

*Above: Radio operators in the United States were able to pick up Sputnik's signals. It came as a shock to learn that the USSR had pulled ahead in the Space Race.*

*Top: Sputnik spent three months circling Earth, traveling at speeds of around 18,000 miles per hour.*

In October 1957, an elite group of Soviet scientists made history. The world's first man-made orbital satellite, *Sputnik*, launched from the Tyuratam Complex in Kazakh. The event marked the dawn of the Space Age.

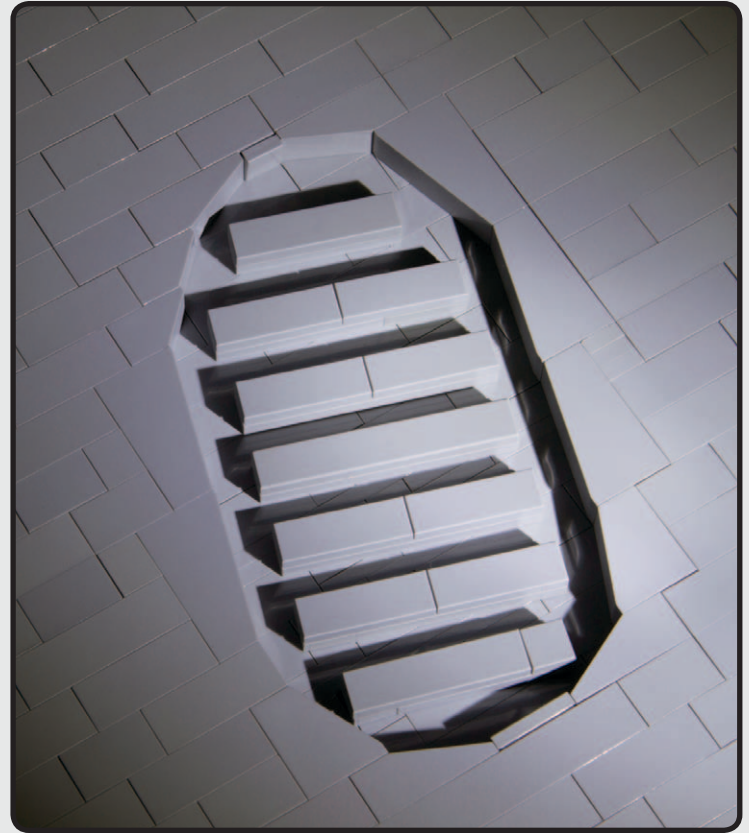
After blasting free from Earth's gravity, *Sputnik* settled into its planned orbit and began transmitting information back to Earth. The scientists were jubilant as they established radio contact with the world's first artificial satellite.

The compact sphere made a complete orbit every 96.2 minutes, transmitting a continuous pattern of beeps to radio operators across the globe. *Sputnik* exceeded its creators' expectations, dispatching information for 22 days before losing battery power. A valuable component of these signals was environmental telemetry, including atmospheric temperature and pressure readings. A decaying orbit drew the satellite slowly back to Earth, and after three months in space, *Sputnik* burned up as it reentered the atmosphere.

In response to the success of *Sputnik*, President Eisenhower ramped up the American space program and created the National Aeronautics and Space Administration (NASA). The failed launch of the American *Vanguard TV3*, just months after *Sputnik*, only increased NASA's resolve. Manned launches soon followed the satellites. Again, the Soviet Union won the race, with Yuri Gagarin being the first man to reach outer space. It was a unique age of scientific exploration.

Just 12 years after *Sputnik* orbited Earth, the first humans stepped onto the surface of the Moon. The American *Apollo* landings were a breathtaking demonstration of technology, engineering, and the human spirit.

But three years later, the lunar program came to an abrupt end. Sending astronauts to the Moon was prohibitively expensive, and public interest in the program was in decline. Plans for a manned mission to Mars were shelved as the projected budget spiraled out of control. The chance of mission failure, and subsequent loss of crew, was analyzed and deemed unacceptably high.

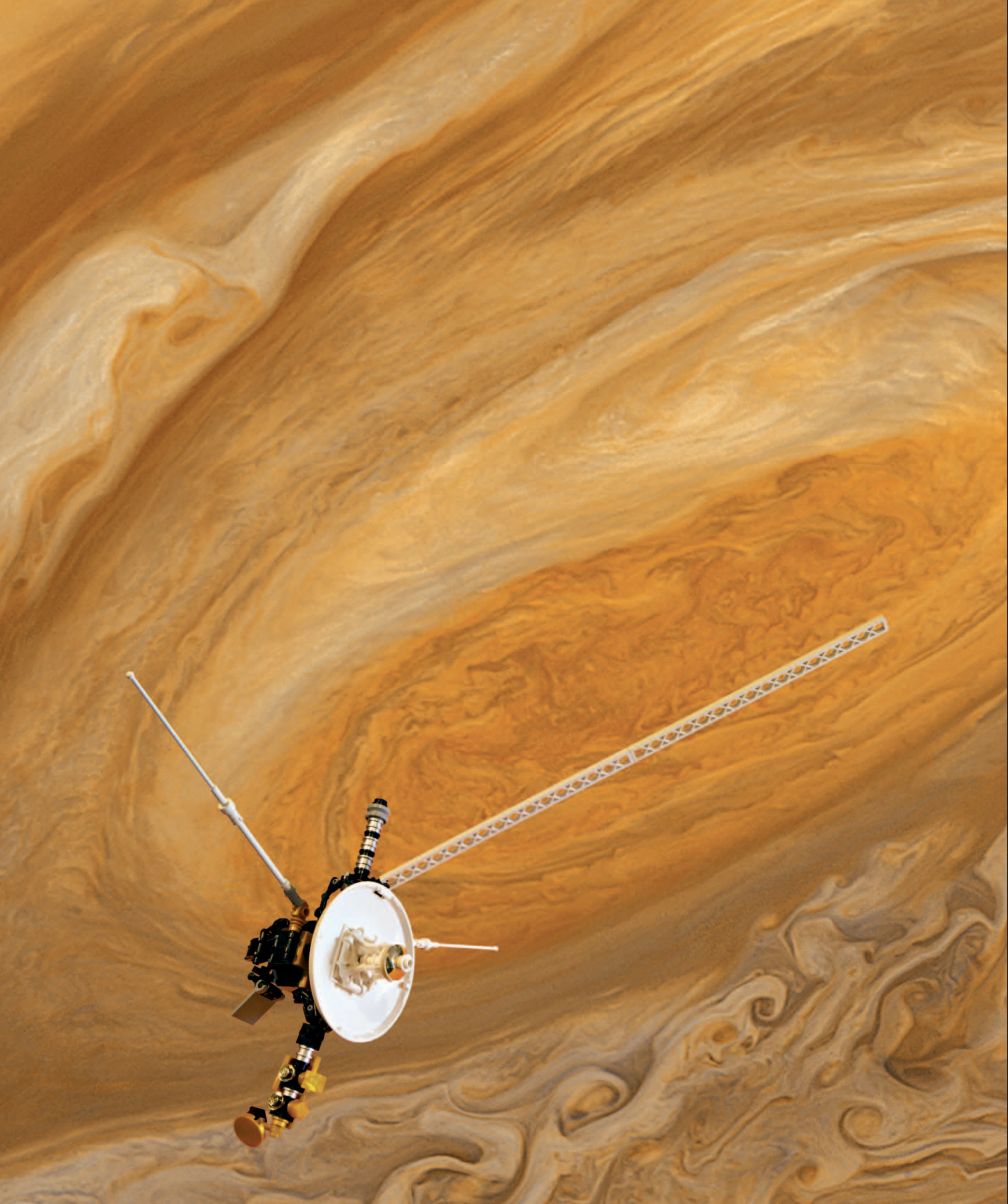


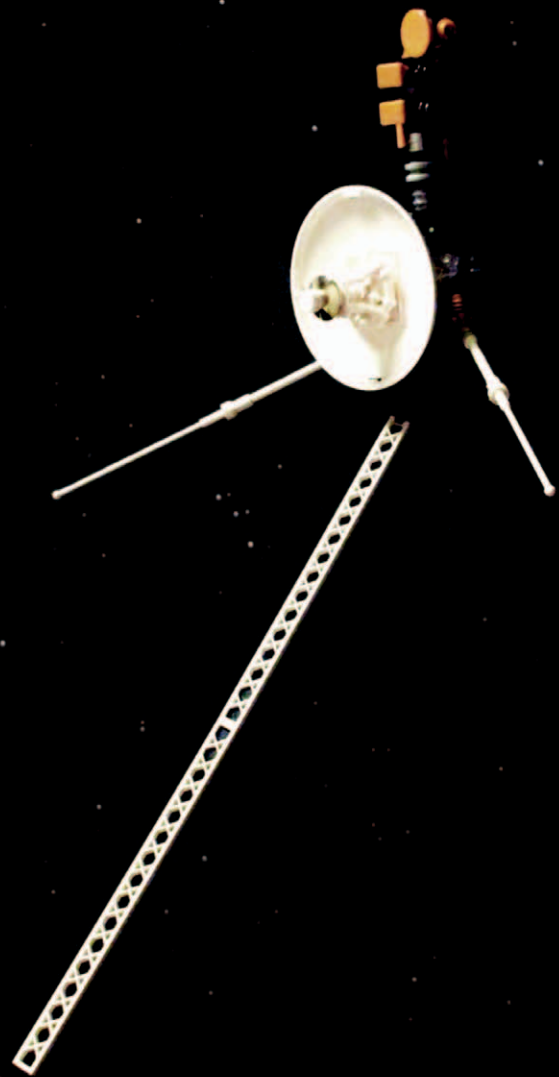
*Above: On July 20, 1969, Neil Armstrong became the first human to leave a footprint on the Moon's surface.*

*Neil Armstrong's first steps on the Moon were watched on television by an estimated 600 million people.*









*By taking a direct route from Earth, Voyager 1 reached Jupiter and Saturn sooner and performed a close flyby of Saturn's moon, Titan.*

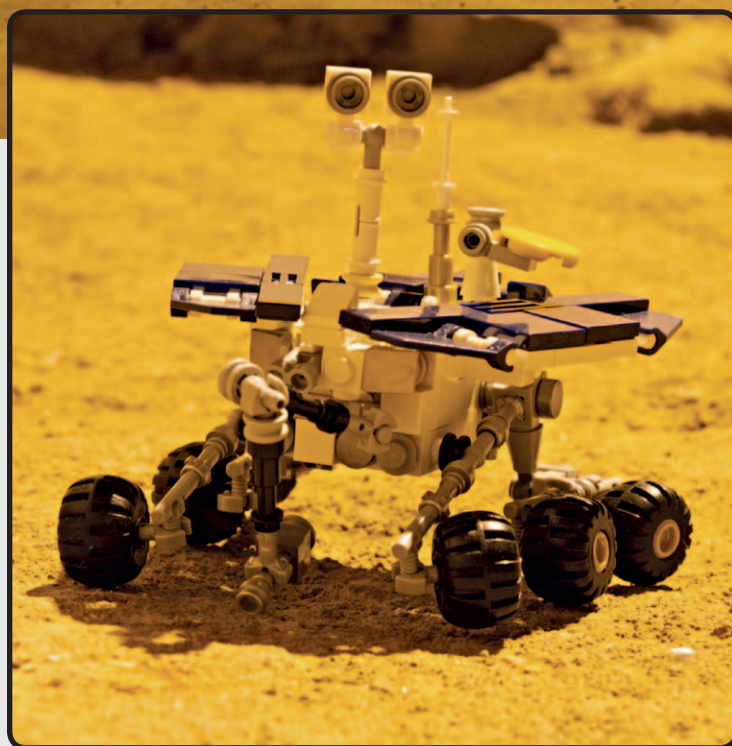
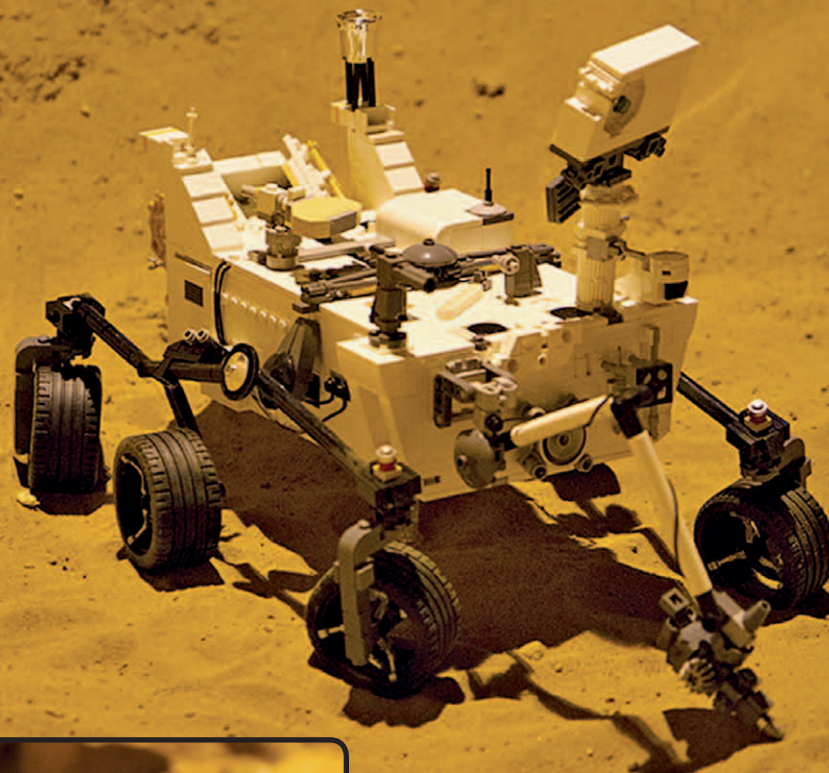
*Opposite: Voyager 2 took a more roundabout trajectory to take in Jupiter, Saturn, Uranus, and Neptune.*

In place of people, probes were sent to explore the cosmos.

In 1977, 20 years after *Sputnik*, the *Voyager* probes were launched. These two identical probes were sent on different routes through the solar system, with carefully calculated launch dates. Both probes embarked on a grand tour of the solar system, studying the outer planets and moons while minimizing power consumption. It was the most ambitious space mission of its time, and it produced hauntingly beautiful images of the outer planets.

The probes carried golden discs etched with sounds and images depicting life on planet Earth. These snapshots of humanity were regarded by some as a dangerous invitation. If intelligent life forms ever found *Voyager* and deciphered the messages on the discs, they would be able to work out precisely where the satellite came from. The information on the discs portrayed a lush planet and extended a friendly greeting to potential observers.





Above: Opportunity proved to be a tenacious explorer. The rover exceeded its operational lifetime dozens of times over.

Top: Curiosity was designed and built to explore Gale Crater for evidence of biological processes and changes in the martian atmosphere.

As *Voyager 1* crossed the outer threshold of the solar system, NASA launched new unmanned missions to Mars. A series of solar-powered rovers traversed the martian surface, taking valuable scientific readings for future colonists.

The fourth rover to successfully touch down, *Curiosity*, was part of the Mars Science Laboratory mission. It was designed to spend two years exploring Gale Crater, an area on Mars where liquid water once flowed and which might have once harbored microbial life.

As the largest, most sophisticated machine to be sent to the red planet, *Curiosity* was a technological triumph. The rover's directives included detailed surface mapping, geological analysis, and searching for evidence of water.

In August 2012, after traveling for nine months, the rover touched down on the martian surface. *Curiosity* gathered invaluable scientific data. Highly detailed maps and telemetry from the rover helped shape the course of future Mars missions.