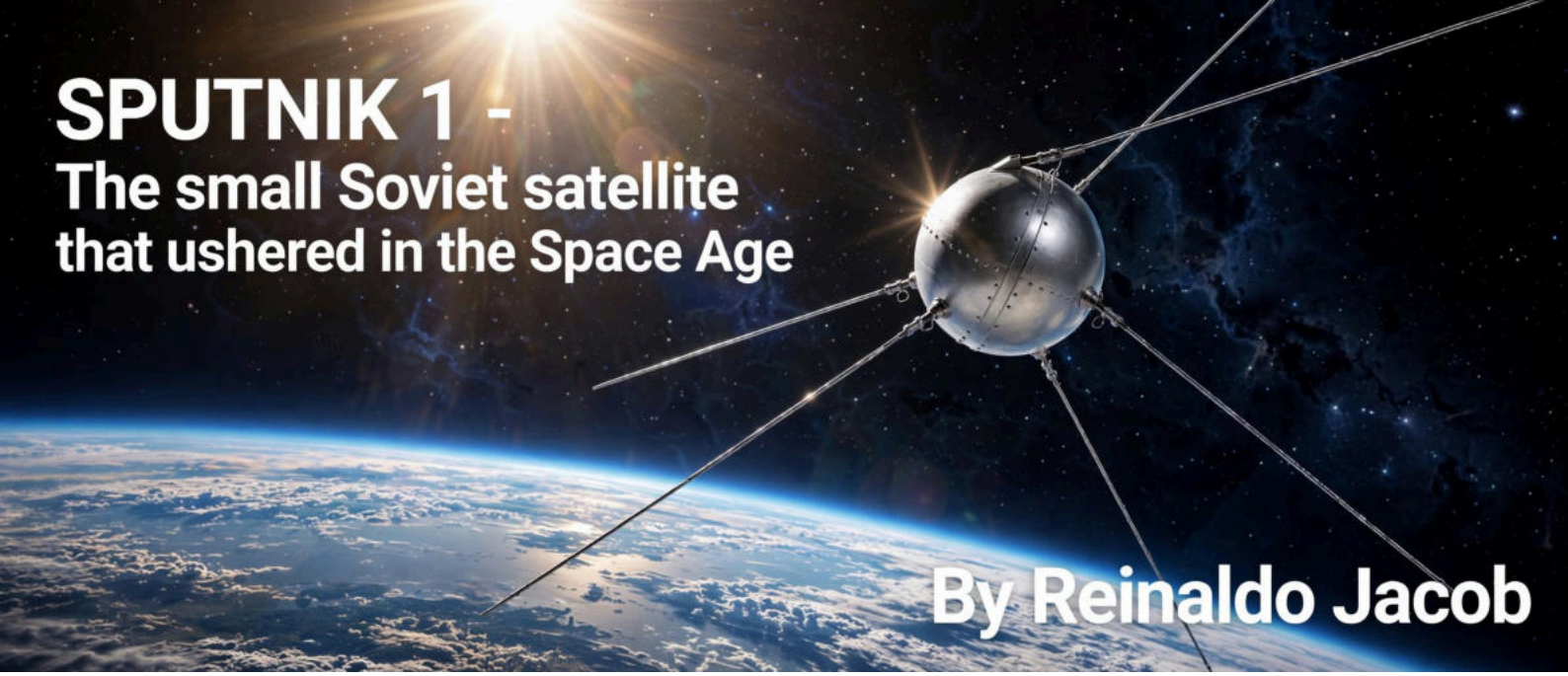


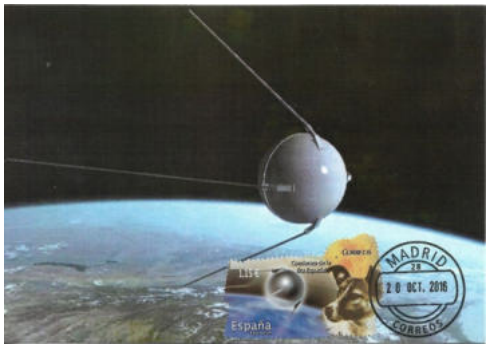
SPUTNIK 1 - The small Soviet satellite that ushered in the Space Age

By Reinaldo Jacob

On the night of 4 October 1957, radio stations and amateur radio operators in different parts of the world began to pick up a short, repetitive signal. These were the 'beeps' transmitted by Sputnik 1, the first artificial satellite to be successfully placed in orbit around the Earth.

The small metallic sphere, measuring just 58 centimetres in diameter, was equipped with neither cameras nor sophisticated scientific instruments. Its mission was relatively simple: to demonstrate that the Soviet Union had the technology to launch an object into space, keep it in orbit and track its trajectory using radio signals.

Despite this simplicity, Sputnik 1 changed history. Its launch officially inaugurated the Space Age, intensifying the technological competition between the Soviet Union and the United States and paving the way for the satellites, probes and manned missions that would transform science and communications in the following decades.



2016 stamp 'Beginning of the Space Exploration' from Spain on a postcard of Sputnik 1

The Cold War Context

Sputnik 1 was launched at a time of intense rivalry between the two dominant post-war powers, the Soviet Union and the United States. During the Cold War, the two countries competed for political influence, military capability and scientific superiority.

Rocket development during this period had important roots in the Second World War. Germany had made significant progress in this area with the A-4, more commonly known as the V-2 — the first large liquid-fuelled ballistic missile to be used in an operational capacity.

Following Germany's defeat in 1945, both the United States and the Soviet Union gained access to German rocket programme-related equipment, components, documentation and knowledge. This technology exerted a significant influence on the missile programmes of both countries in the post-war period, contributing to the technological basis of the future Space Age.

However, this does not mean that subsequent space programmes were simply continuations of German projects. Both countries developed their own increasingly advanced systems.



The USSR issued a 10-kopek postage stamp in 1986 to honour Sergei Korolev.

The Soviet Union, which had already been conducting rocket research prior to the war, incorporated some of this knowledge into the development of its missile technology under the leadership of Soviet engineers, including Sergei Korolev.

Technological competition accelerated during the 1950s. Initially developed for military applications, rockets also began to offer the capacity required to transport payloads beyond the atmosphere. The most notable example in the Soviet programme was the R-7 intercontinental ballistic missile, which was later used to launch Sputnik 1 into orbit.

Meanwhile, the international scientific community was preparing for the International Geophysical Year, which took place between July 1957 and December 1958. This programme brought together researchers from various countries to study the Earth, its atmosphere, the oceans, the magnetic field and near space.

During this period, both the United States and the Soviet Union announced their

intention to place artificial satellites into orbit. Thus, the post-war military and technological competition began to transcend the limits of the atmosphere.

The Creation of the First Artificial Satellite in History



1987 postage stamp from the People's Republic of Congo commemorating the 30th anniversary of Sputnik 1.

As Soviet rocket technology advanced rapidly, the prospect of using it to reach space became a reality. On 30 January 1956, the Soviet government formally authorised the construction of an artificial satellite. Sergei Pavlovich Korolev, the engineer responsible for organising the Soviet Union's main rocket projects, directed the programme.

Korolev is now widely recognised as one of the key figures in space exploration. For many years, however, the Soviet government kept his identity secret, publicly referring to him only as 'chief designer'.

The original plan envisaged the construction of a large space laboratory weighing approximately 1,200 kilograms and carrying various scientific instruments. However, the project became more complex than anticipated and suffered delays.

Fearing that the United States would launch a satellite before the Soviet Union, Korolev proposed constructing a smaller, simpler device. This version was designated PS-1, an abbreviation of the Russian phrase meaning 'simpler satellite'.

Its development was accelerated in 1957. The priority was no longer to build a complete laboratory, but rather to quickly place an object in orbit and publicly demonstrate Soviet dominance in space technology.

A simple and efficient sphere



1963 commemorative 40 groszy postage stamp from Poland featuring Sputnik 1.

Sputnik 1 was a polished metal sphere with a diameter of approximately 58 centimetres and a weight of 83.6 kilograms. Four long antennas were attached to its exterior.

Inside were two radio transmitters, batteries, temperature and pressure sensors, a ventilation system and nitrogen to maintain pressure in the structure.

The transmitters emitted short, regular signals. The famous 'beeps' contained no voice, music or coded messages. Their primary function was to confirm the satellite's operation and enable monitoring from the ground.

These frequencies could be picked up by scientific stations, as well as by amateur radio operators. This meant that people from different countries could hear the signals coming from space directly, making the Soviet success impossible to conceal or contest.

Despite lacking complex instruments, Sputnik provided useful information. Variations in its signals enabled the internal conditions of the sphere to be observed, while changes in its trajectory contributed to the study of the density of the upper atmosphere.

Mission Objectives

The primary objective of Sputnik 1 was to demonstrate the ability to place and maintain a man-made object in Earth orbit.

The mission also aimed to test the launch vehicle's operation, tracking methods and radio signal transmission between space and the surface.

The scientific and technological objectives included testing the placement of a payload in orbit, verifying the operation of transmitters in space, studying the propagation of radio waves through the atmosphere, observing the density of the upper atmosphere, monitoring the satellite's gradual loss of altitude, and testing the resistance of a pressurised structure in space.

By placing the first satellite in orbit, the Soviet Union demonstrated its scientific, industrial and technological capabilities to the rest of the world.



1982 Soviet Union (USSR) commemorative souvenir miniature sheet celebrating the 25th anniversary of the launch of the world's first artificial Earth satellite, Sputnik 1.

The Historic Launch

Sputnik 1 was launched on 4 October 1957 from a Soviet base in present-day Kazakhstan, which would later become known as the Baikonur Cosmodrome.

It was launched using a modified version of the R-7 rocket, which was originally developed as an intercontinental ballistic missile. This rocket gave the satellite enough speed to prevent it from immediately returning to Earth's surface.

After separating from the rocket, Sputnik entered an elliptical orbit. Each orbit took approximately 96 minutes, enabling the satellite to circle the Earth about fifteen times per day.

The orbit was not perfectly circular. Sputnik's distance from the Earth's surface varied during its trajectory. At its closest point, it passed at an

altitude of just over 200 kilometres; at its farthest point, it reached approximately 900 kilometres.

The world had just entered a new era.

The Achievements of Sputnik 1



Australian 50-cent postage stamp from 2007 featuring the Sputnik 1 satellite.

Sputnik's most notable achievement was becoming the first artificial satellite in history. For the first time, a machine built by humans remained in orbit around the Earth.

This success also proved the efficiency of the R-7 rocket, demonstrating that the Soviet Union had mastered launch techniques, trajectory control and orbital tracking.

Sputnik's signals helped scientists to better understand the propagation of radio waves through the ionosphere. Its gradual loss of altitude also enabled the density of the upper atmosphere to be estimated, as little experimental information about this region existed.

The mission also improved tracking techniques that would be fundamental to later space programmes. Determining the position, speed and trajectory of an object in orbit became an essential activity for future satellites and spacecraft.

Beyond the scientific achievements, Sputnik had profound political consequences. In the United States, the launch caused surprise and concern. The fact that the Soviets were able to put a satellite into orbit indicated that they also possessed rockets capable of transporting payloads over long distances. This event became known as the 'Sputnik crash'.

In response, the U.S. government increased investment in scientific education, engineering, rocket technology, and space research. NASA, the agency responsible for the United States civilian space programme, was created in 1958.

Sputnik also intensified the space race. Over the next few years, the Soviet Union would launch the first animal into Earth's orbit and later send the first human into space. Meanwhile, the United States developed a programme that culminated in astronauts landing on the Moon in 1969.

The period during which Sputnik 1 remained in orbit



Stamp issued by Romania in 2007 commemorating the 50th anniversary of the launch of Sputnik 1.

Sputnik 1's transmitters remained operational until 26 October 1957, when the batteries ran out. Thus, signals were emitted for approximately 22 days.

However, the satellite continued to travel around the Earth even after the transmissions ceased.

As it lacked engines capable of correcting its trajectory, it slowly lost altitude due to friction with particles in the upper atmosphere. On 4 January 1958, it re-entered the atmosphere and was destroyed by the intense heat produced during descent.

Sputnik 1 remained in orbit for around 92 days, completing approximately 1,400 orbits of the Earth.

Sputnik 1 in Philately

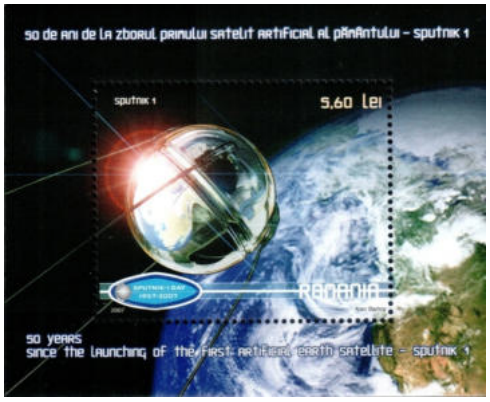


1987 stamp from Batumi featuring the Soviet Sputnik 1 satellite.

The worldwide impact of Sputnik 1 is also evident in philately. Over the decades, postal administrations in various countries have used the first artificial satellite, Sergei Korolev, Soviet rockets and anniversaries of the beginning of the Space Age as themes for commemorative stamps and blocks.

These stamps allow collectors to trace the evolution of space exploration and the way in which different countries commemorated one of the most significant scientific events of the 20th century.

Consequently, space exploration has become one of the richest fields in thematic philately, enabling collectors to build collections that combine science, history and technology.



2007 Romanian commemorative souvenir stamp sheet celebrating the 50th anniversary of the launch of Sputnik 1.

A small satellite, a global transformation

Sputnik 1 was an extremely simple machine compared to today's satellites. It didn't take photographs, provide weather forecasts or broadcast television programmes. Nevertheless, it demonstrated that space exploration was technically feasible.

After 1957, satellites began to play a fundamental role in society. They are currently used in communication systems, navigation, weather forecasting, environmental observation, scientific research and monitoring natural phenomena.

The small Soviet satellite also changed how humanity perceives its own planet. Earth began to be observed not only from its surface, but also from

space.

Although the repetitive signals transmitted by Sputnik lasted only a few weeks, their significance remains. Those ‘beeps’ signalled that a new frontier had been crossed and that space had become part of human history.

In philately, these small pieces of paper continue to preserve the memory of 4 October 1957, the day a 58-centimetre sphere opened the doors of space to humanity.

And what happened after Sputnik 1?



1982 stamp issued by Mongolia commemorating Laika, the first dog in space aboard Sputnik 2.

The success of Sputnik 1 was just the beginning. Less than a month later, on 3 November 1957, the Soviet Union launched Sputnik 2 carrying Laika, the first animal in Earth orbit. The space race advanced rapidly, reaching a new milestone in 1961 when Yuri Gagarin became the first human to travel into space and orbit the Earth.

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This article was first published in Filacap Online (#282, August 2026), and has been translated and reprinted here with permission.

Stamping Through Astronomy: A History of Astronomy Through Stamps and Philately By Renato Dicati

This new edition is a complete revision and expansion of the original, which was first published in 2013 and described as “a fascinating interweaving of philately and astronomy”.

With over 600 pages and more than 1,600 illustrations of astronomers, scientists, places, observation instruments, celestial objects and phenomena, discoveries and theories, and institutions, this second edition aims to provide readers with an overview of recent philatelic publications and an updated picture of the development of astronomical research and our view of the universe.

This unique book provides a comprehensive history of classical and radio astronomy, as well as the 'new astronomy', which uses telescopes and space probes to explore the universe across the entire electromagnetic spectrum. Alongside the great protagonists of this wonderful history, such as Ptolemy, Copernicus, Kepler, Galileo, Newton, Herschel and Einstein, its pages also feature hundreds of other figures who played a significant role in the development of astronomy — the oldest and most modern of sciences — some of whom are even unknown to specialists.

Finally, this comprehensive volume offers a veritable atlas of the sky, with numerous stamps, first-day covers, maximum cards and souvenir sheets illustrating constellations, stars, galaxies, nebulae, planets, comets and other minor celestial bodies.

