# SAMPLE

## Cosmic Explorers: The Space Race

How Humans Reached the Stars

Aira Astralis

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This free sample contains the Introduction and Chapter 1. The complete book contains the full contents above.

# Introduction

The Space Race was a 20th-century competition between the Cold War rivals, the United States and the Soviet Union, to achieve superior spaceflight capability. It had its origins in the ballistic missile-based nuclear arms race between the two nations following World War II and the onset of the Cold War.

The technological advantage demonstrated by spaceflight achievement was seen as necessary for national security, particularly in regard to intercontinental ballistic missile and satellite reconnaissance capability, but also became part of the cultural symbolism and ideology of the time. The Space Race brought pioneering launches of artificial satellites, robotic landers to the Moon, Venus, and Mars, and human spaceflight in low Earth orbit and ultimately to the Moon.

Public interest in space travel originated in the 1951 publication of a Soviet youth magazine and was promptly picked up by US magazines. The competition began on July 29, 1955, when the United States announced its intent to launch artificial satellites for the International Geophysical Year. Five days later, the Soviet Union responded by declaring they would also launch a satellite "in the near future".

The launching of satellites was enabled by developments in ballistic missile capabilities since the end of World War II.

The competition gained Western public attention with the "Sputnik crisis", when the USSR achieved the first successful satellite launch, Sputnik 1, on October 4, 1957. It gained momentum when the USSR sent the first human, Yuri Gagarin, into space with the orbital flight of Vostok 1 on April 12, 1961. These were followed by a string of other firsts achieved by the Soviets over the next few years.

Gagarin's flight led US president John F. Kennedy to raise the stakes on May 25, 1961, by asking the US Congress to commit to the goal of "landing a man on the Moon and returning him safely to the Earth" before the end of the decade. Both countries began developing super heavy-lift launch vehicles, with the US successfully deploying the Saturn V, which was large enough to send a three-person orbiter and two-person lander to the Moon.

Kennedy's Moon landing goal was achieved in July 1969, with the flight of Apollo 11.

# Chapter 01: The Discovery of The Space Race

The USSR continued to pursue crewed lunar programs to launch and land on the Moon before the US with its N1 rocket but did not succeed, and eventually canceled it to concentrate on Salyut, the first space station program, and the first landings on Venus and on Mars. Meanwhile, the US landed five more Apollo crews on the Moon, and continued exploration of other extraterrestrial bodies robotically.

A period of detente followed with the April 1972 agreement on a cooperative Apollo-Soyuz Test Project (ASTP), resulting in the July 1975 rendezvous in Earth orbit of a US astronaut crew with a Soviet cosmonaut crew and joint development of an international docking standard APAS-75. Being considered as the final act of the Space Race by many observers, the competition was however only gradually replaced with cooperation.

The collapse of the Soviet Union eventually allowed the US and the newly reconstituted Russian Federation to end their Cold War competition also in space, by agreeing in 1993 on the Shuttle-Mir and International Space Station programs.

Although Germans, Americans and Soviets experimented with small liquid-fuel rockets before World War II, launching satellites and humans into space required the development of larger ballistic missiles such as Wernher von Braun's Aggregat-4 (A-4), which became known as the Vergeltungswaffe 2 (V-2) developed by Nazi Germany to bomb the Allies in the war.

After the war, both the US and USSR acquired custody of German rocket development assets which they used to leverage the development of their own missiles.

Public interest in space flight was first aroused in October 1951 when the Soviet rocketry engineer Mikhail Tikhonravov published "Flight to the Moon" in the newspaper Pionerskaya pravda for young readers. He described a two-person interplanetary spaceship of the future and the industrial and technological processes required to create it. He ended the short article with a clear forecast of the future: "We do not have long to wait.

We can assume that the bold dream of Konstantin Tsiolkovsky will be realized within the next 10 to 15 years." From March 1952 to April 1954, the US Collier's magazine reacted with a series of seven articles Man Will Conquer Space Soon!

In March 1955, Disneyland's animated episode "Man in Space" which was

broadcast on US television with an audience of about 40 million people, eventually fired the public enthusiasm for space travel and raised government interest, both in the US and USSR.

Soon after the end of World War II, the two former allies became locked in a state of political conflict and military tension known as the Cold War (1947-1991), which polarized Europe between the Soviet Union's satellite states (often referred to as the Eastern Bloc) and the states of the Western world allied with the U.S.

In August 1949, the Soviet Union became the second nuclear power after the United States with the successful RDS-1 nuclear weapon test.

In October 1957, the Soviet Union conducted the world's first successful test of an intercontinental ballistic missile (ICBM), this was the R-7 Semyorka (also known as SS-6 by NATO) and was seen as capable of striking U.S. Fears in the US due to this perceived threat became known as the 'missile gap'.. The first

American ICBM, the Atlas missile, was tested in late 1958.

ICBMs presented the ability to strike targets on the other side of the globe in a very short amount of time and in a manner which was impervious to air interception such as bombers might have been. The value which ICBMs presented in a nuclear standoff were very substantial, and this fact greatly accelerated efforts to develop rocket and rocket interception technology.

The first Soviet development of artillery rockets was in 1921 when the Soviet military sanctioned the Gas Dynamics Laboratory, a small research laboratory to explore solid-fuel rockets, led by Nikolai Tikhomirov, who had begun studying solid and liquid-fueled rockets in 1894, and obtained a patent in 1915 for "self-propelled aerial and water-surface mines. The first test-firing of a solid fuel rocket was carried out in 1928.

Further development was carried out in the 1930s by the Group for the Study of Reactive Motion (GIRD), where Soviet rocket pioneers Sergey Korolev, Friedrich Zander, Mikhail Tikhonravov and Leonid Dushkin launched GIRD-X, the first Soviet liquid-fueled rocket in 1933.

It is Russia, not the United States, who has had the imagination to hitch its wagon to the stars and the skill to reach for the moon and all but grasp it. America is worried. It should be."

Eisenhower ordered project Vanguard to move up its timetable and launch its satellite much sooner than originally planned. The December 6, 1957 Project Vanguard launch failure occurred at Cape Canaveral Air Force Station in Florida.

A subsequent probe named Pioneer 1 was launched with the intention of orbiting the Moon only to result in a partial mission success when it reached an apogee of 113,800 km before falling back to Earth. The missions of Pioneer 2 and Pioneer 3 failed whereas Pioneer 4 had one partially successful lunar flyby in March 1959.

A habit of mind worth keeping from the discovery years: the race was never really about the hardware, which nation could build what, but about proving an ideology could organize talent at scale, and the satellites were simply the receipts.

End of free sample. The full book is available at putrabooks.github.io

# ABOUT THE AUTHOR

Aira Astralis is a science writer specializing in astronomy and space exploration. Her work spans the full breadth of humanity's relationship with the cosmos -- from the earliest naked-eye observations to the engineering marvels of modern space missions.

Her books are built on a foundation of primary sources: peer-reviewed research, mission archives, and direct engagement with the scientific community. She writes for readers who want to understand not just what we know about the universe, but how we came to know it.

She believes that the most important frontier is not out there but in the gap between what scientists discover and what the public understands. Her books exist to close that gap.