Matt Damon the Space Pirate, and Who Owns Space: The Legal Frontier of Critical Minerals and Cosmic Ownership

written by Peter Clausi | November 11, 2024

"Space law is anything but clear. Right now, we're in murky legal waters where international treaties and private claims collide. The question isn't just who gets to explore space, but who's responsible when things go wrong, from satellite collisions to environmental impacts. With growing interest in asteroid mining and commercial ventures, it's time to clarify who owns what in space – and how far those rights should go." – Peter Clausi, Director, **Critical Minerals Institute (CMI)**

I asked myself a simple question and found answers that hurt my brain. Because of something we discussed at the **Critical Minerals Institute (CMI)**, I was curious, who owns space? Who says what satellites go where and how high and in what orbit, and who is responsible for their environmental impact, and who gets to mine critical mineral rich asteroids that may go wandering past, and where does ownership end? Simple, right?

Most of my meandering research ultimately led me around to the same book, the 2023 Cambridge University Press "*Who Owns Outer Space*". The book could use another edit, less text and more footnotes, but it is full of mind-bending information about the legalities of 'space'.

First you have to define 'space'. If you thought about it at all, you'd say it's everything outside Earth's atmosphere. That's almost helpful. A scientific definition is that space

begins 100 kilometres above sea level (the Karman Line). NASA calls it 80 kilometres. But since there is in reality no dramatic line drawn with a Sharpie, both limits are somewhat arbitrary. Like most space law.

Think of the 2015 Matt Damon movie *The Martian*, based on the self-published bestseller by Andy Weir. If you haven't seen it, go see it now. He's on Mars, his team thinks he's dead, so they leave the planet without him. He has to figure out how to survive and get back to Earth with the meagre resources on hand. At one point, Damon's character recognizes he is alone on Mars, and while in the NASA owned habitat, he is under American law, but once he goes outside, he's in 'international waters' planning to seize a previously crashed lander as a 'boat'. So, under space law, he's a space pirate.

The question of who owns space is 'governed' by international treaties, primarily the *Outer Space Treaty of 1967*. This treaty, signed by major spacefaring nations, reads that outer space, including the Moon and other celestial bodies, is not subject to national appropriation by any means. This means no country can claim ownership over space or its celestial bodies.

The key principles of the *Outer Space Treaty* are:

- **Non-Appropriation**: No nation can claim ownership of outer space or celestial bodies
- **Peaceful Purposes**: Space must be used for peaceful purposes, prohibiting the placement of nuclear weapons in orbit or on celestial bodies
- **Freedom of Exploration**: All countries have the right to explore and use outer space without discrimination
- **Liability for Damage**: Nations are liable for damages caused by their space objects and must avoid harmful contamination of space

Reading through the research, liability for damages related to satellites ultimately lies with the country that authorized them to be launched. So, if a SpaceX satellite malfunctions, a rather complex mess of insurance claims get made, with the ultimate responsibility falling upon the country that authorized that satellite's launch.

But then it gets more complex. What happens if Satellite1, authorized by CountryA, collides with Satellite2, owned by another company and authorized by CountryB? The damages could be substantial, not just physical damage to Satellite2 but also damage to persons relying upon Satellite2 to provide data. Imagine, for example, a mining company which relies upon Satellite2 to provide imagery related to the health of its tailing dams, which of course then break at the worst time. Who is responsible for the environmental nightmare that ensues?

And then it gets even weirder. Debris from the two satellites fall to Earth, causing property damage and at the extreme, loss of life. Someone has to pay but the current entwinement of treaties and best practices makes it difficult and time consuming for proper restitution to take place. Reading *Who Owns Outer Space* almost feels like watching rival gangs negotiate for who is going to take which slice of the pie, with no one really caring about the rest of us.

Who Owns Outer Space also shows there are significant environmental impacts from satellites, from launch to operation to eventual decommissioning. The science on aluminium alone should terrify all of us. The book is filled with statistics, but the summary is on page 67: "the deposition of large amounts of aluminium into the upper atmosphere from re-entering mega-constellation satellites will affect the upper atmosphere…". And under space law, who is liable for this environmental contamination? The *Outer Space Treaty* doesn't help here.

While the *Outer Space Treaty* prohibits national claims, it does not explicitly address the mining of asteroids. Asteroids are rich in nickel, iron, iridium, palladium, platinum, gold, and cobalt, among other metals. Some also contain water. They are a tantalizing theoretic source of those resources needed on Earth.

Some countries, including the United States, Luxembourg, Japan, and the UAE, have enacted laws allowing private entities to claim rights over resources extracted from space bodies like asteroids, in essence a ‘finders keepers’ rule. I can think of a couple of hundred questions arising from that. Let’s start with this obvious one: the asteroid itself under the *Outer Space Treaty* cannot be owned, but the critical minerals in it can be? How can there be a distinction between the asteroid and its component minerals?

Treaties like the *Outer Space Treaty* operate within an international environment that emphasizes cooperation and the benefit of all people, not any one nation. It is inevitable that technological advancements will continue, empowering more nations and private companies to engage in space exploration, and setting the stage for conflicts on Earth over what happens in space. Nations have to figure out who owns space and its vast resources.