SPACE ECONOMY: A PRIVILEGE NOT ACCESSIBLE TO EVERYONE?*

Boudour Mefteh[1]

The daily discovery of the truth in space has many implications for mankind. Continued advances in spatial exploration led to rapid advances in science, technology and the field of communication that have transformed human relationships.

The space economy has been studied using a variety of approaches, ranging from science and technology to the effects of government spending on economic growth and the long-term effects on productivity and growth. When we discuss this, the main idea is the difference in effort and benefit for each nation. Since this sector is known as a privilege for "the well-to-do," it shows an injustice toward other categories of people, or perhaps this idea is just a dogma, and the space sector is for humanity to facilitate their lives in a different, modern way. This is made possible by channeling appropriate opportunities provided by space-capable countries to institutions in developing countries that would otherwise have little to no chance of conducting space-related scientific research.

Keywords
public international law, space law, space economy, international relations

> "*We regard the sending of the rocket into outer space, and the delivering of our pennant to the moon as our achievement, and by this word "our," we mean the countries of the entire world, i.e., we mean that this is also your achievement and the accomplishment of all the people living on Earth."* (Khrushchev 1959)

Introduction

The super-rich spacefarer's argument exposes a mentality that may have once served humanity well. Some would argue that it is a fundamental feature of capitalism. Innovation on top of innovation. A strong desire to expand and explore. A primal desire to break free from our origins and reach for the next horizon. Today's interest in the space sector and immersion in space travel is a natural extension of our obsession with economic growth. It is the crowning achievement of capitalism. Its frontier creed is "further and faster" reaching outer space.

Classically, only a few countries have played a significant role in space activity. The United States remains far ahead in terms of funding, with a civil space budget

* DOI 10.21868/PGnG.2023.1.3.

[1] *Boudour Mefteh*, PhD student, Géza Marton Doctoral School of Legal Studies, University of Debrecen

approximately twice that of the next nearest nation and accounting for more than 40% of the worldwide population. However, several countries are increasing their space activity, and approximately 70 have established national space agencies. Some, such as those in the Philippines (2019) (Silver 2019), Costa Rica (2021), and Rwanda (2021) (Zúñiga 2021; Iyanda 2021), are relatively new (Patel 2019). With the addition of the new Latin American and Caribbean Space Agency (ALCE) (Messier, 2021) to the European Space Agency (ESA) and the Asia-Pacific Space Cooperation Organization (APSCO), every region of the world is now involved. In the future, further countries are likely to establish space agencies. As result, international collaboration will become more important as more nations participate in space activities, and some efforts have already begun.

This fact, if it means something, means the effort by other nations to get a place in this marathon with the huge space powers. But also, the intentions that space services can really enhance the economy on Earth, in a century that has seen capitalism control the market and continually push society towards materialistic goals. In this case some nations should keep it in mind that before they spend trillions of dollars wasting their high-tech equipment throughout the solar system, they should pay more attention to what's going on right here on Earth. If we're talking about money investing in space, we can't forget Tesla founder and serial entrepreneur Elon Musk, who is one of these new actors investing in space, alongside Amazon founder Jeff Bezos and Richard Branson: we can call them "those who attack space". While this is understandably thrilling, it also leaves many people asking why they are choosing to spend so much of their wealth on this goal. With other major issues to deal with you may be wondering what has inspired this recent trend among the ultra-rich.

While people lost their jobs due to COVID-19, some countries dropped their economic system, and some families didn't have the money to get medical treatment for this virus, Bezos and Musk have spent the majority of their lockdown competing for the top two spots on Forbes' rich list. Which means that, maybe, this sector is already a privilege not for all humankind and its benefit is already divided between the rich to become richer.

Some people don't even believe in space activities: for them, the statement that humanity made it to the moon is a huge lie to control their little limited minds and ways of thinking. All that they care about is the chance to live a healthy and wealthy life here on our 'Mother Earth'. But we don't have to be narrow-minded because technology has proven in many situations its importance in our lives and since space has far-reaching applications; all countries should be supported in accessing the benefits of space-based technology that facilitates sustainable development. Actually, more countries invest financial and political capital in the space environment, and the world becomes increasingly dependent on space.

This article aims to show that the benefits of space activities are different in every nation based on two hypotheses: either to make the life on Earth better by providing services produced in space for use on Earth to benefit humanity, or as a way to escape Earthly problems, to create a better place outside the Earth's orbit for those who can afford it.

In an attempt to do so, the paper asks the following research questions: Are different nations around the world all involved in the space sector and its benefits equally? Also,

in particular, the idea that space is a privilege for some people and not others – billionaires for example continue to invest in space –, how can this impact the future economy, if investment on Earth is starting to get neglected in favor of, for example, creating a permanent human colony on Mars till the point that we talk about "billionaires' space race", while this can impact creating better lives here on Earth.

To understand this issue, the paper makes a legal and analytical contribution to the debate on space economic activities and analyses different countries' budgets for space activities using a comparative method. The largest yet most neglected challenge is the struggle of regulating international relations between companies and countries that are controlling this domain.

1. Theoretical contexts and scientific approaches

The space economy can be defined as "the full range of activities and the use of resources that create and provide value and benefits to human beings in the course of exploring, understanding, managing and utilising space" (OECD 2019).

In the light of this idea, we can mention *The Political Economy of the Space Age* by Andrea Sommariva following the evolutionary theory of economic change, this book brings all of these aspects together. It investigates the processes that shape the economy through interactions between various economic agents, governments, and the extra-systemic environment in which governments operate. Its historical component aids in better understanding the technical, political, and economic constraints that shaped the growth of the space economy. Global issues, including population changes, critical or limited natural resources, and environmental damage, as well as technological innovations, will drive the evolution of the space economy beyond Earth's orbit in the medium term. This book answers why humans should go into space, as well as the relative roles of governments and markets in the evolution of the space economy. To answer those questions, it takes an interdisciplinary approach. What is possible is defined by science and technology. Economic, institutional, and political factors all influence the realization of the possible (Sommariva 2018).

Giorgio Petroni and Barbara Bigliardi's *The Space Economy: From Science to Market* is also worth mentioning. The book offers a new and broader viewpoint of the space economy, putting the focus on the (measurable) returns on investments made in the space industry since the Space Race.

To approach this issue legally, we must first acknowledge that space law, like general international law, is comprised of a variety of international agreements, treaties, conventions, and United Nations General Assembly resolutions, along with rules and regulations of international organizations. The Outer Space Treaty, 1967, is the most well-known treaty; the OST was the initial agreement that established the fundamental framework for international order in outer space, introducing principles that have since been expanded upon in subsequent treaties. Furthermore, if we are going to talk about space economy and its impacts in different countries, we have to state that there is a relationship between space activities and international trade law: since the space sector is taken also for commercial aims, trade law will be a part of the general legal framework when we talk about space security and the different challenges that it can face.

The United Nations Office for Outer Space Affairs launched the Human Space Technology Initiative (HSTI) in 2010 to assist countries in gaining access to the benefits of space technologies and applications, with the goal of involving more nations in human spaceflight and other space exploration-related activities. HSTI serves as a forum for information exchange, fostering collaboration between spacefaring and non-spacefaring countries, and encouraging emerging and developing countries to participate in space research and benefit from space applications. The Initiative is part of the effort to provide access to space education, data, technology, and research, as well as to make space accessible to all. In collaboration with United Nations-wide activities such as the Secretary-General's Strategy on New Technologies, UNOOSA identifies the best use of technological advances to deliver on the Organization's overall mandates. Without forgetting the effort of The Space Forum of the Organisation for Economic Co-operation and Development (the OECD Space Forum) in the Directorate for Science, Technology, and Innovation, it provides a set of indicators and options for boosting economic measuring system in the space sector.

2. Data and information

Talking about the space sector in combination with law can be a new frontier for jurists since it is traditionally a field connected more to the scientific domains. Actually, space is also connected to the world of economy as a new way to make more investments and to receive more benefits.

2.1 What is space economy?

The space economy can be defined as “the full range of activities and the use of resources that create and provide value and benefits to human beings in the course of exploring, understanding, managing and utilizing space” (OECD 2012). It encompasses the increasingly pervasive impacts of space-derived products, services, and knowledge on economies and societies, in addition to the space manufacturing sector.

The space economy is expanding and progressing in tandem with the development and profound transition of the space sector, as well as the continued integration of space into society and the economy. Today's deployed space infrastructure allows for the development of new services, which in turn facilitates new applications in sectors such as meteorology, energy, telecommunications, insurance, transportation, maritime, aviation, and urban development, resulting in more economic and societal benefits. Not only is the space sector a growth sector in and of itself, but it is also a critical enabler of growth in other domains (ESA 2019).

2.2 Is space economy not equally divided?

Historically, rich people used to build hospitals and fund universities and libraries as a prestigious way of showing their wealth. Nowadays, billionaires such as Bezos, Musk, and Richard Branson appear to be motivated by a noble goal: securing humanity's future by going into space. Many have rejected this as the arrogance of billionaires that pay little attention to real, everyday issues like environmental collapse. Worse, some say it

is similar to cruel, historic land grabs. However, the concepts of "going to space" and "saving the human race" have long fascinated people on Earth (Moynihan 2021). These technophiles are finally admitting that the world is too small for us: the Earth cannot support infinite growth. That is why we must venture into space. If we want to get specific, the cost of sending one chair to space is approximately $24 million. For comparison, $6 billion, according to UN World Food Program Executive Director David Beasley, is how much money it would take to save the 41 million people who are expected to die of hunger this year around the world. Beasley sent a tweet recently urging Musk, Branson, and Bezos to team up to fight hunger, saying, “We can solve this quickly!”

Psychotherapists, in an interview for Salon magazine (Karlis 2021), declare that those billionaires appear to be obsessed with going to space, to the point where they are willing to spend billions of cash from their own finances to accomplish it. According to Michael Kraus, a social psychologist at Yale University who specializes in the study of inequality, while “variation exists in all strata in terms of personality,” including the wealthy, the social context of being very wealthy can cause a person to relate to the world in a more egoistic way. As a result, they aren't preoccupied with issues that affect the Earth right now.

At this point we can tell that since this new generation of economics lucrative (space economy) is highly lucrative, in the 14th meeting of the United Nations general assembly in its seventy-fourth session, some speakers affirmed that outer space activities must benefit all states, no matter their development levels highlighting the injustice and the ignorance toward some countries in this domain. This concept is based on the Outer Space Treaty, which specifies in Article I (1) that the "use of outer space... shall be carried out for the benefit and in the interests of all countries".

Based on this principle, the delegates said that benefits coming from space should no longer be restricted to those with space programmes, which are mainly the powerful countries having a monopoly on and an easy access to space. With many developing countries moving toward acquiring outer space technological capabilities, anachronistic maneuvers to check international cooperation and contain their development should no longer be tolerated, according to the representative of the Democratic People’s Republic of Korea. He went on to say that the failure of his country and others to attend meetings of the Committee on the Peaceful Uses of Outer Space as observers arose as a result of objections raised by other nations trying to pursue politicized selectivity as well as double standards. With several developing countries shifting toward obtaining outer space technological capabilities, anachronistic maneuvers to verify international collaboration and contain their development should no longer be tolerated, according to the representative of the Democratic People’s Republic of Korea. He added that the failure of his country and others to participate as observers in meetings of the Committee on the Peaceful Uses of Outer Space was due to objections raised by certain States pursuing politically motivated selectivity and double standards.

In the light of similar ideas, the representative of South Africa, Xolisa Mfundiso Mabhongo, mentioned that the benefits of space exploration should be available to all countries, regardless of their level of scientific, technological, or economic development, and should not be limited to countries with a space program. "In Africa, we see the use of outer space as a key driver in addressing the triple challenges that our

people face – poverty, inequality, and unemployment," he said. South Africa, as a result, welcomes the African Union's decision to establish an African space agency headquartered in Egypt, he said, adding that his delegation is looking forward to working with partners to ensure that it fulfills its full potential to advance African space policy and strategy as a vital driver of the African Union's Agenda 2063. Highlighting that Africa has one of the highest demands for space products and services as the country's economy becomes more reliant on space, he listed them as communications technology, e-banking, navigation, and the use of space-based technologies to manage disasters and climate change, as well as to advance agriculture, education, and health-related problems (OECD 2019).

We can however mention the "Argentine Doctrine," which states that benefits derived from picking space resources must be offered to all humanity without discrimination, and that steps should be taken to share these benefits in a way that promotes better standards of living and economic growth conditions in accordance with Article 55(a) of the United Nations Charter (Williams 1970, 157–158).

Thus, developing countries, in particular, prefer a broad obligation to share the substantial benefits of space exploration in order to promote economic growth, whereas industrialized nations prefer minimal sharing obligations in order to retain control over their space programs and keep them economically viable (OECD 2019).

2.3 An equal space benefits division following “The Common Heritage concept”

Talking about the ability of making an equal division of space resources, even for those who do not have the ability to start space policy, or a space-based economy is possible based on what international law calls the “common heritage of humanity”, but what is made more specific here in connection with space law.

The concept of common heritage emerged during discussions on the law of the sea at the United Nations. In 1967, Arvid Pardo, the Maltese ambassador to the United Nations, suggested to the General Assembly in a memorandum that the seafloor and ocean floor be declared a "common heritage of mankind," and a treaty drafted to incorporate the concept. The five essential elements of the common heritage principle were as follows: (1) the area under consideration cannot be appropriated; (2) all countries must share in its management; (3) the benefits derived from resource exploitation must be actively shared; (4) the area must be fully committed to exclusively peaceful purposes; and (5) the area must be preserved for future generations (OECD 2019).

Some commentators have attempted to ascribe a broad meaning to the common heritage of mankind concept in order to demonstrate that developing countries should have substantive property rights over the natural resources of the Moon by importing interpretations of the concept from the law of the sea (OECD 2019).

2.4 The place of space economy within the new international economic order (NIEO)

One of the guiding principles of the New International Economic Order is the concept of humanity's common heritage. [2] The NIEO presents developing country needs and development strategies. The NIEO concept was established in two United Nations General Assembly resolutions in 1974. The first, titled "Declaration on the Establishment of a New International Economic Order." (General Assembly resolution 1974, Resolution 3201.) emphasized the needs and aspirations of developing countries. It stated:

"[a] determination to work urgently for the establishment of a new international economic order based on equity... interdependence... and cooperation among all States... that will correct inequalities... allow the developed and developing countries to close the growing gap and ensure steadily accelerating economic and social development.... The benefits of technological progress are not distributed equitably across the international community. The developing countries, which account for 70% of the world's population, account for only 30% of global income.... In a system that was established when most developing countries did not even exist as independent States, the gap between developed and developing countries continues to widen...."

Since 1970, the world economy has gone through a series of severe crises that have had far-reaching consequences, particularly for developing countries, which are generally more vulnerable to external economic urges. Here, what we can affirm is that the prosperity of developed countries is inextricably linked to the growth and development of developing countries. (General Assembly resolution 1974, Resolution 3201.)

Proposals to distribute space resources to developing countries, for example, would advance the goals of "non-exploitation of permanent sovereignty over natural resources", resource distribution, and aid to the poorest countries. Ideas advocated by supporters of the developed countries' position, on the other hand, could also fit into the NIEO. For example, the transfer of space technology may benefit developing countries in at least two ways: it may enable them to enjoy the satisfactions that come from active participation in the applications of aspects of space science, and it may bolster such States' general scientific and technological bases with the wide-ranging incremental benefits that such bases bring (Christol 1976, 243–244). The NIEO seeks a comprehensive, never-before-attempted overhaul of this legal framework, as well as the establishment of a mechanism by which rich countries will no longer become richer at the expense of poorer countries (Christol 1976, 67). The NIEO is global in scope and method, and it strives for total human development (Christol 1976, 76). The NIEO's implementation necessitates new international legal norms as well as new implementing institutions (Christol 1976, 197). The NIEO does not seek to halt the development of

[2] The principles and norms of the international law relating to the New International Economic Order identified by UNITAR and endorsed by the U.N. General Assembly are: (a) preferential treatment for developing countries; (b) stabilization of export earnings of developing countries; (c) permanent sovereignty over natural resources; (d) right of every State to benefit from science and technology; (e) entitlement of developing countries to development assistance; (f) participatory equality of developing countries international economic relations; (g) common heritage of mankind.

developed countries, but rather to integrate developing countries' development with that of developed countries (Christol 1976, 74–75). While the NIEO may impose costs on developed countries, outer space and the sea may be viewed as new frontiers from which developed countries can extract compensation through exploitation (Christol 1976, 91).

2.5 Space economy is the solution and not the problem

To begin involving more countries in the space industry, The United Nations Office for Outer Space Affairs (UNOOSA) works on ensuring strong international cooperation in space, the sustainability of space exploration; and the inclusion of developing countries in benefiting from space lays a solid foundation for The International Telecommunication Union's (ITU) work in leveraging the potential of communication technologies.

The mission of UNOOSA is to promote peaceful uses of outer space and to ensure that everyone, everywhere has access to the benefits of space technology and applications. The ITU, on the other hand, is dedicated to connecting all of the world's people, no matter where they live or what their means, so that they can communicate effectively through radio and satellite technology. "KiboCUBE", one of the Initiative's flagship programs, has already enabled Kenya and Guatemala to launch their first satellites. Other program winners are expected to follow suit, with Mauritius likely to be the next, so this is very exciting (International Telecommunication Union 2021).

In contrast, as previously mentioned, billionaires are investing their fortunes in space. While some argue that resources spent on space exploration would be better spent here on Earth, competition has the potential to create transformative new industries and technologies that can add trillions of dollars to the world's economies over time. NASA, for example, currently has over 700 active international agreements for various scientific research and technology development activities, and the International Space Station, which has been in operation for over 20 years, is a significant representative of international partnerships, representing 15 nations and 5 space agencies. All of this activity generates jobs and revenue in countries and communities around the world. Furthermore, SpaceX, which was founded in 2002 by Elon Musk, is a successful commercial enterprise with over 100 rocket launches, astronauts sent to the International Space Station, and NASA and military contracts.

3. Systematic explanation

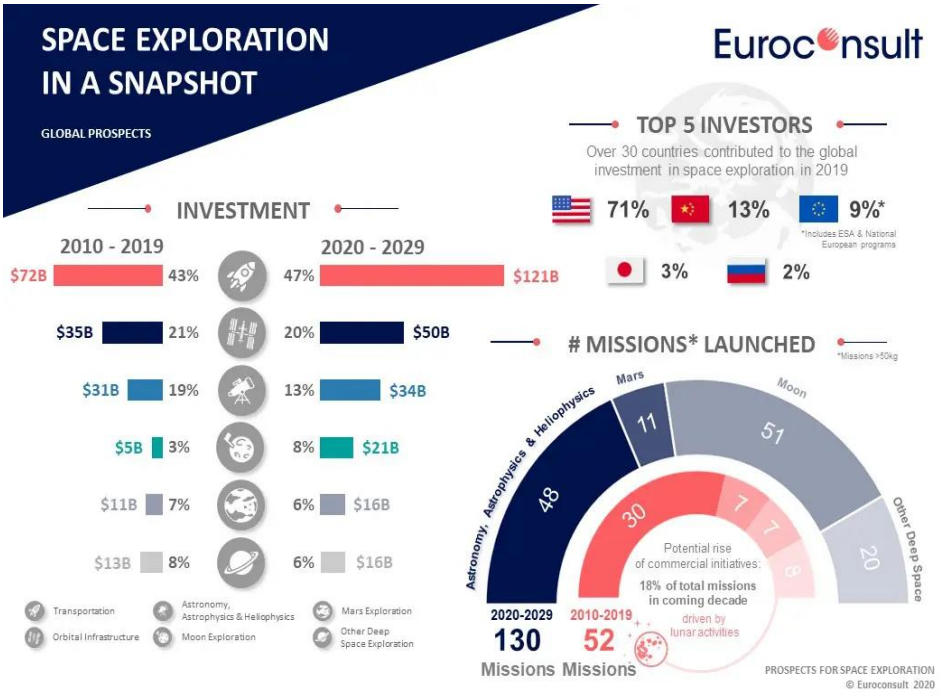
As mentioned above, the space economy is getting more attention from different governments, as, regardless of their financial situations, most countries are trying to invest in this sector because they start believing in its benefits. In this section we will prove this with recent numbers.

3.1 Global government space budget

The most recent edition of Euroconsult's "Government Space Programs" report examines the consequences of rapidly growing government space budgets in civilian

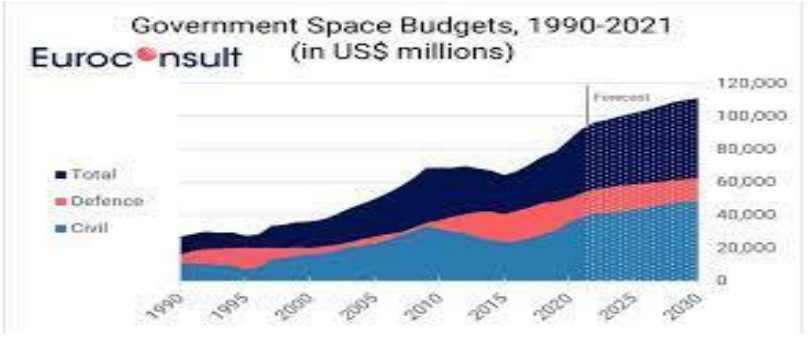
and defense applications over the next decade and extends its signature forecast to 2030. Figure 1 shows the main characters of space, their different activities and investment, while the two last ones show the global government space budget with a forecast until 2030.

Figure 1: Space exploration in a snapshot



Source: euroconsult-ec.com

Figure 3: Government space budget



Source euroconsult-ec.com

3.2 Some options for improved measurement

According to the OECD (ITU 2021) improving the measurement of the space economy and its broader impacts requires progress on the availability and quality of data on the state of the space sector, as well as strengthening the evaluation and impact assessment framework of space programs in general. G20 policymakers could take the following steps in this regard:

- Identify key data and indicator requirements for policy decisions, keeping in mind that they may differ depending on national development strategies.
- Create industry-specific surveys based on globally recognized statistical definitions. This facilitates comparisons with other sectors and with other countries, while contributing to leveraging the time-consuming and expensive data collection efforts Seeking early involvement from government entities in academic science, public research institutes, and the private sector will help to improve data and results uptake.
- Use extant and internationally recognized evaluation and assessment methodologies (for example, cost-benefit analysis of selected space projects) that allow for comparisons and repeat studies (e.g., ex-ante, ex-post). Repeat studies provide an indication of benefits over time and may also help to validate previous assessments.
- Disseminate findings and exchange experiences with stakeholders outside of the space sector, as well as international actors. This aids in fully utilizing the findings and pooling resources.

4. Discussion

4.1 Let’s not let today restrict the opportunities for tomorrow

In order to keep the future filled with opportunities and discovery, we should not be afraid of the unknown and introducing new strategies such as incorporating the space economy within all nations’ politics. Fear is common whenever humanity encounters a new innovation. Before modern science, if a woman enjoyed studying botany or holistic practices, society might blame her of witchcraft and sentence her to death by burning alive. Reading books was once frowned upon and considered foreign. When the internet was invented later, there was a lot of opposition. Elderly adults used to be so disconnected, but now you can walk through a nursing home and see dozens of them scrolling through the internet. People are resistant to change. Although it can be horrifying to try new things, this is why the world has produced so many fantastic innovations. Who would have thought that by studying genetics, scientists would eventually be capable of growing new hearts, livers, and other organs for sick patients? Who would have thought that instead of raising animals, we could grow our meat products in a lab? The concept of space exploration is similar to all of our other discoveries. The unknown can be frightening, but it can also be exciting (Eiler 2022).

Most people thought commercial space travel was a pipe dream twenty years ago. It would have remained that way if Musk, Branson, and Bezos had let today's constraints limit their ambitions for tomorrow. While each of these actors has different goals, their

combined efforts have disrupted the traditional government-run and-funded models for space exploration, paving the way for a new era of commercial space flight led by the private sector. Not to mention that the space sector is not only a growth sector in and of itself, but it is also a key enabler of growth and efficiency in other sectors and specifically economy sector like was mentioned in this paper.

Bezos has stated that he first became fascinated with space while he was still five years old, watching the Apollo moon landing on television merely fifty-two years before launching himself into space. Listening to Bezos and Musk speak to adoring crowds about their childhood obsession with spaceships, one can see another explanation why two of the world's richest men are continuing to spend billions of dollars in public funds to get to space: they think it's awesome (Utrata 2021).

Whether or not it’s equal opportunity, somewhere around 700 people have already registered for commercial passenger flights, which will begin in 2022 and cost between $200,000 and $250,000 per person. The company stopped taking reservations because of the numbers. After Sunday's flight, Branson believes demand will skyrocket. "I think we're going to be overwhelmed with people wanting to go to space when we open up after our trip," he predicted (Wamsley 2021).

4.2 Space exploration facilitates challenging the limits of human consciousness

Aside from money and ego, one of the final reasons many billionaires are interested in space travel is simply to push boundaries. Humans have been fascinated by the idea of space travel for hundreds of years, but after the space race ended, progress slowed significantly. It's understandable why people with a lot of money would want to keep exploring this last frontier. Human colonization of other planets has long been a science fiction plot, but it is now becoming a reality. According to the *Observer* magazine, Elon Musk's company SpaceX intends to visit Mars by 2022 and possibly cruise a human crew there in the years that follow.

One of the reasons for the increased discussion of colonization of other planets in recent years is that we are becoming more aware of the damage that humanity is doing to Earth. As you may be aware, a recent landmark study published by the BBC by the UN's Intergovernmental Panel on Climate Change warned of significant environmental interruption mostly in years ahead because of global warming (Jones 2021).

Conclusion

More countries are likely to establish space agencies, and the world will become increasingly dependent on space. This article aimed to show that space activities and benefits are different in every nation based on two hypotheses: to make the life on Earth better by providing services produced in space for the use on Earth or as a way to escape earthly problems. Outer space activities must benefit all states, no matter their development levels: opposition to these aims highlights the injustice and ignorance toward some countries in this domain. The NIEO seeks a comprehensive, never-before-attempted overhaul of this legal framework, as well as the establishment of a mechanism by which rich countries will no longer become richer at the expense of poorer countries. The mission of UNOOSA is to promote peaceful uses of outer space

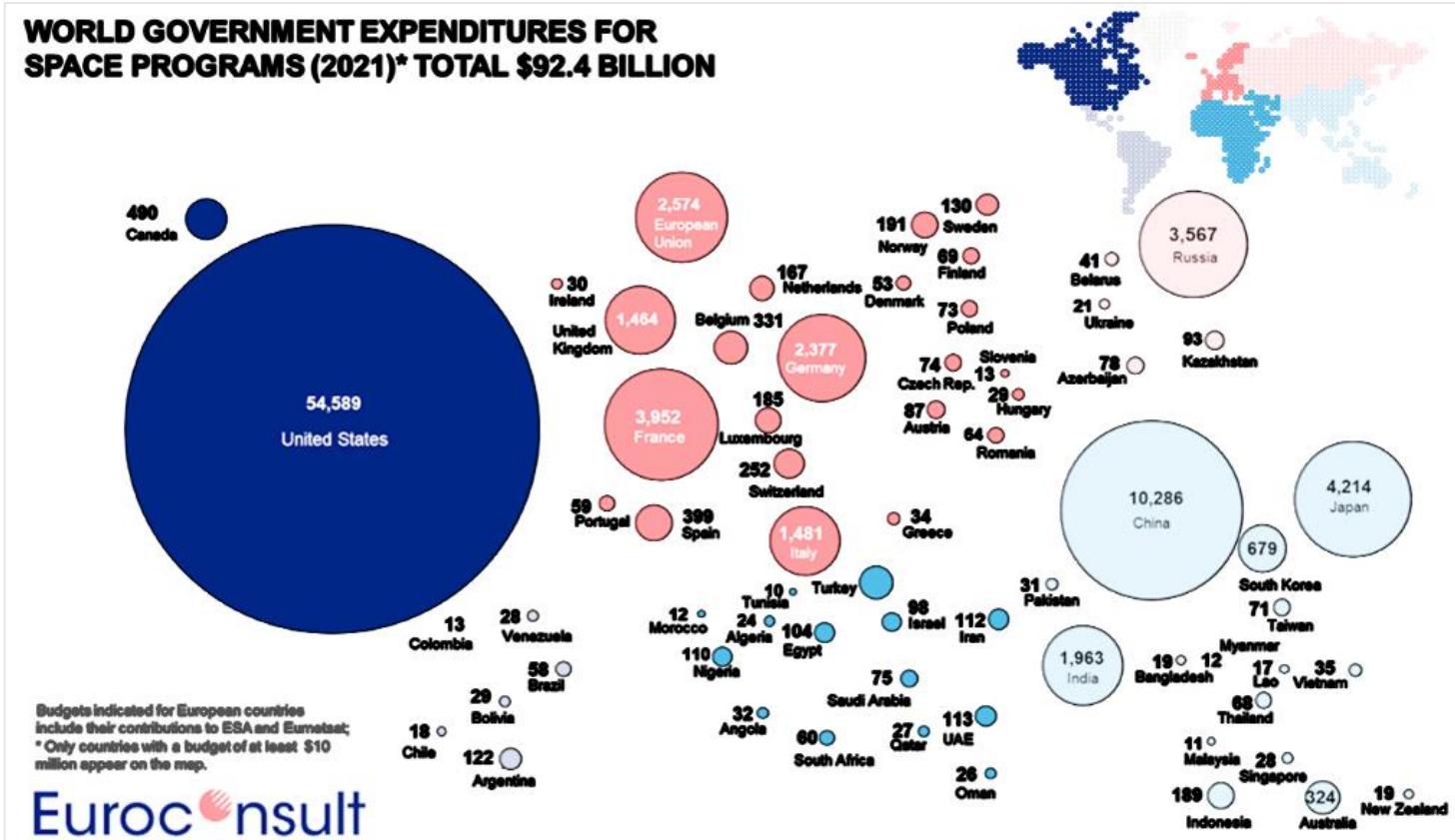
and ensure that everyone, everywhere has access to the benefits of space technology and applications. Competition in space has the potential to create transformative new industries and technologies that can add trillions of dollars to the world's economies over time. Fear is common whenever humanity encounters a new innovation. In order to keep the future filled with opportunities and discovery we should not be afraid of the unknown. It's understandable why people with a lot of money would want to keep exploring this last frontier, because it's time to push boundaries.

References

- Christol, C. (1976). International Space Law and the Less Developed Countries. In Schwartz, M. D. (ed.) *Proceedings of the Nineteenth Colloquium on the Law of Outer Space.* Paris: International Institute of Space Law of the International Astronautical Federation. 243–256
- Eiler, C. (2022). Opinion: What will the future of space travel look like? And what does it mean for this planet? *The San Diego Union Tribute*, February 18, 2022 https://www.sandiegouniontribune.com/opinion/letters-to-the-editor/story/2022-02-18/opinion-what-will-the-future-of-space-travel-look-like-and-what-does-i-mean-for-this-planet [accessed December 7, 2022]
- European Space Agency (2019). What is the Space Economy? https://space-economy.esa.int/article/33/what-is-the-space-economy [accessed November 21, 2022]
- International Telecommunication Union (ITU)(2021). The benefits of space must be accessible to all. 24 May 2021 https://www.itu.int/hub/2021/05/the-benefits-of-space-must-be-accessible-to-all/ [accessed December 8, 2022]
- Iyanda, D. (2021). Rwandan legislature approves law establishing Rwanda Space Agency, *Space in Africa*, March 10, 2021, https://africanews.space/rwanda-legislature-approves-law-establishing-rwanda-space-agency/ [accessed December 2, 2022]
- Jones, P. (2021). Why do billionaires want to go to space? The psychology of the newest ultra-rich status symbol, *The Wire*, https://www.hfmcwealth.com/why-do-billionaires-want-to-go-to-space-the-psychology-of-the-newest-ultra-rich-status-symbol/ [accessed October 29, 2022]
- Karlis, N. (2021). There's a psychological explanation for why the super-rich are obsessed with space. *Salon*, July 2, 2021 https://www.salon.com/2021/07/22/why-are-rich-people-obsessed-with-outer-space-experts-say-theres-a-psychological-explanation/ [accessed december 02, 2022]
- Khrushchev, N. (1974). The Meaning of the Term “Mankind” in Space Legal Language. *Journal of Space Law* 2(2): 125–131
- Mahiou, A. (2011). Declaration on the Establishment of a New International Economic Order. In *United Nations Audiovisual Library of International Law* https://legal.un.org/avl/pdf/ha/ga_3201/ga_3201_e.pdf [accessed December 11, 2022]

- Messier, D. (2021). Latin American and Caribbean Space Agency created. *Parabolic Arc*, October 6, 2021 https://parabolicarc.com/2021/10/06/latin-american-and-caribbean-space-agency-created/ accessed December 2, 2022]
- Moynihan, T. (2021). Why are billionaires obsessed with going to space? *The Guardian*, 16 July 2021 https://www.theguardian.com/commentisfree/2021/jul/16/billionaires-outer-space-elon-musk-jeff-bezos-richard-branson [accessed November 21, 2022]
- OECD (2012). *OECD Handbook on Measuring the Space Economy*. Paris: OECD Publishing doi: 10.1787/9789264169166-en
- OECD (2019). *The Space Economy in Figures: How Space Contributes to the Global Economy*. Paris: OECD Publishing doi: 10.1787/c5996201-en
- OECD (2022). *OECD Handbook on Measuring the Space Economy*. 2nd Edition Paris: OECD Publishing doi: 10.1787/8bfef437-en
- Patel, N. V. (2019). There has never been a better time to start a small space agency. *MIT Technology Review*, November 26, 2019, https://www.technologyreview.com/2019/11/26/131822/why-its-now-the-perfect-time-to-start-a-small-space-agency/ [accessed November 28, 2022]
- Silver, A. (2019). The Philippines creates its first space agency. *Nature.com*, August 19, 2019 https://www.nature.com/articles/d41586-019-02485-9 [accessed December 5, 2022]
- Sommariva A. (2018). *The Political Economy of the Space Age*. Washington DE: Vernon Press
- The United Nations (2019). Outer Space Activities Must Benefit All States, No Matter Their Development Levels, Delegates Tell Fourth Committee as It Begins General Debate. Meeting Coverage, Seventy-Fourth Session, 14th Meeting, 30 October 2019 https://press.un.org/en/2019/gaspd703.doc.htm [accessed December 1, 2022]
- UN General Assembly resolution 1974, Resolution 3201. Declaration on the Establishment of a New International Economic Order
- Utrata, A. (2021). Lost in Space. *Boston Review*, July 14, 2021 https://www.bostonreview.net/articles/lost-in-space/ [accessed December 8, 2022]
- Wamsley, L. (2021). Bezos Vs. Branson: The Billionaire Space Race Lifts Off. *npr.org*, July 11, 2021 https://www.npr.org/2021/07/11/1014581747/bezos-vs-branson-the-billionaire-space-race-lifts-off [accessed november 05, 2022]
- Williams, S. (1970). The Principle of Non-Appropriation Concerning Resources of the Moon and Celestial Bodies. In Schwartz, M. D. (ed.) *Proceedings of the Thirteenth Colloquium on the Law of Outer Space*. Paris: International Institute of Space Law of the International Astronautical Federation, 157–159
- Zúñiga, A. (2021). Costa Rica to create space agency; bill passed by Congress. *Tico Times*, February 19, 2021, https://ticotimes.net/2021/02/19/costa-rica-to-create-space-agency-bill-passed-by-congress-2 [accessed December 4, 2022]

Annex 1: World government expenditures for space programs (2021)



Source: euroconsult-ec.com