

# The History of Space Exploration: Yesterday, Today and in the Future

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## ABSTRACT

Space studies constitute a very important field today. Making new discoveries in space with developing technologies and reaching space in a faster and more practical way create many legal problems (both strategic and security-related) for countries. Since space laws are not framed well enough, being the first in space in some areas has become an important issue recently. This study discusses how space studies developed historically and the importance of legal requirements in space studies.

**Keywords:** Space exploration, Turkish Space Agency, space law, space launch, spacecraft

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## 1. Introduction

We live on a little blue planet which is the third closest to the sun. The distance between the earth and the sun is approximately 150 million kilometers (one astronomical unit, or AU). Since the 1960s, we have been able to investigate only our very nearby neighborhood (up to 150 AU).

Our solar system is almost 40 AU wide and is located in a galaxy which has approximately 100-400 billion stars and is a hundred thousand light-years wide. It would take 2.2 million years traveling at the speed of light to reach the next closest galaxy, Andromeda. All those distances only describe the very nearby universe. The universe hosts trillions of galaxies. No matter which side we look using our current technology, we can only see the 92 billion light-year-diameter bubble in which we're living, so we don't know the real shape of the universe or where exactly we are located in it. All those things has started to happen 13.8 billion years ago and the universe is still continuing to spread.

The knowledge we have so far no doubt makes us feel that we are just a spot in the universe. The first human efforts to understand the universe were very naïve, and we have made relatively little progress since then. The spacecraft we send today can still only reach the edge of our solar system. But every day, with new technologies, we open new horizons in space exploration, and this work will continue till the end of time.

## 2. Space Exploration

Aircraft, aviation and space research has developed rapidly since the 1950s with machines that developed in the Industrial Revolution and especially the direction given to war vehicles by the second world war. Countries began to reach each other not only by land, but also from the air and even from space. They competed to spy on other countries from space, to develop tools that can orbit the earth, and to be the first in space. In the 1960s and 70s, we saw a space race that changed the balance and turned into a show of power and strength in the world, especially for America and Russia, and brought many discoveries along with it. Today, we are aware of how important these studies are for the future of humanity, their positive effects on human life, their technological development and that they are indispensable for the future.

We explore the universe for four fundamental reasons. First of all, we are very curious. Our curiosity is our driving force. Second, we want to perpetuate our own kind. This is our natural instinct. Third, we want to find new resources. Lastly, we want to find other life in the universe and we are searching for it.

In order to do this research, rockets are the vehicle provided by today's technology. The rockets, which burn fuel and create thrust in opposition to the earth's gravity, allow us to go into space. Although the first rocket tests started in the early 1900s, we have been using rockets as war weapons since the 1000s. The first rocket-like vehicle was used by the Chinese by placing it on arrows. Since those years, rockets, which have been transported to different countries and geographies through wars, were part of the arsenals of Europe in the 15th century. Konstantin Tsiolkovsky (1), Robert H. Goddard (2) and Hermann Oberth (3), who developed the theory and mathematics of rocket science, have been pioneers in the development of rocket science since the first quarter of the 1900s.

By the 1950s, we could send objects of a certain weight to a determined height and we started to place vehicles in orbit. Moreover, we started to explore outside of our world. After many different and varied trials, we succeeded in sending the first man into orbit outside the earth in the early 1960s. Then space studies turned into a race and many firsts were accomplished. We were able to go to the Moon and even sent vehicles to the planets Venus and Mars (5).

In the 1990s, we developed tools that help us explore space, such as space stations, space telescopes, and space shuttles. These tools have facilitated human life in space, where we have been able to conduct many tests and experiments. Thanks to these experiences, we are now aiming even further: we plan to establish bases on the Moon and to organize manned flights to Mars.

### **3. The Importance of Space Law**

Particularly in recent years, the participation of private companies in space activities has increased competition, and the race continues on other platforms such as space tourism, space mining and even permanent life in space. This important issue, which concerns all countries and all of humanity, reveals the necessity of legal processes related to space, just like on earth. Just like the rules of the seas, the existence of predetermined rules in space will allow humanity to live in peace there as well.

### **4. Turkiye's Space Agency**

The Turkish Space Agency (TUA) (5) was established in December 2018. While TUA's work, such as sending astronauts into orbit and sending vehicles to the moon with the 10-year National Space Program, continues, TUA also carries out studies in many different fields such as space economy, space mining and space law. Turkiye has been a party to many space agreements for a long time, and is aware of the importance of space law and attaches great importance to it.

### **5. Conclusions**

The existence of legal processes in space is very crucial for both Turkiye and other countries to carry out peaceful and free work in future space studies. Taking various steps for these processes and making and implementing agreements will be among the most important requirements for Turkiye in space in the future.

### **References**

- Arlazorov, Mikhail S.. "Konstantin Tsiolkovsky". Encyclopedia Britannica, 15 Sep. 2021, <https://www.britannica.com/biography/Konstantin-Eduardovich-Tsiolkovsky>. Accessed 3 October 2021.
- Lehman, Milton and Lehman, Mildred K.. "Robert Goddard". Encyclopedia Britannica, 1 Oct. 2021, <https://www.britannica.com/biography/Robert-Goddard>. Accessed 3 October 2021
- Britannica, The Editors of Encyclopaedia. "Hermann Oberth". Encyclopedia Britannica, 21 Jun. 2021, <https://www.britannica.com/biography/Hermann-Julius-Oberth>. Accessed 3 October 2021.
- [https://www.grc.nasa.gov/WWW/k-12/TRC/Rockets/history\\_of\\_rockets.html](https://www.grc.nasa.gov/WWW/k-12/TRC/Rockets/history_of_rockets.html)
- <https://tua.gov.tr/en/national-space-program/national-space-program>

