

Space Tourism By Lee Pennefather

Tourism is one of the biggest industries in the world, and now it's expanding out of it. Since the flight of the world's first space tourist, American businessman Dennis Tito on April 28, 2001, space tourism has gained prominence as more suborbital and orbital tourism opportunities have become available. Companies like Virgin Galactic are aiming to run up to 400 flights per year, sending whoever can afford the \$250-450,000 ticket into space for recreational purposes. And while many lower class people would argue that it's a waste of money, the "overview effect" has encouraged the upper class to join the space tourism trend and reflect on the world with an environmentally-conscious lens. Ironically, these space trips could have devastating impacts on our environment, which begs the question; are we willing to put the Earth at risk just to joyride into the stratosphere?

Space travel is defined by Wikipedia as "space travel for recreational purposes." And while to some of us that may seem like a futuristic, unbelievable thing, for the wealthier population it's their next big trip. After the "commercial space race" of 2021, where Jeff Bezos and Richard Branson launched themselves into the upper atmosphere within weeks of each other, interest in space tourism has grown greatly. Virgin Galactic, an American space tour company led by Richard Branson, has booked 800 customers, with tickets ranging from \$250,000 to \$450,000 per seat. The space tourism market is skyrocketing, and new trips are on offer, including zero-pressure balloon trips and zero-gravity simulated flights. The financial services company UBS estimates that the space travel market could be worth \$3 billion by 2030, but the Federal Aviation Administration is still yet to approve most trips, and construction on facilities like space hotels are not underway. Despite this, there have been 21 space travel flights launched since the first in 2001, and they won't be the last.

Interest in recreational space travel rose after billionaires Jeff Bezos and Richard Branson created a media storm by launching themselves into space, but is this truly the only reason people want to go to space? Everyone has the childhood dream of going to the moon, but evidence suggests there is apparently a "deeper" philosophical desire. Many "spaceflight participants" (a term more widely used to describe space tourists, decided after Dennis Tito felt insulted by the word 'tourist'), have described their space travel to come with an experience of what has been coined as the "overview effect," a result of viewing the Earth from space. This is where space tourists experience a "strong sense of compassion and concern for the state of the planet and the effects that humans are having on it," as Soviet Russian cosmonaut Yuri Artyushkin explained.

In 2021, Star Trek actor William Shatner travelled on a suborbital flight with Jeff Bezos' space tourism company Blue Origin. Although Shatner expected to feel emotions of joy and comfort while viewing "mother and Earth" from space, he reported that he struggled with "the strongest feeling of grief I have ever encountered." Virgin Galactic uses these profound and intensely human feelings of the "Overview Effect," on its homepage, advertised as an experience only felt on space flight. However, many astronauts with long careers have never experienced the Overview Effect, and Frank White, an author of a book on the topic, suggests that while viewing Earth from space provides the "ultimate" Overview Effect, the

same can be felt while looking at a landscape from a high place. Commercial pilots who fly at high altitudes have reported feeling this phenomenon. Using the “Overview Effect” as a promotional message for this industry is certainly an irony, considering the vast environmental impacts of commercial space travel.

The “overview effect,” is a strong motivator and promotion for space travel and provokes a deep reflection on humanity’s impact on the environment, but space travel itself is a great concern for the Earth. The spacecrafts necessary to conduct suborbital and orbital space travel for space tourism create excessive emissions and even black carbon. A 2022 study found commercial space travel produces black carbon particles that are almost *500 times* more efficient at warming the atmosphere than all surface and airline sources of soot combined. After release into the upper atmosphere, these particles circulate in a fine layer for 4-5 years, absorbing solar radiation and blocking it from reaching the surface of the Earth. Aside from this, the emissions that these flights let out are massive.

A 1.5 hour Virgin Galactic flight generates emissions equivalent to a 10 hour trans-Atlantic commercial air flight. However, commercial flights carry hundreds of passengers, but the spaceflight, with a passenger limit of six, emits 4.5 tonnes of carbon per person. This is more than 2 times the Paris Agreement’s recommended annual individual carbon budget, and Virgin Galactic is aiming to launch 400 of these massively emitting space tourism flights *every year*. The continuation and prosperity of this industry will have massive impacts on our environment. And yet there are still companies such as Virgin Galactic which advertise their services in conjunction with the overview effect, promoting it as a “transformative experience” where travellers “deepen [their] connection to Earth and humanity.” This shows an ignorance to the destructive effects of their success.

Space tourism is a new and exciting realm of tourism, where people are achieving childhood dreams of travelling as far as the eye can see. The wealthy are getting the chance to see the world from above, and to contribute to the growth of a new tourism industry. For those who can afford it, the “overview effect” is an inviting motivation for space travel, but one which seems paradox when presented aside the statistical impacts of these flights on the environment. For now, space tourism is a thrilling (and expensive) glimpse into the future of commercial space travel, and the world will see how it evolves and hopefully witness some positive impacts of the “overview effect.”