

September 2020



NASA recently announced that it would buy natural resources on the Moon, as soon as a commercial company collects them for sale.

The intent is to force us to establish more specific lunar laws. That needs doing. The foundational high-level space agreement, The Outer Space Treaty, is being pushed to its limits as multiple countries, and soon private companies, land on the Moon.

Recent tech advances allow lunar settlement faster than most of us think. That's good for humanity; for the first time in history, we can safeguard life onto two planetary bodies, not just one.

A new driving factor is the discovery of ice in the craters at the Moon's poles, making sustainable living far easier than previously thought. Water is the first valuable lunar commodity, and the desirable surrounding territory is very limited. Supply exists and demand is coming – but there are no clear rules.

It's a pivotal time to decide; a rare moment in civilisation's history where we can learn from the past before we settle in a new, huge, uninhabited place. Lunar settlers will need local resources to be able to stay; to extract, use and exchange. We need to avoid the known pitfalls of uncoordinated action and uncontrolled extraction of limited natural resources.

We need to agree on a desired future for the Moon.

Naturally, the limited, high-demand resources will need the most specific governance. NASA has already suggested different levels of regulation for different lunar regions, in its planetary protection policies.

For 60 years the UN Committee on the Peaceful Uses of Outer Space (COPUOS) has been our legal, global decisional body. The international community has an urgent need to clarify the following points, and then work with COPUOS to support and ratify resultant understandings:

- Identify the scarce resources to be governed for coordination, avoiding uncontrolled extraction or utilization: water, peaks of eternal light, the far side radio quiet zone, etc.
- Develop standard sets of property rights that can be applied in different lunar regions and contexts, including mineral rights.
- Establish a lunar registry and consider establishing areas of scientific data commons, where extracted resources can be privately held, but the knowledge is shared for non-commercial purposes.

A month from now, it will have been 20 years of uninterrupted international cooperation with people working together off-Earth, orbiting on the International Space Station. A cross-cultural effort, thriving off the planet, with dozens of countries and commercial/scientific partners actively involved.

Sustainable lunar settlement is the next step, for the good for all. Now is the time to establish the type of market we want for lunar resources, and for other key issues.

More than ever, we need governance arrangements which equitably and sustainably distribute long-term, livable environments.

Thanks for the push, NASA. Let's work together, and get this right.

A handwritten signature in black ink that reads "CHRIS HADFIELD".

Chris Hadfield  
Chair of the Board

A handwritten signature in black ink that reads "Jessie Kate Schingler".

Jessy Kate Schingler  
Chief Strategy Officer

A handwritten signature in black ink that reads "Chelsea Robinson".

Chelsea Robinson  
Chief Operating Officer

# Res Luna: Recommendations for Lunar Resources and Property Management

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## Introduction

“Do unto others as you would have them do unto you.” This ‘Golden Rule’ can be found in some form across most cultures; it speaks of reciprocity and interconnectedness. How can we incorporate this sentiment into the laws, policies and norms of our early activities in outer space?

Last week, NASA administrator Jim Bridenstine made a crucial announcement: NASA will commercially procure regolith on the Moon. In the public announcement, he also made it clear that “what we’re trying to do is make sure that there is a norm of behavior that resources can be extracted, and that we’re doing it in a way that is in compliance with the Outer Space Treaty.”

This is indeed necessary if we are to sustain presence on the Moon. However, “sustainable” lunar settlement is not just an environmental or temporal sentiment – it is also a cultural and institutional one.

Markets and exchange are as foundational to society as laws – perhaps more so. They will be an important element of any sustained human activity off Earth. Yet history also shows that unfettered markets can grow to the detriment of people, places and intentions, especially concerning very finite resources. Now is the time, before contentions arise, to establish the type of markets we want for lunar resources and other matters.

States and the international community can contribute to lunar development through clarifying which matters of resource management need universal agreement, while endorsing specific domains in which bottom up coordination and plural approaches will be recognized. Framing which issues are tackled where will enable actors to coordinate more effectively, within clear boundaries.

This new province of humankind is closer than ever. The Outer Space Treaty (OST) continues to provide the foundations for our activities in outer space. But general guidance must now become specific. And we must figure out those specifics with diverse voices, together.

## Principles for Lunar Resource and Property Management

There are many types of resources on the Moon, as anywhere. In addition to water and mineral deposits, lunar goods include the lunar exosphere, spectrum, and human-made objects or infrastructure. Concepts such as radio quiet zones, notification and coordination zones, and cultural heritage designations are all being explored, each of which will require a consideration of the appropriate property rights. Areas containing unique scientific records or scarce resources may require different approaches to management and coordination than areas of open market activity, for example, a solar power utility, mining site, or salvage site.

NASA’s regolith purchase aims to demonstrate that the OST does not prohibit private property on the Moon. But the absence of prohibition is different from consent. On a most basic level, it simply identifies a grey area - a lacuna - in the law.

It is imperative that the international community engage this precedent, as ongoing practice can become customary law in the absence of dissent.

In particular, private property is a tool for the development of lunar activity which we may well wish to employ. But importantly, acknowledging the existence of private property should not be equated to a de facto private property treatment of all resources.

A right-sized amount of policy will help this market thrive. Whether it’s regolith or radio quiet zones, access rights or priority rights, we will have a more equitable arrangement between lunar actors if we consider distributive mechanisms and management regimes for limited resources.

# RES LUNAR: RECOMMENDATIONS FOR LUNAR RESOURCES AND PROPERTY MANAGEMENT

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## Principles

Considering the important precedent setting opportunity and the broadest goals of different actors to be accommodated, we propose the following principles guide the formulation of policies in service of peaceful futures on the Moon:

- Cooperation and Interdependence
- Plurality and diversity
- Learning and experimentation
- Openness and transparency
- Agency
- Stewardship

## Policy Recommendations

### Create a Register for Scarce Resources

Informed by environmental stewardship, responsible market development, and fairness, the international community should identify specific resources, regions, or conditions of scarcity under which we may want resources to be managed outside of a “first come first served” approach to extraction or utilization. Example might include: the antipode region for radio quiet (there is only one), the Peaks of Eternal light at the poles, or specific resources until we have confidently identified more than an agreed upon threshold (eg. XX metric tons of water ice).

#### Recommendation:

- Establish a multi-stakeholder forum to maintain a living list of resources and regions involving conditions of scarcity. This list should be updated on a regular basis, responding to evolving scientific understanding and input from a wide variety of stakeholder groups.
- Operators, state and otherwise, should involve themselves in this definitional process and publicly commit to recognizing them.
- Participants should strive for consensus, and advance the list to COPOUS for annual endorsement by States parties.

### Resource Rights

The ability to legally extract and even sell lunar resources must not be equated to a de facto private property treatment for all extracted resources. Private property is one of an array of different approaches to property rights. We can consider, among others, the rights of use, withdrawal, exclusion, management, and alienation. The international community, through academia, workshops and track II fora, should develop standard sets of resource rights to be applied to different lunar geographies and resources. For example, occupying a peak of eternal light might come with obligations for sharing or coordination, that do not apply to a research outpost at an equatorial region.

#### Recommendations:

- Establish or leverage existing multi-stakeholder forums to bring together the international community -- with all relevant parties including commercial, non-profit, educational, and civil societies -- to discuss and mature lunar property rights regimes.
- States parties to the OST should formally clarify support for the appropriation of extracted resources while also emphasizing any such appropriation does not create an implicit priority or claim over the underlying territory, or to associated minerals deposits.
- States parties to the OST, in implementing Article VI, should clarify domains in which private arrangements and peer based commitments amongst operators will be recognized.
- Example: Consider introducing an "information right" to lunar resources which is distinct from the right to extract or commercialize the resource itself. Allow for circumstances where the extracted resource is privately held and exchanged, but scientific and technical information about that resource is publicly recorded and accessible.

# RES LUNAR: RECOMMENDATIONS FOR LUNAR RESOURCES AND PROPERTY MANAGEMENT

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## Policy Recommendations Continued

### Multilateral Fora Outside COPUOS

UN COPUOS is the pre-eminent body for discussion of formal international agreements and matters of consensus for space. But to make progress on these important topics, we must also invest in complementary fora which can operate adaptively and include more types of stakeholders. Such fora should be formed on principles of open consultation, immediacy and responsiveness, with processes for learning; recognition of plurality, and emphasis on subsidiarity. These fora must be open at all times to participation by all credible parties, regardless of the context of broader geopolitical relations.

#### Recommendations:

- Develop substantive proposals through multi-stakeholder fora open to all types of actors including civil society and governments, in an iterative and consultative manner. This must include all actors with credible lunar projects or plans.
- Support a bottom up approach to actors and operators working together to endorse normative arrangements.
- In parallel to multi-stakeholder efforts, we would like to see COPUOS adopt an effort to sanction specific rights regimes and/or specific definitions of regional management.

### Towards a Minimal Shared Framework

Towards the principles above, and wishing to ensure that emerging lunar regulations truly enable a plurality of societies, parties and activities, while not over-specifying societal structures based on our past; we consider there to be a unique opportunity now, to establish a foundational document which encodes guiding principles and shared agreements, while protecting the ability for adaptive learning and evolution.

#### Recommendation:

- The international community, including all key actors (see section on Multi-Stakeholder Fora), should establish a framework for adopting a minimal set of overarching policies committed to peace, cooperation and accessibility for a plurality of actors, with their different, unique and fully fledged governance systems, to thrive on the Moon, including but not limited to the appropriate recommendations contained herein.

