

Present and Future Outlook of Space Tourism in the World and Turkiye

Fusun İSTANBULLU DİNÇER¹ 

¹Prof. Dr., Istanbul University, Faculty of Economics Department of Tourism Management, Istanbul, Turkiye

ORCID: F.İ.D. 0000-0003-2338-2462

ABSTRACT

All activities that occur as a result of monitoring and training events related to space and the atmosphere located outside the Earth qualify as space tourism. Due to the developments in the field of technology today, interest in space tourism and research has increased. This study evaluates the current and future state of space tourism on Earth and in Turkiye. As a result of the assessment, it is assumed that the current and potential mass of space tourism will make this tourism a profitable market in the future, as well as have an important position for the World and Turkiye.

Keywords: Space, Tourism, Space Tourism, World, Turkiye

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Corresponding author: Fusun İSTANBULLU DİNÇER / istanbul@istanbul.edu.tr

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1. Introduction

The next generation of innovative and unique technologies is one of the greatest achievements of space exploration in our economic and social life. More precisely, these technologies are all ubiquitous and offer enormous conveniences in every area of our daily life, such as financial transactions in online banking, the way we drive intelligent cars, shopping on the Internet, or personal communications on social media through our smart electronic devices. In terms of digital transformation, accessibility and connectivity, these technologies for fast and accurate data access are nothing to sniff at. The new entrepreneurial companies (startups) in the space economy both innovate, produce, and make ready for the use of these technologies and provide new business markets. Therefore, it is no surprise that more space service companies are cottoning on to the potential benefits of such space trip robots, going by the number of enquiries made and deals signed with space robotics and travel services companies.

With the post modern tourism paradigm in the 21st century, alternative tourism products suitable for individuality, surreal experiences and virtual realities have emerged. Post-modern tourists typically demand fantastic experiences, as well as an upper reality. The upper reality is a blurred and chaotic environment between real and unreal worlds. Space tourism is the best example of postmodern tourism development, and the new trends in space tourism have been discussed within the framework of post-mobility. As a result of the development of innovative spacecraft from the second half of the 20th century, space tourism has started to attract people's attention. Now, and in the 2050s, digital migration to cyberspace centers will get a brand-new start. Today and in the future, "developments on the commercialization of space such as space mining on asteroids, comets and planets, colonization of Mars and other planets, and space tourism " are happening with the contribution of industry 4.0 technologies and will continue to occur (Dirican, 2019). The American Investment Bank, Morgan Stanley, estimates that the space industry, now worth \$350 billion, will reach an annual turnover of \$1.1-1.5 trillion by 2040 (Sökmen Alaca, 2021).

2. The Historical Discovery of Space and Space Tourism

The first bodacious observations and researches on space go back to Sumerian, Babylonian, Egyptian and Ancient Greek civilizations. Islamic civilizations have also conducted serious research on space sciences. In Islamic civilization, it is well known that the history of publishing about space goes back to the Abbasi period in the 8th century. More recently, the founding names of space exploration were Copernicus and Einstein. Later, the Hubble space telescope contributed greatly to space studies (Kiper & Batman, 2018).

Space scientific studies began in the 20th century. The first scientific study took place in the 1960s when the first man set foot on the Moon. This development accelerated in the 1980s and 1990s. The studies carried out in the mentioned years are aimed at observing the world. These scientific initiatives in question are as follows chronologically (Kiper and Batman, 2018):

- 1947: Sending the first animal (fruit fly) into space (US V2 rocket)
- 1951: First dog to go into space (Russian R1 rocket)
- 1957: First satellite to go into space (Russia's Sputnik)

- 1961: First manned flight into space and first astronaut in space (Yuri Gagarin, Russian Vostok1 rocket)
- The concept of space tourism was first introduced in 1961 when Barron Hilton, the owner of Hilton hotels, stated in a speech to the American Astronauts Institution that he wanted to build hotels in space.
- 1966: First successful rocket landing on the Moon (Russian Luna-9 rocket)
- 1969: First human landing on the Moon (U.S. Apollo-11 rocket) / American astronaut Neil Armstrong, Edwin Aldrin Jr and Michael Collins' journey to the Moon.
- 1971: First space station (Russian Salyut-1)
- Space tourism first began with the launch of the International Space Station in 1998.
- In 1985, the US Travel Company called Society Expeditions announced that it had launched tours that would carry people into space. However, this journey did not take place because the missile was not made.
- On April 28, 2001, the extraordinary event was recognized as the beginning of space tourism with Dennis Tito, who is known to have flown with Soyuz 1657 for orbital space tourism. Dennis Tito, who traveled into space from Kazakhstan's Baykonur base and paid \$20 million for that journey, became the first space tourist in history (Crouch, 2001).
- After Dennis Tito, six other people went to space as tourists. These are the ones that are going to Mark Shuttleworth on April 25, 2002, Gregory Olsen on October 1, 2005. Anousheh Ansari on September 18, 2006, Charles Simonyi on April 7, 2007, Richard Garriott on October 12, 2008, Guy Laliberté on September 30, 2009 (Niyet & Korkmaz, 2019).
- In 2000, the US-Russian company MirCor said it would open the Russian Space Station to space tourism, but the project failed to materialize because the mission of this Space Station was over.
- In the fall of 2004, the aerospace company Scaled Composites held a competition. This competition was won by an engineer supported by Microsoft. Consequently, up to 2 weeks of space travel has been possible without the need for government contributions. Later, Scaled Composites signed an agreement with the engineer who won the competition to start space tourism, and the company founded under the name Virgin Galactic became a company that managed the new space tourism industry (Beery, 2012).
- Space X is a space transportation company founded by Elon Musk in 2002. The aim of this company is "to colonize Mars and reduce the cost of space transportation and to transport cheaper to space" (Çakıl, 2020).
- On May 30, 2020, astronauts Robert Behnken and Douglas Hurley were taken to the International Space Station by Space X in a Crew Dragon vehicle from the Kennedy Space Center in Florida, USA. With the launch in question, this company gained the title of a private company that flew manned into space for the first time (Çakıl, 2020). Musk has said he plans to send the first humans to Mars and build a city in 2024.
- In November 2020, it sent astronauts into space for Space X's "Crew-1". These astronauts are Michael Hopkins, Victor Glover, Shannon Walker and Japanese astronaut Soichi Noguchi; They returned to Earth on May 2, 2021. This team stayed in space for 167 days. Thus, the record of staying in space for more than five months in space history was set (Sökmen Alaca, 2021).

3. The Definition of Space Tourism and Classification of Its Types

Space tourism is a whole of activities that occur as a result of monitoring and training events for space and the atmosphere outside the Earth. In space tourism, not only the passenger is transported to space, but also involved in activities such as physical preparation and training, where the necessary information for the flight is provided (Kurtuluş, 2019). The physical-geographical boundaries of space tourism cover the space gap outside the globe. Today, very few businesses offer top-notch products for space tourism; however, there are various tourism alternatives in this market. Space tourism products can be classified in various ways.

According to today's classification, space tourism manifests itself with two types of activities (Kurtuluş, 2019):

- During orbital flights on the International Space Station, astronauts can live within this station for a certain period and carry out various scientific studies.
- In suborbital flights, the spacecraft accelerates to an altitude of a maximum of 100 km and reaches the Karman line, which defines the boundary between Earth and space. Today, projects for many suborbital flights are carried out.

According to another classification, space tourism is divided into four types of activities (Niyet & Korkmaz, 2019):

- **Terrestrial Space Tourism** (Terrestrial space tourism is about activities related to space tourism around the world: such as watching stars in observatories, star tracking in dark parklands and camping activities. These events are organized for both entertainment, and knowledge and education)
- **Half-Space Tourism** (Semi-space tourism is about flights by plane: like zero force flights (zero-g flights))
- **Orbital Space Tour** (Full orbit around the Earth with rockets)
- **Half Orbital Space Tour** (Trips to the International Space Station. This type of tourism is traveled by rockets, but there is no complete circling of the Earth or going to the International Space Station. Only from the area where the takeoff is taken off is vertically climbed into the atmosphere and returned)

As we descend towards the sub-items, the costs increase, and the number of participants decreases. A model that goes into space costs \$50 million; refueling reaches 200 thousand dollars. The flight rises 100 km above the sphere. In this type of tourism, tourists can orbit the Earth and see it as a blue sphere in space ten times farther from Earth (Kiraz & Altun, 2020).

According to NASA, space-related visits and tourism activities, high-altitude sub-orbital flights, global suborbital flights, short-term orbital flights, long-term orbital flights, and tourism activities on Earth are discussed within the framework of space tourism (Kiper & Batman, 2021). Table 1 includes the classification of space tourism types:

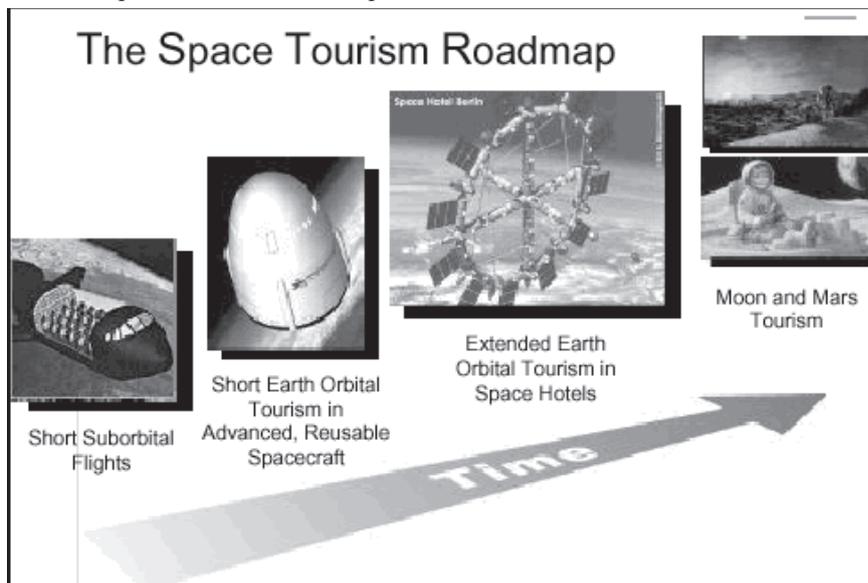
Table 1. Classification of Space Tourism Types

	Class	Type	Examples
Astro-Tourism	Beyond Earth's Orbit	Moon and Mars Expeditions	Not yet available.
	In Earth Orbit	Orbital Flights (350 km)	Flights made by nal International Space Station
		Sub-Orbit Flights (100 km)	Virgin Galactic
Atmospheric Space Tourism		High Altitude Jet Flights (20 km)	MIG31 Flights (Russia)
		Low Altitude Flights	Zero Gravity Company (USA/Russia)
Terrestrial Space Tourism	Specific Space Tourism Regions	Simulations	Space Shuttle Launch
		Space Facilities Tours	Simulator (Kennedy Space Center)
			Kennedy Space Center (USA)
			Parkes Satellite (Australia)
	Non-Regional Flights	Entertainment & Training Tours	Space Walks (Australia)
		Travels related to Space Tourism	Meteor Collection,
		Cyber-Space Tourism Experience	Virtual Space Travel and Gaming Ambits
Popular Culture Products		Travels about Space Movies	

Source: Civelek & Türkay, 2019.

The space tourism market is still not up to scratch and has a long way to go because it is still in the research stage. Virtual Space Tourism products are also being manufactured to attract consumers searching for adventure and excitement. However, they are still unsatisfactory to meet the current desires. “Cyber technique combined with specific activation of certain brain waves can stimulate the mental development of any experience. The American company Sun Microsystems is exploring ways to inject virtual landscapes and scenes into the human brain through a chip placed around its neck” (Çelebi, 2019). It is a project called “Point to Point” and is also intended to be improved for space travel. Although space tourism is still in its development phase, a lot of effort continues to be spent on designing hypersonic technologies to be used in this project. Such a design is available in the British Reaction Engines Skylon (Çelebi, 2019). Virtual-based applications and activities are also considered space tourism activities. The development stages of space tourism are in Table 2 and Table 3.

Table 2. Space Tourism Road Map



Source: Reichert, 2001

The space tourist participates in space activities and returns to Earth. Taken from this point on, astronauts are not space tourists. However, since there were no regular and continuous flights, orbital flights were attempted with people who are considered “space tourists” today.

Table 3. Development Stages of Space Tourism

STAGE	TOURISM PRODUCT	FEE AND CAPACITY
FIRST MOVE	Adventure Journey	Fewer Participants
	Safe Travel in Orbit	Fees More than \$50,000
	A Courageous Adventure	
MATURITY PERIOD	Period of Increased Flights and Demand Flights from Many Airports	Affordable Orbital Tickets Thousands of Passengers a Year
	Construction of Orbital Conveniences	Cheaper Ticket Prices
MASSIVE PERIOD	Orbital Entertainments	Millions of Space Travelers
	Large Capacity Orbital Structures	

Source: Cole, 2015.

4. The Supply Side of Space Tourism

Today, space tourism is predicted to take form mainly in two different ways. The first is flights to low Earth orbit, called orbital flights; the second is suborbital (Sub-Orbit) daily flights to the Earth’s atmosphere. Orbital flights are currently conducted only by one spacecraft: the Russian Soyuz Spacecraft. Two cosmonauts are required to fly the Soyuz, and each launch has an optional seat for a prospective space tourist (İstanbulu Dinçer et al., 2018).

Suborbital space tourism has not yet started to be implemented today; because it is much more difficult to perform than orbital space tourism. Although no spacecraft can serve the suborbital tourism market now, it is known that vehicles are being developed in this area. All potential suppliers are still designing different spacecraft for suborbital space tourism (İstanbulu Dinçer et al., 2018).

5. The Demand Side of Space Tourism

At the present day, some studies have been carried out in order to predict the magnitude of the demand for space tourism. These studies are meticulously summarized below (İstanbulu Dinçer et al., 2018):

“NASA Study: A survey of 1,500 families was conducted by NASA through a sampling methodology in the US in 1996. Respondents; 34% said they would be interested in a two-week vacation on a space shuttle in the future, while 42% said traveling on a spaceship offering accommodation and entertainment programs similar to those on cruise ships was interesting; 7.5% said they agreed to pay 100,000 (+) US dollars to experience space tourism.

Commercial Space Transportation Companies Survey: A research which was related to Commercial Space Transportation Companies and conducted by six American Aerospace Companies, established a link between the prices of tickets to be sold for space tourism and the income levels of individuals (low, medium, and high-income groups) and plotted an estimated demand curve accordingly.

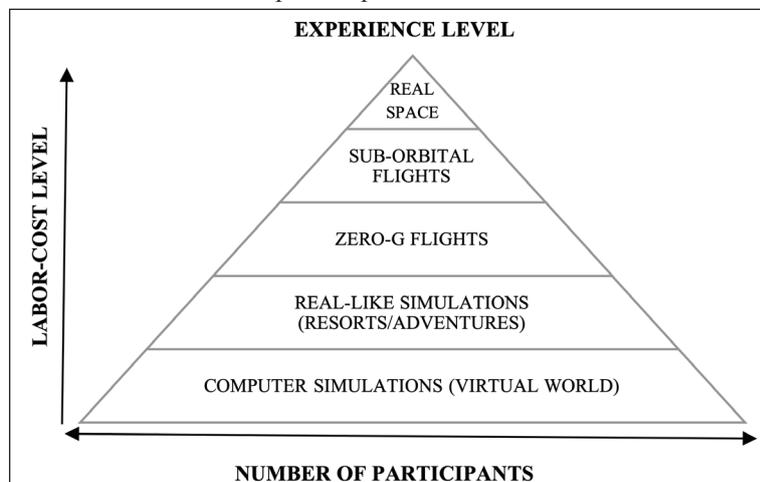
Japan Space Tourism Research: Collins and his colleagues conducted a study in Japan in 1995 to determine the estimated demand results. According to a 1993 study covering 3,030 people, 45% of participants over the age of 60 and about 80% of participants under the age of 60 wanted to go to space. In addition, about 20% said they could spend more than their whole year’s income on space tourism.

North American Space Tourism Survey: The survey conducted in Japan was repeated by Collins and his colleagues in order to find demand for space tourism in the United States and Canada. The survey found that 61% of the population is interested in space tourism, and about 10% are willing to pay a year’s salary or more for such an experience.

Germany Research: The survey of Collins and his colleagues was reused by Abitzsch (1996) to figure out the demand for German space tourism. 43% of Germans expressed interest in participating in space tourism” (İstanbulu Dinçer et al., 2018).

Very few rich people have managed to experience this space adventure to cover the cost of space travel so far. Short and long-term training programs and the possibility of experiencing space attract only astronomy enthusiasts. That’s why private space companies are working on reusable rockets and space planes to provide more people with space experiences at accessible costs. However, although space travel costs are reduced in these projects, very short-term experiences come to the fore.

Table 4. The Levels of Space Experience



Source: Yüncü, 2018

6. Investments and Space Tourism Initiatives That Developed Countries Are Trying to Make Towards Space Tourism

When the publications on Space Tourism are examined in general; that is hard-to-produce on Earth but may be easier on space where there is a lack of gravity, wind, and atmosphere, can be listed as follows:

- Access to space, albeit for a short period of time (Tourism)
- Space cargo transport that delivers supplies to space stations
- Special food supply for astronauts

- Creation of radiation-resistant disguises/clothing and living spaces
- Development of experimental medicine for space
- Scientific studies in the field of Astrobiology
- Building robots that can work in space
- Development of supply companies

While space tourism businesses were only government-affiliated space agencies until a short while ago, companies in the category of space travel agencies have now undertaken this type of journey. SpaceX and Virgin Galactic are the most prominent companies that serve as intermediaries. This type of tourism, which is considered the transportation of people to space by private companies for a fee, currently carries more suborbital trips. Space shuttles have been introduced in space transportation and space tourism recently. A new generation of technological, commercial activities such as space tourism, energy production in space, space tourism with accommodation, space mining, space logistics, construction in space, space transportation is proceeding on its way out.

Although space travel launched under the leadership of the United States and Russia, Asian countries are now trying to get involved in the cutthroat competition. There is no centralized space agency in Asia like Europe; however, the United States and other countries operate through their national space agencies. Among Asian countries, China has managed to bring humans into space and has developed a space station. The current and future investment efforts of private companies in this innovative sector and the development of the sub-technologies necessary for space travel are factors that increase space entrepreneurship (Gürsel, 2020). Attempts at space tourism, which is said to cost tens of millions of dollars for an average trip, are included in Table 5.

Table 5. Space Tourism Initiatives

Institution	Type	Specific for Whom	To Where
NASA	State	Scientists	Mars
Mars One	Private	Selected people	Mars
Virgin Galactic	Private	Tourists	Earth's Orbit
SpaceX	Private	Tourists	Mars
Blue Origin	Private	Tourists	Earth's Orbit
Orion Space Hotel	Private	Tourists	Earth's Orbit
Source: Gürsel: 2020.			

However, together with these initiatives, the strict norms that determine whether the responsibility belongs to the state or the carrier should be clearly set out in the national legislation for the proper development of commercial space transportation and tourism. In the 2040-2050s, with the development of space technologies, the space passenger transportation contract will be replaced by the touristic space package contract (Kurtuluş, 2019).

7. New Professions to Emerge with Space Tourism

Space tourism will eventually lead to the emergence of new professions. Visits to the space station, a tourist trip to the Moon or travel to Mars for a business trip are not fantasies anymore. When the publications on the sectors that will be affected by Space Tourism and the new professions that will emerge are examined in general; the following data is available:

Sectors That Will Be Affected by the Space Industry: logistics (cargo, transportation, shipment), agriculture, food engineering, medicine – pharmacy – biomedical, architecture, industrial design, chemistry, genetics, mining, law, tourism, technology (robotic technologies, artificial intelligence, etc.)

Professions and Work Areas to Be Uncovered by the Space Industry: space traffic control, space flight operator, space mining, space farming, space lawyering, space station design, satellite mechanics, satellite design, space medicine, space station maintenance operator, space reporting, space taxi, space meteorology, space architecture, space technologies specialist, space pilot, space tour guide, space stewards/stewardesses, space astronaut, space traffic controllers, space flight attendants, space lawyers, space biology.

In the future, sophisticated manpower will be needed for these new areas of work. Therefore, it becomes a necessity to carry out human resources planning specialized in space science. It is imperative that the planning of space tourism activities focus on elements such as technological conditions and economics. It is necessary to perform detailed evaluations of the future space brainpower and workforce and their expertise and professions, to plan alternative training and employment areas for people with this profession, and to develop technology and products for professional skills.

8. Development Problems of Space Tourism

Space tourism is discussed where and what activities it covers, and at the same time, there are some limitations of related activities. Such as (Kiper & Batman, 2021):

- “The cost of space travel,
- limited activities that space travelers can do,
- duration of space travel,
- accommodation during the journey,
- legal issues,
- safety and health issues.”

The most important criticisms and problems regarding Space Tourism are as follows:

- Environmental factors (carbon emission, garbage left in space, air pollution in the world, climate change, etc.),
- Expensive space tours,
- Health, education and security problems of tourists and risk factors,
- Management and ownership issues in the use of space,
- Space transportation is not yet developed enough,
- Lack of competition in space,
- High cost of space technologies and entrepreneurship,
- Lack of space tourism awareness.

Apart from the experts who make these criticisms, some academics paint a bright picture. Optimist researchers state that “space tourism activities can reverse some environmental damages in the world, enable the transformation of the industrial structure on Earth, and make possible the formation of different energy supply sectors such as space mining” (Kiper & Batman, 2021).

Together with sustainability within the scope of planning, the legal, health and ethical dimensions of space tourism activities should also be particularly discussed. In addition, the conditions of living in space should be investigated in particular since space tourism has certain risks to human health.

The risks are as follows; space adaptation disorder, high-energy radiation, space adaptation syndrome, bulging head-bird legs syndrome, bone loss, hearing loss, psychological side-effects (Akbaba & Çokal, 2018). Therefore, food is taken into space, and its storage conditions should be stated according to certain rules, gravity should be considered, and necessary measures should be taken for health problems.

9. Space Tourism and Its Future in Turkiye

Space tourism is more of an issue in the magazine news and technology pages in the press in Turkiye. However, it has started to gain momentum in academic studies recently. It is important to know that Turkiye is becoming one of the countries that can launch into space every passing day. The first and only investment in space tourism in Turkiye was made in the last month of 2011 by a travel agency called VIP Tourism. VIP Tourism, which is the Representative of SCX's X-Cor Lynx Space Rocket in Turkiye, aiming to lead the development of space tourism in Turkiye, stated that space travel will start at \$100,000" (İstanbulu Dinçer et al., 2018). However, to date, there has been no progress observed on the issue.

Space Camp Turkiye, one of the three space camps in the world, educates young people and children with camp programs in Izmir, Turkiye.

Orbital space tourism activities operated from Baykonur Space Base are now carried out by the consolidation and merger of the Russian Space Agency and Space Adventures Company. Kazakhstan will also work with such tour operators, or the Kazakh National Space Agency will organize space tours that can offer technical and strategic solutions for space studies in Kazakhstan. At this point, cooperation for space tourism can be realized by joining with sister Turkish countries, especially by agreeing with Turkiye. Recently, Turkiye's economic growth has made its needs an emergency for the space industry. "Turkiye can conduct orbital space tourism in partnership with Kazakhstan or make use of its potential to support Kazakhstan in its expert know-how, production of some space devices and missile parts" (Kozhanazar, 2014).

Founded in Istanbul on October 18, 2018, Statcosmos, Turkiye's first (private) Space Tourism Futurist company, is primarily trying to build infrastructure for the formation of space tourism perception within the country's borders with the right resources, themes and physical studies (statcosmos.com).

The economic dimension of space tourism needs to be pinpointed both worldwide and in Turkiye (Dirican, 2017):

- "This new type of tourism must be added into the "Accommodation and Food Service Activities" title of the Turkish Statistical Institute's "Tourism Statistics" methodologies.
- Required changes should be made to the Central Bank of Turkiye's "Travel Income and Expenses" item listed under the Balance of Payments heading and to the "Facility,

Accommodation, Border Entry and Exit Statistics” together with the “Foreign Visitors and Citizen Survey” items of TR’s Ministry of Culture and Tourism.

- Classifications should be reviewed in accordance with the World Tourism Organization tourism definition of the United Nations, the Codes of Statistical Classification of Economic Activities of the European Union (NACE), and trademark and patent applications to be made through the Turkish Patent Institute.
- The visa/passport procedures of the General Directorate of Police will need to be reorganized. The signature issues about day-to-day, cross-border, and visa-free crossings should also be addressed.
- The port and customs procedures of spaceships should be reorganized, and the touristic travel of spaceships should be reviewed within the scope of yacht tourism and marina management.
- Shall the Ministry of Transport, Ministry of Culture and Tourism, Turkish Space Agency, The Scientific and Technological Research Council of Turkiye (Tübitak), Space Technologies Research Institute or any other official institution be authorized in this type of tourism? It is necessary to think about this issue in advance.
- Economic, financial and legal issues such as insurance law and foreign travel insurance, foreign travel fee, air insurance, visa fee, tourism transport authorization certificate, authorization of captains on cruises, rescue activities, tourism business certificate, customs legislation, employing foreign personnel should be discussed in terms of Space Tourism.
- Signature issues about public incentives such as space hotels, incentives for tourism investments and tax returns, what types of taxes will be applied to which activities, how to apply inter-country double taxation and Value-added tax (VAT) and tax returns (Tax-Free) should be carefully taken into account.
- Since it is unclear which currency or monetary value units will be used in space, exchange rate systems and monetary policies should be evaluated according to developments in the space economy. The calculation of consumer holiday loans and the credits to be made available to space enterprises should also be handled according to the technological banking system.
- It is obligatory to evaluate the investment projects related to going into space and start working to address the financing in terms of time and place dimensions in space.
- In terms of robotic technologies, tourism guidance activities must be quantized in the dimensions such as certification procedures, service and tour cost, guidance and tour fees, copyrights, trademark, and patent.
- Academically, the curriculums of universities and compulsory internship practices should be considered as a priority in the title of Space Tourism. Studies should be initiated for the opening of interdisciplinary academic programs with the name of space economy, and Astro-Economy in the eyes of the Council of Higher Education (YÖK)”.

In the Turkish Space Program Initiative, which handles many missions such as ‘Biotechnology’, ‘Robotics’, ‘Artificial Intelligence’, ‘Nanotechnology’, ‘Space’ and ‘Strategic Services’ (Brains2 Turkiye/ Biotechnology | Robotics | Artificial Intelligence | Nanotechnology | Space | Strategic Services), it is noted that it “considers Turkiye’s current strength and potential both in the academic field and in the industrial sector, it examines which Space areas can promise the highest potential for future growth and what the advantages of the Turkish Space Sector will gain from this growth” (Brains 2 Turkiye/Tasam, 2021).

This initiative proposes studies to determine the following strategies with the correct questions and answers in the Turkish Space Program (Brains 2 Turkiye/Tasam, 2021):

- Development of Social Awareness about Space,
- Planning for the Space Blue-Collar and White-Collar Workforce of the Future and Their Expertise and Professions,
- Making use of Space Technologies in The Field of Defense and Security,
- Focusing on Space in Education,
- Preparing pieces of training to Train Experts in Space,
- Global Space Market Sectoral Review and Classification,
- Analysis and Product Matching of Turkish Companies to Lead,
- Informing Studies for The Adaptation of Space Studies to industry.

Thus, within the framework of the International Comparative Vision for Space, Strategy, Ecosystem and Market Building Theme, and the above-mentioned strategies, the following classifications and regulations are nothing to sniff at:

- “Space R&D Construction/Inventory,
- Space Resources Ecosystem,
- Space Governance and Regulation,
- Space Human Resource,
- Global Space Market Sectoral Review and Classification,
- Analysis and Product Matching of Leading Turkish Companies,
- International Comparative Cooperation and Competition,
- Travel to the Moon, Mars and Other Destinations,
- Commercial Space and Licensing,
- Commercial Space Traffic and Regime,
- Military Space Operations,
- Space Diplomacy.”

The sub-themes listed above (Brains 2 Turkiye/Tasam, 2021) should be so investigated that the space studies in Turkiye will wing a flight. At the end of the day, trips to space and galactic destinations will also improve.

The urgent needs of the space economy in our country have been clearly demonstrated by the ten space targets announced in 2021. Among them, it is at the forefront for Turkiye to be able to make a spacecraft with access to the low orbit of the Earth. The Turkish Space Agency (TUA) was established in December 2018 by a presidential decree for space studies. With the National Space Program, 10 strategic objectives have been set (Sanayi ve Teknoloji Bakanlığı & TUA, 2021):

- Lunar Task,
- Domestic Satellite,
- Regional Positioning,
- SpacePort,
- Space Air,
- Space Objects,

- Space Industry,
- Space Technologies Development Zone,
- Space Awareness,
- Turkish Astronaut.

Following the announcement of the National Space Program, many countries have immediately offered to work in partnership with Türkiye. The first goal of our country is to send Turkish scientists to the International Space Station, which orbits close to 400 kilometres from the Earth. Therefore, Türkiye should presently go to great lengths to be a member of the European Space Agency, which will greatly benefit our country.

10. Conclusion

Industry 4.0 Revolution and digital transformation have begun to shape the post-modern consciousness and behaviors of human beings. As a result of the prolongation of life expectancy and the increase in its standard; there are changes waiting for mankind in the economic world order of the future:

1. Virtual Reality and Augmented Reality,
2. Prosthetic Technology Working with Advanced Brain Technology,
3. Hologram Technology,
4. Advanced Wearable Technologies,
5. New Energy Sources,
6. Driverless Cars,
7. Drone,
8. Artificial Intelligence Robots/Nano Technologies,
9. Space Tourism, Underwater Life, Submarine Travels,
10. Rocket and Supersonic Travel,
11. Mega Passenger Ships,
12. Magnetic Trains,
13. Different Entertainment Venues,
14. Luxury Themed Hotels,
15. Life on the Moon/Mars, Mandatory Sustainable Living Codes, New Passports/Visas.

Within these technological and structural transformations, space tourism becomes possible. In particular, “the greatest success of private entrepreneurs in the history of space lies in making previously disposable space vehicles usable again” (Gürsel, 2020). Space tourism is more profitable than other alternative tourism types considering a huge economic market. Because despite the high demand for this trip, which is very expensive, it is noteworthy that it is in demand. Space travel brings out a sense of high pleasure and difference. Some important factors distinguish space tourism from other types of tourism: to learn to live in space physically and psychologically and to use spacecraft on Earth, to know issues such as safety, risk, health, and emergency drills.

The development of the Turkish space economy depends on the investments of space entrepreneurs and cooperation with international space agencies. It is imperative to develop space technology and the economy to be among the world’s powerful countries.

References

- Akbaba, A., & Çokal, Z. (2018). *Uzay Turizmi*. Şule Aydın & Mustafa Boz (Ed), *Turizmde Güncel Konu ve Eğilimler II*. (401-410). Ankara: Detay Yayıncılık.
- Beery, J. (2012). State, Capital and Spaceships: A Terrestrial Geography of Space Tourism, *Geoforum* 43, 25–34. <https://doi.org/10.1016/j.geoforum.2011.07.013>
- Brains 2 Türkiye/TASAM. (2021). Brains 2 Türkiye Uzay Programı: Uzay Programı Raporu. 1-8. <https://brains2tr.com>.
- Civelek, M., & Türkay, O. (2019). Uzay Turizmine İlişkin Uluslararası Turizm Karikatürlerinin Göstergebilimsel Bir Analizi. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi*, 21(3), 960–980.
- Cole, S. (2015). Space Tourism: Prospects, Positioning and Planning. *Journal of Tourism Futures*, 1(2), 131–140.
- Crouch, G. I. (2001). The Market for Space Tourism: Early Indications. *Journal of Travel Research*, 40(2), 213–219. <https://doi.org/https://doi.org/10.1177/004728750104000212>.
- Çakıl, A. U. (2020). Geleceğin Muhasebesi: Karanlık Muhasebe ve İllellik Muhasebesi. *İzmir YMMO Dergisi*, 2(2), 85–101.
- Çelebi, A. (2019). *Uzay Turizmi: Tarihçesi, Beklentileri ve Geleceği. Sektörün Geleceği İçin Araştırma Önerileri ve Potansiyel Katılımcıların Bakış Açuları* (Yayınlanmamış Lisans Bitirme Tezi). Azerbaycan Cumhuriyeti Eğitim Bakanlığı Azerbaycan Devlet İktisat Üniversitesi Türk Dünyası İktisat Fakültesi Turizm ve Otelcilik Bölümü, Bakü.
- Dirican, C. (2017, Ekim). Uzay Turizminin Finansal, İktisadi ve İşletme Boyutunun Kavramsal Bir Analizi. *18. Ulusal Turizm Kongresi Bildiriler Kitabı. 1. Baskı* (s. 48-58), 18-22 Ekim 2017, Mardin. Ankara: Detay Yayıncılık: 856. www.utk18.artuklu.edu.tr.
- Dirican, C. (2019). Uzaydan Dünyaya Gelebilecek Tehditler, Uzaylı İstilasası veya Dünya Dışı Yaşamla Temas Durumu: Finansal Kurumlarda ve Piyasalarda Sürdürülebilirliğe, Risk Yönetimine Dair Önerme ve Yaklaşımlar. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, 2019 7/ (ICOAEF' 19). 51–68. <http://dx.doi.org/10.18506/anemon.576202>.
- Gürsel, S. (2020). Uzay Turizmi Girişimleri ve Uzay Turizmi ile İlgili Olası Problemler. *International Social Mentality and Researcher Thinkers Journal*, 6(38), 2341–2350. <https://statcosmos.com/> Erişim Tarihi: 25 Nisan 2021.
- İstanbullu Dinçer, F., & Can, İ. I., & İnan, B. (2018). Post-Modern Turizm Paradigması Etrafında Şekillenen Gerçek Üstü Bir Deneyim: Uzay Turizmi. *Güncel Turizm Araştırmaları Dergisi*, 2(1), Bahar, 79–93.
- Kiper, V. O., & Batman O. (2018). Uzay Turizminin Bibliyometrik Analizi. B. Zengin (Ed.), *INGANT-2018, 1. Uluslararası Turizmde Yeni Jenerasyonlar ve Yeni Trendler Kongresi Bildiriler Kitabı* içinde (s.76-85). Sapanca, Sakarya: SUBU Turizm Fakültesi Yayını No: 2018-01 1-3 Kasım 2018. <https://ingant.subu.edu.tr>.
- Kiper, V. O., & Batman, O. (2021). Uzay Turizmi: Olasılıklar, Uygulamalar, Kavramsal Bir Yaklaşım. *Journal of Emerging Economies and Policy*, 6(1), 5–11. <http://dergipark.org.tr/joeep>.
- Kiraz, G., & Altun, Ö. (2020). Değişen Turizm Trendleri (1. Baskı). İstanbul: Hiper Yayın.
- Kozhanazar, A. (2014). Uzay Turizmi: Kazakistan'ın Uzay Turizmi Alanındaki Potansiyeli Üzerine Bir Analiz, İstanbul Üniversitesi Sosyal Bilimler Enstitüsü Turizm İşletmeciliği Anabilim Dalı (Yüksek Lisans Tezi), İstanbul.
- Kurtuluş, D. F. (2019). *Hava ve Uzay Hukukunda Ticari Hizmetlerden Doğan Hukuki Sorumluluk* (Yayınlanmamış Yüksek Lisans Tezi). Başkent Üniversitesi Sosyal Bilimler Enstitüsü Özel Hukuk Anabilim Dalı Özel Hukuk Anabilim Dalı, Ankara.
- Niyet, İ. Z., & Korkmaz, H. (2019). Uzay Turizmi Üzerine Literatür İncelemesi. Mehmetoğlu, T. & Sakhı, Z. (Ed), *ZEUGMA, 1. Uluslararası Multidisipliner Çalışmalar Kongresi Bildiriler Kitabı* (Cilt 2) içinden (s. 1308-1317). Gaziantep: İksad Yayınevi. www.zeugmakongresi.org.
- Reichert, M. (2001). The Future of Human Spaceflight. *Acta Astronautica*, 49(3), 495–522.
- Sanayi ve Teknoloji Bakanlığı & TUA. (2021). Milli Uzay Programı. *Türkiye Turizm Ajansı (TUA)*. <https://tua.gov.tr/tr/milli-uzay-programi> (on-line).
- Sökmen Alaca, A. İ. (2021). Uzay Hayali, Dünyadaki Teknolojik Gelişmelerin Öncüsü. *PERYÖN Popüler Yönetim Dergisi*, 92, 7–8.
- Yüncü, H. R. (2018). Space Tourism: A Vacation to Mars Or A Science Fiction. *GSI Journals Serie A: Advancements in Tourism, Recreation and Sport Sciences*, 1(1), 45–52.