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OUTER SPACE TREATIES DIDN'T ANTICIPATE THE PRIVATIZATION OF SPACE TRAVEL. CAN THEY BE ENFORCED?

If human civilization begins to expand into space, will colonists feel loyalty to their country, their planet, or Elon Musk?

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Ever since humans became a spacefaring species, settling down on other planets has seemed an inevitability—even a necessity. Scientific titans including Stephan Hawking and Carl Sagan believed humans were "obliged" to leave Earth, if only to ensure our survival as a species. The dinosaurs didn't have a space program, as the space-industry axiom goes, and look where it got them.

But increasingly it seems that it will be a man-made disaster, rather than an asteroid, that leads to our own demise on Earth: Last month, Jeff Bezos, the Amazon and Blue Origin aerospace manufacturing chief executive officer who wants to put humans back on the moon as early as 2024, said that we are "destroying the planet" with heavy industry and climate change, and that humans will "have to go to space if we are to continue to have a thriving civilization."

But there are less existential reasons for humans to spread out into the cosmos, from a romantic pursuit of interplanetary manifest destiny to the immeasurable reservoirs of frozen water, gold, platinum, and other rare metals locked up in other celestial bodies including the moon. Colonization on Earth, however, especially in pursuit of resources, is colored by a history of genocide, cultural cleansing, and environmental destruction. There is a growing social justice movement that calls for policies to prevent the same fate in space.

But settling space without repeating the same mistakes on Earth will require a robust policy framework. While our motivations to settle space have broadened and our ability to do so has advanced, the only legal framework for settling space comes from a deliberately vague international treaty drafted during the dawn of the space age. The rapid commercialization of space in recent years has left space law experts debating how to interpret the treaty's flexible language.

Of course, the idea of a long-term settlement in space for any purpose is still technologically and economically unfeasible. But the rise of billionaire-backed, private space companies such as Elon Musk's SpaceX and Bezos' Blue Origin, with lofty goals like Mars settlements and moving heavy industry into artificial space colonies, has made space settlements more realistic than ever.

Historically, space has been viewed as a "common heritage of humanity"—a region preserved for all current and future generations, protected from exploitation. This idealistic framing was born out of an age of conflict on Earth. In 1967, when tensions between the United States and the Soviet Union were high and the space race was well underway, both nations drafted and signed onto a legally binding, international agreement known as the Outer Space Treaty. (More than 100 other countries have since become parties to the treaty.) It was a remarkably cooperative document for its time.

"At that time, there was a real concern that the Cold War was going to extend itself into outer space," says P.J. Blount, a professor of air and space law at the University of Mississippi School of Law. The 17-article treaty was drafted to preserve space as a peaceful and communal zone, where any activities would be for the benefit of all humankind. The treaty bars weapons of mass destruction and military installations on celestial bodies, and it encourages states to share both knowledge gained from scientific and exploratory endeavors and responsibility for the safety of all astronauts, which the treaty designates as "envoys of mankind."

Even throughout the Cold War, Blount notes, the U.S. and the Soviet Union cooperated in space, trading moon rocks and telemetry data on human spaceflight to advance both science and safety.

"On the face of it, it's a very optimistic document," says Lucianne Walkowicz, an astronomer at Chicago's Adler Planetarium. "It really frames space as a peaceful sanctuary."

"Inspired by the great prospects opening up before mankind as a result of man's entry into outer space," as the treaty itself reads, it was an intentionally vague document, designed to guide space exploration as science and technology advanced and new issues arose. It requires states to guard against the contamination of other planets, but doesn't specify how to do so; it allows for stations and installations on celestial bodies for peaceful purposes, but doesn't speculate what those activities might be; and it bans governments from "appropriating" outer space, but doesn't define what the term means.

"There's a lot of debate over this particular clause," Blount says. "It's sort of ambiguous, but I would argue that it really means that states aren't supposed to go out and claim sovereign territory."

So while governments can't claim land on other worlds, they can set up stations for scientific purposes. But there's no discussion in the Outer Space Treaty, or the four other international space treaties that followed it, of the idea of a long-term settlement on other planets. What does that mean for the private companies with plans to set up settlements on the moon or Mars?

When the treaty was drafted, the Soviet Union wanted to outlaw all non-governmental activities in space, but the capitalist U.S. insisted that outer space be open for business. The compromise was that the treaty allows for commercial activities, but requires that federal governments take responsibility for the actions of both their space agencies and non-governmental actors in space. The idea was to keep a private actor from accidentally kicking off a war. "This is, within the world of international law, extraordinary," Blount says. "If you go into space and you do something terrible, the state itself might very well be on the hook for what you've done."

But exactly how much the state has to authorize and supervise the activities of companies like SpaceX or Blue Origin is up for debate. What agency, for example, should companies turn to for approval for space settlements? The questions only get more complicated from there. Under the current law, settlements would be inextricably linked to the nations that authorized them to begin with. So Elon Musk's city on Mars would likely be governed by U.S. law. But what happens when settlers no longer feel like citizens of the U.S.—or even of Earth?

"If you have an actual settlement, where people are living and working permanently, at some point that settlement is no longer going to feel represented by its terrestrial state," Blount says. Imagine a second generation that has never set foot on Earth. "It's a 'no-taxation-without-representation' problem all over again," he says. "That's one of those places where you find yourself in the gap in the law."

SpaceX and Blue Origin are not so different from the contractors that NASA has always been working with such as Boeing or Lockheed Martin, according to Walkowicz. "Private companies have always had a role in space exploration," she says. The difference is that the new generation of private rocket companies are lobbying for greater autonomy. "There are a lot of companies that are advocating for the ability and right to do whatever they want," Walkowicz says. "Why would you want to have to pay for the protection of another world if your ultimate goal is to exploit it and take its resources?"

On multiple occasions, Bezos has outlined his vision for moving heavy polluting industries off of Earth, leaving the planet to be "zoned residential." Other smaller start-ups with less stable capital but equally ambitious plans to mine the moon or asteroids for precious metals and water helped to shepherd through legislation in the U.S. giving private industry more leeway in space. Such bills include the SPACE Act, which President Barack Obama signed into law in 2015—a piece of legislation that, for the first time, gave corporations a right to the resources they extract from other celestial bodies.

"It's the same-old, same-old that we see here on Earth all the time," Walkowicz says, "where companies don't want to have to really preserve the environment that they also plan to strip mine, because the two are incompatible."

How does that square with the Outer Space Treaty? It doesn't, really. But that's not all that surprising. "A lot of the things people are thinking about, and often expressly making plans for, are in direct conflict with treaties," Walkowicz says.

"If you look at the colonization of the Americas in particular, there were lots of treaties that the United States had with American Indian nations—hundreds of them, in fact—all of which have been broken," she says. "What history tells us is that we have to decide whether we want to continue to do things the way that we've always done things, or whether we want to try and uphold some of those high-minded principles that are in the Outer Space Treaty."