

Timeline of space exploration

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It has been suggested that *List of space exploration milestones, 1957–1969* be **merged** into this article or section. ([Discuss](#))

This is a **Space Exploration Timeline** including notable achievements and first accomplishments in humanity's physical exploration of [space](#).

Contents



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[\[edit\]](#) Prior to 1942

Date	Event leading to space exploration	Country	Researcher(s)
1686	Publication of the <i>Philosophiæ Naturalis Principia</i>	 England	Sir Isaac Newton








	<i>Mathematica</i>	d	
1813	First exposition of the rocket equation based on Newton's third law of motion: <i>Treatise on the Motion of Rockets</i>	 UK	William Moore
1898	The War of the Worlds published. This inspired Robert Goddard to investigate rocketry.	 UK	H. G. Wells
1903	Inspired by the writings of Jules Verne , first serious work published that showed physical space exploration was theoretically possible: Исследование мировых пространств реактивными приборами (The Exploration of Cosmic Space by Means of Reaction Devices)[1]	 Russia	Konstantin Tsiolkovsky
1913	Goddard files for and is subsequently awarded U.S. patents on multistage and liquid fueled rockets	 United States	Robert H. Goddard
1919	Goddard's widely influential paper "A Method of Reaching Extreme Altitudes" discussed solid and liquid fueled rocketry	 United States	Robert H. Goddard
15 December 1923	<i>Die Rakete zu den Planetenräumen</i> ("By Rocket into Planetary Space") self-published after its rejection as a doctoral thesis.	 Germany	Hermann Oberth
1924	Society for Studies of Interplanetary Travel founded in Soviet Union	 Soviet Union	members include Konstantin Tsiolkovsky , Friedrich Zander , Yuri Kondratyuk
16 March 1926	Goddard launches the first liquid fueled rocket	 United States	Robert H. Goddard
1927	<i>Verein für Raumschiffahrt</i> (Society for Space Travel) formed; it includes many top European rocket scientists.	 Germany	
1927	"The Conquest of Interplanetary Space" discusses rocket mechanics and orbital effects including the gravitational slingshot	 Soviet Union	Yuri Kondratyuk
1928	<i>Das Problem der Befahrung des Weltraums – der Raketen-Motor</i> (The Problem of Space Travel – The Rocket Motor) discusses space travel and its potential uses for scientific experiments.	 Austria	Herman Potočník
1929	Oberth, with students including Wernher von Braun , launches his first liquid-fueled rocket	 Germany	Hermann Oberth
1931	First German military liquid fueled rocket engines developed	 Germany	Walter Riedel
1933	Work begins on the Aggregate series of rockets which	 Germany	Wernher von Braun




	leads to the V2 rocket .	ny	
25 November 1933	Group for the Study of Reactive Motion (GIRD) launches the first Soviet liquid-fueled rocket	 Soviet Union	Sergey Korolev (group leader), Friedrich Zander (designer)
1935	Graduate student Frank Malina under his professor Theodore von Kármán begins work on a sounding rocket	 United States	Frank Malina

[\[edit\]](#) 1942–1957

Date	Mission Achievements	Country/Organization	Mission Name
3 October 1942	First vehicle to reach 62 mi (100 km) from the Earth's surface (boundary of space)[2]	 Nazi Germany	V2 rocket , military program
10 May 1946	First space research flight (cosmic radiation experiments)	 United States	captured and improved V2 rocket
22 May 1946	First U.S.-designed rocket to reach edge of space (80 km (49 mi))	 United States	Wac Corporal
10 October 1946	First pictures of earth from 62 mi(100 km)[2][3]	 United States	V2
1947	First animals in space (fruit flies)[4][5]	 USA (ABMA)	V2
21 August 1957	First intercontinental ballistic missile (ICBM)	 USSR	R-7 Semyorka/SS-6 Sapwood


[\[edit\]](#) 1957–1961

Date	Mission Achievements	Country/Organization	Mission Name
4 October 1957	First artificial satellite First signals from space	 USSR	Sputnik 1
3 November 1957	First animal in orbit , the dog Laika	 USSR	Sputnik 2
31 January 1958	Confirmed the existence of the Van Allen belts	 USA (ABMA)	Explorer 1
2 January 1959	First firing of a rocket in Earth orbit First reaching Earth escape velocity First detection of solar wind	 USSR	Luna 1
4 January 1959	First man-made object in heliocentric orbit	 USSR	Luna 1
7 August 1959	First photograph of Earth from orbit	 USA (NASA)	Explorer 6
13 September 1959	First impact into another world (the Moon) First delivery of national (USSR) pennants in a celestial body	 USSR	Luna 2

4 October 1959	First photos of far side of the Moon	 USSR	Luna 3
August 19, 1960	First plants and animals to return alive from Earth orbit	 USSR	Sputnik 5
1961	First launch from orbit [<i>clarification needed</i>] First mid-course corrections First spin-stabilisation	 USSR	Venera 1






[edit] 1961–1969

Date	Mission Success	Country/Organization	Mission Name
12 April 1961	First manned spaceflight (Yuri Gagarin) First manned orbital flight	 USSR	Vostok 1
7 March 1962	First orbital solar observatory	 USA (NASA)	OSO-1
14 December 1962	First planetary flyby (Venus closest approach 34,773 kilometers)	 USA (NASA)	Mariner 2
16 June 1963	First woman in space (Valentina Tereshkova)	 USSR	Vostok 6
19 July 1963	First reusable manned spacecraft (<i>suborbital</i>)	 USA (NASA)	X-15 Flight 90
18 March 1965	First extra-vehicular activity	 USSR	Voskhod 2
14 July 1965	First Mars flyby (closest approach 9,846 kilometers)	 USA (NASA)	Mariner 4
15 December 1965	First orbital rendezvous (parallel flight, no docking)	 USA (NASA)	Gemini 6A/Gemini 7
3 February 1966	First soft landing on another world (the Moon) First photos from another world	 USSR	Luna 9
1 March 1966	First impact into another planet (Venus)	 USSR	Venera 3
16 March 1966	First orbital rendezvous (docking)	 USA (NASA)	Gemini 8/Agena target vehicle
3 April 1966	First artificial satellite around another world (the Moon)	 USSR	Luna 10
30 October 1967	First automated (unmanned) docking	 USSR	Cosmos 186/Cosmos 188
7 December 1968	First orbital ultraviolet observatory	 USA (NASA)	OAO-2
21 December 1968	First human orbiting of another celestial body (Moon)	 USA (NASA)	Apollo 8
21 July 1969	First human on the Moon and first space launch from a celestial body	 USA (NASA)	Apollo 11























19 November 1969	First rendezvous on the surface of a celestial body	 USA (NASA)	Apollo 12/Surveyor 3
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[\[edit\]](#) 1970–1980

Date	Mission Success	Country/Organization	Mission Name
24 September 1970	First automatic sample return from the Moon	 USSR	Luna 16
23 November 1970	First lunar rover	 USSR	Lunokhod 1
12 December 1970	First X-ray orbital observatory	 USA (NASA)	Uhuru (satellite)
15 December 1970	First soft landing on another planet (Venus) First signals from another planet	 USSR	Venera 7
23 April 1971	First space station	 USSR	Salyut 1
June, 1971	First Manned orbital observatory	 USSR	Orion 1
14 November 1971	First to maintain orbit around another planet (Mars)	 USA (NASA)	Mariner 9
27 November 1971	First impact into Mars	 USSR	Mars 2
2 December 1971	First soft Mars landing First signals from Mars surface	 USSR	Mars 3
3 March 1972	First human made object sent on escape trajectory away from the Sun	 USA (NASA)	Pioneer 10
15 July 1972	First mission to enter the asteroid belt and leave inner solar system	 USA (NASA)	Pioneer 10
15 November 1972	First orbital gamma ray observatory	 USA (NASA)	SAS 2
3 December 1973	First Jupiter flyby (at 130,000 km). First spacecraft to pass through the asteroid belt.	 USA (NASA)	Pioneer 10
5 February 1974	Venus flyby at 5768 kilometers, first gravitational assist manoeuvre	 USA (NASA)	Mariner 10
29 March 1974	First Mercury flyby at 703 kilometers	 USA (NASA)	Mariner 10
15 July 1975	First multinational manned mission	 USSR  USA (NASA)	Apollo-Soyuz Test Project
20 October 1975	First orbit around Venus	 USSR	Venera 9
22 October	First photos from the surface of another	 USSR	Venera 9

1975	planet (Venus)		
20 July 1976	First photos and soil samples from the surface of Mars	 USA (NASA)	Viking Lander
26 January 1978	First real time remotely operated ultraviolet orbital observatory	 USA (NASA)  ESA ESA  UK-SERC	International Ultraviolet Explorer
1 September 1979,	First Saturn flyby at 21,000 km	 USA (NASA)	Pioneer 11

[[edit](#)] 1981–present

Date	Mission Success	Country/Organization	Mission Name
12 April 1981	First Reusable manned spacecraft (<i>orbital</i>)	 USA (NASA)	STS-1
1 March 1982	First Venus soil samples & sound recording of another world	 USSR	Venera 13
25 January 1983	First Infrared orbital observatory	 USA (NASA)  UK-SERC  Netherlands-NIVR	IRAS
23 March 1983	Ultraviolet orbital observatory	 USSR  France	Astron
13 June 1983	First spacecraft beyond the orbit of Neptune (first spacecraft to pass beyond all Solar System planets)	 USA (NASA)	Pioneer 10
24 January 1986	First Uranus flyby (closest approach 81,500 kilometers)	 USA (NASA)	Voyager 2
19 February 1986	First consistently inhabited long-term research space station	 USSR	Mir
25 August 1989	First Neptune flyby	 USA (NASA)	Voyager 2
18 November 1989	First orbital cosmic microwave observatory	 USA (NASA)	COBE
1 December 1989	Ultraviolet to gamma ray spectrum orbital observatory	 USSR  France  Denmark  Bulgaria	Granat
14 February 1990	First photograph of the whole solar system [3]	 USA (NASA)	Voyager 1
24 April 1990	Optical orbital observatory	 USA (NASA)  ESA	Hubble Space Telescope
21 October 1991	First asteroid flyby (951 Gaspra closest approach 1,600 kilometers)	 USA (NASA)	Galileo
8 February 1992	First polar orbit around the Sun	 USA (NASA)  ESA	Ulysses

7 December 1995	First orbit of Jupiter	 USA (NASA)	Galileo
7 December 1995	First mission into the atmosphere of a gas giant (Jupiter)	 USA (NASA)	Galileo's atmospheric entry probe
14 February 2000	First orbiting of an asteroid (433 Eros)	 USA (NASA)	NEAR Shoemaker
12 February 2001	First landing on an asteroid (433 Eros)	 USA (NASA)	NEAR Shoemaker
4 January 2004	Free ranging Mars rover	 USA (NASA)	Spirit rover
25 January 2004	Free ranging Mars rover	 USA (NASA)	Opportunity rover
1 July 2004	First orbit of Saturn	 USA (NASA)  ESA  ASI	Cassini–Huygens
14 January 2005	First soft landing on Titan	 ESA  USA (NASA)  ASI	Cassini–Huygens
24 October 2007	First stage of the country's lunar probe program , the satellite Chang'e I	 China	Chang'e I
6 March 2009	Kepler Mission is launched, first space telescope designated to search for Earth-like exoplanets ^[4]	 USA	Kepler Mission

¹Project Vanguard was transferred from the NRL to NASA in late 1958.

In addition, virtually all manned duration records have been set by the USSR, due largely to their [Salyut](#) and [Mir](#) series of space stations.

[edit] See also

- [Timeline of Solar System exploration](#)
- [Discovery and exploration of the Solar System](#)
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- [List of communications satellite firsts](#)

[edit] References

- ¹ ↑ *Tsiolkovsky's Исследование мировых пространств реактивными приборами – The Exploration of Cosmic Space by Means of Reaction Devices* (Russian paper)[*dead link*]
- ↑ *Dornberger, Walter* (1954—English translation) [1952 V2—Der Schuss ins Weltall]. *V-2*. New York: Viking Press. pp. 17,256–7.
- ↑ See [1] under "Extended Mission"
- ↑ [NASA launches Kepler Mission: Search for Earth-like worlds](#)

[edit] External links

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