

Research report

Forum: UNCOPUOS
Issue: Establishing regulations on the growing commercialization of space activities
Student Officer: Ayumie Pathirana
Position: Deputy Chair



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Introduction

‘Emerging technology in shaping modern society’ – LmunA 2022’s theme accurately sums up the issue of establishing regulations on the commercialization of space activities, which is only becoming more pressing in recent years. As the general human understanding of space increases, it is inevitable that non-governmental entities shall seize the opportunity to become pioneers in this new field of study – and income. Unlike the past, work related to, and within space have become a viable and realistic option for many people, for more than just aspiring astronauts. Since 2005, commercial activity in space has grown from 110 billion USD in 2005 to 357 billion USD in 2020¹. In recent years, independent commercial companies have achieved ventures that have previously only been done by nation states. Since humans have first ventured into space in 1961, this new locale of exploration has been regarded as both a possible wealth of information and money. Unfortunately, this new avenue of income may not continue to be so ideal, unless these growing commercial space companies begin to operate under regulations making sure their work does not endanger everyone on Earth.

The demand for more commercial space activity shall only increase as technology advances, as it will in every sector. As representatives of member states, delegates will have to work together to propose useful regulations on the commercialization of space activities, in order to make sure commercial entities operate under some semblance of control. As life on Earth becomes increasingly dependent on our development in space, it is essential that we ensure that commercialization in space is both ethical and safe.

¹ Brukardt, Ryan, et al. “Space Spending around the Globe | McKinsey.” *Www.mckinsey.com*, 20 Apr. 2022, www.mckinsey.com/industries/aerospace-and-defense/our-insights/space-around-the-globe

Definitions of key terms

Commercialization

The act of managing something with the main interest being financial gain.

Global Space Economy

The value of all activities and use of resources that create benefits to humanity, within the pursuit of managing, understanding and researching space.

Kármán Line

The imaginary boundary 100 kilometres above sea level, the functional definition for where space begins.

Kessler Syndrome

The phenomenon, observed by NASA space expert Don Kessler, in which the objects orbiting Earth reach such a high frequency that they collide repeatedly, creating more space debris in subsequent collisions².

² Wall, Mike. "Kessler Syndrome and the Space Debris Problem." *Space.com*, 15 Nov. 2021, www.space.com/kessler-syndrome-space-debris

General overview

As mentioned in the introduction, ever since humans first recognised the endless opportunities that came with the discovery of space, there has been a curiosity to find out what it holds. However, along with scientific curiosity, this new frontier also sparked interests in financial gain. Until recently, only governmental organisations have ventured into outer space, however, commercial space operations have achieved many accomplishments related to this field before sending people to space. The first instance of commercial space operations was commercial communication satellites, first made legal by the United States of America's Communication Satellite Act of 1962, allowing commercial entities to own and use their own communication satellites. This act led to the first commercial payload to enter space – Telstar 1³, primarily funded by the private corporation AT&T, a major US telecommunications company. Telstar was observed as a feat of engineering, bringing the wonder of satellite broadcasting to the general public, raising interest in this growing sector for many companies in the Americas. In the 1990s, this method of direct broadcasting would become the most common in most developed countries. Later, German company OTRAG (Orbital Transport and Rocket Corporation)⁴ would be the first private company to attempt launching a private spacecraft, as a progenitor of many modern commercial suborbital flights.

Although there were many attempts and successes in the field of non-government-funded space launch services in the 1900s, the real 'Second Space Race' did not kick into gear until the 21st century⁵. Governments began sponsoring programs in a bid to encourage more private companies to get involved with supplying resources and complete transportation services.

³ "Mission Monday: Five Fast Facts about Telstar, the World's First Active Communications Satellite." *Space Center Houston*, 6 July 2020, spacecenter.org/mission-monday-five-fast-facts-about-telstar-the-worlds-first-active-communications-satellite

⁴ "English Story – FLY ROCKET FLY." *Otrag.com*, otrag.com/english-story/#:~:text=In%201975%2C%20with%20the%20help

⁵ Goswami, Namrata. "The Second Space Race: Democratic Outcomes for the Future of Space." *Georgetown Journal of International Affairs*, 25 Jan. 2022, gjaia.georgetown.edu/2022/01/25/the-second-space-race-democratic-outcomes-for-the-future-of-space

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Launch services began to become more common, making them cheap enough for there to be serious competition in the market of space launches. By 2012, private companies had started transporting their cargo to and from the International Space Station, a field which has since become overcrowded with private entities clamouring to get their products into space. Beyond satellites and cargo, spaceflights themselves have become any man's game. In May of 2020, SpaceX became the first private commercial company to send humans into space, breaking the ceiling on what private companies can do in space.

However, with the new possibilities that commercial activities in space pose, comes the possibility that they will get out of hand. Without comprehensive regulations, this growing sector of business can easily become a pressing issue in a few years. There have of course been actions made against the inevitability that entities shall attempt to use outer space as a possibility for economic development. Until recently, the only entities in space were ones bound to many treaties and laws to ensure their actions were both ethical and safe, however with the opportunities for private corporations to do the same things without extensive regulations, many risks may arise⁶. With more and more corporations launching objects into space (satellites, launch vehicles, etc), the risk of collisions between these, and with space junk has increased dramatically, and shall continue to do so unless properly regulated. This new high frequency of orbital objects in space may lead to the Kessler Syndrome phenomenon becoming a reality, which is a severe danger to Earth. It has been mapped out by many experts that once the Kessler Syndrome begins, a cloud of collisions shall quickly form, taking out many important and iconic orbital objects⁷, including the Hubble Space Telescope, the International Space Station (ISS), and the newly launched James Webb Telescope. This would force the world to suffer a loss of over 100 billion USD from the ISS alone. Another risk that unregulated commercial space activity poses is one that may directly affect the people on Earth. In recent years, the possibility

⁶ Broom, Douglas. "As Private Satellites Increase in Number, What Are the Risks of the Commercialization of Space?" *World Economic Forum*, 12 Jan. 2022, www.weforum.org/agenda/2022/01/what-are-risks-commercial-exploitation-space/.

⁷ Wall, Mike. "Kessler Syndrome and the Space Debris Problem." *Space.com*, 15 Nov. 2021, www.space.com/kessler-syndrome-space-debris

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for a new arms race has emerged – the ‘Space Arms Race’, in which entities will race to develop hypersonic weapons, missiles that can reach a speed of minimum Mach 5⁸. Because of the strict regulations binding governmental organisations in their space-related activities, there was a small chance of this occurring a few years ago. However, now that private space organisations have the power to do what governmental organisations can with minimal repercussions, the likelihood of this possibly cataclysmic event rises dramatically.

There have been a few binding acts made in order to regulate this activity. On the international level, the Treaty on Principles Governing the Activities of States in the Explorations and use of Outer Space, Including the Moon and Other Celestial Bodies, annex to the Outer Space treaty of 1966⁹, states that exploration and use of outer space will be carried out in order to benefit all countries, and shall be in the interest of humankind (This is explored further in the ‘timeline’ section). Further, Article VI of this same treaty requires that the acts of non-governmental entities in space must be subject to authorization and supervision by the ‘appropriate State Party to the Treaty’. This ensured that the government of the country in which these activities would be responsible for all the space-related activities in said country, whether it be private or public. The country is then made responsible for the private commercial activity’s adherence to the Outer Space Treaty. Unfortunately, this is the only major international regulation created for this growing issue, which has led to many national acts being put in place. Treaties and acts such as Luxembourg’s Law on Space Activities¹⁰, outlining the rights that private space organisations have, or the United States of America’s Space Launch Competitiveness Act, which encourages a pro-growth, yet regulated environment for private space organisations. These examples may work relatively well on the national level, but in order

⁸ “What Are Hypersonic Weapons and Who Has Them?” VOA, www.voanews.com/a/what-are-hypersonic-weapons-and-who-has-them-/6492459.html

⁹ “Outer Space Treaty.” *Unoosa.org*, 2019, www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html

¹⁰ “Luxembourg Reinforces Its Legal Framework for Space Activities.” *Space-Agency.public.lu*, space-agency.public.lu/en/news-media/news/2020/Two_new_laws.html

for the international community to go into space as a collective, all-encompassing regulations are necessary.

Major parties involved

United Nations (UN)

The United Nations contains several bodies which address the problems associated with unregulated commercial space activity, including UNOOSA, UNCOPUOS, and many others. The UN ensures that the actions of the committees it oversees are in the interest of humanity.

United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS)

The UNCOPUOS was set up by the General Assembly to oversee the use and explorations of space, and to ensure the actions benefit humanity as a whole. The committee worked in tandem with the General Assembly to create and implement the Outer Space Treaty, and works in general to uphold the advancements in space technology to the standards outlined in the treaty. The committee ensures the . The committee ensures that all space activities are in humanity's best interest, including the newly-frequent commercial activity¹¹.

United Nations Office for Outer Space Affairs (UNOOSA)

UNOOSA works to encourage cooperation between different nations, in terms of the peaceful use and exploration of space, and the usage of space-related science and technology. UNOOSA provides services to UNCOPUOS and other committees, and ensures that the that the United Nations register of objects launched into space is maintained, including privately-owned ones. UNOOSA is a key player in ensuring private space activity is regulated to an acceptable degree

United States of America (USA)

The United States was one of the first big economic powers to make major changes to their legal frameworks in order to make sure commercial space activities may be treated and regulated to the same degree as governmental/non-profit making activities. As a country containing many corporations such as SpaceX, Virgin Galactic and Blue Origin, the USA involves many major space companies that are of interest when considering this issue.

¹¹ "COPUOS History." *W*www.unoosa.org, www.unoosa.org/oosa/en/ourwork/copus/history.html.

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European Union (EU)

The European Union, and the European Space Agency (ESA) have taken strides to involving companies carrying out commercial space activity with the non-profit activities ESA themselves are doing; As shown in ESA's Business in Space Growth Network (BSGN), ESA is encouraging commercial space companies to work in tandem with them, and thus operate under the extensive regulations ESA works with.¹²

The People's Republic of China

China has been steadily involved in current developments in space technology, and has a fast-growing commercial space sector. There are estimated to be 95,000 space-related enterprises in China¹³, and the sector has been financed by many different sources. The government alone spent around 13.5 billion USD in 2020¹⁴, that number is expected to double in coming years. Regulating this field is vital to ensuring commercial space activity as a whole is controlled.

The Russian Federation

Russia has been at the forefront of most space developments, and the commercial space sector is also one of them. In the 2010s, Russia was the country to beat, earning around 707 million USD in 2011 alone¹⁵, when they launched 10 commercial payloads. Although Russia lost its footing in the international launch market over the years, the country is poised to make a comeback with their space agency Roscosmos working in tandem with many space-related companies in the country¹⁶.

¹² "Commercial Opportunities for Space Exploration." *Www.esa.int*, www.esa.int/About_Us/Business_with_ESA/Business_Opportunities/Commercial_Opportunities_for_Space_Exploration

¹³ Hongpei, Zhang. "China's Commercial Space Sector Picking up Momentum, Firms' Financing Expected to Double in 2022: Report - Global Times." *Www.globaltimes.cn*, 19 Apr. 2022, www.globaltimes.cn/page/202204/1259744.shtml#:~:text=According%20to%20domestic%20corporate%20portal.

¹⁴ Hines, R. Lincoln, and Svetla Ben-Itzhak. "NASA's Head Warned That China May Try to Claim the Moon – Two Space Scholars Explain Why That's Unlikely to Happen." *The Conversation*, theconversation.com/nasas-head-warned-that-china-may-try-to-claim-the-moon-two-space-scholars-explain-why-thats-unlikely-to-happen-186614#:~:text=China%20increased%20government%20spending%20on.

¹⁵ *CRS Report for Congress the Commercial Space Industry and Launch Market Name Redacted Specialist in Industry Policy*. 2012.

¹⁶ Howell, Elizabeth. "Roscosmos: Russia's Space Agency." *Space.com*, 18 Jan. 2018, www.space.com/22724-roscosmos.html.

Timeline of Key Events

July 29 th , 1950	The first synthetic object enters space, thus beginning the first Space Race.
1959	The General Assembly establishes UNCOPUOS as a permanent body.
July 10 th , 1962	Telstar 1, the first commercial payload funded launches into space ¹⁷ .
October 1967	The Outer Space Treaty is entered into force.
1990s	Direct-to-home broadcasting from satellites has become the most common method of TV broadcasting, raising the demand for commercial satellites.
May 21 st , 2015	The US establishes the first major national act involving regulations for the growing commercial space industry, the Commercial Space Launch Competitiveness.
May 2020	The first private commercial company sends humans to space, ushering in a new era of space exploration

Possible solutions

There have been many proposed solutions to this issue in the past, but none which have been implemented.

One popular idea is to consider major commercial space companies as ‘states’ of their own in the capacity of space activity, and have them operate under the regulations that governmental organisations operate with. This would, in theory, make sure that commercial space activities are also required to work under the Outer Space Treaty, which would ensure that their work is all in the interest and benefit of humankind at large.

It is impossible to force commercial space companies to be constantly controlled by the nation in which they reside, however, requiring them to have a certain number of qualified UN/government officials in their projects may be a viable solution to making sure their work is

¹⁷ “Mission Monday: Five Fast Facts about Telstar, the World’s First Active Communications Satellite.” *Space Center Houston*, 6 July 2020, spacecenter.org/mission-monday-five-fast-facts-about-telstar-the-worlds-first-active-communications-satellite

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under enough supervision. This would hypothetically allow the companies a certain degree of autonomy, while still being overseen to make sure their activities are to the standard of the UN.

A big issue in unregulated space activity in the earth's orbit is the likelihood of the Kessler Syndrome coming to fruition, mostly due to different governmental organisations and commercial companies seeking to launch satellites and observational technology. Creating a system for the observed data to reach a public database that other organisations can access, may lower the necessity to launch more objects into space. Theoretically, this would make sure that there are not too many orbital objects which carry out the same purpose, and organisations would still have the data that they need.

Further reading

- [The Outer Space Treaty](#)
- [Harvard Business Review – The Commercial Space Age Is Here](#)

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