



Space Tourism – Key Players

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Intro

Since the flight of the world's first space tourist, American businessman Dennis Tito, on April 28, 2001, space tourism has gained new prominence as more suborbital and orbital tourism opportunities have become available. Although the orbital space tourism industry garnered much media attention following Tito's flight, other companies were also hard at work trying to make space tourism a profitable proposition by developing suborbital vehicles designed to take passengers to an altitude of 100 km (62 miles). Within the first decade of the new century space tourism became a small but consistent reality. Starting in 2000, Amazon billionaire Jeff Bezos established Blue Origin; in 2004, Richard Benson established Virgin Galactic. Dozens of other companies launched into the industry, hoping to capitalize on renewed public interest in space and a new mass of wealthy individuals ready to pay for access.

SpaceX

Space Exploration Technologies Corp. (SpaceX) is an American aerospace manufacturer and space transportation services company. It was founded in 2002 by Elon Musk to reduce space transportation costs and enable the colonization of Mars. SpaceX has never really billed itself as a space tourism company as aggressively as Blue Origin and Virgin Galactic. Elon Musk's company launches satellites for government and commercial customers around the world; it's got contracts with NASA for taking cargo and astronauts alike to the space station. It's ramping up progress with building out the Starlink constellation and should start offering internet services to the public sometime this year.

Elon Musk's aerospace company has already sold four multimillion-dollar charter flights, including Inspiration4, dubbed "the world's first all-civilian mission". Scheduled for lift-off in September this year, the three-day trip, sponsored by entrepreneur Jared Isaacman, will see the billionaire and three other people – none of whom will be professional astronauts – fly around the planet in low-Earth orbit. One of the seats is going to a "St. Jude ambassador". But the two others are still up for grabs: one will be raffled off to someone who donates at least \$10 to St. Jude, while the other will be a business entrepreneur chosen through a competition held by Shift4Payments (a digital payments company led by Isaacman). Inspiration4 marks SpaceX's fourth scheduled private mission in the next few years. The other three include a collaboration with Axiom Space to use Crew Dragon to take four people for an eight-day stay aboard the International

SpaceX is increasingly embracing space tourism as an additional revenue stream, offering flights to the ISS and beyond.

Space Station (now scheduled for no earlier than January 2022); another Crew Dragon mission into orbit later that year for four private citizens through tourism company Space Adventures; and Japanese billionaire Yusaku Maezawa's #dearMoon mission around the moon in 2023 for himself plus seven to 10 others aboard the Starship spacecraft.

Blue Origin

Blue Origin is an American aerospace manufacturer and sub-orbital spaceflight services founded in 2000 by Jeff Bezos. The company's name refers to the blue marble, planet Earth, as the point of origin: the vision of the company regards a future in which we must go to space to tap its unlimited resources and energy in order to preserve our home, Earth.

In April 2015, the company started developing and testing the so-called New Shepard vehicle, named after Alan Shepard, the first American to travel into space, who also stepped on the Moon in 1971 (he also hit two golf balls on the lunar surface!), with the goal of making space tourism a tangible reality. The New Shepard vehicle is composed of a crew capsule, accommodating three or more astronauts and a rocket booster. The aim of reducing the cost of space tourism is carried out with both parts of the vehicle being reusable.



Cabin mockup of Blue Origin's New Shepard Space Tourism rocket, 2019

New Shepard is a fully autonomous system, with no pilots on board. The capsule features the largest windows in spaceflight history: making up a third of the capsule, they will allow you to fully immerse in the vastness of space to admire the stunning view of our blue planet. The interior offers over 10 times the room Alan Shepard had on his Mercury flight and every seat is a window seat. As the main engine cuts off, the capsule will separate from its booster, and at the apex of the 11-minute flight, you will experience the freedom of weightlessness, while perfect stillness will surround you. The landing maneuver will consist of a classic parachute landing in the West Texas desert, as the early space pioneers experienced.

Regarding the cost, tickets are estimated in the region of \$200,000, but the goal is to make space travel cheaper for customers over time, through reusable launch systems. However, a date for human flights has not yet been set, but Blue Origin's goal is to target them at some point later this year.

Virgin Galactic

Founded by one of the most notable British entrepreneurs Sir Richard Branson, Virgin Galactic is the front-runner of the developing space tourism industry. In cooperation with the sister company The Space Company, Virgin Galactic's mission is to develop advanced air and space vehicles designed for open space travel to the public. At the core of the company lies a desire for exploration and the support for the advancement of society beyond the limits of the earth. The firm aims to bring space travel to humans, while reducing costs, improving safety and reducing the environmental damages of space launches.



Virgin Galactic's WhiteKnightTwo and SpaceShipTwo preparing for separation and launch, 2020

separation and accessible launch into space. The second part of the system – SpaceShipTwo – is the spacecraft that carries 8 people. It combines the best of two worlds as it runs on a hybrid rocket motor, which is a mix of solid and liquid rocket engines. The most notable part about SpaceShipTwo is its capability to transform in shape while in space, which ensures better safety during the landing phase. Since Virgin Galactic wishes to commercialize space travel, they have designed the SpaceShipTwo with features ensuring a comfortable experience. Specifically, there is a technology that reduced the effect of G-forces, managing the phases of ascending and descending. Furthermore, the ship is designed with an unprecedented number of windows so the “tourists” could enjoy the view. Due to these features, expensive training prior to the flight, like that of an astronaut, is not required.

One of the most impressive aspects of Virgin Galactic is a timeline of the first scheduled commercial flight. While space travel seems to be still far away, the company plans to have its x first flight in May 2021. Anyone could apply to be considered for a light on the official website, however, there is an estimated price tag of estimated \$250,000, hence the possibility of space travel would remain only a wish for the majority. However, the lucky few will only require 3 days of training, after which they will take an approximately two-hour sub-orbital flight.

The premier technology behind the company is the SpaceShipTwo spaceflight system, which consists of WhiteKnightTwo and SpaceShipTwo. Together, they create the first spaceship operated in commercial service. Rolled out in 2018, SpaceShipTwo is an integral part of the overall systems, as it is designed to air-launch the SpaceShipTwo. Opposed to conventional ground launch, this catamaran-like vehicle takes the spaceship upward to 50,000 feet in the air, ensuring clean

Orion Span

Orion Span was a startup aerospace company, which was based in California and was founded in 2018 by Frank Bunger. The company focused on orbital space flight and in 2018, it announced its flagship concept, the Aurora Space Station, which it hoped would provide one of the most popular and exciting space tourism opportunities. In simple terms, the idea was that the Aurora Space Station would be placed into orbit and then work as a sort of space hotel, where tourists could stay and experience life in outer space. Mr. Bunger envisioned the Aurora Space Station being a pill-shaped structure, which should be roughly the size of a large private jet. Once operational, it would have combined elements of a space station and more traditional hotel accommodation. According to the plans, paying customers would have been taken around 200 miles above the surface of the Earth, and consequently spend a total of 12 days in the space hotel, per trip. The Aurora Space Station itself should have been able to cater to six people in total, with each party consisting of two crew members and four space tourists. It planned to welcome its first guests in 2022, with the station's launch supposedly happening in 2021.

Unlike some space tourism companies, Orion Span proposed a clear pricing strategy and claimed to already have a seven-month waiting list in place. Trips to the space hotel would have started from around \$9.5m per person and it was likely that food and additional services would cost extra. A place on the waiting list required an \$80,000 deposit.

Trips to the Space Hotel would have cost \$9.5M per person, with additional costs for food and other amenities and activities

While a \$10 million trip is outside the budget of most people's two-week vacations, Orion Span claimed to offer an authentic astronaut experience. Guests would complete a three-month Orion Span Astronaut Certification program before take-off. Orion Span had a team of space industry veterans who together have more than 140 years of human space experience. The founder claimed in an interview, that Orion has taken what was historically a 24-month training regimen to prepare travelers to visit a space station and streamlined it to three months, at a fraction of the cost.

The hotel would have orbited Earth every 90 minutes, which means guests could have seen around 16 sunrises and sunsets every 24 hours. Activities onboard would have included taking part in research experiments such as growing food while in orbit. There was also zero-gravity ping pong, complete with floating equipment. Guests could have live video chats with their less fortunate loved ones back home via high-speed wireless Internet access and, upon return to Earth, would be greeted with a specially arranged hero's welcome, just like you know it from movies like Armageddon. In March 2021 the website announced that they had shut down operations and refunded all deposits.

Conclusion

Private space companies are already investing across space tourism and companies like UBS want to access space as it enables broader opportunities for investment. For the range of possibilities and creativity, more next-generation engineers will join the space tourism market, gradually lowering entry barriers to increase competitiveness, reduce prices, and democratize space travel for everyday people. Of course, there are also important safety, comfort, and health aspects to consider. Training, medical screenings and liability waivers will need to be examined before tourists head to space. Space tourism will remain a small subsector of the industry for the near future, but it will boost the entire New Space industry. Once space tourism does become mainstream, it will also positively affect several socioeconomic factors on Earth: providing jobs, educating the public about space and launching a new solar-based energy infrastructure. The sweet escape to the stars seems to have the power to awaken us to the awe-inspiring potential of space exploration while also strengthening our appreciation of home.