



# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

H.G. Wells' novel *The War of the Worlds* was published, inspiring Robert Goddard to investigate rocketry

**1898**



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## SPACE GRAB BAG

Based on Jules Verne's novel *From the Earth to the Moon*, the first work that suggested space exploration was possible was published in Russia entitled "The Exploration of Cosmic Space by Means of Reaction Devices"

**1903**



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## SPACE GRAB BAG

Confirmation of the existence of the Van Allen radiation belts

**1958**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

First detection of solar wind

**1959**





# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

First photographs transmitted from the moon

**1966**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

Closest flyby of the sun, 44 million kilometers, by the spacecraft Helios 2

**1976**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

Hubble Space telescope launched

**1990**



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**SOLAR SYSTEM**

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## SPACE GRAB BAG

First asteroid flyby, the asteroid 951 Gaspra by the spacecraft Galileo

**1991**





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## SPACE GRAB BAG

Launch of Ulysses, a collaboration between NASA and the European Space Agency, the first spacecraft to orbit the sun at its poles

**1992**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

First landing on an asteroid, 433 Eros

**2001**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

First sample returned from an asteroid by the Japanese spacecraft Hayabusa

**2010**



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## SPACE GRAB BAG

First man-made probe to make a planned and soft landing on a comet, the European Space Agency spacecraft Rosetta

**2014**





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## SPACE GRAB BAG

Edmond Halley observed that a comet returned regularly every 75-76 years, which was the first evidence something other than a planet orbited

**1705**



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# TIMELINE CARDS

## SPACE GRAB BAG

The term “solar system” first appeared in the English language

**1704**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE GRAB BAG

Giuseppe Piazzi discovered Ceres between Mars and Jupiter which was originally thought to be a new planet, but was later classified as a part of the asteroid belt

**1801**



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# TIMELINE CARDS

## SPACE GRAB BAG

First discovery of a planet system other than our solar system, a series of planets orbiting the pulsar PSR B1257+12

**1992**





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## MANNED SPACE EXPLORATION

First living organism intentionally launched into space (fruit flies)

**1947**



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**TIMELINE CARDS**

## MANNED SPACE EXPLORATION

First vertebrate in space, Albert II, a rhesus monkey aboard a V-2 rocket

**1949**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

The USSR brings back alive the first collection of plants and animals that orbited the Earth aboard Sputnik 5

**1960**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

First chimpanzee in space on the U.S. M-R 2

**1961**





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**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

First human spaceflight, Yuri Gagarin of the USSR  
on the Vostok 1

**1961**



# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

First human piloted space flight, Alan Shepard of the United States aboard the Freedom 7

**1961**



# GIANT MAPS

**SOLAR SYSTEM**

**TIMELINE CARDS**

## MANNED SPACE EXPLORATION

First woman in space, Valentina Tereshkova of the USSR aboard the Vostok 6

**1963**



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**SOLAR SYSTEM**

**TIMELINE CARDS**

## MANNED SPACE EXPLORATION

First spacewalk, Alexi Leonov of the USSR left his capsule for a 12 minute extra-vehicular activity from the Voskhod 2

**1965**





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## MANNED SPACE EXPLORATION

First reusable manned orbital spacecraft, the United States STS-1, better known as Columbia

**1981**



# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

First international manned mission, the Apollo-Soyuz Test Project

**1975**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

Sally Ride, aboard the space shuttle Challenger, becomes the first American woman in space

**1983**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

American Bruce McCandless completes the first untethered spacewalk

**1984**





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**SOLAR SYSTEM**

# TIMELINE CARDS

## MANNED SPACE EXPLORATION

The Space Shuttle Challenger explodes 73 seconds after launch, causing a nearly three-year grounding of the United States space shuttles

**1986**



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# TIMELINE CARDS

## MANNED SPACE EXPLORATION

The International Space Station launched as a collaboration between Russia, the United States, the European Space Agency, Japan, and Canada

**1998**



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## MANNED SPACE EXPLORATION

First food eaten that was also grown in space  
(lettuce) aboard the International Space Station

**2015**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First telescopic observation of the night sky,  
discovery of Jupiter's moons

**1610**



NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

Discovery of the phases of Venus

**1610**

NATIONAL  
GEOGRAPHIC

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SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

The dwarf planet Pluto was discovered by Clyde Tombaugh at the Lowell Observatory in Flagstaff, Arizona

**1930**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First successful Mars flyby. The closest approach was 9,846 km from the Mariner 4

**1965**

NATIONAL  
GEOGRAPHIC

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SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First close up photographs of another planet,  
Mars from Mariner 4

**1965**



NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First impact into another planet, Venus by the Russian spacecraft Venera 3

**1966**

NATIONAL  
GEOGRAPHIC

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SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First lunar rover, the Russian craft Lunokhod 1

**1970**

NATIONAL  
GEOGRAPHIC

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SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First soft landing on another world, the moon by the Russian spacecraft Luna 9

**1966**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First soft landing on Mars, and first signals sent back from Mars

**1971**



NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First mission to enter the asteroid belt and leave the Inner Planets, Pioneer 10 of the United States

**1972**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First maintained orbit around another planet,  
Mars, by the U.S. satellite Mariner 9

**1971**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First Jupiter flyby, by the spacecraft Pioneer 10

**1973**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First Mercury flyby, at a distance of 704 km by  
Mariner 10

**1974**



NATIONAL  
GEOGRAPHIC

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SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First detailed photos and soil samples from the surface of Mars from the Viking Landers 1 and 2

**1976**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

Discovery of volcanism on Io, one of the moons of Jupiter, by Voyager 1

**1979**

NATIONAL  
GEOGRAPHIC

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SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First Saturn flyby, first photograph of Titan, one of the moons of Saturn from space by Pioneer 11

**1979**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First Venus soil samples and sound recordings sent back from the USSR probe Venera 13

**1982**



NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First man-made object beyond Neptune, the U.S. spacecraft Pioneer 10

**1983**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First Uranus flyby by Voyager 2

**1986**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First orbit of Jupiter by the spacecraft Galileo

**1995**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First mission into the atmosphere of a gas giant, Jupiter, by the probe on the spacecraft Galileo

**1995**



NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First operational rover on another planet, the Mars Pathfinder

**1997**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First orbit of Saturn by the Cassini-Huygens spacecraft, a joint mission between NASA, the European Space Agency and the Italian Space Agency Agenzia

**2004**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

# TIMELINE CARDS

## PLANETARY EXPLORATIONS

First flyby of Pluto by the U.S. spacecraft New Horizons

**2015**

NATIONAL  
GEOGRAPHIC

# GIANT MAPS

SOLAR SYSTEM

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## PLANETARY EXPLORATIONS

Discrepancies in the orbit of Uranus led to the thesis that another large planet must be pulling on it, the mathematical calculations which eventually lead to the discovery of the planet Neptune

**1846**





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## SPACE TECHNOLOGY

China combines sulfur, charcoal, and potassium nitrate to make gunpowder to propel rockets for Chinese warfare

**10<sup>th</sup> century C.E.**



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## SPACE TECHNOLOGY

Hyder Ali, the Sultan of Mysore in India, begins to manufacture rockets encased in iron as opposed to paper to improve their range and stability

**18<sup>th</sup> century**



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## SPACE TECHNOLOGY

First explanation of the rocket equation based on Newton's third law of motion in England

**1813**



# GIANT MAPS

**SOLAR SYSTEM**

**TIMELINE CARDS**

## SPACE TECHNOLOGY

First clear photograph of a space object, the moon

**1840**





# GIANT MAPS

**SOLAR SYSTEM**

# **TIMELINE CARDS**

## SPACE TECHNOLOGY

Robert Goddard is awarded patents for liquid fuel and solid fuel rockets

**1914**



# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE TECHNOLOGY

Robert Goddard launches first liquid-fueled rocket

**1926**



# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE TECHNOLOGY

First vehicle crosses the Karman line (100km/~62 miles above Earth's surface) and thereby entered outer space, launched from Germany

**1944**



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**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE TECHNOLOGY

First artificial satellite sends signals back from space, Sputnik 1

**1957**





# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE TECHNOLOGY

First spacecraft to reach the moon, Luna 1,  
launched by the former USSR

**1959**



# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE TECHNOLOGY

First photograph of Earth from an orbiting object,  
the U.S. satellite Explorer 6

**1959**



# GIANT MAPS

**SOLAR SYSTEM**

# TIMELINE CARDS

## SPACE TECHNOLOGY

First artificial satellite around another world, the moon, by the USSR satellite Luna 10

**1966**



# GIANT MAPS

**SOLAR SYSTEM**

# **TIMELINE CARDS**

## SPACE TECHNOLOGY

First human on the moon aboard the Apollo 11

**1969**





# GIANT MAPS

**SOLAR SYSTEM**

# **TIMELINE CARDS**

## SPACE TECHNOLOGY

First space station, Salyut 1

**1971**



# GIANT MAPS

**SOLAR SYSTEM**

# **TIMELINE CARDS**

## SPACE TECHNOLOGY

First consistently inhabited long-term research space station, the Mir

**1986**



# GIANT MAPS

**SOLAR SYSTEM**

**TIMELINE CARDS**

## SPACE TECHNOLOGY

The first GPS satellite, Navstar 1 launches

**1978**



# GIANT MAPS

**SOLAR SYSTEM**

# **TIMELINE CARDS**

## SPACE TECHNOLOGY

Hans Lippershey, a German lens-maker wanted to make an instrument for “seeing things far away as they were nearby” which was the first mention of a telescope like instrument in writing

**1608**





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## SPACE TECHNOLOGY

Galileo Galilei builds his first telescope which he used to discover the four largest moons of Jupiter, sunspots on the surface of the sun, and craters on the moon

**1609**