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THE DEVELOPMENT AND CURRENT TRENDS OF SPACE TOURISM

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All developed nations give space operations a lot of attention, and a lot of it is based on official assistance, including financial support. However, it should be mentioned that in today's global market for space technology and services, there is a definite tendency toward the formation of private enterprises. Space tourism is one of the areas of commercialization of space activities that is currently gaining traction. Space tourism refers to commercial trips into space that are paid for by a person or a group of individuals. This is a promising approach, not only because most of the advancements and concepts can be implemented now, but also because people want to go into space and are prepared to pay for it. Space tourism is one of the areas of commercialization of space activities that are currently being developed and updated.

The idea of space travel was scientifically prepared at the end of the 19th century. As early as 1928, when Fritz Stamer and Fritz von Opel were the first to launch aircraft with rocket propulsion, around 3,000 volunteers volunteered for a possible trip to the moon. After 1945, modern rocket technology development began in the USA and the USSR. During the Cold War, space travel was promoted because it was a matter of prestige, who would be the first to land on the moon. Space exploration began with the launch of Sputnik 1 in October 1957, and manned space travel on April 12, 1961 when the USSR sent Yuri Gagarin into space. Since the 1960s, NASA has completed several programs in preparation for the Apollo moon landing program. In July 1969, the first astronauts landed on the moon. After six moon landings, the program ended in 1972 and he was more or less "left out" for the next two decades. Only in 1994 did the USA launch a small moon probe that brought more than 2 million radar images to earth. One of the images believed to have revealed signs of ice at the lunar south pole, which renewed interest in the moon. Water on the moon would be of interest not only for manned lunar stations, but also for the production of rocket fuel and for a lunar base from which to venture further into space. In early 2004, the USA announced that a manned moon mission would be launched again by 2014 and that space expeditions would be launched from the moon from 2020. Dennis Tito (2001) is often regarded as the first "real" space tourist. But as early as 1985, the Saudi Arabian Sultan Salman bin Abdulaziz al Saud flew into space as a guest, in 1990 the journalist Toyohiro Akiyama was sent by a Japanese publisher to do a live report on the Russian space station MIR, and in 1991 the British Helen Sharman visited MIR with private funding. [1]

To date, two of the largest companies that organize tourist flights into space can be distinguished - the American company Virgin Galactic and the American-Russian Space Adventures, which actively cooperates with Roscosmos. Flights are carried out on the Soyuz TM spacecraft from the Baikonur cosmodrome, the end point is the Russian segment of the ISS.

Different definitions of space tourism may be found in the scientific community. However, this should not disguise the fact that some authors use the word "in space" interchangeably, or merely distinguish it from space flight to emphasize distinctions. Despite the multiplicity of tourism disciplines, the concept and constituent parts of tourism are broadly agreed upon. "Tourism is the temporary leave of one's usual place of abode as well as staying abroad (for various reasons)," according to the World Tourism Organization (WTO).

The special literature also emphasizes the so-called three constitutive elements that help describe (and partly explain) tourism. There are three elements that are important for space tourism.

Time:

Experts believe that excursions and day visits are considered tourist trips if they include at least one overnight stay. But when is an “overnight stay” allowed on a space flight? What about journeys that aren't overnight, such as suborbital flights that are only a few hours long? On the other hand, a visit to a space station/hotel that includes an overnight stay qualifies as space tourism.

Location:

Traveling necessitates abandoning one's "normal living quarters." Because space begins at an altitude of 100 km and orbital journeys normally begin at an altitude of 250 to nearly 400 km, this condition of distance to a foreign area is more than satisfied with an orbital space voyage.

Motives:

Relaxation, entertainment, culture, and sport are all common causes for travels taken in "spare time" and "voluntarily." All "compulsive" causes are contested, including business, i.e. journeys that take place during working hours, such as "work stays" aboard the ISS. Space provides the potential for adventure, fresh learning, and a once-in-a-lifetime experience. Relaxation, adventure, and education are all valid vacation goals for private space travellers. [2]

Corresponding to the basic definition of tourism, space tourism can be defined as follows: space tourism is temporarily leaving the usual place of residence and staying abroad, here in space, for non-touristic reasons. Space tourism in the broader sense is travel where you experience space travel or outer space up close, but do not actually fly into space (e.g. astronomy trips, parabolic flights, visits to space centres, amusement parks, planetariums or space-related museums). If these trips are combined with an overnight stay and the usual place of residence is left, it is space tourism.

Although it was demonstrated in the twentieth century that space travel was conceivable, and this is frequently cited as the start of space tourism, it all started on Earth. While terrestrial space tourism is still a long way from the anticipated concepts for tourist trips into space, it is a manifestation of an enduring fascination with space and space travel, and therefore the foundation for a long-term growing space tourism.

Visiting space centres and museums is another sort of terrestrial space tourism. The first and biggest Baikonur Cosmodrome, for example, includes a number of unique tourist attractions. The International Space School, the Museum of Cosmodrome History, the Measuring Complex "Saturn," and others are among them.

In contrast to space centres and planetariums, where people strive to reproduce true space flight, imagination reigns supreme in amusement parks. Visitors are offered the option to undergo increasingly accurately simulated space excursions. The trend began in the United States, and American amusement parks are still considered pioneers today.

In order to convey a feeling of weightlessness, parabolic flights are offered (e.g. by the cosmonaut training centre in Moscow). Here, a special aircraft flies several parabolas: first an extreme climb and then a direct descent. This parabola-like trajectory creates microgravity for about 20 to 30 seconds in the padded interior of the aircraft. Flights with MiG jets, which are flown at an altitude of 25 km at the edge of space and can be experienced at up to twice the speed of sound, are not completely congruent with parabolic flights, but they come pretty close. At that altitude, pilot and passenger are above 99% of the Earth`s atmosphere, the sky above appears black, and the curvature of the Earth is clearly visible. [3]

Suborbital flights must be separated from orbital missions in space. When taking part in suborbital flights, visitors are transported to an altitude of 100 kilometers, giving them a panoramic view of space and the planet.

Due to the force of gravity, you return to earth after a short time without having orbited it. To date, over 20 different space shuttle concepts have been proposed to space tourists around the world. Small companies realize concepts for the first successfully operated, reusable suborbital space shuttle.

The primary goal of orbital space tourism is to transport as many passengers as possible into space in order to produce substantial economic returns and cut passenger expenses as rapidly as feasible. There are many different ideas for this, from "space cruise ship" concepts to floating hotels made from used shuttle external fuel tanks, "cyclers" that swing back and forth between the Earth and either the Moon or Mars powered solely by gravity, and passenger spacecraft that piggyback on existing rocket launch technology.

For the next 50 years, the moon and Mars will not be viable vacation destinations, thus space vacations will most likely take place in space hotels that can be accessible by orbital travel. This can reach altitudes of 250 to 400 kilometers, which is also the altitude at where the ISS space station is located. The space shuttle reaches similar altitudes - it circles the planet at an altitude of 250 kilometers at a speed of roughly 30,000 kilometers per hour - but it is unsuited for space tourism since launch costs of 25,000 dollars per kilogram of cargo make any tourist usage economically unappealing. Space hotel concepts already exist in a variety of forms. DLR has

developed a study on the space hotel "Berlin". It is based on existing technology by modifying the crew modules of the ISS and plugging them into ring-shaped apartments. [4]

Shimizu, a Japanese construction company, has completed plans for a 64-room space hotel. The hotels all operate on the same fundamental concept. The gyroscopes spin at a rapid rate around their own axis, providing artificial gravity. To experience weightlessness, the pace can be reduced down if necessary. However, because the essential feeder conveyance from Earth has yet to be considered, space hotel models will only be viable in the future when more affordable spacecraft become available. According to a research, the Shimizu Hotel would only be financially viable if rocket launch costs were less than 4% of current Space Shuttle prices.

There are also plans for a "guest residence" that may be docked to the International Space Station. This would make it possible to stay at a typical hotel. However, the presence of a reusable space transporter is also a must. A space hotel's construction timeframe can thus be predicted to be at least 10 to 20 years.

The biggest issue with space tourism is the service's inaccessibility and expensive cost. The cost of the program starts at $30 million. It entails a medical evaluation, training, and the execution of the flight. Another $15 million will be spent on a spacewalk by tourists. This enormous cost is due to the fact that launching a satellite requires more than pricey carriers. The risks faced by both the firm and the passengers are a significant component in determining the price of a trip.

The use of manned suborbital planes is one answer to this challenge. This unit depicts a high-speed aircraft that reaches a height of around 150 kilometers. A human will be able to observe the Earth from orbit and experience weightlessness from its board. Virgin Galactic is one of the companies that makes such equipment. They built SpaceShipTwo, a spacecraft. The technology is accelerated using the WhiteKnightTwo aircraft, with a maximum capacity of 6 passengers and a travel time of 2.5 hours. A voyage to the farthest reaches of space will cost $200,000, which is substantially less than an orbital flight. Following the VSS's first successful test flight. After the first successful test flight of VSS Unity on May 22, 2021, the rocket plane should have received the necessary licenses and on July 11, 2021, the Virgin Galactic Unity 22 suborbital flight took place. Among the 6 passengers was the head of Virgin Galactic, Richard Branson. About 600 future passengers are already waiting in line for a flight on paid tickets.

Another project is the Russian Aerospace Rally System", which is being developed by specialists from Moscow Aviation Institute (MAI), MSTU them. Bauman, TsAGI, the Institute of Military Medicine, and also the Centre for Payloads of Rocket and Space which corporation "Energy". It represents suborbital rocket plane, designed for two passengers and a pilot who will take to the air using the MiG-31 supersonic aircraft. The words developers, the cost of a tourist flight for Russian ship will amount to 50–60 thousand dollars, this well below the prices offered by Virgin Galactic. [5]

Conclusion

Overall, even if some people do not want to notice it, space tourism has long since started and public interest in it is high. This shows the growing number of space-specific offers of a terrestrial nature and the first market studies that have shown that there is interest in orbital space tourism. Space tourism will only have a future if it succeeds in meeting the requirements of the space industry, government agencies and the tourism industry. Space is seen not just as a source of scientific inquiry, but also as a method of generating revenue. Technology does not stand still in the modern world. Suborbital flights are the first step in making space travel more accessible to the general public.

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