

Tourism Social Science Series

Volume 25

Space Tourism

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SPACE TOURISM

The Elusive Dream

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INVESTOR IN PEOPLE

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INTRODUCTION

The Dawn of a New Era?

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Humans have become increasingly aware of the potential to realize the age-old aspiration of flying into space and reaching out toward the planets and stars; yet, space travel remains an elusive dream. Expanding into outer space is seen by many as an appealing, or even inevitable, endeavor for humanity, a magnified vision of what was once considered to be America's "manifest destiny" (Mitchell & Staretz, 2010; Sage, 2008). Some experts argue that becoming a spacefaring species is the only way to ensure humankind's long-term survival. Heavenly bodies offer unprecedented opportunities for adventure and exploration in addition to nearly inexhaustible resources. Traveling beyond the biosphere may fundamentally alter how we view ourselves, our place in the Universe, and our relationship to the Earth. It has even been suggested that a collaborative effort to settle space could help humans recognize their interconnectedness and interdependence, thereby allowing us to finally achieve peace and pursue a collectively advantageous future (Collins & Autino, 2010; White, 1998).

However, as research and development lead to the discovery of novel ways of realizing the dream of space travel, it is increasingly evident that human expansion into space creates potentially momentous new

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challenges here on the Earth. Intensified space exploration and exploitation could lead to monumental environmental consequences, precipitating the destruction of both terrestrial and celestial environs. Unequal access to space, with its abundance of resources, may become a determining factor in the relative wealth or impoverishment of countries, private corporations, social classes, and individuals (Dickens & Ormrod, 2007; Ormrod & Dickens 2017). Dominance of space has become a critical factor in strategic contests among countries in addition to a means of surveillance by states over their citizens. Near-Earth space, in particular, has gained growing significance in the realms of political and military power, leading to concerns about a looming arms race in space (Koplow, 2017). The strategic importance of space is reflected in President Trump's directive to the Department of Defense in June 2018 to establish a sixth branch of the US military – the Space Force. Competition over the domination of space and access to its resources might extend conflicts heretofore limited to the Earth to cosmic proportion.

Space travel development is intimately interwoven with far-sighted visions of space exploration and exploitation and the eventual human expansion to and settlement of other celestial bodies. While such visions are rich in imagery, the constraints are staggering. Optimistic expectations regarding the impending availability of safe and affordable space travel remain, as yet, unfulfilled. With fewer than ten tourists having left the biosphere, space tourism is the epitome of a niche specialty. In the course of the second-half of the twentieth century, the governments of the major world powers were virtually the sole initiators and supporters of activities in outer space. Yet, with the turn of the millennium, the initiative moved progressively into the hands of privately owned companies. The transition to privatization revitalized the field and started a quest for technological innovations, cost reductions, and safety improvements. Some visionaries, space scientists, and academics see space activities, particularly space tourism, as on the verge of a dramatic and unparalleled expansion within the first-half of this century, and the leaders of the space industry see space travel as the next “logical extension” of aviation (Ryabinkin, 2004, p. 108).

This book examines the state and future of space tourism by pitting the grandiose dreams of human expansion into the cosmos against some formidable economic, environmental, and social challenges. Underlying these topics are a broad spectrum of fundamental questions regarding humanity's place and future in the cosmos.

FUNDAMENTAL QUESTIONS

One of the most prominent, and existentially significant, questions which has fascinated humans since antiquity (Rood & Trefil, 1981) and is driving much of contemporary cosmological research is whether we are alone in the universe (Geppert, 2012). This is seen in the observation of the science fiction writer Arthur C. Clarke (1917–2008) that identified the human:

“desire to know, whatever the consequences may be, whether or not man [sic] is alone in an empty universe” as the one key motive underlying all human efforts to overcome gravity and reach out beyond humankind’s natural habitat on planet Earth. (cited in Geppert, 2012, p. 3)

It has even been suggested that an encounter with the Otherness of aliens or extraterrestrials is a precondition for the formation of a human cosmopolitan identity (Novoa, 2016). While efforts of the Search for Extraterrestrial Intelligence project to open contact with alien beings by radio-telescopic devices have not yet born fruit and have a low probability of ever doing so, it is widely believed that human cosmic exploration might eventually establish whether other intelligent beings exist in the Universe and, if so, what they are like (Tarter, 2001).

Another fundamental question, which emerged with the progressive deterioration of the Earthly environment, on the one hand, and prospective future advances in space exploration, on the other, is whether humanity should expand into the cosmos. This touches upon one of the most crucial issues of our collective future – whether to remain the Earthlings or settle the Galaxy and develop into a spacefaring civilization, as envisioned by enthusiasts such as Davies (2010), Hawking (2012), and Zubrin (1999) and, more recently, by such technological wizards as Elon Musk (Buchanan, 2017; Davenport, 2018). However, human expansion into space would be a gigantic and extended project, cutting deeply into the Earth’s resources, therefore diverting them from alternative uses. An extension of human life beyond the Earth may be a fulfillment of the “survival imperative” or it may threaten the viability of life on Earth. Creating a cosmic civilization to escape an increasingly less livable Earth might paradoxically further worsen its livability. There is thus deep uncertainty regarding whether a sustainable, peaceful human future is to be found by looking to the stars or by reigning in our species’ impact and focusing our efforts on the terrestrial environment and its inhabitants.

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Human expansion into space would also affect conceptions of humanity's future on the Earth. Deleuze and Guattari (1987) discuss the possibility that capitalism will eventually exhaust itself as it is fundamentally constrained in its ability to develop functionally distinct products. The popular "limits to growth" hypothesis identifies a fixed cap on the resources available to humans (Meadows, Meadows, Randers, & Behrens, 1972). Yet, these that are based on the assumption that the Earth is our sole habitat – and sole supplier of resources – will become questionable if constraints are overcome and access to celestial resources and habitats becomes technologically and economically viable (Spector, Higham, & Doering, 2017). We must therefore question: What are the implications of extending capitalist methods of production and consumption into the cosmos? Some see the limits that we confront on the Earth as potentially negated by access to outer space, whereas others assert that expansion into space will greatly exacerbate, rather than overcome, those problems.

Political (Steer, 2017), ethical (Fogg, 2000; Galliot, 2016; Marsh, 2006), and legal (Ferreira-Snyman, 2014; Freeland, 2005; Hobe, 2007; Ryabinkin, 2004; von der Dunk, 2011; 2013) challenges and dilemmas accompany our conversion to a spacefaring species. How do we govern human behavior in space and conceive, specify, and justify our rights to invade pristine and untouched environs? What are the consequences of these interventions for other celestial bodies and even, potentially, for intelligent alien beings? And how will those cosmic activities affect life on the Earth? As space is primarily uncharted territory, humanity also faces the dilemma of whether to keep it open for the enjoyment of individuals' personal freedoms or to control their conduct to avoid detrimental developments. But who has the authority to institute laws that will regulate freedoms in space, and how can the rule of law be maintained beyond the Earth? There is a need to anticipate and address these questions by formulating an ethics of space travel and exploration.

Since it is intertwined with the scientific and technological advancement of space exploration, the development of space tourism is affected by, and affects, efforts to deal with and resolve these important questions. This book takes a broad view of the historical background, significance, and implications of space tourism development. Specifically, it addresses four major issues which, while sometimes treated separately, have not been brought together and confronted in a single volume. First, it uncovers the historical, mythological, artistic, and virtual imaginaries of the cosmos which paved the way to the contemporary visions and increasingly realistic projects for space travel and tourism and stand to influence their future

trajectory. Second, it confronts these visions with the actual contemporary achievements and setbacks in the ongoing efforts to create a viable space travel and tourism industry. Third, it considers the potential environmental, economic, social, and legal implications of the successful establishment of such an industry. Finally, it investigates the broader significance of space travel and tourism as forerunners of a possible human expansion into space and creation of a spacefaring civilization.

THE BIRTH PANGS OF A NEW MODE OF TOURISM

Outer space has fascinated humans since ancient times. These fascinations were abetted in the early modern era with the realization of the vastness of space and the Earth's place in it as a small planet circling a medium-sized star in an unremarkable corner of one of the Universe's billions of galaxies. As new technologies made human space travel appear increasingly realistic by the beginning of the second-half of the twentieth century, it became a prominent theme in popular culture. Space science is now adapted for mass consumption and communicated via magazine, newspaper articles, television, radio programs, and popular-press books. Works of fantasy, such as science fiction, films, games, and virtual reality simulations, began offering visions of space tourists' trips into the depths of the cosmos and their encounters with aliens and stellar civilizations, while the possibility of life on other celestial bodies became a major preoccupation of astronomers and other space scientists.

As the space race between the United States and the Soviet Union escalated after World War II, military interests drove progress in cutting-edge space technologies, making the dream of human spaceflight increasingly achievable. The first orbital flight in 1961 by Russian Yuri Gagarin and the American Apollo 11 landing on the Moon in 1969 are the defining milestones in the arrival of the Space Age. Many believed that these events signaled that humanity would soon embark on an unimpeded and exponential conquest of outer space. Early successes, especially the Apollo series of lunar missions, encouraged optimism, particularly in the United States, that rapid development of inter-planetary and even interstellar travel would soon become possible. Visions of humanity's future in space were closely associated with the expectation of a swift rise of space tourism. In the 1960s, the prominent hotelier Barron Hilton was already planning a lunar hotel (Cohen, 2017, p. 33). In 1985, the company Society Expeditions announced "that it will sell trips into space on a rocket to be built by a

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commercial launch company” (Billings, 2006, p. 162). More than two decades ago, the National Aeronautics and Space Administration declared, “For the most part, the machinery to accommodate the needs of an evolving space tourism industry is in place” (NASA, 1994, n.p.). However, these optimistic expectations proved, for the most part, to be premature. Hilton’s space hotel remained a fantasy, and Society Expeditions’ rocket was never built (Billings, 2006, p. 162). Space tourism remained an elusive dream.

The disintegration of the Soviet Union suspended the space race. In the United States, technical problems and disasters, such as the explosion of the Challenger (1986) and Columbia (2003) space shuttles, held back government-led space travel development. At the time of this writing, only 24 humans have traveled beyond the International Space Station (ISS), and no crewed missions have escaped the Earth’s orbit since the conclusion of the Apollo program with the Apollo 17 Moon landing in 1972 (Atkinson, 2013; NASA, n.d.; Williamson, 2001). A highly limited and elitist forerunner of space tourism was initiated in an unexpected manner in post-communist Russia. Following the fall of the Soviet regime, Russia’s space industry found itself short of financing and decided to sell places on its missions to the ISS to well-heeled private individuals (Wall, 2011). Fewer than ten individuals, all multimillionaires, undertook these trips; but concerns were raised about tourists endangering the missions (Wall, 2011). With the enlargement of the ISS crew, Russia’s offer to carry private individuals to the station was discontinued in 2009 in order to retain seats for professional astronauts. No tourists have departed into space since then, though Russia intends to again offer touristic flights to the ISS before the end of the present decade (Fingas, 2015).

In the United States, space exploration and space tourism parted ways, with the initiative of creating a space tourism sector moving into private hands. At the turn of the millennium, a new cadre of wealthy entrepreneurs, billionaires with not only significant disposable capital but also a proclivity for engaging in avant-garde technological projects, founded companies which took the lead in the development of the spacecraft, apparatus, and skills necessary for touristic space travel. These include the likes of Richard Branson’s Virgin Galactic, Elon Musk’s SpaceX, and Jeff Bezos’ Blue Origin. Their immediate target was to create spacecraft to serve sub-orbital and orbital excursions into near-Earth space, but they also engaged in planning trips to the Moon and Mars.

Those who follow space tourism will be familiar with the numerous expectations and predictions that later proved overly optimistic. Complex technological difficulties and major mishaps have forced prolonged delays

in the realization even of relatively modest (compared to grand visions of tourists on Mars) suborbital flights. Virgin Galactic's first SpaceShipTwo, programed for commercial suborbital flights, crashed in 2014 during a test flight (Chang & Chern, 2016). A second model is still undergoing tests, but it is uncertain when it will be put into service (Foust, 2017). In 2015, one of SpaceX's Falcon 9 launch vehicles carrying supplies to the ISS exploded after take-off, causing a disturbance in the company's launch program (Moon, 2015). Another company, XCOR Aerospace, developed a rocket-powered spaceplane, the Lynx Mark I, which was intended to take a pilot and one passenger to an altitude of 100 kilometers. The company planned its virgin flight for 2016 but had to postpone and eventually cancel it owing to financial difficulties. When suborbital flights will be available (much less widely used) is yet uncertain.

The leaders of the American space tourism sector remain seemingly undeterred by these difficulties and delays, continuing to offer ambitious visions of the future of space travel. Elon Musk announced in 2015 that the private sector would land humans on Mars in as few as ten years (Chang, 2016; Mitroff, 2015). Musk, who seeks to initiate "a self-sufficient colony of people on Mars to ensure that the human race could survive an earth-wrecking cataclysm" (cited in *The Economist*, 2015, n.p.), envisioned that the first hundred passengers will reach Mars by 2024, an initial step toward creating a sustainable settlement of one million people on the Red Planet (Chang, 2016). In contrast to this ambitious program, NASA has plans for a crewed mission to orbit Mars in the 2030s, landing astronauts on the planet only in the 2040s (Chang, 2016). There is a very real possibility that the first human mission to Mars will be achieved not by NASA, the most renowned and accomplished government space agency in history, but rather by private companies that have engaged in space-related activities for less than two decades.

The state of human space tourism, as seen to date, is thus marked by a sharp contrast between, on the one hand, an optimistic outlook and growing aspirations and, on the other, the as yet very limited achievements. Space tourism as an ongoing practice does not presently exist. In the immediate future, space tourism available to the public appears likely to remain exclusive, expensive, and intermittent (if it will be available at all). Suborbital spaceflight, if it becomes viable, would afford a brief but extraordinary experience of weightlessness, a vista of the curvature of the Earth from space, and a view of non-twinkling stars (as stars only appear to twinkle due to the Earth's atmosphere). If orbital space trips, such as to the ISS, become more widely available, tourists will have the extraordinary

experience of the so-called overview effect, resulting from seeing the whole Earth floating in the vastness of space (White, 2014; Yaden et al., 2016). Among astronauts, this experience has elicited a deep personal sense of transcendence and transformation (White, 2014; Yaden et al., 2016). The overview effect is likely to become one of the key motivators and experiences of orbital travel.

The destiny of space tourism to further destinations, such as the Moon, Mars, and other celestial bodies, is uncertain. At least initially, such trips would be available only to a small coterie of super-rich individuals. Private trips around the Moon have indeed been offered by the company Space Adventures at the astronomical price of US \$150 million per person (IFLS Store, 2016), but, at the time of this writing, the project's viability is unclear. Given current capabilities, Mars seems to be the only planet in our solar system suitable for human visits and constitutes the furthest achievable destination for space tourism in the next few decades. The expansion of humanity further into the Galaxy will need technologies and organizational forms of a different order – ones that in the year 2018 exist only in the realms of speculation and fantasy.

The United States remains the leader of space exploration and space travel development, but competitors are rising around the world, especially in Asia. Japan initially prepared to launch the Selene-2 mission to the Moon in 2018, but, as is becoming the norm in this arena, the project has been delayed (Hashimoto et al., 2014). Japan is also planning a mission to Mars. India's space program reaches back to the 1960s (Suresh, 2014). In 2008, India sent its first planetary orbiter, Chandrayaan-1, to the Moon to explore its surface and environment and – alone among the Asian nations – a Martian space probe (the Mangalyaan), which has been orbiting the Red Planet since 2014 (Chauhan, 2016). China is believed to be NASA's biggest rival in space exploration. The Chinese have accomplished the first-ever landing on the dark side of the Moon in January 2019, and plan to send a probe to Mars in 2020 (Normile, 2016). They have demonstrated an interest in human space travel, with plans to land *taikonauts* (Chinese astronauts) on the Moon in the 2030s and sometime thereafter on Mars (Bloomberg News, 2016; Qiu & Stone, 2013). But their primary interest seems to be in the exploitation of resources on other celestial bodies rather than in the development of space tourism. In contrast to Asia, South American countries are still “at an early stage of [...] space technology development” (Sarli et al., 2015, n.p.), and even Brazil, one of the world's ten biggest economies, has up to now failed “to emerge as a significant space actor” (Moltz, 2015, p. 13).