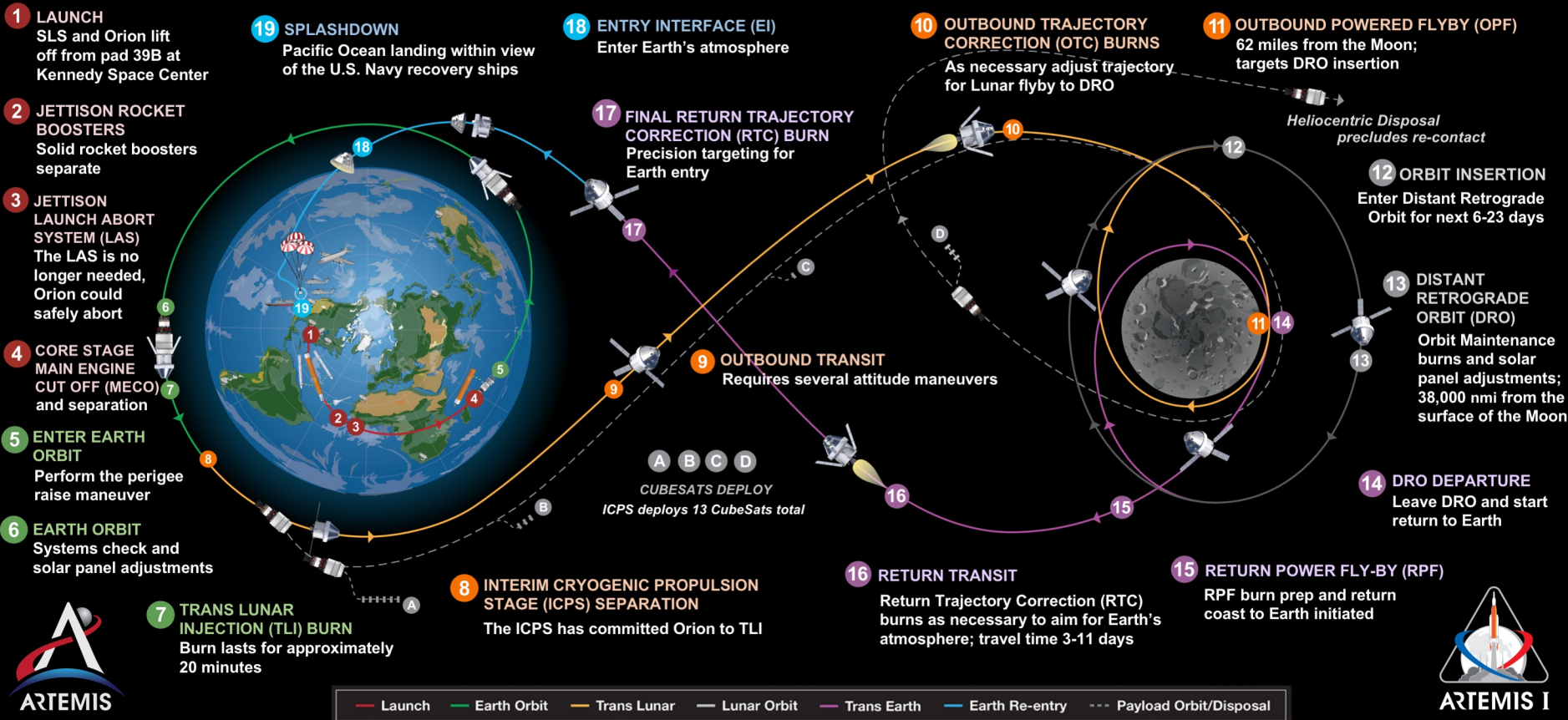


Sources: Nature Astronomy (Lander location), NASA/LRO (Topography), Phys.org (Spa Basin cross section)

AFP

ARTEMIS I

The first uncrewed, integrated flight test of NASA's Orion spacecraft and Space Launch System rocket, launching from a modernized Kennedy spaceport



ARTEMIS I

Total distance traveled: 1.3 million miles – Mission duration: 26-42 days – Re-entry speed: 24,500 mph (Mach 32) – 13 CubeSats deployed

The background of the slide is a deep purple space scene. It features a large, dark planet with a thin blue ring in the upper right. Several smaller, bright blue and white stars are scattered across the dark purple background. The overall aesthetic is futuristic and cosmic.

02

Legal and Policy Gaps

Limitations of OST, 1967

Lack of clarity on property rights and mining operations

Absence of mechanisms for site coordination and conflict prevention

The need for environmental safeguards and scientific site protection

Limitations of the Outer Space Treaty (OST, 1967)

OST is the **foundation of space law**, but it was created in an era when only governments had access to space. It establishes key principles:

- ✓ Space is the **province of all humankind**
- ✓ No **national sovereignty or ownership** of celestial bodies
- ✓ Space activities must be conducted **for peaceful purposes**



<https://www.theverge.com/2017/1/27/14398492/outer-space-treaty-50-anniversary-exploration-guidelines>

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- ✓ Space is the **province of all humankind**
- ✓ No **national sovereignty or ownership** of celestial bodies
- ✓ Space activities must be conducted **for peaceful purposes**

However, it does NOT address modern challenges, such as:

- ✗ How commercial companies can extract and profit from lunar resources
- ✗ How we regulate permanent infrastructure on the Moon
- ✗ How nations coordinate their activities to **avoid conflicts**

Lack of Clarity on Property Rights and Mining Operations

- ❑ The OST says that no nation can claim sovereignty over the Moon. However, **it does not explicitly prohibit resource extraction.**
- ❑ The U.S., Luxembourg, UAE, and Japan have passed **national laws** allowing private companies to extract and own space resources, but there is **no international agreement** confirming this legality.
- ❑ This legal ambiguity creates **three risks**:
 - **Regulatory conflicts** between countries
 - **Unregulated resource exploitation**
 - **Potential disputes** over valuable lunar sites

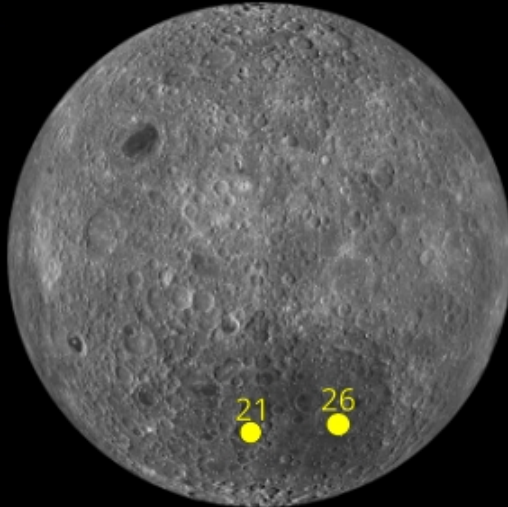
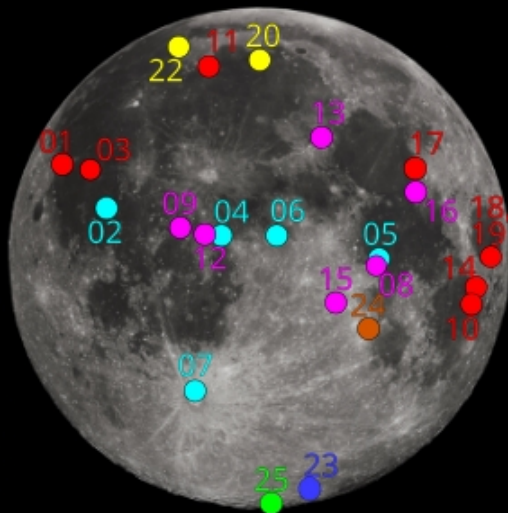
Absence of Mechanisms for Site Coordination and Conflict Prevention

- ❑ The Moon's **most valuable locations**—such as regions near permanently shadowed craters with water ice—are limited.
- ❑ Currently, there is **no global mechanism** to coordinate who lands where and how activities are conducted.
- ❑ Without proper agreements, we risk **interference between missions, competition over key sites, and potential geopolitical tensions**.



<https://www.jpl.nasa.gov/news/ice-confirmed-at-the-moons-poles/>

01.Luna 9
03 Feb, 1966
03.Luna 13
24 Dec, 1966
10.Luna 16
20 Sep, 1970
11.Luna 17
17 Nov, 1970
14.Luna 20
21 Feb, 1972
17.Luna 21
15 Jan, 1973
18.Luna 23
06 Nov, 1974
19.Luna 24
18 Aug, 1976
02.Surveyor 1
2 Jun, 1966
04.Surveyor 3
20 Apr, 1967
05.Surveyor 5
11 Sep, 1967
06.Surveyor 6
10 Nov 1967
07.Surveyor 7
10 Jan, 1968



08.Apollo 11
20 Jul, 1969
09.Apollo 12
19 Nov, 1969
12.Apollo 14
05 Feb, 1971
13.Apollo 15
30 Jul, 1971
15.Apollo 16
21 Apr, 1972
16.Apollo 17
11 Dec, 1972
20.Chang'e 3
14 Dec, 2013
21.Chang'e 4
03 Jan, 2019
22.Chang'e 5
01 Dec, 2020
26.Chang'e 6
01 Jun, 2024
23.Chandrayaan 3
23 Aug, 2023
24.SLIM
19 Jan, 2024
25.IM-1
22 Feb, 2024

Map of the locations of all successful soft landings on the Moon to date

- Luna program (USSR)
- Surveyor program (USA)
- Apollo program (USA)
- Chang'e program (China)
- Chandrayaan program (India)
- SLIM (Japan)
- Intuitive Machines (USA)

Dates are landing dates in [Coordinated Universal Time](#).
Except for the Apollo program, all soft landings were uncrewed.

https://en.wikipedia.org/wiki/Moon_landing

The Need for Environmental Safeguards and Scientific Site Protection

- ❑ The Moon is home to scientifically **significant sites**, such as:
 - ❑ **Apollo and Luna landing sites** (historical importance)
 - ❑ **Permanently shadowed craters** containing water ice (strategic resources)
- ❑ Without regulations, there is a **risk of contamination, disruption, and loss of valuable scientific data**.
- ❑ Should we establish "**Lunar Heritage Protection Zones**" to safeguard these areas?

Who protects Apollo sites when no-one owns the Moon?



Space law says no-one can lay claim to our biggest natural satellite, but with people heading back in the not-too-distant future, we need to preserve our Moon heritage — and time is running out.

3 February 2025

English only

**Committee on the Peaceful
Uses of Outer Space
Scientific and Technical Subcommittee**
Sixty-second session
Vienna, 3-14 February 2025
Item 3 of the provisional agenda*
General exchange of views

**The need for the designation and preservation of Sites of
Special Scientific Interest (SSSI) on the Moon**

Conference room paper by the Committee on Space Research, the
International Academy of Astronautics, the International Astronomical
Union and the Moon Village Association

[https://www.unoosa.org/res/oosadoc/data/
documents/2025/aac_105c_12025crp/
aac_105c_12025crp_18_0_html/
AC105_C1_2025_CRP18E.pdf](https://www.unoosa.org/res/oosadoc/data/documents/2025/aac_105c_12025crp/aac_105c_12025crp_18_0_html/AC105_C1_2025_CRP18E.pdf)

- ❑ Why Are Some Lunar Sites Scientifically Significant?
- ❑ What Are the Risks Without Regulations?
- ❑ What Can Be Done? Establishing "Lunar Heritage Protection Zones"

03 Role of UN COPUOS and Emerging Governance

UN COPUOS; ATLAC - Pre-launch
notification; Voluntary guidelines;
Dispute resolution mechanisms

România preia Președinția Subcomitetului Științific și Tehnic al Comitetului ONU pentru Explorarea Pașnică a Spațiului Extraatmosferic (UN COPUOS)



<https://rosa.ro/romania-a-preluat-presedinta-subcomitetului-stiintific-si-tehnic-al-comitetului-onu-pentru-utilizarea-spatiului-cosmic/>



Scientific and Technical Subcommittee: 2024

Sixty-first session (29 January–9 February 2024)

WEBCAST (STSC PLENARY)

- 29 January 2024 a.m., STSC Meeting 995 29 January 2024 p.m., STSC Meeting 996
- 30 January 2024 a.m., STSC Meeting 997 30 January 2024 p.m., STSC Meeting 998
- 31 January 2024 a.m., STSC Meeting 999 31 January 2024 p.m., STSC Meeting 1000
- 01 February 2024 a.m., STSC Meeting 1001 01 February 2024 p.m., STSC Meeting 1002
- 02 February 2024 a.m., STSC Meeting 1003 02 February 2024 p.m., STSC Meeting 1004
- 05 February 2024 a.m., STSC Meeting 1005 05 February 2024 p.m., STSC Meeting 1006
- 06 February 2024 a.m., STSC Meeting 1007 06 February 2024 p.m., WG LTS Workshop
- 07 February 2024 a.m., STSC Meeting 1009 07 February 2024 p.m., STSC Meeting 1010
- 08 February 2024 a.m., STSC Meeting 1011 08 February 2024 p.m., STSC Meeting 1012
- 09 February 2024 a.m., STSC Meeting 1013 09 February 2024 p.m., STSC Meeting 1014

SESSION DOCUMENTS

STATEMENTS

List of Speakers



Scientific and Technical Subcommittee: 2025

Sixty-second session (3-14 February 2025)

WEBCAST

Morning Meeting	Afternoon Meeting
Monday 3 February 2025 a.m. STSC 1015 meeting	Monday 3 February 2025 p.m. STSC 1016 meeting
Tuesday 4 February 2025 a.m. STSC 1017 meeting	Tuesday 4 February 2025 p.m. STSC 1018 meeting
Wednesday 5 February 2025 a.m. STSC 1019 meeting	Wednesday 5 February 2025 p.m. STSC 1020 meeting
Thursday 6 February 2025 a.m. STSC 1021 meeting	Thursday 6 February 2025 p.m. STSC 1022 meeting
Friday 7 February 2025 a.m. STSC 1023 meeting	Friday 7 February 2025 p.m. STSC 1024 meeting
Monday 10 February 2025 a.m. STSC 1025 meeting	Monday 10 February 2025 p.m. STSC 1026 meeting
Tuesday 11 February 2025 a.m. STSC 1027 meeting	Tuesday 11 February 2025 p.m. STSC 1028 meeting
Wednesday 12 February 2025 a.m. STSC 1029 meeting	Wednesday 12 February 2025 p.m. STSC 1030 meeting
Thursday 13 February 2025 a.m. STSC 1031 meeting	Thursday 13 February 2025 p.m. STSC 1032 meeting
Friday 14 February 2025 a.m. STSC 1033 meeting	Friday 14 February 2025 p.m. STSC 1034 meeting

SESSION DOCUMENTS

<https://www.unoosa.org/oosa/en/ourwork/copuos/stsc/2024/index.html>

<https://www.unoosa.org/oosa/en/ourwork/copuos/stsc/2025/index.html>



Near Earth objects are asteroids and comets whose orbit brings them closer than 1.3 astronomical units, or approximately 195 million kilometres, to the Sun.
| PHOTO: Image by ChatGPT/Prompt by Artem Pashchenko

Once-in-a-millennium event

On 13 April 2029, the asteroid 99942 Apophis will pass safely at a distance of about 32,000 kilometers above Earth's surface, within the geostationary orbit, posing no threat to the planet. This extremely close approach will make the asteroid visible to billions of people with the naked eye in the clear night sky.

This will be a once-in-a-millennium event and a unique occasion for a worldwide campaign to raise awareness with regard to asteroids, their scientific and resource value and the potential hazard they pose.

International Year of Asteroid Awareness and Planetary Defence

In 2024, the General Assembly **declared** 2029 the International Year of Asteroid Awareness and Planetary Defence to take advantage on the close approach of 99942 Apophis and raise global awareness about asteroids.

This initiative aims to highlight the collaborative efforts of the Committee on the Peaceful Uses of Outer Space in mitigating potential hazards from near-Earth objects, while also providing an opportunity for a global educational campaign.

International Asteroid Day

In December 2016, General Assembly adopted resolution A/RES/71/90, declaring 30 June **International Asteroid Day** in order to "observe each year at the international level the anniversary of the Tunguska impact over Siberia, Russian Federation, on 30 June 1908, and to raise public awareness about the asteroid impact hazard."

Did you know?

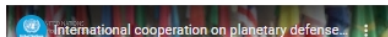
Like all asteroids, Apophis is a remnant from the early formation of our solar system about 4.6 billion years ago. It originated in the main asteroid belt between Mars and Jupiter.

Apophis is about 340 meters in width. It is classified as an S-type, or stony-type asteroid made up of silicate (or rocky) materials and a mixture of metallic nickel and iron.

The orbit of Apophis crosses the orbit of Earth. It completes an orbit around the Sun in a little less than one Earth year (about 0.9 years).

Source: NASA >>>

International cooperation on planetary defense and protection against asteroids



<https://www.un.org/en/observances/asteroid-awareness-year>



Romania UN NY
@RomaniaUN_NY



Romania introduced the resolution "International Year of Asteroid Awareness and Planetary Defence, 2029" which was consensually adopted in Forth Committee.

We thank [@UN](#) membership for supporting this initiative, a great opportunity to learn about near-Earth objects 🇷🇴.



UNOOSA and 7 others

4:13 PM · Nov 1, 2024 · 862 Views

https://x.com/RomaniaUN_NY/status/1852353292988305887



Action Team on Lunar Activities Consultation (ATLAC)

Materials presented during Informal Consultations

Draft Work Plan for 2025-2027

Draft Work Plan 2025-2027

[English](#)

ATLAC Co-Chairs

Mr. Hasan Abbas (Pakistan)

Ms. Ulpia-Elena Botezatu (Romania)

ATLAC Members

Submission by **Algeria** in original format (French)

[French](#)
[English](#)

Submission by **Armenia** in original format

[English](#)

Submission by **Germany** in original format

[English](#)

Submission by **India** in original format

[English](#)

Submission by **Luxembourg** in original format

[English](#)

Submission by **Philippines** in original format

[English](#)

Submission by **Russian Federation** in original format

[English](#)

Update received on 20 February 2025 in original format

[English](#)

<https://www.unoosa.org/oosa/en/ourwork/copuos/atlac/index.html>

POTENTIAL TOPICS

- Regulation of lunar resources
 - responsible use of lunar resources
 - commercial regulation of the exploitation of lunar resources
 - principle of non-appropriation, recognition of property rights, resources claims and sovereignty issues, installations and their effect on the subsurface
- Management of risks relating to lunar activities
 - Protection of the lunar environment and preservation for future generations – lunar orbits, soil and subsoil
 - Pollution and waste management – limitations on abandoned equipment, vehicles, and stations, and recycling
 - Lunar orbital and surface debris mitigation/prevention
- International coordination of lunar exploration missions
 - Planning protocols to avoid harmful interference, such as in landing and departing the lunar surface
 - Coordination of more complex operations having legal and/or policy implications
 - Contributions of the commercial sector (under the aegis of the UN)
- Interoperability of technologies and practices
 - Standardization of hardware, software, and communications deployed on Moon
 - Ensure critical resources for life support is available and compatible for use.
- Scientific cooperation
 - Capacity building and knowledge sharing
- Information sharing
 - Open-source database for environmental, localization and project sustainability information
 - Practical tools to facilitate information sharing
- Preservation of lunar heritage sites (and other important or historical locations)
 - preservation of Lunar sites of specific scientific interests (LSSSI)
 - preservation of human heritage on the Moon
- International cooperation on the Moon with a view to support capacity building, scientific collaboration and technological exchange. |

	Scientific (STSC)	Intersessional	Legal (LSC)	Intersessional	COPUOS Plenary	Intersessional
2025	<p>Aim:</p> <ul style="list-style-type: none"> Start discussion on possible ways forward on a workplan and possible topics of interest <p>Meetings: 4 meetings</p>	<p>Aim:</p> <ul style="list-style-type: none"> Develop and circulate a non-paper by the co-chairs, containing a draft workplan Discuss and elaborate the draft workplan Review possible topics of interest, identify overlaps with ongoing work of other COPUOS and its subsidiary bodies, identify gaps that should be addressed by ATLAC <p>Meetings: 2</p>	<p>Aim:</p> <ul style="list-style-type: none"> Continue discussions on the workplan and possible topics to be addressed by ATLAC Identify ways and means to consult WGs of LSC to avoid duplication of efforts <p>Meetings: 3 meetings (Additionally, hold consultations with Chairs WG-SRA and WG-TRE)</p>	<p>Aim:</p> <ul style="list-style-type: none"> Continue to discuss, further elaborate and agree on the draft workplan to be presented to COPUOS <p>Meetings: 2 meetings</p>	<p>Aim:</p> <ul style="list-style-type: none"> Continue discussions on the possible ways forward on workplan and possible topics to be addressed by ATLAC; Approval by COPUOS of the workplan. <p>Meetings: 3</p> <p>Expected outcome:</p> <ul style="list-style-type: none"> Workplan 	<p>Aim:</p> <ul style="list-style-type: none"> Take actions prior to STSC 2026 per agreed-upon workplan <p>Meetings: 2</p> <ul style="list-style-type: none"> Elaborate an inventory of possible international mechanisms for consultation Elaborate WGs based on the topics for consultation
2026	<p>Aim:</p> <ul style="list-style-type: none"> Focus discussions on technical issues [Consider engaging experts in specific technical areas, as resource persons, as required, to facilitate discussions in ATLAC] [Identify ways and means to maximize synergy of efforts with WGs of STSC] Start developing initial draft recommendations. <p>Meetings: 3 (Additionally, hold consultations with Chairs WG NPS/WG LTS)</p>	<p>Aim:</p> <ul style="list-style-type: none"> Discuss, refine/further elaborate draft recommendations Integrate feedback from meetings during STSC into the draft Review the workplan [and make adjustments as required] Refine topics of interest <p>Meetings: 2</p>	<p>Aim:</p> <ul style="list-style-type: none"> Focus discussions on legal issues [Consider engaging experts in specific legal areas, as resource persons, as required, to facilitate discussions in ATLAC] Further elaborate the draft recommendation <p>Meetings: 3</p>	<p>Aim:</p> <ul style="list-style-type: none"> Discuss, refine/elaborate draft recommendations for presentation to COPUOS Integrate feedback from LSC into the initial draft. Further refine topics of interest <p>Meetings: 2</p>	<p>Aim:</p> <ul style="list-style-type: none"> Advance overall discussions, engage broader stakeholder groups, and align efforts with other COPUOS working groups. Present a first set of recommendations for initial, preliminary feedback from COPUOS <p>Meetings: 3</p>	<p>Aim:</p> <ul style="list-style-type: none"> Discuss, elaborate and agree on the documents for the STSC 2027 Integrate feedback from COPUOS into the draft recommendations Discuss, elaborate and agree on the draft recommendations to be presented to STSC 2027 <p>Meetings: 2</p>
2027	<p>Aim:</p> <ul style="list-style-type: none"> Finalize and agree on core recommendations from scientific perspectives Further refine draft recommendations <p>Meetings: 3</p>	<p>Aim:</p> <ul style="list-style-type: none"> Further refine draft recommendations <p>Meetings: 2</p>	<p>Aim:</p> <ul style="list-style-type: none"> Finalize and agree on core recommendations from legal perspectives Further refine draft recommendations <p>Meetings: 3</p>	<p>Aim:</p> <ul style="list-style-type: none"> Further refine draft recommendations to be presented to COPUOS (containing scientific, legal and policy components) <p>Meetings: 2</p>	<p>Aim:</p> <ul style="list-style-type: none"> COPUOS to endorse the recommendations by ATLAC <p>Meetings: 3</p>	TBD
[2028]	TBD/ ONLY IF NECESSARY					

04 Considerations for Governance

Interoperability and standardization in lunar infrastructure; balancing scientific research and commercial interests; responsible resource utilization



Here is the visual representation of **a chaotic, unregulated lunar environment**, illustrating multiple scattered bases, uncoordinated infrastructure, and conflicting operations.

This image highlights the risks of a **fragmented, competitive lunar landscape without governance or standardization**.

Photo: AI-generated

The background of the slide is a deep space image featuring a dark blue and black cosmic scene. It includes several bright, glowing nebulae and galaxies, with a prominent spiral galaxy visible in the upper right quadrant. The overall effect is a sense of vastness and depth in the universe.

05 Discussions

Food for thought

- ◆ Who decides the **rules on the Moon**—nations, international bodies, or private companies?
- ◆ Should **lunar resources** be first-come, first-served, or globally regulated?
- ◆ How do we **prevent conflicts** over landing sites and water ice deposits?
- ◆ Should parts of the Moon be off-limits for commercial use, like scientific heritage zones?
- ◆ Is a new treaty needed, or can existing space law adapt to lunar realities?



Thank you!



Chair, Scientific and Technical Subcommittee
United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS)
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