Jill Stuart December 19th, 2024

Interview with Jill Stuart: "I think it's very likely we'll see a lunar base in the near future"

In an interview with Maayan Arad, **Jill Stuart** *discusses the role of private companies in space, the future of the International Space Station and why we might soon see a base established on the moon.*

Private companies like SpaceX have invested huge amounts of money in their space programmes recently. How do you see their influence evolving in the coming years?

Space commercialisation is certainly not something new. Commercial space activity has been around since the 1970s. In the 1980s, for example, Ronald Reagan was really pushing research and development to the private sector as part of the ethos of capitalism.

I think we tend to think of space activity as being this dichotomy between the private and the public, but there's a lot of overlap. Even private companies like SpaceX are being funded to a large extent by the US government. It's therefore a lot messier than we tend to think of it.

The big difference that we do have today is this dramatic increase in the number of commercial entities that are going into space. There's been a huge jump due to the costs coming down and the shrinking of the size of things like satellites. This has created a kind of democratisation of space, but also potentially the overcrowding of it. But in terms of commercialisation, it's been more of an evolution than a revolution – these entities have always been there, they're just having a different impact.

Now with regards to international law, everything that goes into space still technically belongs to what we call the launching state. According to the Outer Space Treaty of 1967, outer space is

neutral territory, but every object that's up there is a small piece of the sovereign territory that comes underneath it.

That becomes interesting when you have commercial entities because they're not countries, but every country must take responsibility for every object that's up there. These objects are therefore registered through the United Nations. Some of this has to do with the slightly less interesting topic of insurance as there are liability implications for everything that's up there. If they cause damage in space, then technically it's the country that takes responsibility for it. There's therefore this interesting tension between these entities that I think is really fascinating.

Another thing I wanted to ask about is the likelihood of mining in space. Do you think it's likely we'll see this in our lifetime – mining on asteroids or the moon, for example?

The Apollo missions brought back something like 800 pounds of moon rock, so we have brought things back already. I think in the shorter term, the idea of bringing resources back to Earth is going to be more expensive than the value we could get from them. I think this is therefore something for the future.

But one of the interesting elements is mining and the use of resources in situ. On the moon, for example, we could mine helium or water to support crewed missions there and extend missions further. This raises interesting legal questions because technically no nation state can claim any sort of celestial territory, so I think we'll end up trying to find a way to unpack that legislation.

The United States has already started to look into that through, for example, the Artemis Accords. There was one treaty, the 1979 Moon Treaty, which was intended to unpack this, but it's the only one of the five main treaties on outer space that seems to have failed. This reflects the fact we still have a bit of a question mark over how mining is going to work in the future.

How do we ensure that science remains the key element in space exploration and doesn't get overshadowed by private interests?

Commercial activity – even things like tourism – does help to fund and push the science forward. They're not two separate things and they can go hand in hand. However, with this said, the cynical side of me is also a bit wary about some of it.

There was a launch last year that was intended to land on the moon but ended up failing and was crashed back into the Earth's atmosphere. Among other things, it carried a can of soda from a Japanese company and packages from the delivery company DHL that people could include a lock of hair in.

There were also human ashes on board, which caused some discomfort. In particular, the indigenous nations of the United States raised concerns about the idea of essentially creating a graveyard on the moon. So there are potentially elements that make me uncomfortable, but I think it's inevitable that this is the direction that we're going in.

We therefore need to try and figure out ways to progress with that in a responsible way without failing to appreciate the fact it's re-energising the sector and that there are elements of it that could be very positive. The last mission that went up to test the effects of radiation on the human body, for instance, was a privately funded mission. There are positives, but we have to keep an eye on the negatives as well.

What are your thoughts about lunar bases and the future of the International Space Station?

The International Space Station is nearing the end of its life as a collaborative political project. It's increasingly being used for commercial purposes. Whether it will get to the point of being deorbited or not is unclear. There have been plans for deorbiting it at various points, in the same way that Mir was eventually deorbited. I think it will probably continue because there's been a lot of investment in it, and it does continue to serve scientific and symbolic purposes for us.

There does seem to be a refocusing now on going back to the moon. It's interesting as for a while people were talking about Mars, but now it seems to be the moon. And with the plans that are in place from China, India and the United States, I think it's very likely we'll see a lunar base in the near future through, in particular, the US Artemis programme.

Again, there are concerns about that with regards to sustainability and the responsible use of resources, as well as coordination and safety issues. But I think it's inevitable we will see boots on the moon again in the next probably 15 years, and that we will then see more entities, more countries and potentially private entities as well become involved in these research bases. So, yes, I

think lunar bases will happen within our lifetime certainly. This is probably the next big step for these high-profile scientific projects that we're looking at.

How do you view the importance of international cooperation in space?

The idea of conflict and cooperation – or at least coordination – in space is one of the areas that I've researched for a long time. I think it's interesting that countries have at least coordinated, if not cooperated, in a lot of circumstances. Sometimes that's been for shrewd reasons, for example to shore up alliances. If you're cooperating with other countries, you're showcasing yourself as a leader and demonstrating prestige in the international setting.

Also, the fact that these missions are so expensive might encourage cooperation because it's useful to be able to share the costs. There's also a geographical element given we need to be able to have receiver stations all around the world. It used to be the case – and might still be the case – that if you look at academic papers that are coauthored across two different nationalities, space science is the most cooperative academic discipline. It's interesting that space activities seem to attract this level of cooperation, but at the same time also have this flip side that potentially reinforces geopolitics.

I'm also interested in these feedback loops. For example, after the dissolution of the Soviet Union, the United States decided to coordinate and cooperate more with Russia to build up diplomatic ties and brought the Russians into the International Space Station. This essentially projected diplomacy into space, but then also created relations that shored up that cooperation on Earth.

Of course, that could apply to conflict as well. If someone were to use an anti-satellite weapon against another country's satellite, that could exacerbate tensions on Earth. So again, there's this feedback loop. We have had anti-satellite tests, but countries have always used them on their own satellites so far.

Even if you take a rational understanding of human nature, there are reasons for humans to have to coordinate their activity in space. This includes things like not overlapping radio signals. You can have a tragedy of the commons where everybody loses out if you don't have a minimum level of coordination.

Going forward, I think we can aspire to having a good amount of coordination and cooperation. Unfortunately, however, I think we're also never going to escape the fact that there is an element of competition and that space can be a useful way to manifest that as well.

This interview features extracts from "Who owns outer space?", an LSE iQ podcast episode.

Note: This article gives the views of the interviewee, not the position of EUROPP – European Politics and Policy or the London School of Economics. Featured image credit: Artsiom P / Shutterstock.com

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Jill Stuart is an academic based at the London School of Economics and Political Science. She is an expert in the politics, ethics and law of outer space exploration and exploitation. She is a frequent presence in the global media (print, radio, television, documentary) and regularly gives lectures around the world.

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