

Aerospace & Defense Practice

Wall Street to mission control: Can space tourism pay off?

With the COVID-19 pandemic curtailing earthly travel, space tourism may seem like a far-fetched dream—but some companies are betting on high demand.

by Chris Daehnick and Jess Harrington



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The space industry saw record-breaking growth in 2020 as investors, undeterred by the COVID-19 pandemic, poured almost \$9 billion into private companies. While some of these businesses are simply providing parts and services to government agencies like NASA, others want to venture into space with their own crew and rockets. One ambitious goal, which several companies are now pursuing, involves space tourism for any private citizen willing to pay a hefty fee.

Having private companies lead space exploration ventures was the stuff of science fiction when the human spaceflight era dawned 60 years ago in April 1961.¹ But such companies have now demonstrated the safety and performance of their

systems for a full spectrum of operations. Plans to offer private flights are becoming reality, so what does the future hold? To answer this question, we look at industry trends, investment patterns, and the obstacles ahead.

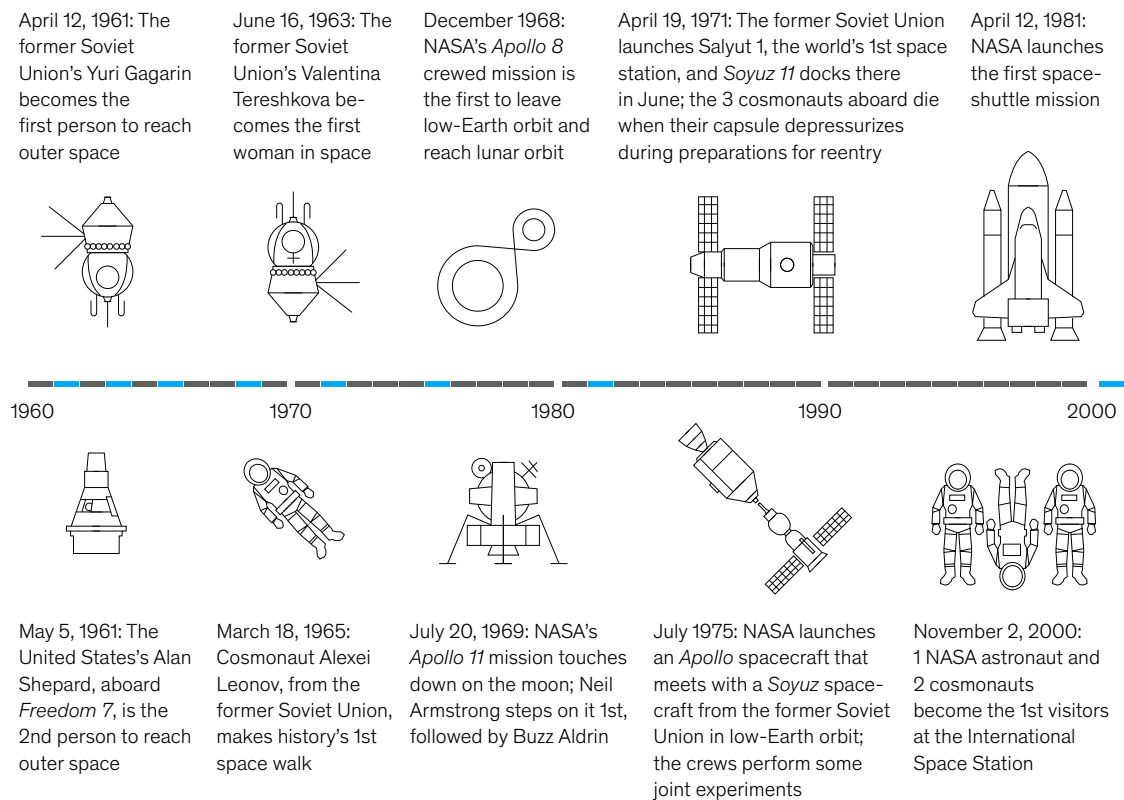
Have \$55 million, will travel

Governments monopolized space exploration in its early days because of the staggering investment and high risks involved. Exhibit 1 shows some of the early milestones of space flight, as well as other important developments through 2000. National pride and the desire to be “first” were also powerful motivators, although many countries now appreciate the value of collaboration, as seen with

Exhibit 1

The first crewed space flight in 1961 ushered in decades of progress.

Major milestones



¹ Nola Taylor Redd, "Yuri Gagarin: First man in space," *Space*, October 12, 2018, space.com.

the International Space Station. Private companies, with vastly fewer resources, had little reason to investigate crewed missions because the likelihood of getting government approval and seeing decent returns was dim.

The past 20 years have brought some major changes, however. From 2001 to 2009, Space Adventures, a private company in the United States, transported seven space tourists to the International Space Station aboard a Russian Soyuz spacecraft as “ride alongs” on a planned mission (Exhibit 2). The passenger fees were reportedly in the \$20 million range. While Space Adventures remains the only company that has transported space tourists, many other contenders have recently emerged thanks to technological advances and an abundance of capital:

- Virgin Galactic was leading in the race to offer suborbital flights to space tourists until a rocket motor did not ignite during a 2020 test flight, forcing it to delay its first launch until 2022.²
- Blue Origin is now reserving civilian seats for 11-minute suborbital flights on *New Shepherd*, a reusable launch vehicle. It plans to auction off one seat on a flight planned for July 20, 2021.
- SpaceX plans to launch *Inspiration 4*, the first all-commercial mission to orbit, in late 2021 and has formed a partnership with Axiom Space and NASA for the first all-commercial astronaut mission to the International Space Station, also in late 2021.³
- Axiom Space hopes to fly four commercial passengers to the International Space Station using SpaceX crew and infrastructure in 2022; Space Adventures also plans to work with SpaceX to take commercial passengers into low-Earth orbit.⁴
- Boeing may offer commercial flights with its *Starliner* capsule, which is being developed as part of NASA's Commercial Crew Program.

These recent ventures have generated excitement and made headlines, driving even more investment in private space companies. For instance, many special-purpose acquisition companies (SPACs) are targeting space companies for acquisition, based on their projected future revenue, allowing them to go public.⁵ Beyond these ventures, three recent uncrewed missions to Mars, including the landing of NASA's *Perseverance* rover, are also creating a sense that we're in a new age of exploration and opportunity.

Are you ready to fill out an astronaut application, many of which are readily available on company websites? If so, check your credit limit, since Axiom Space is charging \$55 million for its trip. Robust demand is unlikely to materialize at this price, although the company had filled all four passenger seats on this flight by March 2021.⁶ Even at a lower price—Virgin Galactic is charging a relatively inexpensive \$250,000 for a suborbital flight—sustainable demand will be an issue.⁷ Will the few people who are willing to pay for space travel be interested in a return flight, or will they move onto the next adrenaline rush?

The other big consideration relates to risk. Operators prioritize safety, but the loss of the space shuttles *Challenger* and *Columbia*—as well as many other incidents with government programs—show that accidents are all but inevitable. Private companies have also had fiery test crashes and other well-publicized disasters that may deter potential customers. If a spacecraft filled with private tourists experiences a catastrophic failure, demand could evaporate or governments might forbid additional flights.

² Chris Morris, “Virgin Galactic space tourism flights delayed until 2022,” *Fortune*, February 26, 2021, fortune.com.

³ “SpaceX to launch Inspiration4 mission to orbit,” SpaceX, February 1, 2021, spacex.com.

⁴ Stephen Clark, “Axiom finalizing agreements for private astronaut mission to space station,” *Spaceflight Now*, September 23, 2020, spaceflightnow.com; Tom Shelley, “Private mission available on the SpaceX Crew Dragon,” Space Adventures, March 5, 2020, spaceadventures.com.

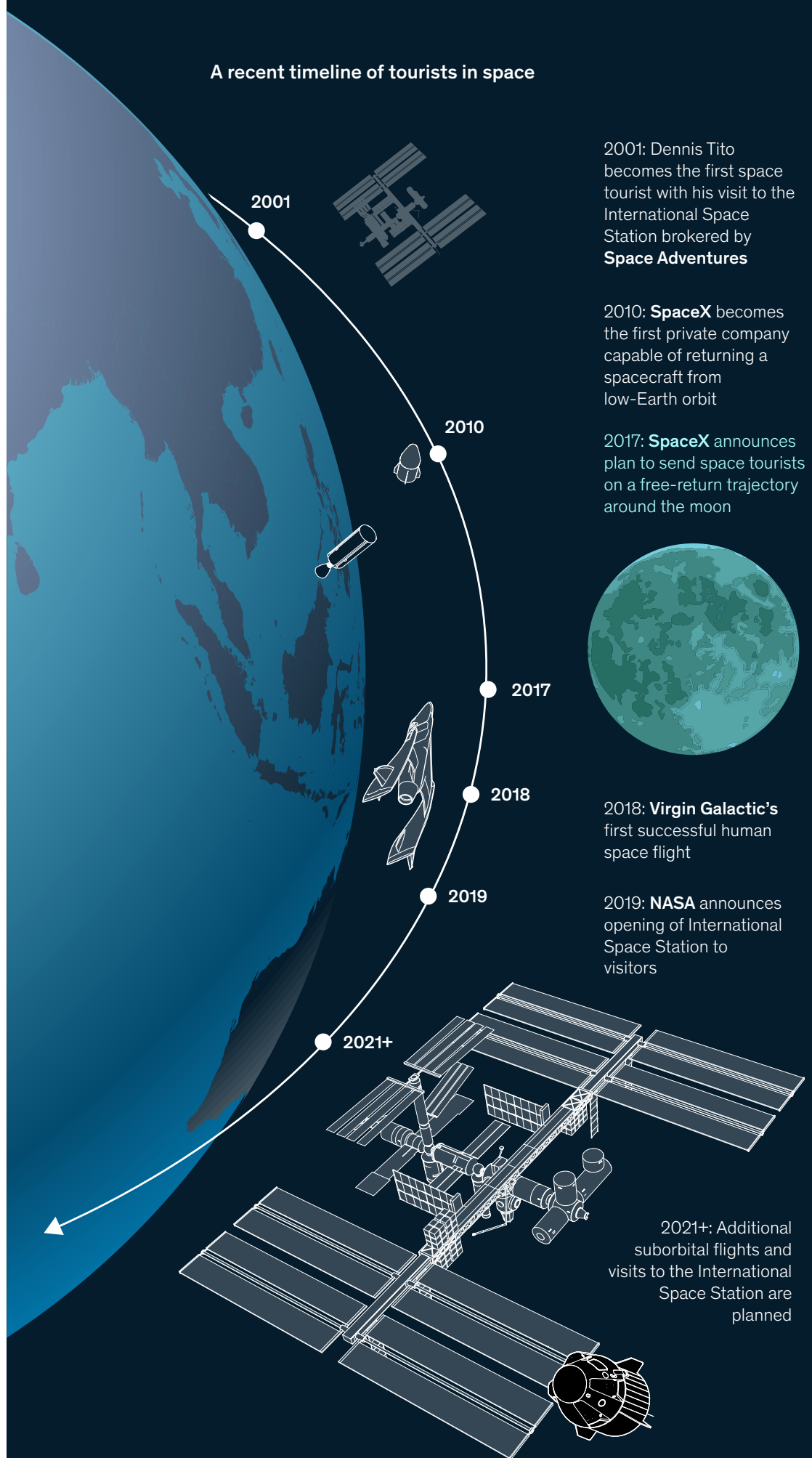
⁵ Jeff Foust, “Can you still spell space without SPAC?” *SpaceNews*, March 23, 2021, spacenews.com.

⁶ Canadian Broadcasting Corporation, “Here's who got the last 2 seats for the 1st all-civilian space flight,” CBC, March 31, 2021, cbc.ca.

⁷ Alex Ledson, “Virgin Galactic says space holidays possible by early 2021—tickets are \$250,000,” *Forbes*, August 4, 2020, forbes.com.

Governments initially sponsored most space travel, but private companies became involved in the early 2000s.

A recent timeline of tourists in space



Source: Press search, company websites

Welcome to the cislunar economy

Although the International Space Station may not become a tourist trap, at least in the near term, private space companies will still find many opportunities for growth as technology and cost barriers continue to fall. Governments worldwide may help them succeed as they increasingly look to the private sector to advance space technology. Some countries have already created more permissive, encouraging policies to spur innovation and offered other forms of support to help private companies. In early 2021, for instance, NASA announced that it was offering \$45 million in support to about 350 small businesses and research institutions to develop innovative technologies.⁸ The agency also recently selected about 20 companies to serve as partners in developing space technologies, such as a 3-D-printing system to make tools in space during the Artemis program, which focuses on lunar exploration.⁹ Other commercial companies have won contracts to carry NASA payloads to the moon.¹⁰

The most ambitious space companies may go even further than lunar expeditions and satellite launches, although some industry experts question whether their goals are feasible. SpaceX is developing *Starship*, a powerful launch vehicle, with the ultimate goal of landing on Mars, and Elon Musk wants to have crewed flights there by 2026.¹¹ Jeff Bezos's Blue Origin is exploring the concept of

space cities while simultaneously acknowledging the substantial obstacles that stand in their way.¹² If such efforts continue, will we one day have a cislunar economy, where business occurs on the moon or while in orbit?

Although questions remain about the exact size and durability of the commercial-space market, it appears poised for significant growth. If the private companies that plan launches in late 2021 and 2022 meet their timelines, we can expect an even greater surge of interest from both investors looking for opportunities and passengers wanting to book future flights. The real question is whether we will see economic activity in space (for instance, asteroid mining or manufacturing) that goes beyond tourism. If the cislunar economy materializes, it would provide reasons for going to space that extend beyond bragging rights—and that might be the ticket to a strong and enduring market for commercial flights.

As we await more developments, we can look forward to the first movie filmed on the International Space Station with a little help from the private sector. NASA has confirmed that it is working with Tom Cruise for this potential venture, and SpaceX is rumored to be the company providing his transport.¹³

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⁸ "NASA provides \$45 million boost to US small businesses," NASA, March 25, 2021, [nasa.gov](https://www.nasa.gov).

⁹ "New NASA partnerships to mature commercial space technologies, capabilities," NASA, November 9, 2020, [nasa.gov](https://www.nasa.gov).

¹⁰ "Commercial lunar payload services," NASA, October 1, 2020, [nasa.gov](https://www.nasa.gov).

¹¹ Kate Duffy, "Will Elon Musk's SpaceX get humans to Mars by 2026? Some experts have raised doubts about the timeframe," *Business Insider*, February 9, 2021, [businessinsider.com](https://www.businessinsider.com).

¹² Korey Haynes, "O'Neill colonies: A decades-long dream for settling space," *Astronomy*, May 17, 2019, [astronomy.com](https://www.astronomy.com).

¹³ Stephen Clark, "NASA working with Tom Cruise to film movie on the International Space Station," *Spaceflight Now*, May 5, 2020, [spaceflightnow.com](https://www.spaceflightnow.com).