

# QUANTUM LEAP

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**IN THE AGE OF DISCOVERY,** claims by Portugal and Spain on territories in Africa, Asia and the Americas were mediated by the Pope, negotiated across treaties and occasionally violently resolved via the dictum “might makes right.”

As humanity ventures to the Moon and to the planets beyond, NASA wants to ensure that the Second Age of Discovery is not ruled by the law of the jungle. The space agency and the U.S. State Department are signing up the free and democratic world to a set of principles: the Artemis Accords.

The Artemis Accords establish a common political-economic understanding of the exploration and peaceful use of outer space, including resources on the Moon. The 43 signatories being mostly liberal democracies signifies that geopolitical rifts on Earth are moving into space. China and Russia have established a rival 11-country bloc around plans for their International Lunar Research Station.

Like in the first Age of Discovery, explorers and entrepreneurs are propelled into this new period by state sponsorship and the promise of riches. When Christopher Columbus sailed across the Atlantic Ocean in search of a shorter trade route to India, his journey was financed by Spain, with the right to 10% of all revenue from lands discovered.

How property rights on the Moon would be enforced is not yet clear, but the nonbinding Artemis Accords are sketching out a framework. Even before property rights are established, entrepreneurs are hoping to wildcat lunar resources by hitching rides to the Moon on spacecraft developed for NASA’s related Artemis program and Commercial Lunar Payload Services initiative.

Case in point: Moon mining startup Interlune of Seattle aims to collect small bottles of rare helium-3 from the lunar regolith and sell it to developers of quantum computers and nuclear fusion reactors (*AW&ST* March 25-April 7, p. 46). Its secret mining prospect might support decades of excavation.

China is searching for resources on the Moon, too. Its Chang’e-6 lunar lander has touched down on the Moon’s far side, drilled into the lunar regolith and sent back a sample to Earth.

Deconflicting Chinese claims on the Moon will be difficult—the country already does not respect claims in the South China Sea or high in the Himalayas on its border with India. However, deconflicting claims among like-minded Artemis Accords participants is a start.

Moreover, signatories have strength in numbers.

Though it is not clear how Artemis signatories would handle lunar claim jumping, the agreement emphasizes Outer Space Treaty articles forbidding claims of national sovereignty, making countries responsible for their actions in space and requiring registration of activities.

Noninterference is “hands down” the most important principle for the accords’ signatories to implement, NASA Deputy Administrator Pam Melroy says. “We should do the obvious thing: Tell everybody where we’re going.”

## Staying in the Lead

Why the U.S. created a geopolitical space bloc with the Artemis Accords



NASA

The gritty details are more complex. For example, lunar landers kick up moon dust during touchdown that can stay suspended, trashing nearby solar panels or sensitive instruments. NASA is studying plume surface interaction, says Melroy.

The agency is also trying to set precedent in space, such as by buying lunar regolith from Japan’s ispace on an upcoming lunar landing mission, where a robot will scoop and photograph the soil to document the ownership transfer.

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As with the preceding Age of Discovery, navigation, prospecting, communications, transportation and situational awareness technologies are important—and have dual military-civilian uses. Instead of nations championing homegrown technologies, the accords emphasize interoperability, allowing joint expeditions to the Moon via standardized airlocks and space suits, for example. Standardization also lays the groundwork for a common space economy.

For its part, the Chinese-Russian-led space bloc is a who’s who of autocracies, including Belarus, Pakistan and Venezuela—countries with little in common except a shared suspicion of the outside world. It is a galactic B-team of disaffected despots.

Most Artemis Accords signatories are party to overlapping security pacts, including bilateral alliances with the U.S., NATO and AUKUS. The accords are a U.S.-led cosmic coalition.

Joint missions stretch NASA’s budget and let it set the agenda, creating a gravitational pull toward U.S. industry. That strategy succeeded on the International Space Station and made the U.S. commercial space sector world-beating in low Earth orbit.

Despite an envious technology lead in space, the U.S. is not putting up political barriers but welcoming others to follow. That is a time-tested innovation strategy. The best way to stay in the lead is to lead.