# Unveiling the Critical Factors of Terrestrial Space Tourism Destinations

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**ABSTRACT**

Spanning from orbital and suborbital flights to spaceports, space museums, space hotels, and much more, space tourism is poised to redefine the landscape of the travel industry, promising economic growth, and prosperity for destinations across the globe. However, despite its transformative potential, existing literature has dedicated little attention to its exploration. Our research endeavours to shed light on the concept of terrestrial space tourism destinations. We crafted a comprehensive theoretical model that forms the bedrock for a deeper understanding of this unique and specialized niche. We employ a qualitative approach, drawing from an array of sources, including interviews with industry experts and key informants. Findings uncovered several critical factors that need to be considered when establishing a competitive and sustainable terrestrial space tourism destination, namely: safety, residents' acceptance, infrastructures, and education. Furthermore, we introduce six research gaps that can inspire future investigations in this dynamically evolving field.

**KEYWORDS**

Conceptual model, destination product development; space industry; terrestrial space tourism

## 1. Introduction

In recent years, space tourism has captured the attention of governments, businesses, and consumers alike (Olya & Han, 2020). While this niche sector remains in its infancy within the broader space industry landscape (Messeni Petruzzelli & Panniello, 2020), the Union Bank of Switzerland (UBS) estimated in a 2018 report that space tourism will become a prosperous market, propelled by technological advancements, cost reductions, and decreased risks. Indeed, we are already witnessing ambitious projects that are raising the space economy to unprecedented heights (Chang, 2015; Spector & Higham, 2019). Visionary entrepreneurs such as Elon Musk with SpaceX, Richard Branson with Virgin Galactic, and Jeff Bezos with Blue Origin, have made substantial investments in space tourism and space services (Friel, 2020). These investments range from the design of innovative rockets and spacecraft to high-performing payloads, in-orbit satellite servicing, space debris mitigation, and resource extraction on celestial bodies (Tkatchova, 2018).

Despite the surging interest in space tourism, however, orbital human spaceflight remains an exclusive segment (Ormond & Dickens, 2019) reserved for few. This exclusivity stems from the

staggering ticket cost, which currently stands at approximately $55 million per person (ReportLinker, 2021). Furthermore, embarking on an orbital journey is physically demanding, requiring individuals to complete specialized training programmes and rigorous fitness assessments (Chang, 2020). Consequently, only the select few civilian passengers who can meet these stringent requirements will have the opportunity to participate in this remarkable experience.

Although the costs of orbital human spaceflights are expected to decrease with time, therefore enlarging the pool of customers, the revenues generated from such activities will likely remain limited (Tasci et al., 2021). Indeed, the future potential of human spaceflight will not be in space, but rather on Earth (Crouch, 2001). Lucrative business opportunities, including super-fast travel through outer space and point-to-point rocket flights between locations on Earth, are poised to emerge in the near future (UBS, 2018), upending established industries such as those of tourism and travel.

This market expansion gives rise to complex challenges, particularly in the establishment and management of terrestrial space tourism destinations, i.e. locations around the world with space-related structures, facilities, and activities (Roberts, 2019). The understanding of both tangible and intangible factors that define such destinations is essential to address a myriad of concerns, including the harmonization of potentially divergent interests, the promotion of sustainable development, and the emergence of markets characterized by unique traits and needs. Indeed, comprehending these factors, which encompass elements such as spaceports, destination management organizations, and accommodation establishments, emerges as an essential prerequisite for the creation of distinctive terrestrial space tourism destinations.

To provide an example, we can refer to spaceports—bases from which spacecraft are launched—and to the very first act of selecting their location. Regions in proximity to the equator are particularly favoured by engineers as they can leverage the Earth's rotational speed to obtain facilitated access to orbit (Friel, 2020). However, many additional variables must be considered, including air traffic management, carbon emissions, population density (particularly in the event of accidents), regulatory flexibility, airspace congestion, the country's level of development, and political stability.

Moreover, along with such high-level considerations, a deep understanding of the operations of commercial spaceports is also vital. Launching and landing space-bound vehicles is a very complex process, necessitating specialized infrastructures and competencies for safe and sustainable activities (Scott, 2022). Thus, it becomes necessary to create an environment where stakeholders such as firms, support organizations, and institutions, coexist and cooperate. In this sense,

> *competitors that agglomerate, that are physically proximate, may create externalities which could increase the production efficiencies or heighten the demand by attracting more customers than the sum of those which the agglomerating firms would attract individually. (Molina-Azorin et al., 2010, p. 23)*

Terrestrial space tourism destinations are a niche of the wider tourism industry, which has been

extensively analysed by scholars. Abreu-Novais et al. (2016), for instance, have emphasized the importance of pinpointing the factors that can bolster the competitive standing of tourism destinations. Ritchie and Crouch (2003) have instead proposed entire conceptual models that delineate the drivers of destination competitiveness. These drivers represent the unique attractions and advantages that sway tourists in favour of one destination over another (Crouch, 2001), and are contingent upon the characteristics of the destination in question and the strategic initiatives devised to attain and maintain a competitive position (Dwyer & Kim, 2003).

Within the existing body of literature focused specifically on space tourism, a conspicuous gap remains in our understanding of the factors that affect terrestrial space tourism destinations. Remarkably, no dedicated models have yet been proposed to systematically study such factors. Therefore, this paper seeks to make a meaningful theoretical contribution by centring its focus on the intricacies of developing terrestrial destinations for space tourism, and answering the following question: "What factors must be considered to establish a competitive terrestrial space tourism destination?"

Given the novelty and uniqueness of the subject matter, we have opted for a qualitative analysis approach, drawing from various data sources as recommended by Yin (1994). This approach has enabled us to construct a conceptual model of terrestrial space tourism destinations which encompasses the pivotal factors that must be in place to not only catalyse commercial, industrial, and technological prospects, but also to nurture destination competitiveness. Additionally, this study introduces several important research gaps that can serve as sources of inspiration for future studies, shedding light on numerous unexplored facets of this evolving field.

## 2. Theoretical background

### 2.1. Space tourism

Space tourism was originally described as "the temporary movement of people for non-military reasons beyond the Earth's atmosphere" (Duval & Hall, 2015, p. 450). Cohen and Spector (2019) state that space tourism is a specific segment of commercial space travel with leisure and recreational purposes, stemming from technological progress and more in general from the space industry's privatization (Johnson & Martin, 2016).

Friel (2020) maintains that there are at least four key considerations related to the current and future development of space tourism, namely: (i) products and experiences already existing or under testing in the space industry; (ii) the economic operators involved; (iii) demand; (iv) possible opportunities and threats for destinations that decide to invest in space tourism. Among the main opportunities, Sommariva (2018) indicates the rapid development of new technologies for miniaturization of satellites and reuse of space rockets. The main threats are instead related to environmental concerns (Duval & Hall, 2015), which includes both increased orbital debris from launch vehicles and atmospheric pollution from rocket emissions. For these reasons, unfavourable opinions towards space tourism have emerged; for example, Peeters (2018, p. 540) maintains that "I do not see any argument to believe that space tourism could be part of sustainable development on earth" and argues that mass space tourism could even provoke a deficiency of terrestrial resources.

The space tourism market has been subdivided by Cater (2010) into three categories: astrotourism, atmospheric space tourism, and terrestrial space tourism. Astrotourism refers to suborbital (up to 100 km altitude) and orbital flights (over 350 km—e.g. trips to the ISS), and is expected to evolve into lunar voyages and even space hotels(Reichert, 2001). Atmospheric space tourism is the label for high altitude jet flights (up to 20 km) and zero-gravity flights. Finally, terrestrial space tourism ranges from visits to space-related attractions around the world, such as space centres, planetariums, and observatories (Le D ily, 2020), to spacecraft launching events (Soleymani et al., 2019) and space travel simulations (Weaver, 2011). Terrestrial space tourism encompasses also astronomical tourism (also known as celestial tourism or star tourism), i.e. travelling to locations to observe celestial phenomena, e.g. meteor showers or comets, eclipses, conjunctions, and more (Sánchez- Medina et al., 2019). In this context, technologies such as multi-sensorial gadgets enable travellers to experience the outer space environment from our planet (Damjanov & Crouch, 2019), hence removing safety, security, financial, and medical constraints (Ceuterick & Johnson, 2019). More and more often, this experience is labelled as virtual or digital space tourism (Frischauf et al., 2018).

### 2.2. Terrestrial space tourism destination planning

Creating competitive tourism destinations entails choices and decisions that vary starkly across regions. Luštický and Štumpf (2021) define such decision-making process as a collection of co-ordinated actions taken by a complex mix of stakeholders, often with opposing goals. In the specific context of space tourism, the complexity is only amplified by the peculiar nature and background of the stakeholders involved. This means that, to develop a distinctive terrestrial space tourism destination, it is necessary to continuously devote attention and resources to strategic planning (Cronjé & du Plessis, 2020) and to the development of coordination, cooperation and/or collaboration procedures (Mandić & Kennell, 2021).

Moreover, the process involves understanding the unique conditions within the target territory, as well as its competitive standing based on opportunities, strengths, and weaknesses (Cronjé & du Plessis, 2020). Monitoring issues such as harm to the Earth's environment and to its atmosphere (Collins & Autino, 2010) is just one of the risk management activities required for space tourism, to be complemented with cultural, geopolitical, and regulatory considerations (Scott, 2022). These in turn will affect the destination's ability to find or develop the skills required to reach the targeted goals (Fayos-Solá, 1996).

The destination planning process can be interpreted as the mix of strategic, organizational, and operational decisions (Gardiner & Scott, 2018) aimed at the efficient management of stakeholders' resources, products, and services. In this sense, it is pivotal to uncover the key determinants that make up a destination ecosystem (Del Chiappa & Baggio,2015). Therefore, the presence or absence of certain factors can facilitate or hinder the development of a tourism destination (Henderson, 2006, p. 88). Moreover, tourism destinations must develop a vision, identify a differentiating value proposition, and select an appropriate positioning and branding strategy (Crouch & Ritchie, 1999). This planning process entails significant challenges in terms of policy, governance, funding, and resources (Benur & Bramwell, 2015). Indeed, tourism is a dynamic network system (Beritelli et al.,

2014) characterized by non-linear interactions among the different components of the destination itself (Sedarati et al., 2019). Hence, destinations can be considered as open, complex, and adaptive systems that generate numerous relationships in the economic, social, and environmental spheres (Baggio & Sainaghi, 2011).

## 3. Research methodology

### 3.1. Data collection

Our work is structured as qualitative research with an exploratory nature (O'reilly & Parker, 2013). We chose this methodology for two main reasons. First, previous studies on the topic of space tourism are extremely rare. Second, the phenomenon under investigation is characterized by complex issues and inexplicit processes (Messeni Petruzzelli & Savino, 2015) that are too difficult to specify a priori.

The data collection methodology was devised to maximize our understanding of the phenomenon under investigation. Indeed, we leveraged diverse data sources, both primary and secondary, to overcome the limitations of each individual source, since "the most important advantage presented by using multiple sources of evidence is the development of converging lines of inquiry" (Yin, 1994, p. 92). After collection, the data was analysed using a coding scheme derived from the research question and the existing theoretical framework, which allowed us to manage the large amount of data and identify the relevant elements for our research.

#### 3.1.1. Data from multiple secondary sources

Data collection began with the gathering of insights from multiple secondary sources (e.g. webpages, magazine articles, dossiers, blogs, academic articles, and material published through research, reports and similar documents produced by governments and government agencies, and documentation produced by non-government agencies and private operators involved in the space industry). These activities culminated in the creation of a database with 353 pages of information. In addition, about ten hours of Facebook Live as well as videos and interviews on Youtube were downloaded. This wealth of sources allowed us to mitigate the risk of informant bias, control for the subjective judgments of individuals, and hence increase construct validity (Gibbert et al., 2008). It also helped us in identifying the main issues of the topic under investigation, and in enriching the description of space tourism.

After a first round of search, all the retrieved information was put assembled, filtered (i.e. duplicates were removed), and the remaining documents were independently analysed by each researcher. Through this activity we reached a more precise and clear definition of terrestrial space tourism destination, and consequently the identification of the critical factors in their selection and development.

#### 3.1.2. Key-informants

As second step, between March and May 2023, we collected primary data through interviews with space tourism and more generally space industry experts, with the goal of strengthening and validating the findings that emerged from the first step (Eisenhardt & Graebner, 2007). Experts

were identified through online searches, mainly using LinkedIn and Google Scholar. This activity allowed us to reach a list of 11 potential interviewees. While two were not interested in participating and two said they were too busy, seven experts accepted to be interviewed. Thanks to the richness and thoroughness of the information retrieved, we soon reached the "saturation point" (Guest et al., 2006) and decided to end the search for further stakeholders to be interviewed. Interviews were semi-structured and open-ended, lasting between one hour and one hour and twenty minutes. They were conducted in Italian or English with online meeting platforms (Google Meet and Skype) and recorded with the permission of the respondents.

Table 1 lists all the interviewees and the main information about them. An identification code was assigned to each one to facilitate the management of our findings and to preserve anonymity. The semi-structured interview was presented introducing the general aim of the study without making presumptions on the topic. In this way, we encouraged interviewees to talk freely about the aspects they thought to be most relevant.

**Table 1.** The sample.

| Interviewee | Role | Gender | Country | Length of the interview |
|---|---|---|---|---|
| i1 | President of the Apulian Aerospace District | M | Italy | 1 h |
| i2 | Head of Commercialization Department at European Space Agency —ESA | M | Italy | 1 h |
| i3 | Senior Lecturer of Tourism, Hospitality and Events, La Trobe University | M | Australia | 1 h and 20 min |
| i4 | Associate Professor of aerospace engineering, University of Molise | M | Italy | 1 h |
| i5 | Fellow Professor of space tourism, College of Hotel & Tourism Management, Kyung Hee University | F | South Korea | 1 h and 10 min |
| i6 | Director of Business Development & External Relations at G-nous, Venture Space Tech | M | Italy | 1 h and 20 min |
| i7 | Associate Professor in Tourism, School of Management, Yr Ysgol Rheolaeth Swansea University | M | United Kingdom | 1 h |

Questions were designed to provide us with a clearer understanding of the stakeholders and dynamics that occur in a terrestrial space tourism destination. Examples of questions include: what are the relevant actors involved and what is their role in supporting the development of space tourism industry in the Earth? Which are the main factors that companies operating in space tourism consider as priorities in choosing to start new terrestrial space tourism projects? The interviews allowed the authors to obtain a clear portrait of the phenomenon under investigation. Moreover, the richness of sources has been functional for identifying the main issues and assuring data triangulation (Eisenhardt, 1989; Flick et al., 2004).

### 3.2. Data analysis

The analysis of data followed an inductive and iterative process (Strauss & Corbin, 1998). Specifically, we investigated the several domains that compose the space tourism industry, independently evaluating the data sources to form a general understanding of the different cases revealed by the analysis. Procedurally, we first organized all the data to facilitate comparison. This allowed us to comprehensively identify the main factors related to the development of a terrestrial space tourism destination. Then, we discussed our interpretation of the data to identify relationships between the various cases that emerged, hence developing a preliminary understanding of the entire system. Finally, following Eisenhardt (1989), we conducted further iterations between the primary and secondary data and the literature on space tourism, to enhance the emerging findings and better identify the theoretical foundations of our arguments.

## 4. Results

The following sections describe the critical factors that must be considered to develop a distinctive terrestrial space tourism destination. The aim is to generalize as much as possible by explaining the features that should be considered for this type of destination. Hence, the conclusions are deliberately theoretical and do not refer to a specific case.

### 4.1. Terrestrial space tourism destination

In the words of i3, space tourism can be distinguished between "ground-based and air-based space tourism, even if connections could always exist between both experiences, opening to further terms such as terrestrial, virtual, near-space, sub-orbital, low-orbital, and high orbital space tourism". Terrestrial space tourism destinations can be considered as places
designed to provide tourists with the opportunity to live extraordinary experiences based on space-related initiatives. Le D ily (2020, p. 71) has proposed a definition of terrestrial space tourism as "a generic term including any form of tourism happening down on earth, for which the activities are directly or indirectly related to space". This definition is in line with that of Crouch et al. (2009), who states that a terrestrial space tourism destination can be understood as a destination in which there is a coherent and adequate ecosystem of resources and services around a main attraction.

Our findings highlighted important insights including how to harmonize the plethora of interests in this destination and how to persuade tourists to visit it. Particularly interesting was what i3 stated:

> *in the past, it was all about the "space race" between Russia and America for the first country to put a human on the moon. Then, others such as China and India joined in. These were all government sponsored and often part of the defence budgets of each country. Then, other countries like Japan also developed space programs to launch satellites and of course the international space station for science. Now things are shifting, and the private sector has joined the race.*

Being a novel phenomenon, space tourism requires complex intervention by policy makers. As stated by i7, "[policy makers] must develop regulations, rules, guidelines, and strategies that directly affect both the daily activities and long-term development of stakeholders and their

decisions". A further concern regards opportunities and threats related to public- private partnerships that highlight new complex forms of destination governance (Mazzucato & Robinson, 2018, p. 175). The reasons to collaborate can be of different nature, ranging from the need to provide better public services by introducing commercial sector know-how, to improving efficiencies, building infrastructures, providing funding, and ensuring regulation and safety standards (from the interview to i5 and to i6).

Around the world, countries have implemented specific interventions for this phenomenon. Space Coast can be considered the best example for several reasons. It is in a region of the U.S. state of Florida where, in 1958, after NA SA was formed, the agency set up its base of operations for space exploration. Today it is home to many space-themed businesses with the space tourism industry accounting for as much as 15% of total tourism in the region. The Space Coast Office of Tourism (https://www.visitspacecoast.com/) is the destination management organization of the Brevard County, Florida. Funded through a tourist development tax, the D MO works for advertising and marketing as well as projects that support tourism, such as beach renourishment and support for event organization.

There is a rising number of companies engaged in favouring the emergence of space tourism demand or in supporting the development of technologies that will facilitate space tourism firms to function. Table 2 lists the five most valuable space companies in a thriving market where several incumbents and start-ups are redefining the whole space travel industry.

**Table 2.**The five most valuable space companies.

| | |
|---|---|
| Virgin Galactic | With the spaceplane VSS Unity the company started to test flights in the outer space in December 2018 with the goal start regular commercial suborbital spaceflights soon |
| Blue Origin | The company is testing orbital spaceflights based on a more traditional rocket, known as the New Shepard. It takes off and lands vertically |
| SpaceX | The company intention is to send paying customers on a trip around the moon, opining to lunar tourism and other forms of space travel extending beyond Earth's orbit |
| Boeing | The company has an agreement with NASA as part of its Commercial Crew Development programme. The aim is to engage private sector companies in the production of crew vehicles. The company's contract with NASA pushed Boing to be as a major player in the space tourism industry. It has the right to sell seats to space tourists: the project is to reserve at least one seat for space tourist in each future space mission |
| Orion Span | The company' mission is to build a private commercial space station placed in Earth's low orbit that would function as a space hotel. Even if the project is still out to start, the company has declared to have already sold out several months' worth of hotel reservations |

Source: https://www.revfine.com /space-tourism /.

From the opportunity to witness rocket launches to directly meeting an astronaut, there is a range of products, activities, and events that can be useful to explain what kind of leisure and recreation is

provided. This includes active products such as zero-gravity and potentially suborbital flights, to places very similar to theme parks (Cater, 2010). Further examples are "space art museum, space pool & Aquarium, space gym, space disco, space 4D theatre, space academy, space MICE, future food farm, future clothes store" as listed in the visionary project of the Space Port Japan (Space Port Japan, 2020).

The visitor centre at Kennedy Space Center is a notable example of leisure and recreation activities related to space(Cater, 2019). It has all the services visitors could desire, including restaurants, buses, and retail shops. Filled with engaging exhibits, attractions, and activities—such as the ones listed in Table 3—the Kennedy Space Center Visitor Complex offers tourists a glimpse into the world of space and technology.

**Table 3.** Examples of experiences provided by the Kennedy Space Centre Visitor Complex.

| Experiences | Explanation |
|---|---|
| Astronaut Training Simulators | Visitors can learn how to pilot the space shuttle using high-tech simulators that using virtual reality replicate activities on Mars |
| Saturn V Rocket | Visitors can visit and discover a real Saturn V rocket that is the largest rocket ever flown through space |
| Journey to Mars | Visitors can play interactive games that allow users to trying simulator replicas of the Mars rovers |
| Rocket Garden | Visitors can discover the history of early rocket science |

Source: https://www.kennedyspacecenter.com /explore-attractions/all-attractions.

The National Air and Space Museum of the Smithsonian Institution in Washington, D C, is one of the most popular museums in the world. About eight million tourists each year visit the site and see flying machines ranging from the 1903 Wright Flyer to SpaceShipOne(National Air and Space Museum,n.d.). The Smithsonian Institution National Air and Space Museum (NA SM) holds several space flight equipment such as the Apollo 11 command module, the "Spirit of St. Louis", the original Wright 1903 Flyer, and a lunar rock sample that visitors can touch. It is also a research centre for the history, science, and technology of aviation and space flight. Additional examples are the Euro Space Centre located in Wallonia (Belgium) (Euro Space Center, n.d.) and Dubai Museum of the Future(Museum of the Future, n.d.). The former has simulators of space flight and micro-gravity and hosts the Amicitia, the only full-scale mock-up of a U.S. Space Shuttle present in Europe. The latter explores how society could evolve in the coming decades using science and technology. It incorporates elements of traditional exhibitions, immersive theatre, and themed attractions, so visitors can look beyond the present, towards the future's limitless possibilities.

Considering the specific context of terrestrial space tourism, hotels that better intercept this specific tourism demand are the ones that offer proposals in line with the segment. Many examples exist around the world. The Fantasyland Hotel can be considered the most thoroughly space-themed immersive hotel. From a custom bed to complete lighting and stars on every wall, the hotel offers rooms in a variety of space décors. At the Barceló Sants, guests can imagine they are on an inter-

galactic trip thanks to the space-themed, minimalist atmosphere ( B arceló, n.d.). The hotel's 312 Orbital rooms, 52 Stratosphere rooms and 14 Orbital suites give the hotel an avant-garde and futuristic look that resembles a space station. The Pengheng Space Capsules Hotel might beconsidered the most advanced and potentially the most exciting space-themed hotel. Figure 1 shows a deluxe capsule room with a sleeping capsule designed to mimic space life in both form and function. This hotel is entirely staffed by robots.

**Figure 1.** Pengheng Space Capsules Hotel, Shenzhen. A room proposal. Source: Pengheng Space Capsules Hotel Shenzhen.

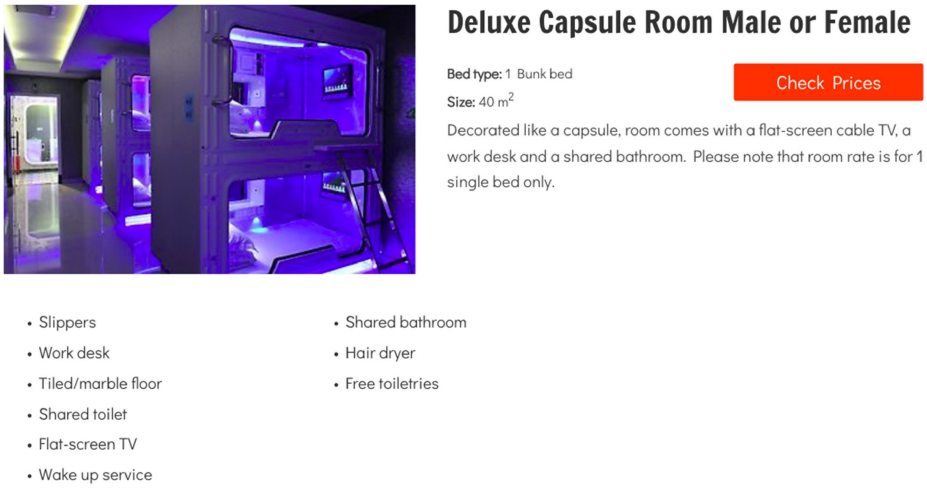



**Figure 2.** The UFO tree hotel. Source: Three Hotel (n.d.).

Although of smaller impact in terms of tourist flows, there are other significant space-themed accommodations that harness the growing attraction of space. For example, UFO (Figure 2) is the name of a treehouse hotel designed to look like a flying saucer landing on Earth. It is located 30

miles south of the Arctic Circle and includes outer-space-themed offerings that accommodate up to five people.

### 4.2. Commercial spaceport

In a terrestrial space tourism destination, the presence of a commercial spaceport is pivotal. Described as "a launch facility whose main target market is commercial vehicle operators, and whose primary mission is to generate revenue by offering competitive, responsive, and efficient launch services with minimal bureaucratic and regulatory burden" (Futron Report, 2005, p. 5), the spaceport serves as a front door to space, acting as a catalyst to stimulate space-related economic activities (Webber, 2013). Sophisticated ecosystems usually develop around spaceports, with industrial and aerospace companies specialized in products and services for take-off, launch, maintenance, and assembly activities.

First established for scientific endeavours, spaceports are increasingly shifting towards commercial purposes. Although their primary goal is to become a hub for tourists who ascend to and return from space, spaceports can also attract the interest of people who want to visit and enjoy experiences proposed in situ. Three main types of spaceports exist, namely greenfield spaceports, augmented airports, and federal sites that have been repurposed for commercial use. Greenfield spaceports are sites that have been purposely built from the ground up, such as Spaceport America (New Mexico, USA). Officially declared operational on 18 October 2011, Spaceport America was the first spaceport in the world to be built for commercial purposes. A second example of greenfield spaceport is Wenchang Spacecraft Launch Site (WSLS) (seeBox 1), located on the island of Hainan, in southern China. Conceived as a suborbital test centre, it was selected for its position, which is only 19° north of the equator. With its mix of tropical beaches and space tourism, Wenchang has attempted to transform the area of Longlou into a special aerospace-themed township by constructing several inns, hotels, and furniture malls. The observation facilities outside the space centre have a capacity of nearly 25 thousand people, while a huge space theme park, with an estimated annual capacity of two million visitors, is expected to open soon. Tourists can attend science exhibits and experience realistic space missions through advanced technologies such as virtual reality (China Space Report, n.d.).

***Box 1. The Wenchang Spacecraft Launch Site.***

***The Wenchang Spacecraft Launch Site allows tourists to visit the aircraft assembly plant, vertical rocket assembly test plant, the launch tower, launch site, command hall, observation room, and remote ignition and launch court. There are also an aerospace science exhibition, three dimensional (3D) movies cinemas, and a space theme park.***

***Source: Our elaboration from https://chinaspacereport.wordpress.com/facilities/wenchang/.***

As their classification suggests, augmented airports are instead existing airports that have been augmented to support spaceflight. They are becoming increasingly popular, with several examples around the world such as the Mojave Air and Space Port in California (USA). These augmented airports can also host parabolic flights, which "reproduce gravity-free conditions in an aircraft by alternating upward and downward arcs interspersed with level flight" (AirZeroG,n.d.). Born to

provide a microgravity environment for scientists to conduct research without going into space, there are nascent examples of parabolic flights that have leisure scope and that offer passengers "the opportunity to experience simulated weightlessness through a flight on an adapted Boeing 727 aircraft. It flies in parabolic arcs, at the top of which passengers inside the plane float in weightlessness for nearly 30 s" (from the interview to i2).

Notably, a strong trend towards recreational and extreme tourism experiences has now become evident. As found in the interview to i2, balloon-borne pressurized capsules as the ones proposed by the U.S. company Space Perspective are becoming of interest for consumers, and therefore for investors as well. The tourist-carrying stratospheric balloon systems fly for about six hours from lift-off to splashdown, taking "passengers on a gentle ride to a maximum altitude of about 100,000 feet (30,000 meters), allowing a view of our thin atmosphere against the blackness of space" (Wall, 2022).

Finally, commercial spaceports built on federal property that has been repurposed for commercial use include popular destinations such as the NA SA Kennedy Space Centre in Florida (USA), which registers over 1.5 million visitors per year and has been active since 1949 (Toivonen, 2022). Box 2 sketches its history.

***Box 2. The history of the visitor complex at NASA Kennedy Space Centre.***

***The visitor complex at NA SA Kennedy Space Centre opened in 1967 while since 1995 it is run by Delaware North, a leading hospitality and visitor management company. Born for self-guided car tours, today the centre hosts 1.5 million visitors with a large set of attractions.***

***Source: Our elaboration from https://www.kennedyspacecenter-tickets.com/kennedy-space-center-nasa/.***

As highlighted also by the interview to i7, a terrestrial space tourism destination can exist also without the presence of a dedicated spaceport. Examples span from sophisticated ecosystems built to simulate space life experiences, to more simple sites such as astronomical observatories for dark sky tourism. La Palma, in the Canary Islands, is "one of the best places for stargazing. Its unique position in the Atlantic Ocean and its exceptionally clear skies allow it to be a natural cloud screen that reproduces sunlight away from the sky above" (from the interview with i2). Finnish Lapland is a further example. It is an internationally renowned and popular tourism destination for witnessing the Aurora Borealis (Northern Lights), exploring the universe from Earth using the naked eye (Toivonen, 2022). These experiences could be offered in tandem with other space-related activities, such as "a virtual game environment for authentic astronaut training and adventure space travel experiences" (Space Nation, 2020 cited in Toivonen, 2022, p. 3). Of course, these activities would have different purposes and organizational structures compared to spaceports. However, they are in line with tourism sustainability issues that continue to be preeminent for both scholars and practitioners (Ruhanen et al., 2015).

### 4.3. Contextual factors that can support or hinder the development of a terrestrial space tourism destination

It makes sense to consider the contextual factors that can support or hinder the development of a terrestrial space tourism destination, related to, inter alia, location and the predicted flight trajectory path and exclusion zone, existing facility infrastructures, economic viability, and carrying capacity in a broader sense (as confirmed also by i3 and i5).

Space tourism can benefit the economy of terrestrial space tourism destinations in several ways (Friel, 2020). On the micro level, these include new opportunities for entrepreneurship, financing, and funding, while on the macro level the economic impact of space tourism favours job creation, taxation generation, and sustain the entire supply chain (Friel, 2020). More in general, we can say that there are three variables to consider: safety, local community acceptance, and quality of the environment. To these we should add the need for a good education for all the stakeholders involved.

#### 4.3.1. Critical factor 1: safety

Safety is a central issue for the space tourism industry (Crouch et al., 2009). Due to its uniqueness, space tourism needs specific safety regulations and standards to ensure the economic sustainability and applicable procedures for its players (from the interview to i6). Specific protocols and standards refer to several aspects such as robust safety systems, safety- oriented training activities, and emergency response procedures for dealing with potential incidents (Reddy et al., 2012).

In spaceports for example, some key aspects clearly arise. Regulatory compliance is at the base of any discussions. Spaceports and their operators must adhere to strict regulations and standards set by aviation and space agencies that cover aspects such as safety protocols, vehicle design, and operational procedures. They must produce detailed emergency response plans in place to address scenarios such as launch and landing accidents, fires, or medical emergencies. These plans involve coordination with local emergency services and healthcare facilities. Safety communication is also essential. All stakeholders need to be informed about the risks associated with space travel, and informed consent is a vital part of the process.

Space tourism is a rapidly evolving field, and safety is a priority for both regulators and industry stakeholders. As the industry matures, safety standards and practices will continue to evolve to ensure the well-being of all those involved in space tourism.

#### 4.3.2. Critical factor 2: local community acceptance

A high level of acceptance by residents is also pivotal for the project's development since a hostile local community will affect destination attractiveness (from the interview to i6). The quality of the environment is associated to the capacity of local stakeholders to support the sustainability of the project not only in terms of economic impact, but also of social and environmental ones (from the interview to i5). Therefore, the issue of sustainable development is highly relevant "to ensure long-term viability, minimize environmental impact, promote responsible growth, and reduce emissions" (i5).

Beyond the compelling boost space tourism can provide to the economy, this activity could have a profound impact on current political-economic geography and the neoliberal capitalism paradigm

(Beery, 2012), which opens new research topics for tourism economists.

### 4.3.3. Critical factor 3: quality of the environment

Accessibility and ease of access to a destination is a further issue to consider. In part, this is influenced by transportation services, and more in general by spatial issues. It is also influenced by regulatory hurdles and high investment costs (i5).

Widespread knowledge superstructures are a prerequisite. These are ad-hoc knowledge hubs where science and technology parks, incubators, and accelerators for enriched technology transfer, research institutions, and universities find fertile ground to establish roots and flourish. The main aim is to facilitate their accessibility, especially for researchers and start-ups (from the interview to i6).

A final concern refers to the aerospace industry that plays a leading role in the development of terrestrial space tourism destinations. Space companies come from high-tech industries, producing innovation that can cross-fertilize the whole value chain, as well as spill over into other industries and technology enablers (from the interview to i1). Space is not yet recognized as a category in international standards of industrial classification. This produces a high level of fragmentation in worldwide national space statistics, which therefore vary in definition, coverage, and methodology, thus generating a lackof international comparability (European Space Agency,2019). Undseth et al. (2020) defined the segments that compose the space value chain. As explained in Table 4, to set up the perimeters of space activities, products, and services, three space segments have direct implications in the application of the space industry to other segments that indirectly benefit from it.

**Table 4.** The space value chain.

| Space segments | Components |
|---|---|
| Upstream segment | This group refers to research, space manufacturing and ground systems such as primary and applied research, engineering and scientific support initiatives, supply of components and materials, manufacturing of space systems, tracking and command stations, equipment and subsystems, telemetry |
| Downstream segment | Products and services for terrestrial use. Examples are: satellite technology, signals, data to function (e.g. satellite broadcasting, selected GIS, GNSS-enabled devices) |
| Space- related segment | Technology transfer from the space sector that use satellite technology but do not depend on it or space applications, products and services created by spin-offs |

Source*:* https://space-economy.esa.int/article/34/measuring-the-space-economy.

Several key points emerge on this flourishing industry, such as the impressive number of companies, investors, and R&D hubs that have already crossed the US$400bn (International Banker, 2022). A further highlight is represented by new job growth. As stated by the U.S. Chamber of Commerce(2022), “the number of jobs in the space economy is estimated to be

somewhere around 400,000 today, but it is projected to rise to 1.5 million jobs or more in the future". Therefore, new jobs need to be filled not just by rocket scientists, but also in other areas such as marketing, accounting, design, and manufacturing (from the interview to i4).

#### 4.3.4. Critical factor 4: good education

Education and training are a further category that needs attention. The fast-growing space market calls for highly skilled human resources (from the interview to i3). At the same time, training programme criteria for leisure passengers must be also considered. The higher education system feeding tourism and hospitality also needs to focus on the new skills and competencies required to nurture the next generation of space leaders (Toivonen, 2022). The "space hotel" and its management could be a new branch of hospitality studies (Reichert, 2001). Strickland (2012) has attempted to portray and define hotel operations in space, and then he has moreover discussed challenges for staff working at space hotels (Strickland, 2017). Moreover, Goehlich et al. (2013) has discussed the qualifications and training requirements for future spacecraft pilots and proposed that tour guide skills would become one of the competences of pilots. More generally, the goal will be to offer students new skills and competencies to understand the space tourism industry (also confirmed with the interview to i7 and i1). Specific topics can refer to regulations, market demand and supply, suborbital and orbital space flight engineering, delivery vehicle capability, and safety, among others.

An emerging has also been identified for all the activities developed to train people who want to experience being "an astronaut for a day". Table 5 lists some examples provided by the Kennedy Space Center Visitor Complex. Similarly, the start-up Orbite has the mission to open in 2024 the Astronaut Training and Spaceflight Gateway Complex—the first commercial equivalent of a NA SA training centre(n.d.). In the meantime, the company has launched space camps for adults in Florida and France where students can experience different programmes to study rocket science and modern spaceflight vehicles, taste food that astronauts eat, take virtual-reality space vehicle hangar tours and mission simulations, plus feel weightlessness from different parabolic flight experiences (Compton, 2021).

**Table 5.** Examples of education programmes provided by the Kennedy Space Centre Visitor Complex.

| Programmes | Explanation |
|---|---|
| Overnight Adventures | Students can stay one night long at the Space Shuttle Atlantis and the Apollo/Saturn V Centre |
| Mars Base 1 | Students can work through the challenges of living on set in a futuristic landscape that reproduces the Martian surface (managing a base operations centre on Mars, growing, and harvesting plants in the botany lab, etc.) |
| After Hours Adventure | Students can spend an evening solving STEM-based challenges and exploring Space Shuttle Atlantis |

| | |
|---|---|
| Astronaut Training Experience | Students can do mission simulations including launching, landing, and walking on Mars |

Source: https://www.kennedyspacecenter.com /cam ps-and-education.

Both projects highlight how it is becoming more and more difficult to distinguish between an entertainment attraction and a service with an educational mission that offers commercial space training programmes to introduce potential private astronauts to space (Cater, 2010). This is the case of places such as the dome-shaped Hawaii Space Exploration Analog Simulation (H I-SE A S) habitat, where people experience life as it would be in extreme space environments. There are many examples such as rooms for hostile environments (survival simulator), vegetable garden for simulating which food products better fit with the life in the space, and laboratories for experimenting new materials to build infrastructures in other planets (from the interview to i2).

Support services complement the space tourism industry. These include general infrastructure such as roads and public and private transport systems, telecommunications, health care facilities, sanitation, electricity generation systems, sewage treatment, water supply, financial services, and technology. In addition, service infrastructure embraces administrative offices, food storage, pharmacies, shopping facilities, and bookstores that provides services to both tourists and locals. Finally, the destination's location (accessibility) relative to major source markets is an "added value" and can have a major impact on a terrestrial space tourism destination competitiveness (from the interview to i7).

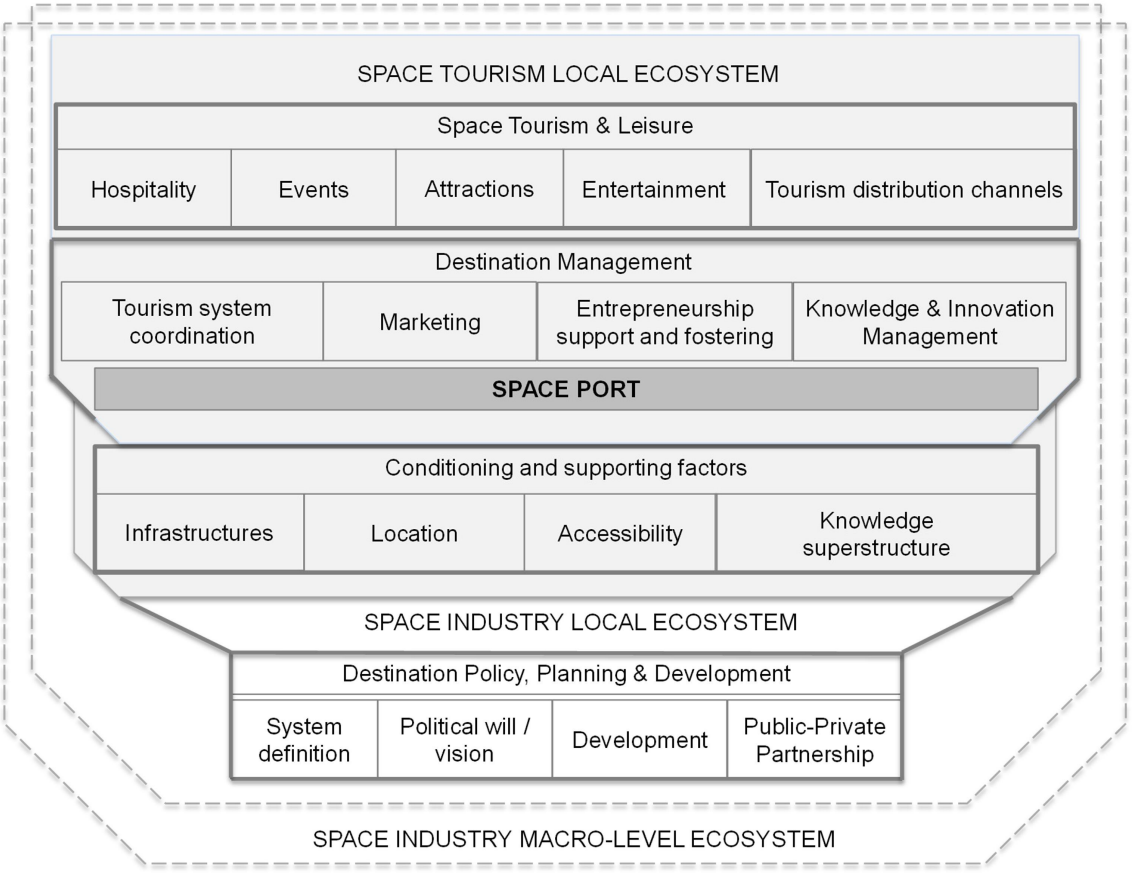
**5. Discussion and future research avenues**

The main aim of this research was to unveil the critical factors that gravitate around the concept of terrestrial space tourism destination. These are summarized in Figure 3.

According to Browder and Newman(2019, p. 1), "a spaceport requires significant investment of public funds, which can be risky considering there is already an overcapacity of launch sites in comparison to launch demand". At the same time, the role of space tourism seems to be pivotal for the success of commercial spaceports, given that without the tourism, it is safe to say that very few, if any, of the developing spaceports can be commercially viable (Webber, 2012). This underlines the importance and nature of public-private cooperation for terrestrial space tourism destinations. Governments seeking to expand their capabilities for space applications need to recognize the important position that the private sector has in providing these capabilities at reduced cost and risk if governments collaborate with for-profit organizations.

The space industry is currently witnessing a rapid surge in both interest and investment, suggesting it may be on a trajectory that surpasses conventional expectations of sustainability (Scott, 2022). Since the increasing of the commercial space tourism generates obvious environmental concerns, such as orbital debris from launch vehicles and greater emissions, it is urgent to better understand the repercussions associated with the growth of space tourism. This is also true when the focus is on the development of space tourism on Earth since it involves critical economic, social, and environmental concerns such as overcrowding and excessive dependence on tourism.

**Figure 3.** The terrestrial space tourism destination.




On the other side, the destination development through activities related to space tourism can be a great opportunity to develop new competences and knowledge, encouraging economic and cultural growth (Collins & Autino, 2010). This means for example that new types of jobs will quickly become reality and so designing a new learning ecosystem will become a priority soon given the complexity and variety of new skills and competencies that the space industry requires (Webber, 2012).

The cases discussed above suggest that future research should investigate new business models at terrestrial space tourism destinations and the role that innovation can have in generating new and appealing services. Future research is also required to support our understanding of space firms because new business and financing models are multiplying rapidly.

As with other types of destinations, terrestrial space tourism destinations also require a well-organized and complex system of suitable physical and technological structures (Webber, 2013). Finally, it requires the ability to develop a common vision among players directly involved in space tourism but also to efficiently communicate with the plethora of stakeholders that gravitate around the space tourism system since this sector has several implications and interdependencies with other sectors.

Research that investigates tourist perceptions of space-launch destinations have been almost non-

existent, expect for Wang et al. (2022)'s recent paper that revealed how Chinese tourists display great curiosity towards space-related activities. They also found that interest in this market to visit a space launch tourism destination is generally high. That should encourage future researchers to empirically validate and generalize these theoretical assertions.

Our paper reveals how space tourism is a niche market with specificities that call for dedicated research. In addition, we have shown how a focus on space tourism at the destination level can be a promising research field. Our analysis suggests some future research avenues that we summarize in six research gaps.

**Research Gap 1**: Research on commercial spaceports should identify standard methodologies to perform analyses on the sustainability of a spaceport. In addition, more studies are required on how to merge tourism needs with the efficient functioning of these sites.

**Research Gap 2**: Research on destination governance for space tourism should take into serious consideration the possible problems of environmental sustainability connected with the development of space tourism.

**Research Gap 3**: Research on space firms should address the factors that can support the birth and development of new space businesses.

**Research Gap 4**: Research on space tourism should consider tourists' orientation towards space-related activities at the destination level.

**Research Gap 5**: Research on education and training is needed to assess the educational content that must be developed to prepare future managers and operators in space tourism.

**Research Gap 6**: Research on terrestrial space tourism destinations should address various sources of risk and crisis, including not only those linked to health and safety issues for tourists but also the great financial, legal, and reputational risks for tourism operators.

Finally, to give further support to our theoretical model, we encourage future mixed methodologies as well as multi- method research methods based on large samples and comparisons of different destinations. Since such designs are complex and require a wealth of resources, programmatic research projects may be the best choice to address these challenging issues.

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**References**

Abreu-Novais, M., Ruhanen, L., & Arcodia, C. (2016). Destination competitiveness: What we know, what we know but shouldn't and what we don't know but should. *Current Issues in Tourism*, *19*(6), 492–512. https://doi.org/10.1080/13683500.2015.1091443

Airzerog. (n.d.). Take an air zero G. Flight on board the airbus a310 zero G. https://www.airzerog.com/

Baggio, R., & Sainaghi, R. (2011). Complex and chaotic tourism systems: Towards a quantitative approach. *International Journal of Contemporary Hospitality Management*, *23*(6), 840–861. https://doi.org/10.1108/09596111111153501

Barceló. (n.d.). *About*. https://www.barcelo.com/en-es/barcelo-sants/

Beery, J. (2012). State, capital and spaceships: A terrestrial geography of space tourism. *Geoforum*, *43*(1), 25–34. https://doi.org/10.1016/j.geoforum.2011.07.013

Benur, A. M., & Bramwell, B. (2015). Tourism product development and product diversification in destinations. *Tourism Management*, *50*, 213–224. https://doi.org/10.1016/j.tourman.2015.02.005

Beritelli, P., Bieger, T., & Laesser, C. (2014). The new frontiers of destination management: Applying variable geometry as a function-based approach. *Journal of Travel Research*, *53*(4), 403–417. https://doi.org/10.1177/0047287513506298

Browder, B., & Newman, D. (2019). How to build a spaceport: Analysing spaceport feasibility via financial analysis. In *Proceedings of the 70th International Astronautical Congress* (pp. 1–10). AIAA.

Cater, C. (2019). History of space tourism. In E. Cohen & S. Spector (Eds.), *Space tourism* (pp. 51–66). Emerald Publishing Limited.

Cater, C. I. (2010). Steps to space. Opportunities for astrotourism. *Tourism Management*, *31*(6), 838–845. https://doi.org/10.1016/j.tourman.2009.09.001

Ceuterick, M., & Johnson, M. R. (2019). Space tourism in contemporary cinema and video games. In E. Cohen & S. Spector (Eds.), *Space tourism* (pp. 51–66). Emerald Publishing Limited. Chang, E. Y. W. (2020). From aviation tourism to suborbital space tourism: A study on passenger screening and business opportunities. *Acta Astronautica*, *177*, 410–420. https://doi.org/10.1016/j.actaastro.2020.07.020

Chang, Y. W. (2015). A preliminary examination of the relationship between consumer attitude towards space travel and the development of innovative space tourism technology. *Current Issues in Tourism*, *20*(14), 1431–1453. https://doi.org/10.1080/13683500.2015.1005580

China Space Report. (n.d.). Whenchang Space Launch Centre. https://chinaspacereport.wordpress.com/facilities/wenchang/

Cohen, E., & Spector, S. (2019). Space tourism-past to future: A perspective article. *Tourism Review*, *75*(1), 136–139. https://doi.org/10.1108/TR-03-2019-0083

Collins, P., & Autino, A. (2010). What the growth of a space tourism industry could contribute to employment, economic growth, environmental protection, education, culture and world peace. *Acta Astronautica*, *66*(11–12), 1553–1562. https://doi.org/10.1016/j.actaastro.2009.09.012

Compton, N. B. (2021, December 8). The next step in space tourism? A luxury training center for civilians. https://www.washingtonpost.com/travel/2021/12/08/space-tourism-luxury-training/

Cronjé, D. F., & du Plessis, E. (2020). A review on tourism destination competitiveness. *Journal of Hospitality and Tourism Management*, *45*, 256–265. https://doi.org/10.1016/j.jhtm.2020.06.012

Crouch, G. I. (2001). The market for space tourism: Early indications. *Journal of Travel Research*, *40*(2), 213–219. https://doi.org/10.1177/004728750104000212

Crouch, G. I., Devinney, T. M., Louviere, J. J., & Islam, T. (2009). Modelling consumer choice behaviour in space tourism. *Tourism Management*, *30*(3), 441–454. https://doi.org/10.1016/j.tourman.2008.07.003

Crouch, G. I., & Ritchie, J. B. (1999). Tourism, competitiveness, and societal prosperity. *Journal of Business Research*, *44*(3), 137–152. https://doi.org/10.1016/S0148-2963(97)00196-3

Damjanov, K., & Crouch, D. (2019). Virtual reality and space tourism. In E. Cohen & S. Spector (Eds.), *Space tourism* (pp. 117–137). Emerald Publishing Limited.

Del Chiappa, G., & Baggio, R. (2015). Knowledge transfer in smart tourism destinations: Analyzing the effects of a network structure. *Journal of Destination Marketing & Management*, *4*(3), 145–150. https://doi.org/10.1016/j.jdmm.2015.02.001

Duval, D. T., & Hall, C. M. (2015). Sustainable space tourism: New destinations, new challenges. In C. M. Hall, S. Gossling, & D. Scott (Eds.), *The Routledge handbook of tourism and sustainability* (pp. 450–459). Routledge.

Dwyer, L., & Kim, C. (2003). Destination competitiveness: Determinants and indicators. *Current Issues in Tourism*, *6*(5), 369–414. https://doi.org/10.1080/13683500308667962

Eisenhardt, K. M. (1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, *32*(3), 543–576. https://doi.org/10.2307/256434

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, *50*(1), 25–32. https://doi.org/10.5465/amj.2007.24160888

European Space Agency. (2019). *Measuring the space economy*. https://space-economy.esa.int/article/34/measuring-the- space-economy

Euro Space Center. (n.d.). *About*. https://www.eurospacecenter.be/en/

Fantasyland Hotel. *About*. https://flh.ca/

Fayos-Solá, E. (1996). Tourism policy: A midsummer night's dream? *Tourism Management*, *17*(6), 405–412. https://doi.org/10.1016/0261-5177(96)00061-1

Flick, U., Von Kardorff, E., & Steinke, I. (2004). What is qualitative research? An introduction to the field. *A Companion to Qualitative Research*, *1*, 3–11.

Friel, M. (2020). Tourism as a driver in the space economy: New products for intrepid travellers. *Current Issues in Tourism*, *23*(13), 1581–1586. https://doi.org/10.1080/13683500.2019.1628189

Frischauf, N., Horn, R., Kauerhoff, T., Wittig, M., Baumann, I., Pellander, E., & Koudelka, O. (2018). New space: New business models at the interface of space and digital economy: Chances in an interconnected world. *New Space*, *6*(2), 135–146. https://doi.org/10.1089/space.2017.0028

Futron Report. (2005). *Feasibility study of a Florida commercial spaceport*. https://www.rymdturism.se/images/pdf/Futron- Feasibility-Study-of-a-Florida-Commercial-Spaceport-Sept-2005.pdf

Gardiner, S., & Scott, N. (2018). Destination innovation matrix: A framework for new tourism experience and market development. *Journal of Destination Marketing & Management*, *10*, 122–131. https://doi.org/10.1016/j.jdmm.2018.07.002

Gibbert, M., Ruigrok, W., & Wicki, B. (2008). What passes as a rigorous case study? *Strategic Management Journal*, *29*(13), 1465–1474. https://doi.org/10.1002/smj.722

Goehlich, R. A., Anderson, J. K., Harrold, N. N., Bemis, J. A., Nettleingham, M. T., Cobin, J. M., & Ilchena, N. Y. (2013). Pilots for space tourism. *Space Policy*, *29*(2), 144–153. https://doi.org/10.1016/j.spacepol.2013.03.011

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, *18*(1), 59–82. https://doi.org/10.1177/1525822X05279903

Henderson, J. C. (2006). Tourism in Dubai: Overcoming barriers to destination development. *International Journal of Tourism Research*, *8*(2), 87–99. https://doi.org/10.1002/jtr.557

International Banker. (2022). *Space: Investing in the final frontier*. https://internationalbanker.com/brokerage/space- investing-in-the-final-frontier/

Johnson, M. R., & Martin, D. (2016). The anticipated futures of space tourism. *Mobilities*, *11*(1), 135–151. https://doi.org/10.1080/17450101.2015.1097034

Le Dily, C. (2020). *Tourist motivations & terrestrial space tourism* [Unpublished Master thesis]. Arctic University of Norway.Luštický, M., & Štumpf, P. (2021). Leverage points of tourism destination competitiveness dynamics. *Tourism ManagementPerspectives*, *38*, Article 100792. https://doi.org/10.1016/j.tmp.2021.100792

Mandić, A., & Kennell, J. (2021). Smart governance for heritage tourism destinations: Contextual factors and destination management organization perspectives. *Tourism Management Perspectives*, *39*, Article 100862. https://doi.org/10.1016/j.tmp.2021.100862

Mazzucato, M., & Robinson, D. K. (2018). Co-creating and directing innovation ecosystems? NASA's changing approach to public-private partnerships in low-earth orbit. *Technological Forecasting and Social Change*, *136*, 166–177. https://doi.org/10.1016/j.techfore.2017.03.034

Messeni Petruzzelli, A., & Panniello, U. (2020). *Space economy. Storia e prospettive di business*.

FrancoAngeli.
Messeni Petruzzelli, A., & Savino, T. (2015). Reinterpreting tradition to innovate: The case of Italian haute cuisine. *Industry and Innovation*, *22*(8), 677–702. https://doi.org/10.1080/13662716.2015.1122512
Molina-Azorin, J. F., Pereira-Moliner, J., & Claver-Cortés, E. (2010). The importance of the firm and destination effects to explain firm performance. *Tourism Management*, *31*(1), 22–28. https://doi.org/10.1016/j.tourman.2009.02.009
Museum of the Future. (n.d.). *About*. https://museumofthefuture.ae/en/about-us
National Air and Space Museum. (n.d.). *About*. https://airandspace.si.edu/about
Olya, H. G., & Han, H. (2020). Antecedents of space traveller behavioural intention. *Journal of Travel Research*, *59*(3),528–544. https://doi.org/10.1177/0047287519841714
Orbite inc. (n.d.). *About*. https://www.orbitespace.com/
O'reilly, M., & Parker, N. (2013). "Unsatisfactory saturation": A critical exploration of the notion of saturated sample sizes in qualitative research. *Qualitative Research*, *13*(2), 190–197. https://doi.org/10.1177/1468794112446106
Ormond, J., & Dickens, P. (2019). Space tourism, capital, and identity. In E. Cohen & S. Spector (Eds.), *Space tourism* (pp.223–244). Emerald Publishing Limited.
Peeters, P. (2018). Why space tourism will not be part of sustainable tourism. *Tourism Recreation Research*, *43*(4), 540–543. https://doi.org/10.1080/02508281.2018.1511942
Pengheng Space Capsules Hotel Shenzhen. *About*. https://pengheng-space-capsules-hotel.hotel-shenzhen.com/en/
Reddy, M. V., Nica, M., & Wilkes, K. (2012). Space tourism: Research recommendations for the future of the industry and perspectives of potential participants. *Tourism Management*, *33*(5), 1093–1102. https://doi.org/10.1016/j.tourman.2011.11.026
Reichert, M. (2001). The future of human spaceflight. *Acta Astronautica*, *49*(3–10), 495–522. https://doi.org/10.1016/S0094-5765(01)00133-3
ReportLinker. (2021). *Global space tourism growth opportunities*. https://www.reportlinker.com/p06188596/?utm_source = GNW
Ritchie, J. B., & Crouch, G. I. (2003). *The competitive destination: A sustainable tourism perspective*. Cabi.
Roberts, T. G. (2019). *Spaceports of the world*. Center for Strategic and International Studies. https://csis-website- prod.s3.amazonaws.com/s3fs-public/publication/190314_Spaceports_The_World.pdf
Ruhanen, L., Weiler, B., Moyle, B. D., & McLennan, C.-L. J. (2015). Trends and patterns in sustainable tourism research: A25-year bibliometric analysis. *Journal of Sustainable Tourism*, *23*(4), 517–535. https://doi.org/10.1080/09669582.2014.978790
Sánchez-Medina, A. J., Alonso-Hernández, J. B., & Voltes-Dorta, A. (2019). Astrotourism and night sky brightness forecast: First probabilistic model approach. *Sensors*, *19*(13), 2840. https://doi.org/10.3390/s19132840
Scott, M. (2022). A space tourism destination: Environmental, geopolitical and tourism branding considerations for New Zealand as a "launch state". *Journal of Sustainable Tourism*, *30*(9), 2240–2253. https://doi.org/10.1080/09669582.2020.1817049
Sedarati, P., Santos, S., & Pintassilgo, P. (2019). System dynamics in tourism planning and development. *Tourism Planning& Development*, *16*(3), 256–280. https://doi.org/10.1080/21568316.2018.1436586
Soleymani, M., Fakoor, M., & Bakhtiari, M. (2019). Optimal mission planning of the reconfiguration process of satellite constellations through orbital manoeuvres: A novel technical framework. *Advances in Space Research*, *63*(10), 3369–3384. https://doi.org/10.1016/j.asr.2019.02.003
Sommariva, A. (2018). *The political economy of the space age*. Vernon Press.
Space Port Japan. (2020). *Space Port Japan*. https://www.spaceport-japan.org/
Spector, S., & Higham, J. E. (2019). Space tourism in the anthropocene. *Annals of Tourism Research*, *79*, Article 102772. https://doi.org/10.1016/j.annals.2019.102772
Strauss, A., & Corbin, J. (1998). *Basics of qualitative research techniques*. Sage Publications.

Strickland, P. (2012). Do space hotels differ from hotels on earth? The mystery is solved. *Journal of Hospitality Marketing & Management*, *21*(8), 897–908. https://doi.org/10.1080/19368623.2012.680241

Strickland, P. (2017). The first space hotel employees: Human resources challenges in a post-terrestrial paradigm. *Journal of Human Resources in Hospitality & Tourism*, *16*(4), 445–458. https://doi.org/10.1080/15332845.2017.1266875

Tasci, A. D., Fyall, A. D., & Fu, X. (2021). Social representations of space travel: Modelling the antecedents and outcomes. *International Journal of Tourism Research*, *23*(4), 611–635. https://doi.org/10.1002/jtr.2430

Three Hotel. (n.d.). The UFO. https://treehotel.se/en/rooms/the-ufo

Tkatchova, S. (2018). *Emerging space markets*. Springer.

Toivonen, A. (2022). Sustainability dimensions in space tourism: The case of Finland. *Journal of Sustainable Tourism*, *30*(9), 2223–2239. https://doi.org/10.1080/09669582.2020.1783276

UBS Union Bank of Switzerland. (2018). Longer term investments. *Space*. https://www.ubs.com/magazines/wma/insights/en/investing/2019/space-tourism.html

Undseth, M., Jolly, C., & Olivari, M. (2020). *Space sustainability* (OECD Science, Technology and Industry Policy Papers). https://www.proquest.com/openview/54c190cbbb6d5d37242996bf2c691ef7/1?pq-origsite = gscholar&cbl = 6245952

U.S. Chamber of Commerce. (2022). *Space economy: 4 trends to watch in 2022*. https://www.uschamber.com/space/space- economy-4-trends-to-watch-in-2022

Wall, M. (2022, November 2). Space perspective raises $40 million for tourist carrying stratospheric balloon system. www.space.com/space-perspective-raises-funding-balloon-tourism

Wang, L., Fu, C. F., Wong, P. P., & Zhang, Q. (2022). The impact of tourists' perceptions of space-launch tourism: An extension of the theory of planned behavior approach. *Journal of China Tourism Research*, *18*(3), 549–568. https://doi.org/10.1080/19388160.2021.1900972

Weaver, D. (2011). Celestial ecotourism: New horizons in nature-based tourism. *Journal of Ecotourism*, *10*(1), 38–45. https://doi.org/10.1080/14724040903576116

Webber, D. (2012). A training framework for private space travel operations. In *63rd International Astronautical Congress*. IAF. https://www.spaceportassociates.com/pdf/training_framework.pdf

Webber, D. (2013). Space tourism: Its history, future and importance. *Acta Astronautica*, *92*(2), 138–143. https://doi.org/10.1016/j.actaastro.2012.04.038

Yin, R. K. (1994). Discovering the future of the case study. Method in evaluation research. *Evaluation Practice*, *15*(3), 283–290.