

# THE FUTURE OF SPACE TOURISM AND LEGAL CONCERNS

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## ABSTRACT

*Advancements in technology have made unbelievable developments in the space sector. One such development is Space tourism, which refers to taking humans to space for the experience of exploring space, parallel to tourism in general. It is governed by international treaties like the Outer Space Treaty, but ambiguities remain due to outdated laws. India, which gained global attention with its Chandrayaan-3 lunar mission, is exploring its potential in space tourism. ISRO aims to launch human spaceflights by 2024-2025, with plans to offer space tourism by 2030. Despite the excitement surrounding space tourism, challenges such as environmental concerns, safety risks, and the high costs of space travel persist. Furthermore, there is a need to update international space laws to address the evolving dynamics of space tourism and to provide clear regulations for both private and governmental entities involved in this sector. India's ISRO is progressing to reach heights of NASA [ USA ] and ROSCOSMOS[ Russia ] This research is done with the motive of throwing light on the intricacies of outer space, future prospects in space explorations, introduction of a unique field of law, i.e. space law, brief of treaties and regulations currently governing the space sector in the world, laws made by the US problems in these laws space tourism, agencies conducting it, India's progress and future prospects, public-private partnership as a medium to reach great heights and finally concluding with suggestions for successful implementation of space tourism.*

**Key Words:** Space tourism, Outer Space Treaty, ISRO, space law, orbital flights

## INTRODUCTION

An average human may think that laws made for any part of the world have no role to play in outer space as it is beyond the earth's territory. But this is not the case as international laws, agreements, and treaties are applicable in outer space too. With the improvement of technology and progress in the exploration of the space sector, there has been a rise in new commercial activity known as space tourism. Space tourism means when humans are taken aboard as tourists for various purposes, be it watching the earth from its orbit feeling weightlessness traveling around the planet, or any other purpose. It was started by government institutions but the market has been growing ever since private parties entered the field such as SpaceX, Blue Origin, Virgin Galactic, Space Adventures, etc. The target customers for space tourism are the niche wealthy people. Currently there are many projects which are being undertaken as the demand is on the rise, such as the Gaganyaan-1<sup>1</sup> by ISRO or

<sup>1</sup> ISRO, 'Gaganyaan' (Isro, 23 November 2022) <<https://www.isro.gov.in/Gaganyaan.html>> accessed 24 October 2024

SpaceAdventure`s DSE-Alpha. Gaganyaan-1 is an upcoming mission of ISRO which is a research mission that is one step towards achieving commercialized space flights by 2030.

Space tourism was in the news in May 2024 when Gopi Thotakura became the first Indian-born Commercial Pilot ever to become a space tourist.<sup>2</sup> He is based in USA and went with 5 other space tourists in a Blue Origin Spacecraft- New Shephard NS-25.

## What is Outer Space?

Outer space is the area beyond the earth`s atmosphere and between the celestial bodies<sup>3</sup>. Therefore technically it is not part of the jurisdiction of the earth and hence the laws made for the earth are not applicable to outer space. Instead, there are specific laws and international treaties bound to be followed by countries.

Outer space is not as far as it seems, the planets and the stars are millions of miles away, but what we consider the inception of space is a mere 62 miles [100 km] above sea level, determined by an invisible line, known as the Karman Line. It separates outer space from the Earth`s atmosphere. It has huge significance as no aircraft are allowed to fly above the Karman Line whereas a spacecraft is built to fly above the altitude of the Karman Line. Karman Line was determined by the **Federation of Aeronautique Internationale (FAI)**<sup>4</sup>, which is the world governing body of air sports. The Karman line has been termed to honor Theodore von Karman (1881–1963), Hungarian-American physicist and engineer whose key focus of work was aeronautics and astronautics. He became the first person to find out that 83 km above sea level, aeronautical flight can`t carry on as the atmosphere would become too thin.

## Space Law

Space law is the field of law which includes all those treaties, international and national laws which are established by International organizations such as United Nations [UN], treaty among nations and countries for themselves. These regulations address a wide range of issues, including safeguarding the environment in both space and on Earth, liability for damage caused by space objects, mechanisms for resolving disputes, protocols for rescuing astronauts, sharing information about space hazards, using space technologies, and promoting international cooperation. Moreover, individual countries also establish their own laws governing space exploration and related activities.

<sup>2</sup> Gopichand Thotakura, 'India`s first civilian space tourist, recieves warm welcome in Delhi, *The Hindu*, [August 26, 2024 01:07 pm], <<https://www.thehindu.com/news/national/first-indian-commoner-in-space-comes-home/article68568056.ece>>

<sup>3</sup> "Outer space." *Merriam-Webster.com Dictionary*, Merriam-Webster, <<https://www.merriam-webster.com/dictionary/outer%20space>> accessed 1 Feb. 2025.

<sup>4</sup>FAI 'Federation of Aeronautique Internationale' <<https://www.fai.org/>> accessed Jan. 29, 2025)

The International Space law has been established by UN through its 5 instruments with the help of General Assembly's committee known as UNCOPUOS [Committee on the Peaceful Uses of Outer Space]<sup>5</sup>.

## Space Tourism

Space tourism, as the words suggest is defined as “A commercial activity that offers customers direct or indirect space travel. A space tourist is someone who tours or travels to space into or through space or to a celestial body for pleasure and/or recreation”<sup>6</sup>.

Space tourism like other tourism involves exploration of outer space by private individuals via spacecrafts. Now, it can have various motives, it can be for exploration, recreation, research or even business purposes. Space tourism can be divided into short-term orbital flights, long-term orbital or suborbital flights, and lunar space tourism.

1. **Suborbital:** Passengers are being given the experience of weightlessness as they are taken to the edge of space.
2. **Orbital:** Passengers are taken to the orbit surrounding the earth and experience the weightlessness for a bit longer.

**Dennis Tito**, an American businessman was the first space tourist in the world, who took flight in Russian Soyuz-TM32 to travel to International Space Station in April, 2001. The Russian Soyuz<sup>7</sup>. Spacecraft was used by 7 space tourists for 8 flight from 2001 to 2009. The first female space tourist was Anousheh Ansari, an Iranian-American engineer. At that time, it was very expensive as only some billionaires could afford it. Then efforts were made to make it more affordable.

## Government Companies and Private Agencies

Space tourism is being provided by some government agencies and some private companies. **NASA**<sup>8</sup> has funded commercial businesses to establish itself in the space tourism industry. It also collaborated with SpaceX and Blue Origin for developing space travel technology. It also made ISS accessible to private tourists.

<sup>5</sup> UNOOSA.org <https://www.unoosa.org/oosa/en/ourwork/copuos/index.html> (last visited Oct 27, 2024)

<sup>6</sup> Tanja Masson-Zwaan, Steven Freeland, Between heaven and earth: The legal challenges of human space travel, Volume 66, Issues 11–12, Acta Astronautica  
<https://www.sciencedirect.com/science/article/abs/pii/S0094576509006006?via%3Dihub>

<sup>7</sup> esa.int [https://www.esa.int/Enabling\\_Support/Space\\_Transportation/Launch\\_vehicles/The\\_Russian\\_Soyuz\\_spacecraft](https://www.esa.int/Enabling_Support/Space_Transportation/Launch_vehicles/The_Russian_Soyuz_spacecraft)

<sup>8</sup> NASA.gov <https://www.nasa.gov/about/>

**ROSCOSMOS**<sup>9</sup>, Russia's agency was the first one to send space tourists to space. Other government agencies are FAA (Federal Aviation Administration) and ESA [European Space Agency] which provide support for space tourism.

**Indian Space Agency [ISRO]**<sup>10</sup> has been dreaming of making space tourism plans in the future. It must be affordable for tourists and economically feasible to operate. The Gaganyaan mission is the one ISRO has been working on to launch in the near future. It's a mission to research the capability of the country to perform human space travel, basically a test for space tourism.

### Private Agencies

**Virgin Galactic**, founded by Richard Branson and owned by Virgin group was established in 2005 but its first commercially successful spacecraft was launched in 2021, June 29. It built Spaceship 2 class space planes. The first spaceplane was VSS Enterprise, which broke down sadly in test flight. They sold 700 tickets for the flight of 200,000\$ each. The second spaceplane was the VSS Unity which was successful in its test flight with 4 passengers. Galactic 01 was the first spacecraft commercially successful with the price of 450,000\$.

**Blue Origin**, founded in 2000 by the Amazon's founder, Jeff Bezos followed subsequently to launch its first commercially successful spacecraft for tourism named New Shepard. It was funded by NASA- 130 million recently to develop commercial space stations along with Northrop Grumman's System and Nanorocks.

Other private players include **SpaceX**, founded by Elon Musk, which is also planning to send space tourists on a free return trajectory. SpaceX's Crew Dragon Spacecraft has been active for orbital flights. Inspiration-4 mission was successful by Crew Dragon taking 4 passengers.

With the entry of private players, especially after the trip of Jeff Bezos in the field of space tourism, its market has grown significantly. In 2022, the global value of the space tourism market was 695M USD and projected to reach 8, 669.2 USD<sup>11</sup>. The market is to grow more and more in future as the fares are becoming cheaper.

### Space Perspective: A failed Chapter

Space Perspective, was the first ever carbon-neutral company among the Space experience providing companies. It was also the first one to send gas-filled balloon in space in September 2024.<sup>12</sup> Although it was unmanned and for testing purpose, billionaire and founder of Virgin Galactic agreed to co-pilot the first crewed space flight. Commercial flights to space got an exciting avenue with space exploration in something similar to a hot air balloon. The first commercial flight launch was expected in 2025.

<sup>9</sup> Government.ru Government of Russia

[http://archive.government.ru/eng/power/106/#:~:text=The%20Federal%20Space%20Agency%20\(Roscosmos,and%20programmes%20in%20space%2C%20space](http://archive.government.ru/eng/power/106/#:~:text=The%20Federal%20Space%20Agency%20(Roscosmos,and%20programmes%20in%20space%2C%20space)

<sup>10</sup> ISRO <https://www.isro.gov.in/profile.html>

<sup>11</sup> Space Tourism, Drishti IAS <https://www.drishtiiias.com/daily-updates/daily-news-analysis/space-tourism>

<sup>12</sup> <https://www.space.com/space-perspective-completes-first-uncrewed-test-flight> by Josh Dinner

But, what was supposed to be the most luxurious space exploration experience, got hit by financial crisis. Mismanagement, unpaid rent and inability to failed investments have forced the company out of its own premises. Now, it seems a tough task to keep the company alive.<sup>13</sup>

## Laws regulating Space Tourism

The space tourism industry has been dealt mainly through 4 main regulations: **Outer Space Treaty[1867]<sup>14</sup>, Rescue Agreement [1968], Liability Convention [1976]** and **Registration Convention**. All these treaties were formed during the Cold War.

**1. Outer Space Treaty[OST]**, also known as “**Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies**” was signed on January 1967 and got effect on October 1967. It is the most significant space treaty with 115 countries. Although this treaty has not specifically defined or mentioned Space tourism or space tourist, as it was not in the eyesight at that time, it has some provisions which are to be interpreted with the context of space tourism.

A] Article 2 of the treaty prohibits any country to claim sovereignty rights over the moon or any celestial body and using them for peaceful purposes only.

B] Government is only responsible for any activity done by such state or non-government entities or its private individuals. Hence, states need to take responsibility while granting license to private individuals

C] Article 5 of the treaty protects astronauts as “envoys of mankind”. But whether to give private individuals the status of astronauts or tourists is unclear.

**2. The Rescue Agreement [1968]<sup>15</sup>**: This was an agreement applicable to all parties of OST to make efforts to return Astronauts and also of objects that remained in outer space. But again, the status of a space tourist is ambiguous.

**3. Liability Convention [1972]<sup>16</sup>** also known as the “**Convention on International Liability for Damage Caused by Space Objects**” holds states liable for the damages caused due to any space activities. There are 2 types of liability- Absolute and fault based.

**Absolute:** When damages occur on earth or aircraft in flight.

**Fault-based:** When damage occur in outer space.

<sup>13</sup> [https://talkoftitusville.com/2025/02/06/space-perspective-shutting-down-after-failed-investments-eviction-and-allegations-of-mismanagement/#google\\_vignette](https://talkoftitusville.com/2025/02/06/space-perspective-shutting-down-after-failed-investments-eviction-and-allegations-of-mismanagement/#google_vignette)

<sup>14</sup> Outer Space Treaty, 1967, Article 2,3,5 & 6, Adopted by the UNGA

<https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html#:~:text=Outer%20space%2C%20including%20the%20moon%20and%20other%20celestial%20bodies%2C%20is,or%20by%20any%20other%20means.>

<sup>15</sup> *Rescue Agreement, 1968, enforced by the UNGA* <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/rescueagreement.html>

<sup>16</sup> Liability Convention, 1972, adopted by the UNGA

<https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/liability-convention.html>

**4. Registration Convention [1976]:** The purpose of this agreement is to keep a record of space objects sent to space and intimate the United Nations. The space vehicles for space tourism must be registered in the launching state.

**5. Moon Agreement [1984]:** It is also known as the “Agreement Governing the Activities of States on the Moon and Other Celestial Bodies” has regarded the moon and its objects as the ‘common heritage’ and therefore all practices and space activities must be done for the good of all the countries.

The Moon Agreement is not very effective for space tourism as most countries including the United States, Russia, and China have not ratified it.

Thus, these are the 5 main treaties by The United Nations. These treaties were established at the time of the Cold War, so there are some drawbacks in the application of these space legislations. The main space powerhouses, the US and USSR were engaged in dreadful war and thus agreed on very few points, and thus some points with great potential to be effective were not included.

#### **Concerns and drawbacks of these treaties and regulations:**

1. **Ambiguity:** As these treaties were made, private parties, space tourism and other commercial activities were not given consideration as they were not anticipated at that time. This led to a lack of specific regulations on space tourism. Thus it created several ambiguities.

2. **Legal Status of Space Tourists:** No clarity if space tourists should be classified as private individuals or astronauts or personnel of spacecraft. The astronauts are given special protection through the Rescue agreement under the Outer Space Treaty. The first space tourist claimed to be classified as an astronaut because of the amount of time he stayed in space.

3. **Liability Convention:** There is uncertainty even in the liability convention that if a space vehicle crashes in outer space, what liability would apply, absolute liability in Article 2 or Fault-based provided in Article 3.

#### **US Laws on Space Tourism**

The US was the only government to establish specific regulations regarding space tourism. The States issued a set of rules in 2005 December relating to space tourism. In 1984, the US passed an act to encourage commercialization of space travel, known as Commercial Space Launch Act<sup>17</sup>.

<sup>17</sup> Commercial Space Launch Act, 1984 -<https://www.congress.gov/bill/98th-congress/house-bill/3942#:~:text=Commercial%20Space%20Launch%20Act%20%2D%20Prohibits,cas%20of%20a%20license%20holder%2C>

Current US law requires any aviation company intending to launch spacecraft for space tourism need to have a license necessarily from Federal Aviation Administration's Office of Commercial Space Transportation (FAA/AST).

### India`s Stance on Space Law:

India is yet to enact a space specific enactment. The first dedicated effort was in 2018, when the government came out with the first draft, but it didn`t pass. In, 2023 government prepared a policy document, the draft got ready by November 2024 and it will be up for consultation in March 2025. If passed, India will have its own Space law, which will define, clarify and systemize space tourism in India.<sup>18</sup>

### Other Concerns in Space Tourism<sup>19</sup>

- **Environment Issues:** The increase in a number of space flights in past years, can lead to the degradation of the atmosphere. As the sub-orbital and orbital spacecraft passes from different layers of outer space, the air is affected negatively. It can impact climate change. The spacecrafts require fuel and energy to work which pollutes air and land.
- **Safety Issues:** Even with all the safety measures that a company or agency takes, there is still a risk of mishap. A test flight is a must before the actual launch with tourists in space.
- **Finances:** Even with efforts to decrease the fares, only the niche and extremely wealthy can afford to travel to space as a tourist. SpaceX was planning to offer a trip around the moon for 70 to 100 million USD. It is an expensive and risky business too. With large amounts of spending, if it fails commercially, the vehicle doesn`t pass the test or it breaks down then the companies have to bear huge losses. The **Space Perspective`s** downfall is a clear evidence that it`s a risky business considering the heavy requirement of capital.
- **IPR:** The Outer Space Treaty although provides for jurisdiction and control of objects and territory in space among different countries doesn`t provide for any intellectual rights to states.

### Current Big Projects around the world:

- Axion Space, a p rivate agency in collaboration with SpaceX sends crew members through Crew Dragon flights to ISS. Till October 2024, three spacecrafts, Mission 1, Mission 2 and Mission 3 have been successfully launched. Mission 4 is to be launched in October 2024.<sup>20</sup>

<sup>18</sup> <https://www.livemint.com/industry/space-law-pawan-goenka-in-space-policy-isro-satellite-launch-startups-agnikul-cosmos-skyroot-aerospace-11730896706798.html> by Shouvik Das

<sup>19</sup> Ankit Kumar Padhy, Amit Kumar Padhy, Legal conundrums of space tourism, Volume 184, Acta Astronautica

<sup>20</sup> Vajiram & Ravi, <https://vajiramandravi.com/upsc-daily-current-affairs/mains-articles/axiom-4-mission/>

- The Boeing Starliner Capsule was designed by NASA to send crew members to and from ISS. NASA allows the selling of seats for space passengers.<sup>21</sup>
- Space Adventures Ltd. company has announced its plan to take space tourists around the moon in the mission DSE-Alpha<sup>22</sup> for 100 million USD per seat.

### Future for India

- Since the successful launch of Chandrayaan-3<sup>23</sup> on 22 August 2023, space sector has been looked as great potential for tourism. This mission had huge impact on the reputation in space exploration, economy and job creation and growth. India can have its own space station effectively by 2035.
- ISRO has been planning to launch Gaganyaan, if it gets green light then by 2024-2025, India is expected to launch its first human mission for space tourism. Affordability and reliability will remain key essentials.
- ISRO has also planned to create a reusable spacecraft for the cost of 6 crore per trip. It is set to be launched in 2030.
- ISRO has predicted that by 2030, India will be having space tourism for an estimated cost of 6 crore, only affordable for the wealthy.
- Orbital and sub-orbital flights are for the present, looking at the future, trip to Mars. Such as Mangalyan[India]<sup>24</sup>, Hope[UAE]<sup>25</sup>, Mariner 4[NASA]<sup>26</sup> and other exciting space explorations are being sighted.
- Two Indian Astronauts, who were part of Gaganyaan were being trained vigorously in the United States of America and Europe for the long due Axiom-4 (Ax-4) mission. Group Captain Shubhanshu Shukla will be the primary Astronaut, i.e. captain while his backup will be Group Captain Prasanth Balakrishnan Nair for this historic mission.<sup>27</sup>

Moreover, the Financial Minister of India, Nirmala Sitharaman have announced Rs 13,416 crore allocation for Department of Space to bolster developments, achievements and successful completion of ongoing missions.<sup>28</sup>

<sup>21</sup> Boeing.com <https://www.boeing.com/space/starliner>

<sup>23</sup> ISRO [https://www.isro.gov.in/Chandrayaan3\\_Details.html](https://www.isro.gov.in/Chandrayaan3_Details.html)

<sup>24</sup> ISRO <https://www.isro.gov.in/MarsOrbiterMissionSpacecraft.html>

<sup>25</sup> Planetary.org <https://www.planetary.org/space-missions/uae-hope>

<sup>26</sup> jpl.nasa.gov.in <https://www.jpl.nasa.gov/missions/mariner-4/>

<sup>27</sup> Gaganyaan Mission: Indian astronauts undergo rigorous training with SpaceX, <https://www.indiatoday.in/science/gaganyaan-mission/story/gaganyaan-mission-indian-astronauts-undergo-rigorous-training-with-spacex-2637684-2024-11-22>

<sup>28</sup> Missions lined up, ISRO gets more space in Budget, <https://timesofindia.indiatimes.com/business/india-business/missions-lined-up-isro-gets-more-space-in-budget/articleshow/117843909.cms>



**NGLV tech Mission-** ISRO's vision of an Indian space tourism project in near future can be fostered with the Next Generation Launch Vehicle(NGLV) which was approved by the Union Cabinet in September 2024, seeking to replace (Polar Satellite Launch Vehicle) PSLV. ISRO is looking to add Vehicle take-off and vertical landing (VTVL) technique in this vehicle, which as per the project director of NGLV, S. Sivakumar, will be instrumental for Space tourism mission in India. He also mentioned the need of private-Public partnership and need for initiation from private parties to help India's space tourism goal. The debut flight of NGLV is projected for 2031 as of now.<sup>29</sup>

**Public-Private Partnership:** Space tourism is an expensive and risky venture. Governments need the helping hands of private agencies or they can provide help to private agencies. NASA has funded Spaces, Blue Origin and other private companies to boost the market of space tourism. These partnerships have proved to be successful and allow the sharing of costs for projects resulting in economic viability.

ISRO has also made some initiatives to involve private companies in space sector. PSLV-C53<sup>30</sup> was the first Private-Public Partnership mission under the New Space India Limited[ NSIL] initiative.

## Conclusion

Space tourism is an expensive and complicated business and requires sophisticated technology, expenditure and Research and Development. This is why only a few private companies and government agencies have been successful in commercial space ventures. As for the general public, if you got the expense for this experience, space tourism is as fascinating as it sounds. Its an achievement in space technology that today, you don't have to be astronaut to explore space, you just need to have money and you can fulfil your ambition of reaching space.

With rapid progress in space explorations, India have significant achievements to be among the few successful countries in space explorations. With huge boost to space sector in the 2024-2025 budget, ISRO is expected to enter space tourism market soon. ISRO has also made some initiatives to involve private companies in space sector. PSLV-C53<sup>31</sup> was the first Private-Public Partnership mission under the New Space India Limited[ NSIL] initiative.

There is a serious need for introspecting the current space legislations and making amendments to such laws and implementing new laws that give attention to the developments and remove ambiguity created by previous laws.

<sup>29</sup> NGLV, Ganganyaan tech to help India's space tourism take off by Puran Choudhary; <https://www.msn.com/en-in/news/techandscience/nglv-ganganyaan-tech-to-help-india-s-space-tourism-take-off/ar-AA1rOjFH>

<sup>30</sup> ISRO [https://www.isro.gov.in/mission\\_PSLV\\_C35SCATSAT\\_1.html?timeline=timeline](https://www.isro.gov.in/mission_PSLV_C35SCATSAT_1.html?timeline=timeline)

<sup>31</sup> ISRO [https://www.isro.gov.in/mission\\_PSLV\\_C35SCATSAT\\_1.html?timeline=timeline](https://www.isro.gov.in/mission_PSLV_C35SCATSAT_1.html?timeline=timeline)