

TOURISM BEYOND ATMOSPHERE

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Abstract

"Tourism beyond Atmosphere" refers to any commercial operation that provides customers with direct or indirect space travel experiences. Long-term stays in orbital facilities, short-term orbital or suborbital flights, and even parabolic flights in an aircraft exposing passengers to brief periods of weightlessness are all examples of such activities. Flights into space by private individuals are gaining popularity among the general public. While chartered flights are not yet available, "space tourists" have taken orbital flights on occasion. So far, seven "space tourists" have been flown to the International Space Station ("ISS"), all of whom have been charged a significant sum of money for their participation. In this work, I have attempted to provide a clear and accessible description of Space Tourism. In this paper, the notion of space and space stations is discussed in great detail, as well as the details of the first space station. In this study paper, I also touched on the history and growth of space tourism. This paper also discusses the benefits and drawbacks of space tourism. In addition, I have attempted to analyse the impact of space flight on humanity, as well as the development and future of Space Tourism.

Key Words: Virtual reality, astronauts, cosmonauts, spaceship, space tourist, space station, weightlessness, space, gravity.



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Introduction

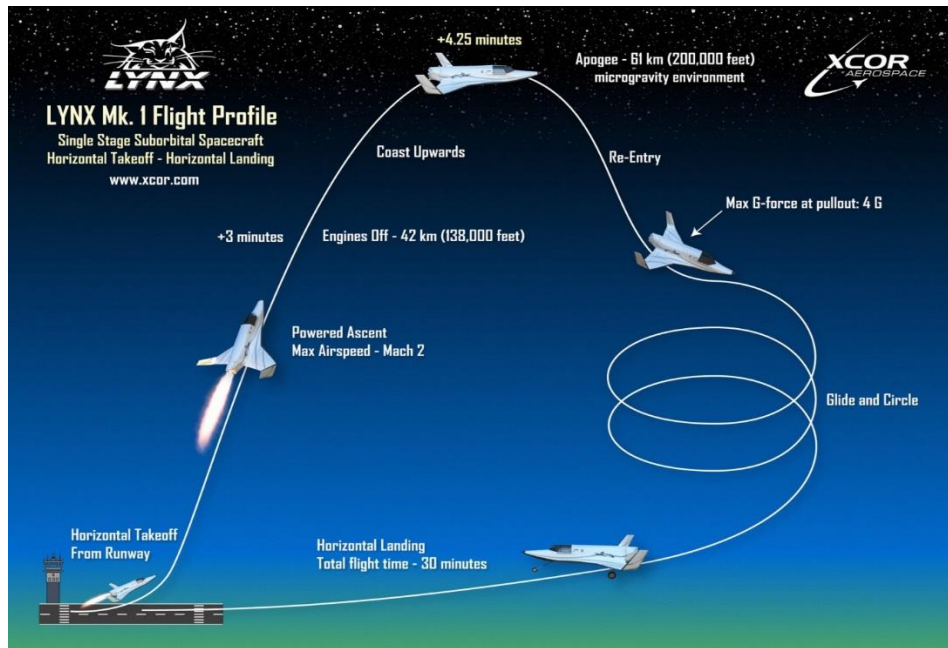
"Tourism beyond Atmosphere" refers to space travel for leisure, recreation, or business. The term "space tourism" refers to the concept of paying consumers travelling beyond the atmosphere of the Earth. Space tourism can also be characterized in terms of the destination concept, rather than only the vehicles that transport public people into space. As a result, the industry can be imagined to include not only earth-based attractions that simulate the space experience, such as Space Theme Parks, Space Training Camps, Virtual Reality

Facilities, Space Hotels (Skotel), Multimedia interactive games, and Tele Robotic Moon Rovers controlled from Earth, but also parabolic flights, vertical suborbital flights lasting up to three days, or a weeklong stay at a floating Space Hotel, including participatory educational activities.

Space experience options	Parabolic flight	High altitude balloon flight (Proposed)	High altitude jet flight	Suborbital flight (Proposed)	Orbital flight
Brief description	Flying on a passenger jet in a series of parabolic arcs to create brief periods of weightlessness	A balloon ride in a commercially built "gondola" to the upper reaches of the atmosphere	Flying with a pilot on a fighter jet to twice the altitude of a commercial airline flight	Flying on a commercially built suborbital spacecraft past the threshold of space	Launching into orbit for a multi-day stay aboard the International Space Station
Total flight duration	90 minutes	3 to 4 hours	45 minutes	2 hours	1 to 2 weeks
Weightlessness	30-second bursts for a total of 10 minutes	Brief periods of reduced gravity may be possible during descent	None	1 to 5 minutes	1 to 2 weeks
Required Training	1 hour briefing	1 hour briefing	Same-day training and medical checks	2 to 3 days of training and medical checks	3 to 6 months of training and medical checks
Passenger Capacity (per flight)	Up to 30 people	Up to 4 people	1 person	Up to 6 people	1 person
Price per person (not including transportation to launch site)	\$5,200	\$155,000	\$25,000	\$95,000 to \$200,000	\$50 million
Maximum altitude	34,000 feet (~6 miles)	118,000 feet (~22 miles)	70,000 feet (~13 miles)	327,000 feet (~62 miles)	1 million feet (~200 miles)
View	Similar to the view from a commercial airliner	Curvature of the Earth, blackness of space, and thin blue layer of the atmosphere	Curvature of the Earth, blackness of space	Curvature of the Earth, blackness of space, and thin blue layer of the atmosphere	Orbit the entire Earth every 90 minutes

Table 6: Space-related tourism experiences (including SRVs)

However, when it comes to diverse points of view, different governments and organisations have different definitions of space tourism. Many private travellers have objected to the label "Space Tourist," claiming that their involvement was more than that of a bystander because they conducted scientific experiments during their visit. Suborbital flights at even greater altitudes might open up new realms of space exploration. The term "suborbital space travel for tourism" can be defined. Customers take a short ballistic journey into space in a Space Craft, experience a few minutes of weightlessness, and then return to Earth without orbiting. Suborbital flight, for example, can be achieved with Ascender (Bristol Space Planes).



Suborbital space tourism has yet to take place, but it is expected to be more inexpensive in the future. Many businesses see it as a money-making opportunity. Passengers would remain weightless for three to six minutes, with a view of the Twinkle free Starfield and the bent earth below.

Passengers on orbital flights would be able to see multiple continents as well as numerous sunsets and sunrises. There would be plenty of opportunities for weightlessness experiences. Take, for example, an Orbit mission with the Kankon Maru (Kawasaki). The intricacy of the situation for a Moon Trip increases dramatically when compared to a basic Suborbital or Orbital travel. The total delta velocity required for the entire operation is in the range of 20 kilometers per second. Moon trips are unlikely in the medium term, but could happen in the long run in the framework of space tourism. Holidays on the Moon, for example, or space tourism to other planets.




















However, attention appears to be changing toward providing "cheaper trips" that aren't aiming at the ISS but are still "suborbital," making them more accessible to a wider audience. Even with such brief travels, a space traveler has a variety of possibilities. (i) One idea is to employ an aircraft to carry a space cabin to a predetermined altitude, similar to Space Ship One. The cabin then detaches from the plane and continues on its suborbital journey to greater altitudes. When this procedure is utilized, the space vehicle has two options for returning: (a) it returns to where it started, or (b) it returns to a different spot on Earth ("space transportation"). The "Delta Clipper Experimental"(ii) is a second option that employs a rocket with a space capsule on top that is launched, and then the capsule separates

from the rocket at a specific altitude. As a result, the space capsule's passengers are exposed to Zero-G gravity, and both vehicles return to Earth separately. This method is intended to be used by Blue Origin's "New Shepard." (iii) As a result, "Space Tourism" activities may entail the utilization of aircraft and/or spacecraft. Depending on the location of such actions, either air or space law, or even both, may apply. The two legal systems have evolved independently throughout history, and as a result, they have significant distinctions. As a result, a number of legal difficulties concerning the conduct of Space Tourism operations develop. The delimitation of airspace and outer space, authorization to perform Space Tourism, registration of the aircraft or spaceship, liability to passengers and third parties, and the status of passengers are all topics covered in this article. In terms of aviation law, both international and national law provides detailed requirements for passenger transportation. However, there are currently no comprehensive restrictions for passenger transportation in international space law. The United States was the first country to make a particular reference to "space flight participants" in its national space law. Even if these regulatory measures in the United States are only of a national nature, they may signal a trend toward control of Space Tourism operations on both the national and international levels. In this regard, the Swedish government announced an agreement with Virgin Galactic on January 26, 2007, covering mid-summer and mid-winter flights of Virgin's "Spaceship Two" from Sweden's spaceport in Kiruna. (iv) Their Memorandum of Understanding requires Swedish authorities to develop a regulatory structure modelled after the Federal Aviation Administration in the United States ("FAA"). (v) As a result, a closer examination of the relative recent regulatory actions in the United States appears to be particularly fascinating. (vi) When considering these legal issues, it's logical to wonder whether current laws are sufficient for future Space Tourism activities, or whether new international legal instruments or amendments to existing laws or legal structures are required.

What is Space

Outer space, from the perspective of an Earthling, is a zone roughly 100 kilometers (60 miles) above the planet earth, where there is no oxygen to breathe or light to scatter. Because there aren't enough oxygen molecules in that area to keep the sky blue, blue loses way to black. Furthermore, no one knows the size of the space. No one can hear you scream in space. This is due to the fact that space is devoid of air - it is a vacuum. In a vacuum, sound waves cannot travel. No one can hear you scream in space. This is due to the fact that space is devoid of air - it is a vacuum. In a vacuum, sound waves cannot travel. Because there

is no earth's gravity in space, there is no such thing as weightlessness. The Moon, where the GPS satellites orbit, Mars, other planets, other stars, the Milky Way, black holes, and distant quasars are all examples of space beyond the Earth's atmosphere. Space also refers to the near-vacuum that exists between planets, moons, stars, and other objects — it's the interplanetary medium, interstellar medium, inter-galactic medium, intra-cluster medium, and so on; in other words, it's very low density gas or plasma.

Flight up (craft)	Flight down (craft)	Duration	Mission	Tourist(s)	Destination	Fee paid	Tour company
October 13, 2021 (New Shepard Crew Capsule)	October 13, 2021 (New Shepard Crew Capsule)	10 minutes	Blue Origin NS-18	 William Shatner  Chris Boshuizen  Audrey Powers  Glen de Vries	Sub-orbital spaceflight (Kármán line)		Blue Origin
December 11, 2021 (New Shepard Crew Capsule)	December 11, 2021 (New Shepard Crew Capsule)	10 minutes	Blue Origin NS-19	 Lane Bess  Cameron Bess  Evan Dick  Laura Shepard Churchley  Michael Strahan  Dylan Taylor	Sub-orbital spaceflight (Kármán line)		Blue Origin
March 30, 2022 (planned) (Crew Dragon Endeavour)	April 9, 2022 (planned) (Crew Dragon Endeavour)	10 days	Ax-1	 Eytan Stibbe  Larry Connor  Mark Pathy	International Space Station	US\$55 million each	Axiom Space
December 8, 2021 (Soyuz MS-20)	December 20, 2021 (Soyuz MS-20)	12 days	ISS EP-20	 Yusaku Maezawa  Yozo Hirano	International Space Station		Space Adventures
September 16, 2021 (Crew Dragon Resilience)	September 19, 2021 (Crew Dragon Resilience)	3 days	Inspiration4	 Jared Isaacman  Sian Proctor  Hayley Arceneaux  Christopher Sembroski	Low Orbit Earth		Space X

Flight up (craft)	Flight down (craft)	Durati on	Missi on	Tourist(s)	Destination	Fee paid	Tour company
July 20, 2021 (New Shepard Crew Capsule)	July 20, 2021 (New Shepard Crew Capsule)	10 minutes	Blue Origin NS-16	 Jeff Bezos  Mark Bezos  Oliver Daemen  Wally Funk	Sub-orbital spaceflight (Kármán line)		Blue Origin
September 30, 2009 (Soyuz TMA-16)	October 11, 2009 (Soyuz TMA-14)	12 days	ISS EP-15	 Guy Laliberté	International Space Station	US\$35 million	Space Adventures
March 26, 2009 (Soyuz TMA-14)	April 8, 2009 (Soyuz TMA-13)	14 days	ISS EP-14	 Charles Simonyi	International Space Station	US\$35 million	Space Adventures
October 12, 2008 (Soyuz TMA-13)	October 24, 2008 (Soyuz TMA-12)	13 days	ISS EP-13	 Richard Garriott	International Space Station	US\$30 million	Space Adventures
April 7, 2007 (Soyuz TMA-10)	April 21, 2007 (Soyuz TMA-9)	10 days	ISS EP-12	 Charles Simonyi	International Space Station	US\$25 million	Space Adventures
September 20, 2006 (Soyuz TMA-9)	September 29, 2006 (Soyuz TMA-8)	10 days	ISS EP-4	 AnousheAno usheh Ansari	International Space Station	US\$20 million	Space Adventures
October 1, 2005 (Soyuz TMA-7)	October 10, 2005 (Soyuz TMA-6)	10 days	ISS EP-3	 Gregory Olsen	International Space Station	US\$20 million	Space Adventures
April 25, 2002 (Soyuz TM-34)	May 5, 2002 (Soyuz TM-33)	10 days	ISS EP-2	 Mark Shuttleworth	International Space Station	US\$20 million	Space Adventures
April 28, 2001 (Soyuz TM-32)	May 6, 2001 (Soyuz TM-31)	8 days	ISS EP-1	 Dennis Tito	International Space Station	US\$20 million	Space Adventures

Source: wikipedia

Findings:

1. So far only 16 tourists have experience of space.
2. Since this is costly affair, the number of tourists is negligible.
3. Training session before going to space is necessary; therefore it is also time consuming affair.
4. There is a risk factor involved in this type of tourism.

5. More awareness and interest of the potential tourists is needed.
6. This activity should be made a regular process rather than long time consuming process.
7. Investment and promotion of Space Tourism is the need of the hour.
8. We cannot expect a mass character but in future it may take off.

Conclusion

Certain areas of Space Tourism, such as cost analysis, present market base, risk assessment, and future scenarios, were investigated in order to determine whether Space Tourism could become a reality. According to recent surveys conducted in Europe, the United States, and Japan, over forty million people are eager to invest in space tourism. According to market research, the space tourism industry has the potential to become a major player in the trillion-dollar tourism industry, rivaling the size of the commercial airline industry. In addition, a cost analysis revealed that Space Tourism could generate significant profits for investors. However, it would take more than twenty years to recoup the initial investment, and the original infrastructure is highly unlikely to be preserved. Expensive risks on initial investments, which result from the low reliability of current launching mechanisms and the high cost of transportation into space, have impeded the development of the Space Tourism business. We promote investment in new technologies like the RLV to improve the cost and reliability of orbital transportation systems (Reusable Launch Vehicles). The construction of the RLV would solve what we view to be the key ailments that are currently holding the Space Tourism business grounded. RLV provides a long-term cost reduction and risk reduction solution. The safety of space flight can be increased because to previous projects like the Kankoh-maru and new technical breakthroughs. The tourist sector would not only transport people into space, but also fund activities that are only possible in space. Ground facilities derived from the space tourism industry's current infrastructure would support and complement space tourism. Finally, we've established the potential of the Space Tourism sector, and we advise investors to take advantage of this potentially massive industry while it's still in its infancy. Through the use of technology, money, and risk, we attempted to show them how this could become a reality. All that remains is for individuals to take the first step toward Space Tourism investment. We cannot expect a mass character in Space Tourism because it is a matter of very high wealth group.

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