OPEN LUNAR FOUNDATION

Chasing Peaceful Innovation

Exploring intersections between technical Internet and Lunar governance

IPNSIG Academy Keynote, April 2024

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Introducing Open Lunar

Seeds of change

A peaceful Lunar future.

Founded in 2018, Open Lunar is an independent non-profit organization.

We work globally to achieve our vision of **a peaceful and sustainable Lunar future.**

Curious about why we think the Moon matters for life on Earth? [Watch our Founder Jessy Kate's TED talk](#).

Our Directors

Our Directors bring their experience, talent and networks to guide us with strategic insight and support.

Chris Hadfield - Chair
Astronaut, Fmr. ISS Commander

Lindy Elkins-Tanton
ASU Professor, Psyche Mission Principal Investigator

Tanja Masson-Zwaan
Prof. Leiden Institute of Air & Space Law

Jessy Kate Schingler
Fmr NASA, space policy & technical expert

Robbie Schingler
Co-founder, Planet

Carlos Alvarado (Incoming)
Fmr President of Costa Rica

Will Pomerantz (Incoming)
Brooke Owens & Patti Grace fellowship Co-founder
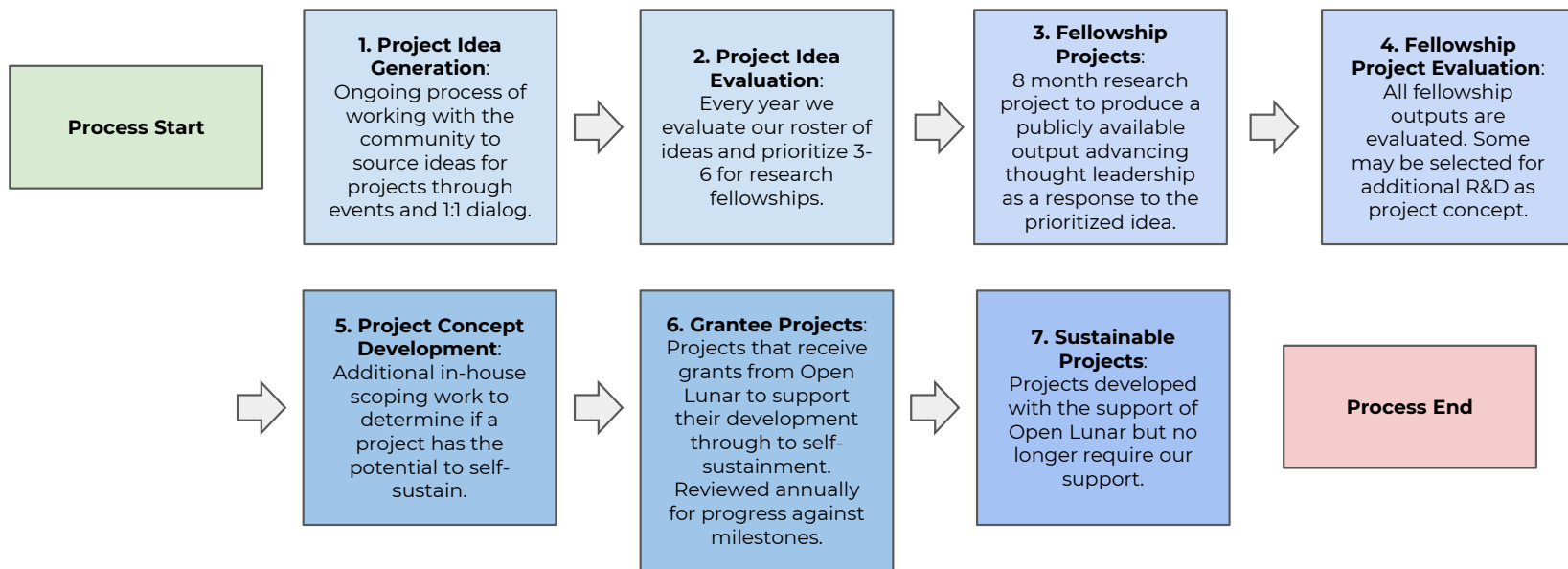
Innovation where it's needed

Creating lasting impact

We develop leaders and ideas through our project development process. Our goal is to create real-world examples that inspire optimism about the future of Lunar exploration.

Project development

Our seven step model draws on an innovation lab framework to prioritize, develop and spin-out projects with impact potential.

Process Start	**1. Project Idea Generation**: Ongoing process of working with the community to source ideas for projects through events and 1:1 dialog.

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2. Project Idea Evaluation: Every year we evaluate our roster of ideas and prioritize 3-6 for research fellowships.

3. Fellowship Projects: 8 month research project to produce a publicly available output advancing thought leadership as a response to the prioritized idea.

4. Fellowship Project Evaluation: All fellowship outputs are evaluated. Some may be selected for additional R&D as project concept.

5. Project Concept Development: Additional in-house scoping work to determine if a project has the potential to self-sustain.

6. Grantee Projects: Projects that receive grants from Open Lunar to support their development through to self-sustainment. Reviewed annually for progress against milestones.

7. Sustainable Projects: Projects developed with the support of Open Lunar but no longer require our support.

Process End

Dive deeper on our process with this blog post.

Project prioritization

We prioritize the project ideas based on eight impact criteria. Project ideas are ranked by our Affiliates and other independent experts. The results are then aggregated and prioritized by staff against internal viability criteria for operations and staffing.

Contribution to sustainability	Does the project promote the sustainable use and management of Lunar resources?
Contribution to governance	Does the project supports a management model that involves multiple stakeholders (government, private sector, non-profit)?
Building commons management capacity	Does the project advance humanity's ability to govern shared Lunar resources effectively?
Cooperation and conflict reduction	Does the project foster cooperation and/or mitigate potential for conflict among different stakeholders involved in Lunar activities?
Timeliness and relevance	Does the project have the potential for either near or long term impact?
Non-duplication and unique value	Does the project offer something novel or significantly different from existing efforts, particularly those being undertaken by the public or private sectors?
Addresses a market failure	Is the project particularly suited to being led by or as a non-profit vs government, academic or the private sector?

Find out more about how we decide where to invest.

Snapshot of past projects

	Topic	Lead	Additional Information
Fellowship Project	**Lunar timekeeping:** proposes the concept of a local Lunar time standard that can be accessed using technology that is likely to be included in most Lunar missions.	Philip Linden	https://www.openlunar.org/projects/timekeeping-lunar-clocks
Fellowship Project	**Antitrust:** From Toxic to Noble Competition: Implementing A New Perspective of Antitrust in Outer Space based on Ethics and Beyond	Maria Rhimbassen	https://www.openlunar.org/research/from-toxic-to-noble-competition
Fellowship Project	**Confidence building measures:** Transparency and confidence building measures for Lunar Security.	Nivedita Raju	https://www.openlunar.org/research/transparency-and-confidence-building-measures-for-lunar-security
Open Lunar Project	**Res Luna** analysed governance approaches from Earth systems to draw insights on their applicability to Lunar resource systems.	Lukas Kuhn, Jessy Kate Schingler	https://www.openlunar.org/projects/res-lunae
Open Lunar Project	**The Moon Dialogs** was a partnership focused on governance and coordination mechanisms for the lunar surface. It comprised a series of in person and remote dialogs and research salons.	Jessy Kate Schingler, Chelsea Robinson, Harshita Khera	https://www.moondialogs.org/
Open Lunar Project	**The Lunar Policy Handbook** is a reference guide that explores key Lunar policy issues looking to understand responsible Lunar ecosystem development.	Harshita Khera, Jessy Kate Schingler, Heloise Vertadier	https://www.moondialogs.org/lunar-policy-handbook
Grantee Project	Breaking Ground Trust's Deliberation on our Resources Rights **(DOORR) Process** developed recommendations on resource management concepts for regolith held in trust	Heloise Vertadier, Jessy Kate Schingler	https://breakingground.space/recommendations

Current projects 2024

Stage	Topic	Lead	Status
Fellowship Project	Developing a business model for cooperative and sustainable lunar landing pad infrastructure.	Ashley Kozak	Started Jan 2024, scoping research. Initial pitch completed.
Fellowship Project	Establishing a transparent payload review mechanism for lunar missions, inspired by systems like ICANN and the FAA.	Abbhinav Muralidharan	Started Jan 2024, scoping research. Initial pitch completed.
Fellowship Project	Revisiting lunar settlement challenges with updated technology and proposing key payloads.	Daniel Tompkins	Started Jan 2024, scoping research. Initial pitch completed.
Fellowship Project	Investigating the standardization of power provisions for lunar missions, focusing on both public and private sector practices.	Paolo Pino	Started Jan 2024, scoping research. Initial pitch completed.
Fellowship Project	Constructing a registry for logging accidents and issues across lunar missions, inspired by FAA's Accident and Incident Data.	Ali Nasseri	Started Jan 2024, scoping research. Initial pitch completed.
Concept Development	Designing a registry of Lunar Objects and Activities	Eric Cremer	Started Jan 2023, concept paper completed. Evaluating next steps.
Grantee Project	Lunar Policy Platform: Developing a platform to support international policy-maker deliberations on key emerging Lunar policy issues.	Antonino Salmeri	Started January 2023. Reviewing second set of annual milestones.
Grantee Project	Breaking Ground Trust: Advancing understanding of opportunities for innovation in sustainable Lunar resource management.	Alex Gilbert (Interim)	Started January 2023. Conducting an internal strategic review. .

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## Exploring MSMs in the Lunar Context

The New Lunar Era

Sustained human presence

Over 100 Lunar missions are planned in the next decade. We can expect multiple permanent human settlements in our lifetime.

Lunar Policy Context

- Increasing mission frequency and decreasing mission cost.

- Multiple actors from different jurisdictions.

- Testing of treaties (OST) and emergence of new regimes (Artemis, ILRS).

- Emergent exploration of best practices and ways of coordinating.

- Evolving roles for science, industry and civil society.
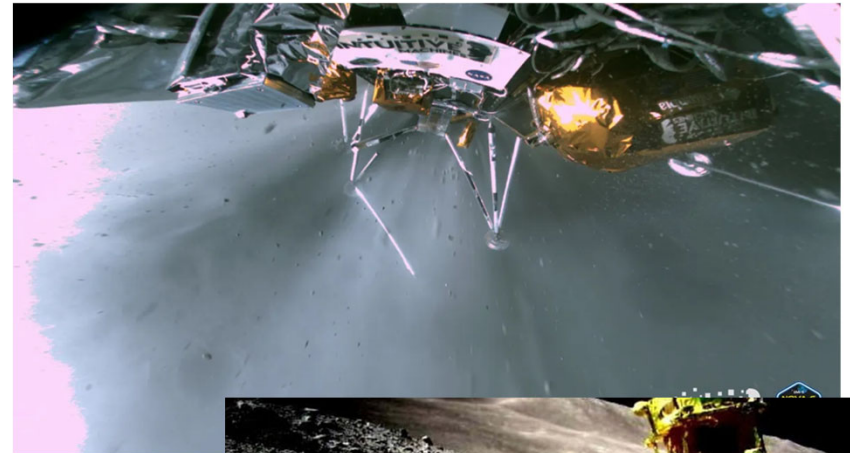
Lunar Technology Context

- Private sector is lowering costs and changing approach, but it is still government research driving innovation, notably NASA's CLPS program.

- The role of multi-stakeholder models in decision making has been discussed in the context of Low Earth Orbit, but so far has not been adopted there, putting their application in the Lunar context into question.

- Open Lunar believes these models can play a catalytic role in fostering peaceful and sustainable Lunar settlement.

Lunar MSM Opportunities

- We see particular opportunities for standards development. Particularly for communications, navigation and power, but also for shared infrastructure.
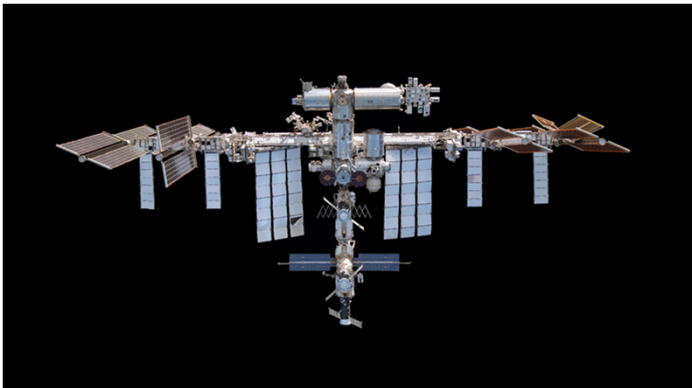
INTERNATIONAL SPACE POWER SYSTEM INTEROPERABILITY STANDARDS (ISPSIS) This electrical power quality standard is to ensure commonality, reliability, safety, interchangeability, and interoperability for electrical load applications between space power systems that will enable collaborative endeavors utilizing different spacecraft systems in deep space.

Professors Jordi Puig-Suari of California Polytechnic State University and Bob Twiggs of Stanford University proposed the CubeSat reference design in 1999

Lunar exploration continues to surge. Established by DARPA and managed by the Johns Hopkins Applied Physics Laboratory (APL), the Lunar Operating Guidelines for Infrastructure Consortium (LOGIC) brings together international stakeholders to identify critical lunar infrastructure interoperability and interface needs.

Lunar MSM Opportunities

- We also observe elements of the technical Internet governance ecosystem that could be creatively applied in the Lunar and space context.

Lunar MSM Risks

- **Almost but not quite multi-stakeholder** models that still work under the authority of a single stakeholder group.

- **Clique-ification of MSM models** that results in an calcification of policy making, reducing the agility and relevance of their policy outcomes.

- **Imbalances due to existing inequalities** in the sector, for example economic or technological that are reflected in the governance process.

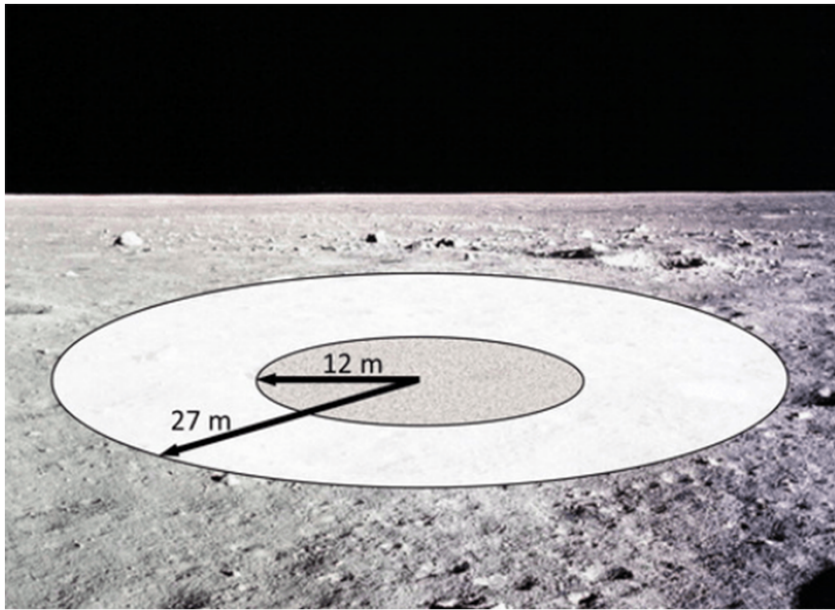# Lunar MSMs in Open Lunar's Research

Adopting the 'registry' concept to drive transparency and collaboration. Registries offer a unique opportunity to embed an MSM model.

Two applications:
- Objects and Activities
- Incidents

Lunar MSMs in Open Lunar's Research

Cooperative models for Lunar Landing pads - exploring models for shared infrastructure.

Lunar MSMs in Open Lunar's Research

Facebook Time Card

Exploring the application of open source components for comms/PNT services in the Lunar context.

Help Enable Our Vision

A peaceful Lunar future.

1. Join our Slack Community.

2. Apply to become an expert.

3. Submit your research ideas.

4. Propose an institutional partnership.

All at: www.openlunar.org

Thank you