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SPACE TOURISM AND THE EMERGING LEGAL ORDER: A MULTIDISCIPLINARY ANALYSIS OF TECHNOLOGY, ECONOMICS, ETHICS, AND GOVERNANCE

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I. ABSTRACT

Space tourism has emerged as one of the most significant developments of the twenty-first century, driven by rapid technological innovation, growing private-sector participation, and humanity's enduring interest in outer space. The transition from state-sponsored space missions to commercially operated human spaceflight has enabled private individuals to participate in suborbital and orbital journeys, transforming space travel into an emerging commercial industry. This paper examines space tourism through a multidisciplinary lens by analysing its historical evolution, technological foundations, economic prospects, ethical implications, environmental consequences, and legal challenges. The study finds that while space tourism offers substantial opportunities for innovation, economic growth, scientific advancement, and broader public engagement with space activities, it also generates significant concerns relating to social inequality, environmental sustainability, passenger safety, liability, and access to outer space. A central finding of the paper is that the existing international legal framework, particularly the Outer Space Treaty and related conventions, was developed primarily for state-led space activities and remains inadequately equipped to regulate contemporary commercial space tourism. Critical regulatory gaps persist in areas such as private operator liability, environmental protection, passenger safety standards, and transnational governance. In response, the paper advocates the development of a harmonised international regulatory framework under the guidance of international institutions such as the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). It further recommends the adoption of stronger environmental safeguards, mandatory insurance and safety standards for commercial operators, and reforms to existing space governance mechanisms to accommodate private-sector participation while preserving the principle that outer space should be utilised for the benefit of all humankind. The paper concludes that

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effective and coordinated governance will be essential to ensuring the sustainable, equitable, and legally accountable growth of the global space tourism industry.

II. KEYWORDS

Space Tourism; Commercial Spaceflight; Space Law; Environmental Governance; Ethics.

III. INTRODUCTION

The concept of space tourism represents a paradigm shift in humanity's engagement today with outer space. Traditionally, space exploration was the exclusive domain of sovereign states, conducted through national space agencies with strategic, scientific, and geopolitical motivations. However, the emergence of private aerospace companies has fundamentally altered this landscape by introducing commercial incentives into space travel.[2] Space tourism, broadly defined as the activity of sending private individuals into space for recreational or experiential purposes, has transitioned from speculative fiction to a tangible reality within the past two decades.

This transformation has been driven by advancements in aerospace engineering, particularly the development of reusable launch vehicles, as well as increased private investment in the space sector.[3] Private aerospace companies have been at the forefront of commercial human spaceflight, ranging from suborbital tourism initiatives to long-term plans for orbital and lunar missions. While Virgin Galactic previously operated commercial suborbital flights, it suspended operations following its final VSS Unity mission in June 2024 and is currently developing its next-generation Delta-class spacecraft. Meanwhile, companies such as SpaceX and Blue Origin continue to pursue broader commercial human spaceflight objectives. Although commercial space tourism has enormous potential, it also has many significant obstacles such as how to provide liability protection for those flying, as well as ensuring safe and sustainable practices are instituted to protect the environment; the

[2] *Space Tourism*, *Encyclopaedia Britannica*, https://www.britannica.com/topic/space-tourism (last visited Apr. 11, 2026).
[3] Steven Freeland, *Up, Up and…Back: The Emergence of Space Tourism and Its Impact on the International Law of Outer Space*, 6 *Chi. J. Int'l L.* 1, 3–5 (2005).

issues of equitable access and ethics associated with connecting the entire world through space), and whether today's legal systems are able to support the type of tourism that will be available for consumers. With this essay, we will study each of these issues related to commercial space tourism, in detail, and put those issues into the broader context of socio-economic conditions and the legal system; thereby allowing the reader to see how all of these issues fit together.[4]

While space tourism through commercial means is a groundbreaking development in the activities of humans in space, this paper suggests that the present legal system fails to provide the necessary means to deal with such complexities created by private space travel. The need for an effective system of international governance will prove to be essential in ensuring that space tourism can continue to develop sustainably in the future.

A. Research Problem

The advent of space tourism as a business has surpassed the establishment of legal instruments necessary to regulate outer space operations. Though private companies are helping people explore space, the current international space law, which is mainly meant to regulate space ventures by states, does not cover such important aspects as liability, security, sustainable environmental practices, and accessibility. Therefore, the problem with the absence of relevant regulation is that environmental damage, space waste, and social inequality cannot be sufficiently regulated. The problem to investigate is whether there exist appropriate legal and political mechanisms to regulate space tourism, and if not, how they should be developed.

B. Research Objectives

1. To study the origins and development of space tourism as a business sector.
2. To analyse the role of technology and economics in space tourism.
3. To assess the extent to which international space laws can effectively govern private space activities.

[4] Frans G. von der Dunk, *Space Tourism, Private Spaceflight and the Law: Key Aspects*, 27 *Space Policy* 146 (2011).

4. To consider the ethical, ecological, and societal concerns surrounding space tourism.
5. To develop recommendations for the future management of space tourism.

C. Research Questions

1. What are the factors that have led to the emergence of space tourism?
2. What is the level of regulation of commercial manned space flights by existing international laws?
3. What are the significant environmental and moral implications of space tourism?
4. Is space tourism a violation of the concept of "common heritage of mankind"?
5. What regulatory framework must be established for sustainable space tourism?

D. Research Hypothesis

Space tourism has become more commercialised, but at a pace which is faster than the capabilities of the existing international laws. This calls for the development of a comprehensive regulatory system to deal with all the legal and ethical issues arising.

E. Research Methodology

The methodological approach used in this research is a doctrinal and analytical one, which makes use of both primary and secondary sources. The primary sources consist of international conventions, including the Outer Space Treaty, policy papers, and guidelines from various institutions, such as the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). Secondary sources comprise journal articles, textbooks, research papers, and reliable online sources concerning space law, economics, and technologies. This research is qualitative in nature and involves an analysis of legal theories, policies, and expert views on the issue of space tourism.

F. Literature Review

The topic of space tourism has attracted considerable attention from the legal, economic, and technological literature. Von der Dunk, for instance, has considered the

impact of private space transportation on international space law and the current insufficiencies in regulating business operations. On the other hand, Freeland has investigated the changing nature of non-state actors in outer space and the associated difficulties within customary legal principles.

Economic researchers have focused on the growth opportunities associated with space tourism, despite the high barriers to market entry and reliance on technological innovation. The ethical implications of the practice have been reviewed by several authors, including David Fennell, who questions the socio-economic disparities that accompany space travel.

Recent scientific literature has addressed the ecological consequences of space tourism, including greenhouse gas emissions and space debris. Nevertheless, there is insufficient literature linking legal, ethical, and ecological perspectives of space tourism within one framework a subject matter that this paper attempts to explore.

IV. RESEARCH AND ANALYSIS

A. Historical Evolution of Space Tourism

Space travel was originally conceived as both a scientific and literary concept. However, the emergence of technology associated with manned exploration of Space provided a way for humans to actually visit Space in the late 20th century because of Cold War development. Spaceflight eventually became a reflection of the geopolitical rivalry between the United States and the Soviet Union; therefore, only government-trained astronauts were initially allowed to fly to outer space.

The commercialisation of space travel began in earnest in the early 2000s. An important event that marked the beginning of the commercialisation of space travel occurred when Dennis Tito became the first private individual to fly into space in 2001. [5] The first privately funded missions to the International Space Station demonstrated that access to space was no longer limited exclusively to professional astronauts. These developments highlighted the commercial potential of human

[5] T Malik, Dennis Tito: The World's First Space Tourist, NASA (Apr. 28, 2021), https://www.nasa.gov.

spaceflight and encouraged closer collaboration between governmental space agencies and private enterprises, laying the foundation for the modern space tourism industry.[6]

Over time, the tourism industry has created three separate industries, i.e., suborbital tourism, orbital tourism, and possibly terrestrial space travel. Until June 2024, Virgin Galactic conducted commercial suborbital flights that enabled private passengers to experience microgravity and observe Earth from the edge of space. Following the completion of the Galactic 07 mission, the company retired its VSS Unity spaceplane and suspended commercial operations in order to focus on the development of its Delta-class spacecraft, which are intended to support a higher flight frequency and improved commercial viability in future operations.[7]

B. Technological Foundations

The advancement of technology in flight is a key part of maintaining the viability of space tourism. One of the largest advancements in technology for this purpose exist in reusable launch vehicles. These reusable launch vehicles have effectively reduced the cost of travel into space, which will allow for more people to travel to space than was ever possible with traditional rockets, through the ability of reusing the same launch vehicle many times as opposed to the cost of building a new vehicle for each launch like previous to reusable launch vehicles.[8]

SpaceX is one of the pioneers of this technological movement by working towards creating reusable rockets that can land so that they may fly multiple times. This innovation has helped make launches significantly less expensive while simultaneously providing more frequently scheduled launches that are much more reliable.[9]

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[6] Patrick Collins, 'Space Tourism: From Earth Orbit to the Moon' (2006) 37 Advances in Space Research 116, 118–21.
[7] Erik Seedhouse, *Tourists in Space: A Practical Guide* 12–18 (2008).
[8] Federal Aviation Administration, Commercial Space Transportation: 2023 Year in Review (2023), https://www.faa.gov/space.
[9] Henry R. Hertzfeld & Frans G. von der Dunk, *Bringing Space Law into the Commercial World: Property Rights without Sovereignty*, 6 *Chi. J. Int'l L.* 81, 90–92 (2005).

Traditionally, rockets were designed for single use, making space travel prohibitively expensive. The introduction of reusable rockets has transformed this equation by enabling multiple launches using the same hardware.[10]

Spacecraft technology has been developed for the purposes of business, military operations, and research with the use of spacecrafts. Development of spacecraft types and models has always been a vital step for any space business development.

The development of spacecraft and reusable launch vehicles has led to more launches at lower costs. Another crucial factor is the training and simulation of the space passengers before they are launched. The space passengers will be trained rigorously to acclimate them mentally and physically with the experience they will have in space. Such training includes teaching about emergencies, training in tight quarters, and experiencing microgravity.

Similarly, Blue Origin has invested in reusable launch systems designed to reduce operational costs and expand access to suborbital tourism. However, the suspension of operations by major industry participants such as Virgin Galactic illustrates the economic and technological uncertainties that continue to affect the long-term viability of commercial space tourism. High development costs, technological challenges, safety requirements, and fluctuating market demand continue to create operational risks for commercial operators. The temporary suspension of services by leading companies demonstrates the importance of establishing adaptive and resilient regulatory frameworks capable of responding to rapid technological and commercial changes within the sector.

However, space travel remains highly dangerous even with all the advances in technology. Accidents are rare, but their consequences could be disastrous.

C. Economic Dimensions of Space Tourism

The economic potential of space tourism has attracted significant attention from investors, policymakers, and industry stakeholders.[11] With the increasing demand

[10] National Aeronautics and Space Administration, *Human Integration Design Handbook* (rev. ed. 2014).
[11] Future Market Insights, *Space Tourism Market Size and Forecast* 2026–2036, (2024), https://www.futuremarketinsights.com.

and advancements in technology, it is expected that the business will witness a significant expansion in the coming years.

The main reason behind the increased demand can be attributed to the increasing number of individuals who are willing to spend fortunes on flying into outer space. The truth of the matter is that at present, only the rich can afford suborbital travel, which may cost anywhere between hundreds of thousands of dollars up to several million.[12]

The economic benefits that the industry has enjoyed are through employment creation, inventions, and expansion into new related sectors such as space tourism and education. These have been accomplished due to collaborations between private and government institutions, in which the latter has provided funding and developed the infrastructure.[13]

The economic potential of space tourism remains a principal driver of industry growth. Although participation is currently limited to high-net-worth individuals due to the substantial costs of commercial spaceflight, ongoing technological innovation and the increasing use of reusable launch systems are expected to reduce operational expenses over time. Beyond direct revenue generation, the industry contributes to employment creation, technological advancement, and the development of ancillary sectors such as aerospace training, hospitality, and specialised infrastructure.[14] Nevertheless, the long-term commercial sustainability of space tourism remains uncertain due to high capital requirements, safety concerns, and regulatory ambiguity. These challenges highlight the need for clearer international legal standards capable of fostering investment while ensuring accountability and consumer protection.

There are limitations associated with the profitability of space travel, however. The high costs involved in the operation of this business, vague regulations, and the

[12] Patrick Collins, *The Economic Development of Space Tourism*, 33 *Space Policy* 1, 4–8 (2017)
[13] Organisation for Economic Co-operation and Development, *The Space Economy in Figures* 72–75 (2019)
[14] Bryce Space & Technology, *Global Space Economy Report* (2023).

possibility of accidents affecting public perception can all limit its development. The state of the economy could also influence the demand for this costly service.

D. Ethical and Social Considerations

Space travel has been increasing and will continue to grow in the future, which brings ethical and sociological issues. The first issue that arises is that of equality. Very few individuals on earth have access to space flight, and this brings up issues of how resources should be allocated and why extravagance takes precedence over urgent social concerns.

People who object to space travel claim that the money could be used elsewhere.[15] Proponents, however, contend that the industry drives technological innovation and economic growth, which can have broader societal benefits.

Another ethical consideration is the impact of space tourism on human identity and humanity's relationship with the environment. The experience of viewing Earth from space, often referred to as the "overview effect," has the potential to cultivate a heightened awareness of the planet's interconnectedness and vulnerability. Scholars of contemporary space ethics have argued that the increasing participation of non-governmental actors in space activities requires careful consideration of environmental stewardship, social responsibility, and the equitable use of outer space resources. Consequently, space tourism may not only influence individual perspectives but also contribute to broader discussions concerning global cooperation and sustainable governance of outer space.[16]

There are also broader ethical considerations related to the commercialisation of space. Traditionally, outer space has been regarded as the "province of all mankind." The commercialisation of space raises concerns about the privatisation of a shared resource.[17]

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[15] David Schweinsberg & David A. Fennell, *Space Tourism: A Historical and Existential Perspective*, 52 *Tourism Recreation Research* 1, 6–10 (2023)
[16] Ioana Cozmuta & Sheryl Bishop, Ethical Considerations for the Age of Non-Governmental Space Exploration, Nature Communications (2024).
[17] United Nations Office for Outer Space Affairs, *Space for All Initiative* (2022).

The people backing the industry argue that the industry advances both technology and economy of the society, as well as improving the technology uses in the society. Other ethical concerns surround space tourism's effect on human identity and our connection to nature. A potential outcome of the overview effect, or viewing the earth from space, is a greater understanding of earth and the delicate balance of life on it. This suggests a possibility for space travel to result in more cooperation among the world and greater concern for the environment.

However, advocates of commercial space tourism contend that the involvement of the private sector has helped in technological innovations, cost reduction, and increased scientific possibilities which have not been possible through government programs alone. In addition, private sector participation has been responsible for advances in reusable launch vehicles, satellite launches, and space-based scientific research facilities. Therefore, the issue here is not to stop commercialisation, but to manage the process in a sustainable and safe way for the benefit of mankind as a whole.

V. INTERNATIONAL LEGAL FRAMEWORK GOVERNING SPACE TOURISM

1. **Outer Space Treaty:** Article 6 of the Outer Space Treaty clearly defines that nations have international responsibility for their space-related activities carried out by any private companies as well. Thus, organisations like SpaceX, Blue Origin, and Virgin Galactic are still governed by nation-states in accordance with international law
2. **Liability Convention:** The international convention on the Convention on International Liability for Damage caused by Space Objects outlines provisions regarding liability concerning damage caused by space objects. As per the Convention, states may be held absolutely liable for damage caused by space objects to the earth, whereas states shall be held liable based on fault in cases

where damage is caused to outer space. However, this Convention was formulated prior to the advent of commercial human spaceflight.[18]

3. **Registration Convention 1976:** According to the Convention on Registration of Objects Launched into Outer Space, states are expected to register the objects that they have launched into space as well as exercising control and jurisdiction over those objects. Unfortunately, while this is helpful in identifying accountability for the administration of the spacecraft, it lacks in handling the complexities of commercial travel among multiple countries. Even though these treaties provide the basic principles of governance for outer space, they have been framed in a period of space exploration when the focus was mainly on states and therefore do not cater to the needs of regulating modern space tourism by private entities.

VI. EXISTING LEGAL INSTRUMENTS AND THEIR APPLICABILITY TO SPACE TOURISM

Despite the foundational role played by the Outer Space Treaty, several additional legal and regulatory instruments are highly relevant to the governance of commercial space tourism. Their application, however, reveals important gaps in the current legal order.

First, the Convention on International Liability for Damage Caused by Space Objects (Liability Convention, 1972) establishes a framework under which launching states may be held liable for damage caused by their space objects. While the Convention provides for absolute liability for damage occurring on the surface of the Earth and fault-based liability for damage occurring in outer space, it was drafted before the emergence of commercial human spaceflight. Consequently, uncertainty remains regarding its application to private passengers participating voluntarily in commercial tourism missions and the extent to which private operators may bear direct responsibility for injuries suffered by space tourists.

[18] *Convention on International Liability for Damage Caused by Space Objects* (adopted 29 November 1971, entered into force 1 September 1972) 961 UNTS 187.

Second, the Convention on Registration of Objects Launched into Outer Space (1976) requires states to maintain records of space objects launched under their jurisdiction. Although registration contributes to transparency and accountability, it does not address issues unique to commercial passenger transport, including consumer protection, operational safety standards, and cross-border liability disputes involving private operators.

At the domestic level, the United States Commercial Space Launch Competitiveness Act of 2015 represents one of the most influential regulatory models governing commercial human spaceflight. The legislation adopts an "informed consent" approach, requiring passengers to acknowledge and accept the inherent risks of space travel. It also limited extensive federal safety regulation during the industry's developmental phase, reflecting a policy preference for innovation and market growth. While this approach has encouraged private investment, critics argue that excessive reliance on informed consent may leave passengers insufficiently protected and may not provide an appropriate model for international regulation.

Another important development is the emergence of the Artemis Accords (2020), a non-binding set of principles developed to guide cooperation in civil space exploration. Although not specifically designed for space tourism, the Accords address issues such as transparency, interoperability, registration, preservation of space heritage, and the peaceful use of outer space. Their growing acceptance among participating states suggests that soft-law instruments may play an increasingly important role in shaping future governance frameworks where formal treaty reform remains politically difficult.

Collectively, these instruments demonstrate that while a regulatory foundation for space activities exists, substantial gaps remain concerning passenger rights, liability allocation, environmental obligations, and the governance of private commercial operators. The fragmented nature of existing regulation supports the argument that a more comprehensive and internationally harmonised framework is necessary to ensure the safe, sustainable, and equitable development of space tourism.

A. Environmental Impact

Growing concerns have emerged regarding the environmental consequences of space tourism. Research by Ryan et al. demonstrates that rocket launches release black carbon, nitrogen oxides, and other pollutants into the upper atmosphere, where they can contribute to stratospheric ozone depletion and influence global climate systems. Because these emissions are injected directly into higher atmospheric layers, their environmental effects may be disproportionately significant when compared with many terrestrial sources of pollution.[19]

Space tourism contributes to both air pollution and space debris issues. Spacecraft activities also mean there is an increased opportunity for craft to collide resulting in debris which threatens satellites and other space assets.

Both types of environmental issues could be solved with increased legislation and technological innovation. Currently there are ongoing attempts to develop more ecologically friendly propulsion systems including ones that use cleaner fuels. Development of these technologies is at a very early stage.[20]

In addition to atmospheric emissions, the expansion of commercial space tourism contributes to the growing challenge of space debris management. Increased launch frequency heightens the risk of orbital congestion and collisions, potentially threatening satellites, scientific missions, and critical communications infrastructure. These concerns expose significant regulatory gaps, as international space law presently contains limited binding obligations concerning emissions control and debris mitigation for commercial tourism activities. Consequently, the sustainable development of the industry requires both technological innovation and strengthened regulatory oversight, including internationally coordinated debris mitigation standards, environmental impact assessments, and emissions-monitoring mechanisms. Such measures are essential to uphold broader principles of

[19] Robert G Ryan and others, 'Impact of Rocket Launch and Space Debris Air Pollutant Emissions on Stratospheric Ozone and Global Climate' (2022) 10 Earth's Future e2021EF002612.
[20] European Space Agency, *Environmental Impacts of Space Activities* (2022).

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sustainability and intergenerational equity recognised within international environmental law.

B. Health and Safety Risks

Space tourists encounter various health and safety issues. Microgravity exposure leads to physiological changes such as muscle atrophy and decreased bone density. Also, travellers in space are exposed to much higher amounts of radiation than those on Earth, putting them at an increased risk for developing cancers and other health problems.[21]

Psychological risks are also significant. The confined and isolated environment of a spacecraft can lead to stress, anxiety, and other challenges. Ensuring the well-being of space tourists requires comprehensive training and support systems.[22]

The health risks associated with commercial spaceflight have important legal implications in addition to their medical consequences. Exposure to microgravity can result in muscle atrophy, bone density loss, and other physiological changes, while increased exposure to cosmic radiation may elevate long-term health risks. These hazards raise significant questions regarding operator liability, passenger informed consent, medical screening obligations, and mandatory insurance requirements. Given the absence of a comprehensive international legal framework governing passenger protection in commercial space tourism, the development of uniform safety standards and compensation mechanisms should form a central component of future regulatory reforms.

VII. SPACE TOURISM AND THE "PROVINCE OF ALL MANKIND" PRINCIPLE

One of the most significant legal and philosophical questions raised by space tourism concerns its compatibility with the principle that outer space constitutes the "province of all mankind," as recognised under Article I of the Outer Space Treaty 1967.

[21] National Aeronautics and Space Administration, *Human Health and Performance Risks of Space Exploration Missions* (2023).
[22] Erik Seedhouse, *Astronaut Health and Safety* 55–78 (2010).

Article I of the Outer Space Treaty provides that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and that outer space shall be regarded as the "province of all mankind." This principle emphasises freedom of exploration and access while requiring that the benefits of space activities be shared broadly among states. This concept must be distinguished from the doctrine of the "common heritage of mankind," which is contained in Article 11 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement, 1979).

While the "province of all mankind" principle focuses primarily on open access and the peaceful use of outer space, the Moon Agreement adopts the stronger concept of the "common heritage of mankind," envisioning an international regime to govern the exploitation and distribution of benefits derived from lunar and other celestial resources. However, the Moon Agreement has not been ratified by major spacefaring nations, including the United States, Russia, and China. Consequently, its practical influence on contemporary commercial space activities and space tourism remains limited despite its normative significance in academic and policy discussions.

The commercialisation of space tourism appears, at first glance, to conflict with this principle. The high cost of participation effectively restricts access to a small, affluent segment of the global population, raising concerns about the privatisation of a shared resource. Critics argue that this trend undermines the egalitarian ethos of international space law and risks transforming outer space into an exclusive domain for the wealthy.

However, proponents of space tourism contend that commercialisation does not necessarily contradict the principle that outer space should be used for the benefit of all humankind. They argue that private investment and innovation can contribute to the broader development of space infrastructure, ultimately benefiting humanity as a whole. For example, advancements in reusable launch technology and life-support systems, initially driven by commercial interests, may facilitate scientific research and humanitarian applications.

It can be difficult to find a way to merge two opposing views (two sides of an issue). In this case we are looking for some method to redefine the concept of a common heritage so that we can operate economically and distribute the wealth created by the creations equitably. Potential methods could be through the implementation of international tax systems, joint agreements regarding technologies developed from outer space and/or the establishment of cash distributions for scientific and/or humanitarian projects.

Ultimately, whether space tourism remains consistent with the "province of all mankind" principle will depend on how commercial activities are governed and whether their benefits are distributed in a manner consistent with the objectives of international space law. In order to comply with the fundamental framework of space law, a balanced approach is essential. Through a balanced approach, we will have established a means for protecting the interests of all as well as providing innovative business opportunities.

VIII. NATIONAL REGULATORY FRAMEWORKS AND THEIR LIMITATIONS

Though international regulation continues to be fragmented, some countries have put in place legal regimes regulating commercial human spaceflight within their respective jurisdictions. In the case of the US, for instance, it has taken the lead role due to laws such as the Commercial Space Launch Competitiveness Act 2015.

Other elements governed by the FAA regulation include issues like qualifications of pilots, consent of passengers, authorisation for takeoff, and passenger safety in respect of companies like SpaceX, Blue Origin, and Virgin Galactic. It is also important to note that there are some restrictions regarding domestic regulation that limit its capacity to cope with liability matters abroad, as well as environmental concerns.

A. Future Prospects

The future of space travel looks bright but uncertain. Innovations in technology will bring about the development of new capacities such as space hotels, travel to the

moon, and perhaps even interplanetary travel. All this might make space travel a profitable business venture.[23]

Reducing costs will be an important consideration for the viability of space tourism. With greater competition and advancements in technology, it can be expected that costs will fall, making way for more people to participate.[24]

Another significant trend is the inclusion of space tourism in the larger project of establishing a permanent human presence in outer space. Space tourism might act as a trigger for the creation of sustainable space communities by offering the facilities and financial motivations that would allow humans to remain in outer space.

The prospects for space travel seem bright but uncertain. Advances in technology are predicted to bring about innovations such as space hotels and lunar tourism. Such progress might make space travel an important commercial enterprise.[25]

However, the pace of development will depend on several factors, including technological progress, regulatory frameworks, and public acceptance.

B. Challenges and Policy Recommendations

One of the key objectives will be to create a unified regulatory system. This regulatory system will provide standard safety guidelines, protect the environment, and address liability issues.[26]

The sustainability of the environment must also be one of the top priorities. It is essential that policies reducing emissions and space debris are put in place to reduce any adverse impacts on the environment that may arise from space tourism.

Lastly, ethical considerations need to be considered while governing space tourism.[27]

[23] SpaceX, Starship Program Overview (2024), https://www.spacex.com.
[24] Blue Origin, New Shepard overview (2024), https://www.blueorigin.com.
[25] National Space Society, *Space Tourism and Settlement* (2023).
[26] Organisation for Economic Co-operation and Development, *Space Policy and Regulation Report* (2022)
[27] Ram S. Jakhu & Joseph N. Pelton, *Global Space Governance* 201–10 (2017).

To ensure the sustainable development of space tourism, several policy measures are necessary. These include[28]:

1. **The Need for Harmonisation of Regulations Internationally:** Perhaps the single most important need for sustainable development of space tourism lies in the creation of a harmonised international regulatory framework. The current laws were formulated at a time when the activities in space were primarily spearheaded by states and are not equipped to deal with the issues that arise in relation to commercial human spaceflight activities. An internationally coordinated effort led by the United Nations Committee on the Peaceful Uses of Outer Space could provide a way forward.
2. **Strengthening Liability and Insurance Frameworks:** Liability and compensation structures must be established to compensate any injuries, damages, and accidents resulting from business-oriented commercial space tourism endeavours. While the Liability Convention for Damage Caused by Space Objects defines state liabilities, there is no provision to solve the issues that may arise between passengers and operators of commercial spaceships or satellites. Thus, insurance coverage will be an important aspect in business space tourism.
3. **International Standards for Environmental Sustainability in Rocket Launches:** Increased rocket launches have serious implications on the environment that call for the need for better global regulation. These regulations should be in the form of international standards regulating greenhouse gases, black carbon, and space debris produced during commercial space missions. The use of sustainable propulsion systems and sustainable launch processes should also be promoted.
4. **Establishment of Universal Passengers' Safety and Informed Consent Guidelines:** Human commercial space flight comes with its own set of

[28] United Nations Committee on the Peaceful Uses of Outer Space, *Guidelines for the Long-Term Sustainability of Outer Space Activities* (2019).

physical and psychological dangers. Therefore, guidelines for passenger safety have to be instituted in order to ensure that each participant is properly trained, medically examined, and fully informed about the dangers of the space mission. Having a universal informed consent policy would provide clarity in this regard.

5. **Encouragement of International Collaboration and Coordination of Governance Efforts:** Due to the cross-border nature of activities related to outer space exploration, regulation by individual nations is not enough in overseeing the rapid growth of space tourism. More collaboration among nations, corporations, organisations, and research institutes needs to be encouraged for responsible governance. This will aid in avoiding fragmented regulation, thus ensuring proper use of outer space.
6. **Outer Space Governance - Ensuring Equitable and Inclusive Access to Outer Space:** With the advancement of space tourism, policymakers need to ensure that outer space is not transformed into an exclusive arena for the use of only the rich and wealthy. Space tourism needs to be governed in a manner that upholds some fundamental principles of international space law, such as the exploration and utilisation of outer space for the benefit of all mankind.

IX. SUGGESTIONS AND RECOMMENDATIONS

The recommendations to guarantee sustainable and fair development of space tourism include:

1. **International Regulation:** The necessity of establishing an internationally recognised regulatory body, which will address such concerns as liability, safety, and jurisdiction, under the auspices of international agencies like the UN, is urgent.
2. **Environmental Measures:** It is crucial to adopt strict regulations that would address the problem of space pollution, emissions, and encourage the use of eco-friendly fuels for spacecrafts.

3. **Safety and Liability Norms:** It is necessary to establish safety rules and mandatory insurance policies for space tourists.
4. **Equal Access Policies:** Taxation schemes or public-private ventures could help to guarantee equal access to space research programmes.
5. **Space Governance Revisions:** The revision of existing space agreements and conventions is needed to make room for private entities and commercial ventures while preserving the concept of "common heritage of mankind".

X. CONCLUSION

The rise of space tourism is a critical milestone in the history of space travel by humans. It reflects the integration of technical creativity, commercial ventures, and human aspirations. While this industry has many promising aspects, it also faces several tough questions.[29].

In conclusion, this essay has analysed the different facets of space tourism. Specifically, it has considered how technology, economics, ethics, law, and environment will play an integral role in shaping the future of space tourism.[30].

However, for space tourism to be of service to the future of humankind, it must embrace sustainability and inclusivity in its operations. The problems highlighted above can, therefore, be used to maximise the contribution of space tourism to the well-being of current and future generations.

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