Master Catalogue of Lunar and Mars Exploration Missions

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This paper contains catalogues of Chronology of Lunar and Mars Exploration Missions with their respective probe parameters such as launch mass, probe mass, the period of mission duration and mission degradation, mission intervals between launches. The novel feature of this catalogues are precise and verified data gathered from reliable online resources and journal articles than other resources available. These catalogues are assorted to have clearance in mission attempts and trends since the last century towards the Moon and Mars. It also encloses random graphical images generated using the data mentioned in this catalogue. The catalogues also comprise gravity assist probes and test launches. Some of the unclear data were gathered from online resources and have uncertain in data validation. This catalogue is derived from our previous complied works described in the supplementary materials section.

I. Nomenclature

<i>AIMP</i>	= Anchored Interplanetary Monitoring Platform
<i>ARC</i>	= Ames Research Center
<i>BMDO</i>	= Ballistic Missile Defense Organization
<i>CAST</i>	= China Academy of Space Technology
<i>CC-LC</i>	= Cape Canaveral Launch Complex
<i>CC-SLC</i>	= Cape Canaveral Space Launch Complex
<i>CNSA</i>	= China National Space Administration
<i>DSPSE</i>	= Deep Space Program Science Experiment
<i>DSWLP</i>	= Discovering the Sky at Longest Wavelengths Pathfinder
<i>ELA</i>	= Ensemble de Lancement Ariane
<i>ELS</i>	= Ensemble de Lancement Soyuz
<i>ESA</i>	= European Space Agency
<i>ESPD</i>	= Elapsed
<i>GGS</i>	= Global Geospace Science
<i>GRAIL</i>	= Gravity Recovery and Interior Laboratory
<i>GSFC</i>	= Goddard Space Flight Center
<i>GSLV</i>	= Geosynchronous Satellite Launch Vehicle
<i>GSMZ</i>	= Lavochkin Research and Production Association (NPO)
<i>HIT</i>	= Harbin Institute of Technology
<i>IAI</i>	= Israel Aerospace Industries
<i>ICE</i>	= International Cometary Explorer
<i>ISAS</i>	= Institute of Space and Aeronautical Science
<i>ISEE</i>	= International Sun=Earth Explorer
<i>ISRO</i>	= Indian Space Research Organisation
<i>JAXA</i>	= Japanese Aerospace Exploration Agency
<i>JHUAPL</i>	= The John Hopkins University Applied Physics Laboratory
<i>JPL</i>	= Jet Propulsion Laboratory
<i>LADEE</i>	= Lunar Atmosphere and Dust Environment Explorer

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<i>LaRC</i>	= Langley Research Center
<i>LCROSS</i>	= Lunar Crater Observation and Sensing Satellite
<i>LM</i>	= Lunar Module
<i>LMSS</i>	= Lockheed Martin Space Systems
<i>LOK</i>	= Lunniy Orbitalny Korabl
<i>LRO</i>	= Lunar Reconnaissance Orbiter
<i>LUX</i>	= Luxemburg
<i>LV</i>	= Launch Vehicle
<i>MARS-LP</i>	= Mid-Atlantic Regional Spaceport Launch Pad
<i>MAVEN</i>	= Mars Atmosphere and Volatile Evolution
<i>MCO</i>	= Mars Climate Orbiter
<i>MER</i>	= Mars Exploration Rover
<i>MGS</i>	= Mars Global Surveyor
<i>MIP</i>	= Moon Impact Probe
<i>MIT</i>	= Massachusetts Institute of Technology
<i>MMMM</i>	= Manfred Memorial Moon Mission
<i>MOM</i>	= Mars Orbiter Mission
<i>MPL</i>	= Mars Polar Lander
<i>MRO</i>	= Mars Reconnaissance Orbiter
<i>MS</i>	= Mars Surveyor
<i>MSL</i>	= Mars Science Laboratory
<i>MV</i>	= Mars Venus
<i>NAA</i>	= North American Aviation
<i>NAR</i>	= North American Rockwell Grumman
<i>NASA</i>	= National Aeronautics and Space Administration
<i>NASA</i>	= National Aeronautics Space Administration
<i>NPO</i>	= Lavochkin Research and Production Association
<i>NRAO</i>	= National Radio Astronomy Observatory
<i>OKB</i>	= Opytnoye Konstruktorskoye Buro (Experimental Design Bureau)
<i>PAS 22</i>	= PanAm Sat
<i>PFS</i>	= Particles & Fields Sub=satellite
<i>PSLV</i>	= Polar Satellite Launch Vehicle
<i>RAE</i>	= Radio Astronomy Explorer
<i>RSAT</i>	= Radio Satellite
<i>SANSEI</i>	= Shanghai Aerospace System Engineering Institute
<i>SELENE</i>	= Selenological and Engineering Explorer
<i>SHAR</i>	= Sriharikota Launch Pad
<i>SLC</i>	= Space Launch Complex
<i>SLV</i>	= Space Launch Vehicle
<i>SMART</i>	= Small Missions for Advanced Research in Technology
<i>SSC</i>	= Swedish Space Corporation
<i>STEREO</i>	= Solar Terrestrial Relations Observatory
<i>STL</i>	= Space Technology Laboratories
<i>STS</i>	= Space Transportation System
<i>TAS</i>	= Thales Alenia Space
<i>TESS</i>	= Transiting Exoplanet Survey Satellite
<i>TsKBEM</i>	= S.P. Korolev Rocket and Space Corporation Energia
<i>TSS</i>	= Toshiba Space Systems
<i>TY</i>	= Tanegashima Yoshinobu 1
<i>US</i>	= United States
<i>USC</i>	= Uchinoura Space Center
<i>USSR</i>	= Union of Soviet Socialist Republics (Russia)
<i>VRAD</i>	= Very-Long-Baseline-Interferometer Radio Source
<i>WMAP</i>	= Wilkinson Microwave Anisotropy Probe
<i>XL</i>	= Extra Large
<i>XLS/XSLC</i>	= Xichang Satellite Launch Center

Table-1 Chronology of Lunar Exploration Missions

S.No	Spacecraft	Distinct Name	Type	Manufacturer	Launch Date	End of Mission Decay Date	Launcher	Launcher Type	Launch Site	Country
01.	Pioneer 0	Able-1	Orbiter	STL	17-Aug-1958	17-Aug-1958	Thor	DM-18-Able-1	CC-LC-17A	US
02.	Luna E-1 No.1		Impactor	OKB-1	23-Sep-1958	23-Sep-1958	Luna 8K72	S.No. B1-3	Baikonur 1/5	USSR
03.	Pioneer 1	Able-2	Orbiter	STL	11-Oct-1958	13-Oct-1958	Thor	DM-18-Able-1	CC-LC-17A	US
04.	Luna E-1.No.2		Impactor	OKB-1	12-Oct-1958	12-Oct-1958	Luna 8K72	S.No. B1-4	Baikonur 1/5	USSR
05.	Pioneer 2	Able-3	Orbiter	STL	08-Nov-1958	08-Nov-1958	Thor	DM-18-Able-1	CC-LC-17A	US
06.	Luna E-1.No.3		Impactor	OKB-1	04-Dec-1958	04-Dec-1958	Luna 8K72	S.No. B1-5	Baikonur 1/5	USSR
07.	Pioneer 3		Flyby	JPL	06-Dec-1958	07-Dec-1958	Juno	Version – II	CC-LC-05	US
08.	Mechta /Luna 1	Luna E-1.No.4	Impactor	OKB-1	02-Jan-1959	05-Jan-1959	Luna 8K72	S.No. B1-6	Baikonur 1/5	USSR
09.	Pioneer 4		Flyby	JPL	03-Mar-1959	06-Mar-1959	Juno	Version – II	CC-LC-05	US
10.	Luna E-1A.No.1	Luna E-1A.No.5	Impactor	OKB-1	18-Jun-1959	18-Jun-1959	Luna 8K72	S.No. L1-7	Baikonur 1/5	USSR
11.	Luna 2	Luna E-1A.No.2	Impactor	OKB-1	12-Sep-1959	14-Sep-1959	Luna 8K72	S.No. L1-7B	Baikonur 1/5	USSR
12.	Pioneer P-1		Orbiter	STL	24-Sep-1959	26-Sep-1959	Atlas-C	Able	CC-LC-12	US
13.	Luna 3	Luna E-2A.No.1	Flyby	OKB-1	04-Oct-1959	22-Oct-1959	Luna 8K72	S.No. L1-8	Baikonur 1/5	USSR
14.	Pioneer P-3	Able-IVB	Orbiter	STL	26-Nov-1959	26-Nov-1959	Atlas-D	Able	CC-LC-14	US
15.	Luna 1960A	Luna E-3.No.1	Circumlunar	OKB-1	15-Apr-1960	15-Apr-1960	Luna 8K72	S.No.L1-9	Baikonur 1/5	USSR
16.	Luna 1960B	Luna E-3.No.2	Circumlunar	OKB-1	19-Apr-1960	19-Apr-1960	Luna 8K72	S.No.L1-9A	Baikonur 1/5	USSR
17.	Pioneer P-30	Able-VA	Orbiter	STL	25-Sep-1960	25-Sep-1960	Atlas-D	Able	CC-LC-12	US
18.	Pioneer P-31	Able-VB	Orbiter	STL	15-Dec-1960	15-Dec-1960	Atlas-D	Able	CC-LC-12	US
19.	Ranger 1	P-32	Deep Space	JPL	23-Aug-1961	30-Aug-1961	Atlas	Agena-B-1	CC-LC-12	US
20.	Ranger 2	P-33	Deep Space	JPL	18-Nov-1961	19-Nov-1961	Atlas	Agena-B-2	CC-LC-12	US
21.	Ranger 3	P-34	Impactor	JPL	26-Jan-1962	02-Feb-1962	Atlas LV-3	Agena-B	CC-LC-12	US
22.	Ranger 4	P-35	Impactor	JPL	23-Apr-1962	26-Apr-1962	Atlas LV-3	Agena-B	CC-LC-12	US
23.	Ranger 5	P-36	Impactor	JPL	18-Oct-1962	21-Oct-1962	Atlas LV-3	Agena-B215D-AA7	CC-LC-12	US
24.	Sputnik 25	Luna E-6.No.2	Lander	OKB-1	04-Jan-1963	11-Jan-1963	Molniya-L	8K78-S.No.T103-09	Baikonur 1/5	USSR
25.	Luna E-6.No.3	Luna E-6.No.3	Lander	OKB-1	03-Feb-1963	03-Feb-1963	Molniya-L	8K78-S.No.G103-10	Baikonur 1/5	USSR
26.	Luna 4	Luna E-6.No.4	Lander	OKB-1	02-Apr-1963	15-Apr-1963	Molniya-L	8K78/E6/G103-11	Baikonur 1/5	USSR
27.	Kosmos 21	Cosmos 21	L1 Test	OKB-1	11-Nov-1963	14-Nov-1963	Molniya-L	8K78M.S.No.G103-18	Baikonur 1/5	USSR
28.	Ranger 6	P-53	Impactor	JPL	30-Jan-1964	02-Feb-1964	Atlas LV-3	Agena-B/199D/AA8	CC-LC-12	US
29.	Luna 1964A	Luna E-6.No.6	Lander	OKB-1	21-Mar-1964	21-Mar-1964	Molniya-M	8K78-M/T15000-20	Baikonur 1/5	USSR
30.	Luna E-6.No.5	Luna E-6.No.5	Lander	OKB-1	20-Apr-1964	20-Apr-1964	Molniya-M	8K78L/R103-25	Baikonur 1/5	USSR
31.	Ranger 7	P-54	Impactor	JPL	28-Jul-1964	31-Jul-1964	Atlas LV-3	Agena-B-9	CC-LC-12	US
32.	Ranger 8	Ranger-C	Impactor	JPL	17-Feb-1965	20-Feb-1965	Atlas LV-3	Agena-B-13	CC-LC-12	US
33.	Kosmos 60	Luna E-6.No.9	Lander	OKB-1	12-Mar-1965	17-Mar-1965	Molniya-M	8K78L/R103-26	Baikonur 1/5	USSR
34.	Ranger 9	Ranger-D	Impactor	JPL	21-Mar-1965	24-Mar-1965	Atlas LV-3	Agena-B-14	CC-LC-12	US
35.	Luna 1965A	Luna E-6.No.8	Lander	OKB-1	10-Apr-1965	10-Apr-1965	Molniya-M	8K78-M/R103-26	Baikonur 1/5	USSR
36.	Luna 5	Luna E-6.No.10	Lander	OKB-1	09-May-1965	12-May-1965	Molniya-M	8K78-M/U103-30	Baikonur 1/5	USSR
37.	Luna 6	Luna E-6.No.7	Lander	OKB-1	08-Jun-1965	18-Jun-1965	Molniya-M	8K78-M/U103-31	Baikonur 1/5	USSR
38.	Zond 3	3MV-4.No.3	Flyby	OKB-1	18-Jul-1965	03-Mar-1966	Molniya-M	8K78-M	Baikonur 1/5	USSR
39.	Luna 7	Luna E-6.No.11	Lander	OKB-1	04-Oct-1965	07-Oct-1965	Molniya-M	8K78-M/U103-27	Baikonur 1/5	USSR
40.	Luna 8	Luna E-6.No.12	Lander	OKB-1	03-Dec-1965	06-Dec-1965	Molniya-M	8K78-M/U103-28	Baikonur 31/6	USSR
41.	Luna 9	Luna E-6.No.13	Lander	GSMZ-Lavochkin	31-Jan-1966	06-Feb-1966	Molniya-M	8K78M/U103-32	Baikonur 31/5	USSR
42.	Kosmos 111	Luna E-6S.No.204	Orbiter	OKB-1	01-Mar-1966	03-Mar-1966	Molniya-M	8K78-M/N103-41	Baikonur 31/6	USSR
43.	Luna 10	Luna E-6S.No.206	Orbiter	GSMZ-Lavochkin	31-Mar-1966	30-May-1966	Molniya-M	8K78M/N103-42	Baikonur 31/5	USSR
44.	Luna 1966A		Orbiter	OKB-1	30-Apr-1966	30-Apr-1966	Proton K/D	UR-500K	Baikonur 1/5	USSR

S.No	Spacecraft	Distinct Name	Type	Manufacturer	Launch Date	End of Mission Decay Date	Launcher	Launcher Type	Launch Site	Country
45.	Surveyor 1	Surveyor-A	Lander	NASA/JPL	30-May-1966	07-Jan-1967	Atlas LV-3C	Centaur-D-10	CC-LC-36A	US
46.	Explorer 33	AIMP-D	Orbiter	NASA/GSFC	01-Jul-1966	21-Sep-1976	Delta	E1	CC-LC-17A	US
47.	Lunar Orbiter 1	Luna Orbiter-A	Orbiter	NASA/LaRC	10-Aug-1966	29-Oct-1966	Atlas SLV-3	Agena-D	CC-LC-13	US
48.	Luna 11	E-6LF.No.101	Orbiter	GSMZ Lavochkin	21-Aug-1966	01-Oct-1966	Molniya-M	8K78-M	Baikonur 31/6	USSR
49.	Surveyor 2	Surveyor-B	Lander	NASA/JPL	20-Sep-1966	23-Sep-1966	Atlas LV-3C	Centaur-D	CC-LC-36A	US
50.	Luna 12	E-6LF.No.102	Orbiter	GSMZ Lavochkin	22-Oct-1966	19-Jan-1967	Molniya-M	8K78M/N103-44	Baikonur 31/5	USSR
51.	Lunar Orbiter 2	Luna Orbiter-B	Orbiter	NASA/LaRC	06-Nov-1966	11-Oct-1967	Atlas LV-3	Agena-D-18	CC-LC-13	US
52.	Luna 13	E-6M.No.205	Lander	GSMZ Lavochkin	21-Dec-1966	28-Dec-1966	Molniya-M	9K78M/N103-45	Baikonur 1/5	USSR
53.	Apollo 1		Crewed Orbiter	NAA	27-Jan-1967	27-Jan-1967	Saturn V	AS-204	CK-LC-34A	US
54.	Lunar Orbiter 3	Luna Orbiter-C	Orbiter	NASA/LaRC	05-Feb-1967	09-Oct-1967	Atlas LV-3	Agena-D-20	CC-LC-13	US
55.	Kosmos 146	7K-L1.No.2P	L1 Test	OKB-1	10-Mar-1967	22-Mar-1967	Proton K/D	USR500K-N10722701	Baikonur 1/5	USSR
56.	Kosmos 154	7K-L1.No.3P	L1 Test	OKB-1	08-Apr-1967	10-Apr-1967	Proton K/D	UR-500K	Baikonur 81/36	USSR
57.	Surveyor 3	Surveyor-C	Lander	NASA/JPL	17-Apr-1967	03-May-1967	Atlas LV-3C	Centaur-D-12	CC-LC-36B	US
58.	Lunar Orbiter 4	Luna Orbiter-D	Orbiter	NASA/LaRC	04-May-1967	06-Oct-1967	Atlas LV-3	Agena-D-22	CC-LC-13	US
59.	Kosmos 159	E6LS.No.111	Orbiter	GSMZ Lavochkin	17-May-1967	11-Nov-1967	Molniya-M	8K78M/A716-56	Baikonur 1/5	USSR
60.	Surveyor 4	Surveyor-D	Lander	NASA/JPL	14-Jul-1967	17-Jul-1967	Atlas LV-3C	Centaur-D	CC-LC-36A	US
61.	Explorer 35	AIMP-E	Orbiter	NASA/GSFC	19-Jul-1967	24-Jun-1973	Thor	Delta-E1/50	CC-LC-17B	US
62.	Lunar Orbiter 5	Luna Orbiter-E	Orbiter	NASA/LaRC	01-Aug-1967	31-Jan-1968	Atlas LV-3	Agena-D-24	CC-LC-13	US
63.	Surveyor 5	Surveyor-E	Lander	NASA/JPL	08-Sep-1967	17-Dec-1967	Atlas-LV-3C	Centaur-D-13	CC-LC-36B	US
64.	Zond 1967A	Soyuz 7K-L1.No.4L	Flyby	TsKBEM	27-Sep-1967	27-Sep-1967	Proton K/D	S.No.229-01	Baikonur 81/23	USSR
65.	Surveyor 6	Surveyor-F	Lander	NASA/JPL	07-Nov-1967	14-Dec-1967	Atlas-LV-3C	Centaur-D-14	CC-LC-36B	US
66.	Zond 1967B	Soyuz 7L-L1.No.5L	Flyby	TsKBEM	22-Nov-1967	22-Nov-1967	Proton K/D	S.No.230-01	Baikonur 81/24	USSR
67.	Surveyor 7	Surveyor-G	Lander	NASA/JPL	07-Jan-1968	21-Feb-1968	Atlas LV-3C	Centaur-D-15	CC-LC-36A	US
68	Luna 1968A	Luna E-6LS.No.112	Orbiter	GSMZ Lavochkin	07-Feb-1968	07-Feb-1968	Molniya-M	8K78M.S.No.YG716-57	Baikonur 1/5	USSR
69.	Zond 4	7K-L1.No.6L	Deep Space	TsKBEM	02-Mar-1968	07-Mar-1968	Proton K/D	UR-500K	Baikonur 81/6	USSR
70.	Luna 14	E-6LS.No.113	Orbiter	GSMZ Lavochkin	07-Apr-1968	24-Jun-1968	Molniya-M	8K78/A716-58	Baikonur 1/5	USSR
71.	Zond 1968A	Soyuz 7K-L1.7L	Flyby	TsKBEM	22-Apr-1968	22-Apr-1968	Soyuz	7K-L1.S.No.7	Baikonur 1/5	USSR
72.	Zond 5	7K-L1.No.9L	Circumlunar	TsKBEM	14-Sep-1968	21-Sep-1968	Proton K/D	UR-500K/234-01	Baikonur 81/5	USSR
73.	Apollo 7		Crewed Orbiter	NAR	11-Oct-1968	22-Oct-1968	Saturn IB	SA-205	CK-LC-34	US
74.	Zond 6	7K-L1.No.12L	Flyby	TsKBEM	10-Nov-1968	17-Nov-1968	Proton-K/D	11S824	Baikonur 81/26	USSR
75.	Apollo 8		Crewed Orbiter	NAR	21-Dec-1968	27-Dec-1968	Saturn V	AS-503	CC-LC-39A	US
76.	Zond 1969A	Soyuz 7K-L1.No.13L	Flyby	TsKBEM	20-Jan-1969	20-Jan-1969	Soyuz	7K-L1.S.No.13	Baikonur 81/24	USSR
77.	Luna 1969A	Luna E-8.No.201	Lander/Rover	GSMZ Lavochkin	19-Feb-1969	19-Feb-1969	Proton K/D	S.No.239-01	Baikonur 81/24	USSR
78.	Zond L1S-1	Soyuz 7K-L1S.No.3S	Orbiter	TsKBEM	21-Feb-1969	21-Feb-1969	N1	SL-15	Baikonur 110/38	USSR
79.	Apollo 9	LM-Spider	Crewed Orbiter	NAR / Grumman	03-Mar-1969	13-Mar-1969	Saturn V	AS-504	CK-LC-39A	US
80.	Luna 1969B		Sample Return	GSMZ Lavochkin	15-Apr-1969	15-Apr-1969	Proton K/D	UR-500K	Baikonur 81/24	USSR
81.	Apollo 10	LM-Snoopy	Crewed Orbiter	NAR / Grumman	18-May-1969	26-May-1969	Saturn V	AS-505	CC-LC-39B	US
82.	Luna 1969C	Luna E-8-5.No.402	Sample Return	GSMZ Lavochkin	14-Jun-1969	14-Jun-1969	Proton-K/D	UR-500K	Baikonur 81/24	USSR
83.	Zond L1S-2	Soyuz 7L-L1S.No.5L	Orbiter	TsKBEM	03-Jul-1969	03-Jul-1969	N1	SL-15	Baikonur 110/38	USSR
84.	Luna 15	E-8-5.No.401	Sample Return	GSMZ Lavochkin	13-Jul-1969	21-Jul-1969	Proton K/D	UR-500K/242-01	Baikonur 81/24	USSR
85.	Apollo 11	LM-Eagle	Crewed Orbiter	NAR / Grumman	16-Jul-1969	24-Jul-1969	Saturn V	AS-506	CC-LC-39A	US
86.	Zond 7	7K-L1.No.11L	Flyby	TsKBEM	07-Aug-1969	14-Aug-1969	Proton K/D	UR-500K/243-01	Baikonur 81/5	USSR
87.	Kosmos 300	E-8-5.No.403	Sample Return	GSMZ Lavochkin	23-Sep-1969	27-Sep-1969	Proton K/D	UR-500K/244-01	Baikonur 81/5	USSR
88.	Kosmos 305	E-8-5.No.404	Sample Return	GSMZ Lavochkin	22-Oct-1969	24-Oct-1969	Proton K/D	UR-500K/241-01	Baikonur 81/5	USSR
89.	Apollo 12	LM-Intrepid	Crewed Orbiter	NAR / Grumman	14-Nov-1969	24-Nov-1969	Saturn V	AS-507	CC-LC-39A	US

S.No	Spacecraft	Distinct Name	Type	Manufacturer	Launch Date	End of Mission Decay Date	Launcher	Launcher Type	Launch Site	Country
90.	Luna 1970A	Luna E-8-5.No.405	Sample Return	GSMZ Lavochkin	06-Feb-1970	06-Feb-1970	Proton K/D	S.No.247-01	Baikonur 81/23	USSR
91.	Luna 1970B		Orbiter	GSMZ Lavochkin	19-Feb-1970	19-Feb-1970	Proton K/D	S.No.12/D-1e	Baikonur 81/23	USSR
92.	Apollo 13	LM-Aquarius	Crewed Orbiter	NAR / Grumman	11-Apr-1970	17-Apr-1970	Saturn V	AS-508	CC-LC-39A	US
93.	Luna 16	E-8-5.No.406	Sample Return	GSMZ Lavochkin	12-Sep-1970	24-Sep-1970	Proton K/D	SL-12/D-1.E	Baikonur 81/24	USSR
94.	Zond 8	7K-L1.No.14L	Flyby	TsKBEM	20-Oct-1970	27-Oct-1970	Proton K/D	UR-500K/250-01	Baikonur 81/5	USSR
95.	Luna 17	E-8.No.203	Lander/Rover	GSMZ Lavochkin	10-Nov-1970	17-Nov-1971	Proton K/D	UR-500K/251-01	Baikonur 81/5	USSR
96.	Apollo 14	LM-Antares	Crewed Orbiter	NAR / Grumman	31-Jan-1971	09-Feb-1971	Saturn V	AS-509	CC-LC-39A	US
97.	Soyuz 7K-LOK	7K-L1E.No.1	Circumlunar	TsKBEM	27-Jun-1971	27-Jun-1971	N1	N1	Baikonur 110/37	USSR
98.	Apollo 15	LM-Falcon	Crewed Orbiter	NAR / Grumman	26-Jul-1971	23-Aug-1973	Saturn V	AS-510	CC-LC-39A	US
99.	PFS-1		Orbiter	NASA	26-Jul-1971	23-Aug -1973	Saturn V	AS-510	CC-LC-39A	US
100.	Luna 18	E-8-5.No.407	Sample Return	GSMZ Lavochkin	02-Sep-1971	11-Sep-1971	Proton K/D	8K82K /S.No.256-01	Baikonur 81/24	USSR
101.	Luna 19	E-8LS.No.202	Orbiter	GSMZ Lavochkin	28-Sep-1971	20-Oct-1972	Proton K/D	UR-500K/257-01	Baikonur 81/5	USSR
102.	Luna 20	E-8-5.No.408	Sample Return	GSMZ Lavochkin	14-Feb-1972	25-Feb-1972	Proton K/D	UR-500K/258-01	Baikonur 81/5	USSR
103.	Apollo 16	LM-Orion	Crewed Orbiter	NAR / Grumman	16-Apr-1972	27-Apr-1972	Saturn V	AS-511	CC-LC-39A	US
104.	PFS-2		Orbiter	NASA	16-Apr-1972	29-May-1972	Saturn V	AS-511	CC-LC-39A	US
105.	Soyuz 7K-LOK	Soyuz 7K-LOK.No.1	Orbiter	TsKBEM	03-Jul-1972	03-Jul-1972	NI	NI	Baikonur 110/37	USSR
106.	Soyuz 7K-LOK	7K-LOK.No.6A	Circumlunar	TsKBEM	23-Nov-1972	23-Nov-1972	N1	N1	Baikonur 110/37	USSR
107.	Apollo 17	LM-Challenger	Crewed Orbiter	NAR / Grumman	07-Dec-1972	19-Dec-1972	Saturn V	AS-512	CC-LC-39A	US
108.	Luna 21	E-8.No.204	Lander/Rover	GSMZ Lavochkin	08-Jan-1973	15-Jan-1973	Proton K/D	UR-500K/259-01	Baikonur 81/5	USSR
109.	Explorer 49	RAE-B	Orbiter	NASA/GSFC	10-Jun-1973	30-Aug-1977	Delta	1913-95	CC-LC-17B	US
110.	Mariner 10		Flyby	NASA/JPL	03-Nov-1973	24-Mar-1975	Atlas-SLV-3	Centaur-D-34	CC-LC-36B	US
111.	Luna22	E-8LS.No.206	Orbiter	GSMZ Lavochkin	29-May-1974	10-Nov-1975	Proton K/D	UR-500K/282-02	Baikonur 81/5	USSR
112.	Luna 23	E-8-5M.No.410	Sample Return	GSMZ Lavochkin	28-Oct-1974	09-Nov-1974	Proton K/D	8K82K/S.No.285-01	Baikonur 81/24	USSR
113.	Luna 1975A	Luna E-8-5.No.412	Sample Return	NPO Lavochkin	16-Oct-1975	23-Oct-1975	Proton K/D	SL-12/D-1.E	Baikonur 81/23	USSR
114.	Luna 24	E-8-5M.No.413	Sample Return	NPO Lavochkin	09-Aug-1976	22-Aug-1976	Proton K/D	UR-500K/288-02	Baikonur 81/5	USSR
115.	ISEE-3	Explorer 59/ICE	Gravity Assist	NASA/GSFC	12-Aug-1978	05-May-1997	Delta	2914-144	CC-LC-41	US
116.	Galileo		Flyby	NASA/JPL	18-Oct-1989	21-Sep-2003	STS-34R	IUS	CC-LC-39B	US
117.	Hiten	MUSES-A	Flyby/Orbiter	ISAS	24-Jan-1990	10-Apr-1993	MU-3S11	S.No.5-3S11	Launch Complex M1	JAPAN
118.	Hagoromo		Orbiter	ISAS	24-Jan-1990	10-Apr-1993	Mu-3511	S.No.5-3S11	Launch Complex M1	JAPAN
119.	Geotail		Gravity Assist	ISAS	24-Jul-1992	EPSP:20 Years	Delta-II	6925	CC-LC-17A	US
120.	Clementine	DSPSE	Orbiter	NASA/BMDO	25-Jan-1994	10-May-1995	Titan-III	S.No.4	Vandenberg SLC-4W	US
121.	WIND	GG5	Gravity Assist	NASA/GSFC	01-Nov-1994	EPSP :25Y4M13D	Delta	7925-10/227	CC-SLC-17B	US
122.	Cassini	Huygens	Flyby	NASA/JPL	15-Oct-1997	15-Sep-2017	Titan 401B	Centaur-D-21	CC-LC-40	US
123.	HGS-1	Asiasat-3/PAS-22	Gravity Assist	HUGHES	24-Dec-1997	00-Jul-2002	Proton-K	DM-3	Baikonur	USSR
124.	Lunar Prospector	Discovery 3	Orbiter	NASA/ARC	07-Jan-1998	31-Jul-1999	Athena-2	LM-004	Vandenberg SLC-46	US
125.	Nozomi	Planet-B	Gravity Assist	ISAS	03-Jul-1998	09-Dec-2003	M-V	M-V	Launch Complex M5	JAPAN
126.	WMAP		Gravity Assist	NASA/NRAO	30-Jun-2001	20-Oct-2010	Delta-II	7425-10	CC-SLC-17	US
127.	SMART-1		Orbiter	SSC/ESA	27-Sep-2003	03-Sep-2006	Ariane 5G	5G	Kourou ELS-3	EUROPE
128.	STEREO-A		Gravity Assist	JHUAPL/NASA	25-Oct-2006	Operational	Delta-II	7925-10L	CC-SLC-17B	US
129.	STEREO-B		Gravity Assist	JHUAPL/NASA	25-Oct-2006	23-Sep-2016	Delta-II	7925-10L	CC-SLC-17B	US
130.	ARTEMIS-P1		Orbiter	Swales Aerospace	17-Feb-2007	Operational	Delta-II	7925-10C	CC-SLC-17B	US
131.	ARTEMIS-P2		Orbiter	Swales Aerospace	17-Feb-2007	Operational	Delta-II	1925-10C	CC-SLC-17B	US
132.	SELENE	Kaguya	Orbiter	NEC - TSS	14-Sep-2007	10-Jun-2009	H-IIA	2022-F13	Tanegashima TY-1	JAPAN
133.	Okina	RSAT	Orbiter	NEC - TSS	14-Sep-2007	12-Feb-2009	H-IIA	2022-F13	Tanegashima TY-1	JAPAN
134.	Ouna	VRAD	Orbiter	NEC - TSS	14-Sep-2007	29-Jun-2009	H-IIA	2022-F13	TY-1	JAPAN

S.No	Spacecraft	Distinct Name	Type	Manufacturer	Launch Date	End of Mission Decay Date	Launcher	Launcher Type	Launch Site	Country
135.	Chang'e 1		Orbiter	CNSA	24-Oct-2007	01-Mar-2009	Long March	3A	XLC-3	CHINA
136.	Chandrayaan 1		Orbiter	ISRO	21-Oct-2008	28-Aug-2009	PSLV-XL	C11	SHAR	INDIA
137.	MIP	Moon Impact Probe	Impactor	ISRO	21-Oct-2008	14-Nov-2008	PSLV-XL	C11	SHAR	INDIA
138.	LRO		Orbiter	NASA/GSFC	18-Jun-2009	Operational	Atlas-V	401	CC-SLC-41	US
139.	LCROSS		Impactor	Northrop Grumman	18-Jun-2009	09-Oct-2009	Atlas-V	401	CC-SLC-41	US
140.	Chang'e 2		Orbiter	CNSA	01-Oct-2010	ESPD: 9Y 5M 17D	Long March	3C	XLC-3	CHINA
141.	Ebb	GRAIL-A	Orbiter	MIT/LMSS	10-Sep-2011	17-Dec-2012	Delta-II	7920H-10-D356	CC-SLC-17B	US
142.	Flow	GRAIL-B	Orbiter	MIT/LMSS	10-Sep-2011	17-Dec-2012	Delta-II	7920H-10D-356	CC-SLC-17B	US
143.	LADEE		Orbiter	ARC	07-Sep-2013	18-Apr-2014	Minotaur V	Flight-1	MARS-LP-0B	US
144.	Chang'e 3		Lander	SASEI	01-Dec-2013	Operational	Long March	3B-Y-23	XLC-2	CHINA
145.	Yutu		Rover	SASEI	01-Dec-2013	00-Mar-2015	Long March	3B-Y-23	XLC-2	CHINA
146.	Chang'e 5-T1		Flyby	CAST	23-Oct-2014	31-Oct-2014	Long March	3C-G-2	XLC-2	CHINA
147.	MMMM	4M Mission	Flyby	LUX Space	23-Oct-2014	11-Nov—2014	Long March	3C-G-2	XLC-2	CHINA
148.	TESS		Gravity Assist	Orbital ATK	18-Apr-2018	ESPD:1Y 11M	Falcon 9	Block-4	CC-SLC-40	US
149.	Queqiao	Chang'e 4 Relay	Gravity Assist	CNSA	20-May-2018	Operational	Long March	IV (4)	XLC-3	CHINA
150.	Longjiang 1	DSWLP-A1/LO-93	Orbiter	CNSA/HIT	20-May-2018	21-May-2018	Long March	IV (4)	XLC-3	CHINA
151.	Longjiang 2	DSWLP-A2/LO-94	Orbiter	CNSA	20-May-2018	31-Jul-2019	Long March	IV (4)	XLC-3	CHINA
152.	Chang'e 4		Lander/Rover	CNSA	07-Dec-2018	ESPD: 440D	Long March	3B	XLC-3	CHINA
153.	Beresheet		Lander	IAI	22-Feb-2019	04-Apr-2019	Falcon	Falcon-9-B5	CC-SLC-40	ISRAEL
154.	Chandrayaan 2		Orbiter	ISRO	22-Jul-2019	ESPD: 6M 18D	GSLV	Mark-III-M1	SHAR	INDIA
155.	Vikram/Pragyan		Lander/Rover	ISRO	22-Jul-2019	06-Sep-2019	GSLV	Mark-III-M1	SHAR	INDIA

Table-2 Spacecraft Parameters of Lunar Missions

S.No	Spacecraft	Distinct Name	No. of Instruments	Spacecraft Mass	Launch Mass	Approx. Spacecraft Mass	Approx. Launch Mass	Mission Duration	Mission Intermission between		Mission Degradation
									L-Date	D-Date	
01.	Pioneer 0	Able-1	03	38	38	38	38	0.00089	37	37	01
02.	Luna E-1 No.1		05	156	360	156	360	0.00108	18	20	01
03.	Pioneer 1	Able-2	05	34.2	38.3	36.25	38.3	1.8	01	01	02
04.	Luna E-1.No.2		05	156	360	156	360	0.0012	27	27	01
05.	Pioneer 2	Able-3	06	39.2	39.5	39.5	39.2	0.03125	26	26	01
06.	Luna E-1.No.3		05	156	360	156	360	0.00284	02	03	01
07.	Pioneer 3		02	5.87	5.87	5.87	5.87	1.59	27	29	02
08.	Mechta /Luna 1	Luna E-1.No.4	05	205	360	181.15	282.5	2.58	60	60	03
09.	Pioneer 4		02	6.1	7.0	6.55	6.55	3.42	107	104	03
10.	Luna E-1A.No.1	Luna E-1A.No.5	05	156	390	156	390	0.00186	86	88	01
11.	Luna 2	Luna E-1A.No.2	05	205	390	180.5	297.5	1.46	12	12	02
12.	Pioneer P-1		10	25.3	88.4	25.3	88.4	-	10	26	02
13.	Luna 3	Luna E-2A.No.1	03	278	278.5	278.25	278.25	18	53	35	18
14.	Pioneer P-3	Able-IVB	10	168.7	169	169	168.70	0.0012	141	141	01
15.	Luna 1960A	Luna E-3.No.1	03	279	280	279.5	280	0.00844	04	04	01
16.	Luna 1960B	Luna E-3.No.2	03	279	280	279	280	0.000116	159	159	01
17.	Pioneer P-30	Able-VA	09	175.5	176	175.5	175.5	0.012	81	81	01
18.	Pioneer P-31	Able-VB	10	175.5	176	176	175.5	0.000787	251	258	01
19.	Ranger 1	P-32	07	304	306	306.18	306.2	7	87	81	07
20.	Ranger 2	P-33	08	304	306	306.18	304	2	69	75	02
21.	Ranger 3	P-34	04	188	336	259	336	1.4	87	83	02
22.	Ranger 4	P-35	04	188	336	259.56	336	2.67	178	178	03
23.	Ranger 5	P-36	04	203	351	272.73	351	0.33	78	82	01
24.	Sputnik 25	Luna E-6.No.2	02	1500	2500	15..	2500	0.045	30	23	07
25.	Luna E-6.No.3	Luna E-6.No.3	02	500	1420	1350	1420	0.00122	58	71	01
26.	Luna 4	Luna E-6.No.4	02	500	1420	925	1422	12	223	213	14
27.	Kosmos 21	Cosmos 21	09	800	890	800	890	-	80	80	03
28.	Ranger 6	P-53	01	172	381	276.5	372.85	2.74	52	48	03
29.	Luna 1964A	Luna E-6.No.6	02	500	1420	1420	1422	0.00566	30	30	01
30.	Luna E-6.No.5	Luna E-6.No.5	02	500	1420	1420	1422	0.00394	99	102	01
31.	Ranger 7	P-54	01	365	365	362.5	365.35	2.73	204	204	03
32.	Ranger 8	Ranger-C	01	366	368	726	367.5	2.70	23	25	03
33.	Kosmos 60	Luna E-6.No.9	02	1600	6530	1600	6530	-	09	07	05
34.	Ranger 9	Ranger-D	01	360	368	363.5	367.5	2.69	20	17	03
35.	Luna 1965A	Luna E-6.No.8	02	1422	1470	1470	1422	-	29	32	01
36.	Luna 5	Luna E-6.No.10	02	300	1476	888	1422.5	3	30	37	03
37.	Luna 6	Luna E-6.No.7	02	280	1442	861	1441	10	40	258	10
38.	Zond 3	3MV-4.No.3	06	960	960	960	960	-	78	147	228
39.	Luna 7	Luna E-6.No.11	02	300	1504	903	1505	3	60	60	03
40.	Luna 8	Luna E-6.No.12	02	350	1550	951	1551	3	59	62	03
41.	Luna 9	Luna E-6.No.13	02	300	1580	200	1581.5	6.46	29	25	06

S.No	Spacecraft	Distinct Name	No. of Instruments	Spacecraft Mass	Launch Mass	Approx. Spacecraft Mass	Approx. Launch Mass	Mission Duration	Mission Intermission between		Mission Degradation
									L-Date	D-Date	
42.	Kosmos 111	Luna E-6S.No.204	07	1580	6459	1580	6459	2	30	88	02
43.	Luna 10	Luna E-6S.No.206	07	245	1582	172.5	1582	60	30	30	60
44.	Luna 1966A		-	280	1600	940	1600	-	30	252	01
45.	Surveyor 1	Surveyor-A	01	270	995	281	990.6	220	32	3545	222
46.	Explorer 33	AIMP-D	05	57	94	75.2	153	1876	40	3615	3734
47.	Lunar Orbiter 1	Luna Orbiter-A	03	261	385	323.3	382.8	78.19	11	28	79.7
48.	Luna 11	E-6LF.No.101	07	1308	1640	1474	1640	38	30	08	41.2
49.	Surveyor 2	Surveyor-B	01	292	1004	292	999.6	2.62	32	118	03
50.	Luna 12	E-6LF.No.102	07	1288	1620	1288	1620	-	15	265	89
51.	Lunar Orbiter 2	Luna Orbiter-B	03	261	385	261	382.8	339	45	287	339
52.	Luna 13	E-6M.No.205	05	300	1620	300	1620	6.83	37	30	07
53.	Apollo 1		-		20000	-	20000	0	09	255	--
54.	Lunar Orbiter 3	Luna Orbiter-C	03	270	387	270	387.3	246	33	201	246
55.	Kosmos 146	7K-L1.No.2P	-	2800	5017	2800	5348.5	8	29	19	12
56.	Kosmos 154	7K-L1.No.3P	-	5017	5600	5017	5600	2	09	23	02
57.	Surveyor 3	Surveyor-C	02	296	1036	299	1031	16	17	156	16
58.	Lunar Orbiter 4	Luna Orbiter-D	03	270	389	270	387.3	180	13	36	155
59.	Kosmos 159	E6LS.No.111	-	283	5600	283	5600	-	58	117	178
60.	Surveyor 4	Surveyor-D	03	299	1042	299	1040.5	2.58	05	2169	03
61.	Explorer 35	AIMP-E	06	67	104	67	85.65	2167	13	1971	2167
62.	Lunar Orbiter 5	Luna Orbiter-E	03	270	392	270	388.8	183	38	45	183
63.	Surveyor 5	Surveyor-E	04	289	1006	296	1006	101	19	81	100
64.	Zond 1967A	Soyuz 7K-L1.No.4L	-	5375	5390	5375	5390	0.00118	41	78	01
65.	Surveyor 6	Surveyor-F	04	289	1006	294.6	1006.5	37	15	22	37
66.	Zond 1967B	Soyuz 7L-L1.No.5L	-	5375	5390	5375	5390	0.0015	46	91	01
67.	Surveyor 7	Surveyor-G	04	305	1038	305.35	1038.5	45	31	14	45
68.	Luna 1968A	Luna E-6LS.No.112	-	5375	5600	5375	5600	0.00607	24	29	01
69.	Zond 4	7K-L1.No.6L	-	2800	5680	4087.5	5410	-	36	109	05
70.	Luna 14	E-6LS.No.113	-	1368	1700	1368	1700	75	15	63	78
71.	Zond 1968A	Soyuz 7K-L1.7L	-	5375	5600	5375	5375	0.003125	145	152	01
72.	Zond 5	7K-L1.No.9L	03	2800	5680	2800	5527.5	6.67	27	57	07
73.	Apollo 7		-	5175	16519	5175	16519	10.84	30	31	11
74.	Zond 6	7K-L1.No.12L	05	2800	5680	4087.5	5527.5	7	41	26	07
75.	Apollo 8		-	4979	28870	8326	26201	6.125	30	40	07
76.	Zond 1969A	Soyuz 7K-L1.No.13L	-	5375	5600	5375	5600	0.00579	30	24	01
77.	Luna 1969A	Luna E-8.No.201	07	5590	5700	5590	5700	0.00059	02	30	01
78.	Zond L1S-1	Soyuz 7K-L1S.No.3S	-	6900	6900	6900	6900	0.00081	10	20	01
79.	Apollo 9	LM-Spider	-	5032	43,196	5032	43196	10.042	43	33	--
80.	Luna 1969B		-	5375	5700	5375	5700	-	33	53	01
81.	Apollo 10	LM-Snoopy	-	4945	44576	4945	44576	8.00234	27	41	08
82.	Luna 1969C	Luna E-8-5.No.402	03	5600	5600	5600	5600	-	19	19	01
83.	Zond L1S-2	Soyuz 7L-L1S.No.5L	-	6900	6900	6900	6900	0.000118	10	18	01

S.No	Spacecraft	Distinct Name	No. of Instruments	Spacecraft Mass	Launch Mass	Approx. Spacecraft Mass	Approx. Launch Mass	Mission Duration	Mission Intermission between		Mission Degradation
									L-Date	D-Date	
84.	Luna 15	E-8-5.No.401	03	1360	5700	3480	5700	8	03	03	08
85.	Apollo 11	LM-Eagle	-	4932	45702	4932	45702	8.138	22	21	09
86.	Zond 7	7K-L1.No.11L	03	2800	5680	2800	5829.5	6.67	47	44	07
87.	Kosmos 300	E-8-5.No.403	03	5600	5700	5600	5700	-	29	27	04
88.	Kosmos 305	E-8-5.No.404	03	5600	5700	5600	5700	-	23	31	02
89.	Apollo 12	LM-Intrepid	-	5010	45870	5010	45870	10.20	84	74	10
90.	Luna 1970A	Luna E-8-5.No.405	03	5600	5700	5600	5700	-	64	70	01
91.	Luna 1970B		-	5600	5700	5600	5700	-	154	160	06
92.	Apollo 13	LM-Aquarius	-	5050	45931	5050	45931	5.954	38	33	12
93.	Luna 16	E-8-5.No.406	03	1360	5700	3480	5700	12	21	21	07
94.	Zond 8	7K-L1.No.14L	02	5375	5700	5375	5375	07	82	84	308
95.	Luna 17	E-8.No.203	07	1124	5700	3362	4522	308	147	138	10
96.	Apollo 14	LM-Antares	-	5208	46305	5208	46305	9.00136	29	788	01
97.	Soyuz 7K-LOK	7K-L1E.No.1	-	6698	9850	6698	9850	-	29	712	13
98.	Apollo 15	LM-Falcon	-	5321	48599	5321	48599	12.30	38	712	759
99.	PFS-1		03	36	36	36	36	537	26	39	09
100.	Luna 18	E-8-5.No.407	04	1360	5700	3480	5725	09	139	128	388
101.	Luna 19	E-8LS.No.202	07	3000	3800	4300	4750	388	62	62	11
102.	Luna 20	E-8-5.No.408	04	1360	5727	3480	5134.5	11	62	32	12
103.	Apollo 16	LM-Orion	-	5441	48637	5441	48637	11.077	78	35	43
104.	PFS-2		03	36	36	36	36	34	143	143	01
105.	Soyuz 7K-LOK	Soyuz 7K-LOK.No.1	-	2505	6316	2505	6316	-	14	26	01
106.	Soyuz 7K-LOK	7K-LOK.No.6A	-	9500	9850	9500	9850	0.00124	32	27	13
107.	Apollo 17	LM-Challenger	-	5500	48607	5500	48607	12.578	153	1688	08
108.	Luna 21	E-8.No.204	10	4850	5950	2987	4647	08	146	890	1542
109.	Explorer 49	RAE-B	05	330.2	328	330.2	328	1520	207	230	508
110.	Mariner 10		07	502.9	502.9	502.9	502.9	508	162	366	521
111.	Luna22	E-8LS.No.206	07	3000	3800	4000	4750	521	353	348	12
112.	Luna 23	E-8-5M.No.410	04	1360	5800	3480	4930.5	12	298	304	07
113.	Luna 1975A	Luna E-8-5.No.412	04	5600	5800	5600	5800	07	733	7561	13
114.	Luna 24	E-8-5M.No.413	04	1360	5800	1360	5750	13	4085	2331	6841
115.	ISEE-3	Explorer 59/ICE	13	389	479	389.5	479	6840	98	3816	5086
116.	Galileo		10	1297	2562	1590.5	2433	5086	98	760	1172
117.	Hiten	MUSES-A	01	143	197	146	191.2	1172	912	760	1172
118.	Hagoromo		01	08	08	08	12	1172	550	-	-
119.	Geotail		-	640	980	640	994.5	-	280	8164	-
120.	Clementine	DSPSE	09	183	424	205	419	-	29	27	04
121.	WIND	GGs	12	895	1250	922.5	1222.5	115	1079	-	470
122.	Cassini	Huygens	11	2523	5712	2324	5483	7274	70	5555	7275
123.	HGS-1	Asiasat-3/PAS-22	-	1822	3480	2611	3472.5	1644	14	1066	1650
124.	Lunar Prospector	Discovery 3	06	158	296	142	295.5	570	542	1592	570
125.	Nozomi	Planet-B	14	262	540	260	538	1980	1093	2507	1985
126.	WMAP		05	768	840	765.5	837.5	3320	819	1508	3400
127.	SMART-1		07	287	367	287	367	1070.26	1124	3673	1072

S.No	Spacecraft	Distinct Name	No. of Instruments	Spacecraft Mass	Launch Mass	Approx. Spacecraft Mass	Approx. Launch Mass	Mission Duration	Mission Intermission between		Mission Degradation
									L-Date	D-Date	
128.	STEREO-A		04	560	620	553.5	619.5	4892	115	-	-
129.	STEREO-B		04	560	620	553.5	619.5	3612	115	2662	3621
130.	ARTEMIS-P1		07	76	630	76.5	377.5	4780	209	-	-
131.	ARTEMIS-P2		07	76	630	76.5	377.5	4780	209	-	-
132.	SELENE	Kaguya	13	1984	2914	1852	2899.5	640	249	118	-
133.	Okina	RSAT	01	45	45	45	45	-	249	137	635
134.	Ouna	VRAD	01	53	35	53	53	-	249	120	517
135.	Chang'e 1		06	1000	2350	1000	2351	490	363	180	654
136.	Chandrayaan 1		11	560	1380	528	1380	306.8	603	287	494
137.	MIP	Moon Impact Probe	01	29	34	31.5	29	-	603	329	310
138.	LRO		07	1018	1916	1018	1916	3945	470	-	21
139.	LCROSS		09	585	2305	603	2277	20.59	470	1165	-
140.	Chang'e 2		04	1000	2480	1000	2480	3456	344	-	113
141.	Ebb	GRAIL-A	03	132.6	307	166.8	307	462.38	728	487	3456
142.	Flow	GRAIL-B	03	132.6	307	166.8	307	462.38	728	487	346
143.	LADEE		03	248	383	248.1	383	223	85	317	346
144.	Chang'e 3		04	1200	3800	1200	3790	959	326	-	223
145.	Yutu		03	140	140	140	1970	42	326	121	959
146.	Chang'e 5-T1		02	1000	2480	667.5	2347.5	1973	1273	11	485
147.	MMMM	4M Mission	02	14	14	14	14	19	1273	1289	1973
148.	TESS		04	317	362	317	362	700	32	-	19
149.	Queqiao	Chang'e 4 Relay	02	325	425	325	425	-	201	-	-
150.	Longjiang 1	DSWLP-A1/LO-93	-	45	45	46	45	-	201	436	-
151.	Longjiang 2	DSWLP-A2/LO-94	-	45	45	45	45	-	201	118	01
152.	Chang'e 4		09	1200	3780	1200	3780	440	77	-	437
153.	Beresheet		02	150	585	150	585	47.7	150	155	440
154.	Chandrayaan 2		08	1308	3850	995	3850	-	-	-	48
155.	Vikram/Pragyan		06	626	1471	612.5	1471	-	-	-	46

Table-3 Lunar Exploration Missions and their Objectives

S.No	Spacecraft	Distinct Name	Objective of the Mission	S.No	Spacecraft	Distinct Name	Objective of the Mission
01.	Pioneer 0	Able-1	Launch Probe into Deep Space	41.	Luna 9	Luna E-6.No.13	Soft-Landing attempt
02.	Luna E-1 No.1		Intended to Impact the Moon	42.	Kosmos 111	Luna E-6S.No.204	Orbit around the Moon
03.	Pioneer 1	Able-2	Intended to Orbit around Moon	43.	Luna 10	Luna E-6S.No.206	Orbit around the Moon
04.	Luna E-1.No.2		Intended to Impact the Moon	44.	Luna 1966A		Orbit around the Moon
05.	Pioneer 2	Able-3	To probe Cislunar Space	45.	Surveyor 1	Surveyor-A	Lunar Soft-Landing attempt
06.	Luna E-1.No.3		Intended to Impact the Moon	46.	Explorer 33	AIMP-D	Orbit around the Moon
07.	Pioneer 3		To Orbit around the Moon	47.	Lunar Orbiter 1	Luna Orbiter-A	Orbit around the Moon
08.	Mechta /Luna 1	Luna E-1.No.4	Intended to Impact the Moon	48.	Luna 11	E-6LF.No.101	Orbit around the Moon
09.	Pioneer 4		Flyby around the Moon	49.	Surveyor 2	Surveyor-B	Lunar Soft-Landing attempt
10.	Luna E-1A.No.1	Luna E-1A.No.5	Intended to Impact the Moon	50.	Luna 12	E-6LF.No.102	Orbit around the Moon
11.	Luna 2	Luna E-1A.No.2	Intended to Impact the Moon	51.	Lunar Orbiter 2	Luna Orbiter-B	Orbit around the Moon
12.	Pioneer P-1		Heavy Instrumented Probe in Lunar Orbit	52.	Luna 13	E-6M.No.205	Lunar Soft-Landing attempt
13.	Luna 3	Luna E-2A.No.1	Photograph far side of the Moon	53.	Apollo 1		Manned Moon Mission
14.	Pioneer P-3	Able-IVB	Heavy Instrumented Probe in Lunar Orbit	54.	Lunar Orbiter 3	Luna Orbiter-C	Orbit around the Moon
15.	Luna 1960A	Luna E-3.No.1	Flyby around the Moon in Cislunar Orbit	55.	Kosmos 146	7K-L1.No.2P	Flyby & Return to Earth Test
16.	Luna 1960B	Luna E-3.No.2	Flyby around the Moon in Cislunar Orbit	56.	Kosmos 154	7K-L1.No.3P	Test Spacecraft
17.	Pioneer P-30	Able-VA	Heavy Instrumented Probe in Lunar Orbit	57.	Surveyor 3	Surveyor-C	Lunar Soft-landing attempt
18.	Pioneer P-31	Able-VB	Heavy Instrumented Probe in Lunar Orbit	58.	Lunar Orbiter 4	Luna Orbiter-D	Orbit around the Moon
19.	Ranger 1	P-32	Test Performance Probe	59.	Kosmos 159	E6LS.No.111	Achieve high elliptical Earth Orbit
20.	Ranger 2	P-33	Test Performance Probe	60.	Surveyor 4	Surveyor-D	Lunar Soft-landing attempt
21.	Ranger 3	P-34	First attempt to land on the Moon	61.	Explorer 35	AIMP-E	Orbit around the Moon
22.	Ranger 4	P-35	Intended to Impact the Moon	62.	Lunar Orbiter 5	Luna Orbiter-E	Orbit around the Moon
23.	Ranger 5	P-36	Intended to Impact the Moon	63.	Surveyor 5	Surveyor-E	Lunar Soft-landing attempt
24.	Sputnik 25	Luna E-6.No.2	Soft-Landing attempt	64.	Zond 1967A	Soyuz 7K-L1.No.4L	Perform Circumlunar Flyby
25.	Luna E-6.No.3	Luna E-6.No.3	Soft-Landing attempt	65.	Surveyor 6	Surveyor-F	Lunar Soft-landing attempt
26.	Luna 4	Luna E-6.No.4	Soft-Landing attempt	66.	Zond 1967B	Soyuz 7L-L1.No.5L	Perform Circumlunar Flyby
27.	Kosmos 21	Cosmos 21	Deep Space Technology Test	67.	Surveyor 7	Surveyor-G	Lunar Soft-landing attempt
28.	Ranger 6	P-53	Achieve Lunar Impact Trajectory	68.	Luna 1968A	Luna E-6LS.No.112	Orbit around the Moon
29.	Luna 1964A	Luna E-6.No.6	Soft-Landing attempt	69.	Zond 4	7K-L1.No.6L	Crewed Flyby Spacecraft Test
30.	Luna E-6.No.5	Luna E-6.No.5	Soft-Landing attempt	70.	Luna 14	E-6LS.No.113	Orbit around the Moon
31.	Ranger 7	P-54	Achieve Lunar Impact Trajectory	71.	Zond 1968A	Soyuz 7K-L1.7L	Crewed Lunar Flyby Test
32.	Ranger 8	Ranger-C	Obtain Close-up Image of Moon	72.	Zond 5	7K-L1.No.9L	To perform Circumlunar Flyby
33.	Kosmos 60	Luna E-6.No.9	Soft-Landing attempt	73.	Apollo 7		Crewed Orbital Flyby Test
34.	Ranger 9	Ranger-D	Achieve Lunar Impact Trajectory	74.	Zond 6	7K-L1.No.12L	Crewed Lunar Flyby Test
35.	Luna 1965A	Luna E-6.No.8	Soft-Landing attempt	75.	Apollo 8		Crewed Spaceflight Mission
36.	Luna 5	Luna E-6.No.10	Soft-Landing attempt	76.	Zond 1969A	Soyuz 7K-L1.No.13L	Lunar Flyby Circumlunar Flight
37.	Luna 6	Luna E-6.No.7	Soft-Landing attempt	77.	Luna 1969A	Luna E-8.No.201	Lunar Landing Attempt
38.	Zond 3	3MV-4.No.3	Flyby around the Moon	78.	Zond L1S-1	Soyuz 7K-L1S.No.3S	NI Launch Test
39.	Luna 7	Luna E-6.No.11	Soft-Landing attempt	79.	Apollo 9	LM-Spider	Landing on the Moon Test
40.	Luna 8	Luna E-6.No.12	Soft-Landing attempt	80.	Luna 1969B		Sample Return Attempt

S.No	Spacecraft	Distinct Name	Objective of the Mission	S.No	Spacecraft	Distinct Name	Objective of the Mission
81.	Apollo 10	LM-Snoopy	Crewed Spaceflight Mission	121.	WIND	GGS	Flyby around the Moon
82.	Luna 1969C	Luna E-8-5.No.402	Sample Return Attempt	122.	Cassini	Huygens	Saturn/Gravity Assist
83.	Zond L1S-2	Soyuz 7L-L1S.No.5L	N1 Launch Test	123.	HGS-1	Asiasat-3/PAS-22	Gravity Assist Probe
84.	Luna 15	E-8-5.No.401	Lunar Sample Return Attempt	124.	Lunar Prospector	Discovery 3	Orbit around the Moon
85.	Apollo 11	LM-Eagle	First Crewed Landing on the Moon	125.	Nozomi	Planet-B	Gravity Assist Probe
86.	Zond 7	7K-L1.No.11L	To Perform Circumlunar Flyby	126.	WMAP		Gravity Assist Probe
87.	Kosmos 300	E-8-5.No.403	Lunar Sample Return Attempt	127.	SMART-1		Orbit around the Moon
88.	Kosmos 305	E-8-5.No.404	Lunar Sample Return Attempt	128.	STEREO-A		Orbit around the Moon
89.	Apollo 12	LM-Intrepid	Crewed Lunar Landing	129.	STEREO-B		Orbit around the Moon
90.	Luna 1970A	Luna E-8-5.No.405	Lunar Sample Return Attempt	130.	ARTEMIS-P1		To Study Earth's Magnetosphere
91.	Luna 1970B		Orbit around the Moon	131.	ARTEMIS-P2		To Study Earth's Magnetosphere
92.	Apollo 13	LM-Aquarius	Crewed Lunar Landing Mission	132.	SELENE	Kaguya	Orbit around the Moon
93.	Luna 16	E-8-5.No.406	Lunar Sample Return Attempt	133.	Okina	RSAT	Orbit around the Moon
94.	Zond 8	7K-L1.No.14L	To Perform Circumlunar Flyby	134.	Ouna	VRAD	Orbit around the Moon
95.	Luna 17	E-8.No.203	Lunar Roving Operations	135.	Chang'e 1		Orbit around the Moon
96.	Apollo 14	LM-Antares	Crewed Lunar Landing Mission	136.	Chandrayaan 1		Orbit around the Moon
97.	Soyuz 7K-LOK	7K-L1E.No.1	Crewed Lunar Flyby Test	137.	MIP	Moon Impact Probe	Impact on the Moon
98.	Apollo 15	LM-Falcon	Crewed Lunar Landing Mission	138.	LRO		Orbit in an eccentric polar orbit
99.	PFS-1		Orbit around the Moon	139.	LCROSS		Explore water near polar region
100.	Luna 18	E-8-5.No.407	Lunar Sample Return Attempt	140.	Chang'e 2		Orbit around the Moon
101.	Luna 19	E-8LS.No.202	Orbit around the Moon	141.	Ebb	GRAIL-A	To determine Moon Interior Structure
102.	Luna 20	E-8-5.No.408	Lunar Sample Return Attempt	142.	Flow	GRAIL-B	To determine Moon Interior Structure
103.	Apollo 16	LM-Orion	Crewed Lunar Landing Mission	143.	LADEE		To Study Lunar Exosphere
104.	PFS-2		Orbit around the Moon	144.	Chang'e 3		Landing and Roving Attempt
105.	Soyuz 7K-LOK	Soyuz 7K-LOK.No.1	Orbit around the Moon	145.	Yutu		Landing and Roving Attempt
106.	Soyuz 7K-LOK	7K-LOK.No.6A	Crewed Lunar Flyby Test	146.	Chang'e 5-T1		Lunar Capsule Re-entry Test
107.	Apollo 17	LM-Challenger	Crewed Lunar Landing Mission	147.	MMMM	4M Mission	Flyby around the Moon
108.	Luna 21	E-8.No.204	Lunar Roving Operations	148.	TESS		Search for Exoplanet
109.	Explorer 49	RAE-B	Orbit around the Moon	149.	Queqiao	Chang'e 4 Relay	Communication Relay for Chang'e 4
110.	Mariner 10		Mercury/Venus/Lunar Flyby	150.	Longjiang 1	DSWLP-A1/LO-93	Microsatellite Mission – Orbiter
111.	Luna22	E-8LS.No.206	Orbit around the Moon	151.	Longjiang 2	DSWLP-A2/LO-94	Microsatellite Mission – Orbiter
112.	Luna 23	E-8-5M.No.410	Lunar Sample Return Attempt	152.	Chang'e 4		Landing and Roving Attempt
113.	Luna 1975A	Luna E-8-5.No.412	Lunar Sample Return Attempt	153.	Beresheet		Lunar Lander Demonstrator Probe
114.	Luna 24	E-8-5M.No.413	Lunar Sample Return Attempt	154.	Chandrayaan 2		Orbit around the Moon
115.	ISEE-3	Explorer 59/ICE	Lunar Flyby	155.	Vikram/Pragyan		Lunar Soft-Landing Attempt in South Pole
116.	Galileo		Jupiter/Earth/Lunar Flyby				
117.	Hiten	MUSES-A	Flyby around the Moon				
118.	Hagoromo		Lunar Orbit				
119.	Geotail		Study Dynamics of Magnetosphere				
120.	Clementine	DSPSE	Orbit around the Moon				

Table-4 Chronology of Failed Lunar Missions

S.No	Spacecraft	Distinct Name	Type	Manufacturer	Launch Date	End of Mission Decay Date	Launcher	Launcher Type	Launch Site	Country
01.	Pioneer 0	Able-1	Orbiter	STL	17-Aug-1958	17-Aug-1958	Thor	DM-18-Able-1	CC-LC-17A	US
02.	Luna E-1 No.1		Impactor	OKB-1	23-Sep-1958	23-Sep-1958	Luna 8K72	S.No. B1-3	Baikonur 1/5	USSR
03.	Pioneer 1	Able-2	Orbiter	STL	11-Oct-1958	13-Oct-1958	Thor	DM-18-Able-1	CC-LC-17A	US
04.	Luna E-1.No.2		Impactor	OKB-1	12-Oct-1958	12-Oct-1958	Luna 8K72	S.No. B1-4	Baikonur 1/5	USSR
05.	Pioneer 2	Able-3	Orbiter	STL	08-Nov-1958	08-Nov-1958	Thor	DM-18-Able-1	CC-LC-17A	US
06.	Luna E-1.No.3		Impactor	OKB-1	04-Dec-1958	04-Dec-1958	Luna 8K72	S.No. B1-5	Baikonur 1/5	USSR
07.	Pioneer 3		Flyby	JPL	06-Dec-1958	07-Dec-1958	Juno	Version – II	CC-LC-05	US
08.	Mechta / Luna 1	Luna E-1.No.4	Impactor	OKB-1	02-Jan-1959	05-Jan-1959	Luna 8K72	S.No. B1-6	Baikonur 1/5	USSR
09.	Pioneer 4		Flyby	JPL	03-Mar-1959	06-Mar-1959	Juno	Version – II	CC-LC-05	US
10.	Luna E-1A.No.1	Luna E-1A.No.5	Impactor	OKB-1	18-Jun-1959	18-Jun-1959	Luna 8K72	S.No. L1-7	Baikonur 1/5	USSR
11.	Pioneer P-1		Orbiter	TRW-STL	24-Sep-1959	26-Sep-1959	Atlas-C	Able	CC-LC-12	US
12.	Pioneer P-3	Able-IVB	Orbiter	TRW-STL	26-Nov-1959	26-Nov-1959	Atlas-D	Able	CC-LC-14	US
13.	Luna 1960A	Luna E-3.No.1	Circumlunar	OKB-1	15-Apr-1960	15-Apr-1960	Luna 8K72	S.No.L1-9	Baikonur 1/5	USSR
14.	Luna 1960B	Luna E-3.No.2	Circumlunar	OKB-1	19-Apr-1960	19-Apr-1960	Luna 8K72	S.No.L1-9A	Baikonur 1/5	USSR
15.	Pioneer P-30	Able-VA	Orbiter	TRW-STL	25-Sep-1960	25-Sep-1960	Atlas-D	Able	CC-LC-12	US
16.	Pioneer P-31	Able-VB	Orbiter	TRW-STL	15-Dec-1960	15-Dec-1960	Atlas-D	Able	CC-LC-12	US
17.	Ranger 3	P-34	Impactor	JPL	26-Jan-1962	02-Feb-1962	Atlas LV-3	Agena-B	CC-LC-12	US
18.	Ranger 4	P-35	Impactor	JPL	23-Apr-1962	26-Apr-1962	Atlas LV-3	Agena-B	CC-LC-12	US
19.	Ranger 5	P-36	Impactor	JPL	18-Oct-1962	21-Oct-1962	Atlas LV-3	Agena-B215D-AA7	CC-LC-12	US
20.	Sputnik 25	Luna E-6.No.2	Lander	OKB-1	04-Jan-1963	11-Jan-1963	Molniya-L	8K78-S.No.T103-09	Baikonur 1/5	USSR
21.	Luna E-6.No.3	Luna E-6.No.3	Lander	OKB-1	03-Feb-1963	03-Feb-1963	Molniya-L	8K78-S.No.G103-10	Baikonur 1/5	USSR
22.	Luna 4	Luna E-6.No.4	Lander	OKB-1	02-Apr-1963	15-Apr-1963	Molniya-L	8K78/E6/G103-11	Baikonur 1/5	USSR
23.	Kosmos 21	Cosmos 21	L1 Test	OKB-1	11-Nov-1963	14-Nov-1963	Molniya-L	8K78M.S.No.G103-18	Baikonur 1/5	USSR
24.	Ranger 6	P-53	Impactor	JPL	30-Jan-1964	02-Feb-1964	Atlas LV-3	Agena-B/199D/AA8	CC-LC-12	US
25.	Luna 1964A	Luna E-6.No.6	Lander	OKB-1	21-Mar-1964	21-Mar-1964	Molniya-M	8K78-M/T15000-20	Baikonur 1/5	USSR
26.	Luna E-6.No.5	Luna E-6.No.5	Lander	OKB-1	20-Apr-1964	20-Apr-1964	Molniya-M	8K78L/R103-25	Baikonur 1/5	USSR
27.	Kosmos 60	Luna E-6.No.9	Lander	OKB-1	12-Mar-1965	17-Mar-1965	Molniya-M	8K78L/R103-26	Baikonur 1/5	USSR
28.	Luna 1965A	Luna E-6.No.8	Lander	OKB-1	10-Apr-1965	10-Apr-1965	Molniya-M	8K78-M/R103-26	Baikonur 1/5	USSR
29.	Luna 5	Luna E-6.No.10	Lander	OKB-1	09-May-1965	12-May-1965	Molniya-M	8K78-M/U103-30	Baikonur 1/5	USSR
30.	Luna 6	Luna E-6.No.7	Lander	OKB-1	08-Jun-1965	18-Jun-1965	Molniya-M	8K78-M/U103-31	Baikonur 1/5	USSR
31.	Luna 7	Luna E-6.No.11	Lander	OKB-1	04-Oct-1965	07-Oct-1965	Molniya-M	8K78-M/U103-27	Baikonur 1/5	USSR
32.	Luna 8	Luna E-6.No.12	Lander	OKB-1	03-Dec-1965	06-Dec-1965	Molniya-M	8K78-M/U103-28	Baikonur 31/6	USSR
33.	Kosmos 111	Luna E-6S.No.204	Orbiter	GSMZ-Lavochkin	01-Mar-1966	03-Mar-1966	Molniya-M	8K78-M/N103-41	Baikonur 31/6	USSR
34.	Luna 1966A		Orbiter	OKB-1	30-Apr-1966	30-Apr-1966	Proton K/D	UR-500K	Baikonur 1/5	USSR
35.	Explorer 33	AIMP-D	Orbiter	NASA/GSFC	01-Jul-1966	21-Sep-1976	Delta	E1	CC-LC-17A	US
36.	Lunar Orbiter 1	Luna Orbiter-A	Orbiter	NASA/LARC	10-Aug-1966	29-Oct-1966	Atlas SLV-3	Agena-D	CC-LC-13	US
37.	Luna 11	E-6LF.No.101	Orbiter	GSMZ-Lavochkin	21-Aug-1966	01-Oct-1966	Molniya-M	8K78-M	Baikonur 31/6	USSR
38.	Surveyor 2	Surveyor-B	Lander	NASA/JPL	20-Sep-1966	23-Sep-1966	Atlas LV-3C	Centaur-D	CC-LC-36A	US
39.	Kosmos 154	7K-L1.No.3P	L1 Test	OKB-1	08-Apr-1967	10-Apr-1967	Proton K/D	UR-500K	Baikonur 81/36	USSR
40.	Surveyor 4	Surveyor-D	Lander	NASA/JPL	14-Jul-1967	17-Jul-1967	Atlas LV-3C	Centaur-D	CC-LC-36A	US
41.	Zond 1967A	Soyuz 7K-L1.No.4L	Flyby	OKB-1	27-Sep-1967	27-Sep-1967	Proton K/D	S.No.229-01	Baikonur 81/23	USSR
42.	Zond 1967B	Soyuz 7L-L1.No.5L	Flyby	OKB-1	22-Nov-1967	22-Nov-1967	Proton K/D	S.No.230-01	Baikonur 81/24	USSR
43.	Luna 1968A	Luna E-6LS.No.112	Orbiter	GSMZ-Lavochkin	07-Feb-1968	07-Feb-1968	Molniya-M	8K78M.S.No.YG716-57	Baikonur 1/5	USSR
44.	Zond 4	7K-L1.No.6L	Deep Space	OKB-1	02-Mar-1968	07-Mar-1968	Proton K/D	UR-500K	Baikonur 81/6	USSR

S.No	Spacecraft	Distinct Name	Type	Manufacturer	Launch Date	End of Mission Decay Date	Launcher	Launcher Type	Launch Site	Country
45.	Zond 1968A	Soyuz 7K-L1.7L	Flyby	OKB-1	22-Apr-1968	22-Apr-1968	Soyuz	7K-L1.S.No.7	Baikonur 1/5	USSR
46.	Zond 6	7K-L1.No.12L	Flyby	OKB-1	10-Nov-1968	17-Nov-1968	Proton-K/D	11S824	Baikonur 81/26	USSR
47.	Zond 1969A	Soyuz 7K-L1.No.13L	Flyby	OKB-1	20-Jan-1969	20-Jan-1969	Soyuz	7K-L1.S.No.13	Baikonur 81/24	USSR
48.	Luna 1969A	Luna E-8.No.201	Lander/Rover	GSMZ-Lavochkin	19-Feb-1969	19-Feb-1969	Proton K/D	S.No.239-01	Baikonur 81/24	USSR
49.	Zond L1S-1	Soyuz 7K-L1S.No.3S	Orbiter	OKB-1	21-Feb-1969	21-Feb-1969	N1	SL-15	Baikonur 110/38	USSR
50.	Luna 1969B		Sample Return	OKB-1	15-Apr-1969	15-Apr-1969	Proton K/D	UR-500K	Baikonur 81/24	USSR
51.	Luna 1969C	Luna E-8-5.No.402	Sample Return	GSMZ-Lavochkin	14-Jun-1969	14-Jun-1969	Proton-K/D	UR-500K	Baikonur 81/24	USSR
52.	Zond L1S-2	Soyuz 7L-L1S.No.5L	Orbiter	OKB-1	03-Jul-1969	03-Jul-1969	N1	SL-15	Baikonur 110/38	USSR
53.	Luna 15	E-8-5.No.401	Sample Return	GSMZ-Lavochkin	13-Jul-1969	21-Jul-1969	Proton K/D	UR-500K/242-01	Baikonur 81/24	USSR
54.	Kosmos 300	E-8-5.No.403	Sample Return	GSMZ-Lavochkin	23-Sep-1969	27-Sep-1969	Proton K/D	UR-500K/244-01	Baikonur 81/5	USSR
55.	Kosmos 305	E-8-5.No.404	Sample Return	GSMZ-Lavochkin	22-Oct-1969	24-Oct-1969	Proton K/D	UR-500K/241-01	Baikonur 81/5	USSR
56.	Luna 1970A	Luna E-8-5.No.405	Sample Return	GSMZ-Lavochkin	06-Feb-1970	06-Feb-1970	Proton K/D	S.No.247-01	Baikonur 81/23	USSR
57.	Luna 1970B		Orbiter	GSMZ-Lavochkin	19-Feb-1970	19-Feb-1970	Proton K/D	SL-12/D-1.E	Baikonur 81/24	USSR
58.	Soyuz 7K-LOK	7K-L1E.No.1	Circumlunar	OKB-1	27-Jun-1971	27-Jun-1971	N1	N1	Baikonur 110/37	USSR
59.	Luna 18	E-8-5.No.407	Sample Return	GSMZ-Lavochkin	02-Sep-1971	11-Sep-1971	Proton K/D	8K82K /S.No.256-01	Baikonur 81/24	USSR
60.	Soyuz 7K-LOK	7K-LOK.No.6A	Circumlunar	OKB-1	23-Nov-1972	23-Nov-1972	N1	N1	Baikonur 110/37	USSR
61.	Luna 23	E-8-5M.No.410	Sample Return	GSMZ-Lavochkin	28-Oct-1974	09-Nov-1974	Proton K/D	8K82K/S.No.285-01	Baikonur 81/24	USSR
62.	Luna 1975A	Luna E-8-5.No.412	Sample Return	GSMZ-Lavochkin	16-Oct-1975	23-Oct-1975	Proton K/D	SL-12/D-1.E	Baikonur 81/23	USSR
63.	Hiten	MUSES-A	Flyby/Orbiter	JAXA	24-Jan-1990	10-Apr-1993	MU-3S11	S.No.5-3S11	Launch Complex M1	JAPAN
64.	Hagoromo		Orbiter	JAXA	24-Jan-1990	10-Apr-1993	Mu-3511	S.No.5-3S11	Launch Complex M1	JAPAN
65.	HGS-1	Asiasat-3/PAS-22	Gravity Assist	HUGHES	24-Dec-1997	00-Jul-2002	Proton-K	DM-3	Baikonur	USSR
66.	Nozomi	Planet-B	Gravity Assist	JAXA	03-Jul-1998	09-Dec-2003	M-V	M-V	Launch Complex M5	JAPAN
67.	Chandrayaan 1		Orbiter	ISRO	21-Oct-2008	28-Aug-2009	PSLV-XL	C11	SHAR	INDIA
68.	Longjiang 1	DSWLP-A1/LO-93	Orbiter	CNSA	20-May-2018	21-May-2018	Long March	IV (4)	XLC-3	CHINA
69.	Beresheet		Lander	ISA	22-Feb-2019	04-Apr-2019	Falcon	Falcon-9-B5	CC-SLC-40	ISRAEL
70.	Vikram/Pragyan		Lander/Rover	ISRO	22-Jul-2019	06-Sep-2019	GSLV	Mark-III-M1	SHAR	INDIA

Table-5 Spacecraft Parameters of Failed Lunar Missions

S.No	Spacecraft	Distinct Name	No. of Instruments	Spacecraft Mass	Launch Mass	Approx. Spacecraft Mass	Approx. Launch Mass	Mission Duration	Mission Intermission between		Mission Degradation
									L-Date	D-Date	
01.	Pioneer 0	Able-1	04	38	38	38	38	0.00089	37	37	01
02.	Luna E-1 No.1		05	156	360	156	360	0.00108	18	20	01
03.	Pioneer 1	Able-2	05	34.2	38.3	36.25	38.3	1.8	01	01	02
04.	Luna E-1.No.2		05	156	360	156	360	0.0012	27	27	01
05.	Pioneer 2	Able-3	06	39.2	39.5	39.5	39.2	0.03125	26	26	01
06.	Luna E-1.No.3		05	156	360	156	360	0.00284	02	03	01
07.	Pioneer 3		02	5.87	5.87	5.87	5.87	1.59	27	29	02
08.	Mechta / Luna 1	Luna E-1.No.4	05	205	360	181.15	282.5	2.58	60	60	03
09.	Pioneer 4		02	6.1	7.0	6.55	6.55	3.42	107	104	03
10.	Luna E-1A.No.1	Luna E-1A.No.5	05	156	390	156	390	0.00186	98	100	01
11.	Pioneer P-1		10	25.3	88.4	25.3	88.4	-	63	61	02
12.	Pioneer P-3	Able-IVB	10	168.7	169	169	168.70	0.0012	141	141	01
13.	Luna 1960A	Luna E-3.No.1	03	279	280	279.5	280	0.00844	04	04	01
14.	Luna 1960B	Luna E-3.No.2	03	279	280	279	280	0.000116	159	159	01
15.	Pioneer P-30	Able-VA	09	175.5	176	175.5	175.5	0.012	81	81	01
16.	Pioneer P-31	Able-VB	10	175.5	176	176	175.5	0.000787	407	505	01
17.	Ranger 3	P-34	04	188	336	259	336	1.4	87	83	02
18.	Ranger 4	P-35	04	188	336	259.56	336	2.67	178	178	03
19.	Ranger 5	P-36	04	203	351	272.73	351	0.33	78	82	01
20.	Sputnik 25	Luna E-6.No.2	02	1500	2500	1500	2500	0.045	30	23	07
21.	Luna E-6.No.3	Luna E-6.No.3	02	500	1420	1350	1420	0.00122	58	71	01
22.	Luna 4	Luna E-6.No.4	02	500	1420	925	1422	12	223	213	14
23.	Kosmos 21	Cosmos 21	09	800	890	800	890	-	80	80	03
24.	Ranger 6	P-53	01	172	381	276.5	372.85	2.74	51	48	03
25.	Luna 1964A	Luna E-6.No.6	02	500	1420	1420	1422	0.00566	30	30	01
26.	Luna E-6.No.5	Luna E-6.No.5	02	500	1420	1420	1422	0.00394	326	331	01
27.	Kosmos 60	Luna E-6.No.9	02	1600	6530	1600	6530	-	29	24	05
28.	Luna 1965A	Luna E-6.No.8	02	1422	1470	1470	1422	-	29	32	01
29.	Luna 5	Luna E-6.No.10	02	300	1476	888	1422.5	3	30	37	03
30.	Luna 6	Luna E-6.No.7	02	280	1442	861	1441	10	118	111	10
31.	Luna 7	Luna E-6.No.11	02	300	1504	903	1505	3	60	60	03
32.	Luna 8	Luna E-6.No.12	02	350	1550	951	1551	3	88	62	03
33.	Kosmos 111	Luna E-6S.No.204	07	1580	6459	1580	6459	2	62	58	02
34.	Luna 1966A		-	280	1600	940	1600	-	40	3797	01
35.	Explorer 33	AIMP-D	05	57	94	75.2	153	1876	11	3615	3734
36.	Lunar Orbiter 1	Luna Orbiter-A	03	261	385	323.3	382.8	78.19	30	28	79.7
37.	Luna 11	E-6LF.No.101	07	1308	1640	1474	1640	38	200	08	41.2
38.	Surveyor 2	Surveyor-B	01	292	1004	292	999.6	2.62	97	199	03
39.	Kosmos 154	7K-L1.No.3P	-	5017	5600	5017	5600	2	25	98	02

S.No	Spacecraft	Distinct Name	No. of Instruments	Spacecraft Mass	Launch Mass	Approx. Spacecraft Mass	Approx. Launch Mass	Mission Duration	Mission Intermission between		Mission Degradation
									L-Date	D-Date	
40.	Surveyor 4	Surveyor-D	03	299	1042	299	1040.5	2.58	75	72	03
41.	Zond 1967A	Soyuz 7K-L1.No.4L	-	5375	5390	5375	5390	0.00118	56	56	01
42.	Zond 1967B	Soyuz 7L-L1.No.5L	-	5375	5390	5375	5390	0.0015	101	77	01
43.	Luna 1968A	Luna E-6LS.No.112	-	5375	5600	5375	5600	0.00607	24	29	01
44.	Zond 4	7K-L1.No.6L	-	2800	5680	4087.5	5410	-	77	46	05
45.	Zond 1968A	Soyuz 7K-L1.7L	-	5375	5600	5375	5375	0.003125	51	240	01
46.	Zond 6	7K-L1.No.12L	05	2800	5680	4087.5	5527.5	7	202	64	07
47.	Zond 1969A	Soyuz 7K-L1.No.13L	-	5375	5600	5375	5600	0.00579	71	30	01
48.	Luna 1969A	Luna E-8.No.201	07	5590	5700	5590	5700	0.00059	30	02	01
49.	Zond L1S-1	Soyuz 7K-L1S.No.3S	-	6900	6900	6900	6900	0.00081	02	53	01
50.	Luna 1969B		-	5375	5700	5375	5700	-	53	60	01
51.	Luna 1969C	Luna E-8-5.No.402	03	5600	5600	5600	5600	-	60	19	01
52.	Zond L1S-2	Soyuz 7L-L1S.No.5L	-	6900	6900	6900	6900	0.000118	19	18	01
53.	Luna 15	E-8-5.No.401	03	1360	5700	3480	5700	8	82	68	08
54.	Kosmos 300	E-8-5.No.403	03	5600	5700	5600	5700	-	29	27	04
55.	Kosmos 305	E-8-5.No.404	03	5600	5700	5600	5700	-	107	105	02
56.	Luna 1970A	Luna E-8-5.No.405	03	5600	5700	5600	5700	-	13	13	01
57.	Luna 1970B		03	5600	5700	5600	5700	-	493	493	01
58.	Soyuz 7K-LOK	7K-L1E.No.1	-	6698	9850	6698	9850	-	67	76	01
59.	Luna 18	E-8-5.No.407	04	1360	5700	3480	5725	09	448	439	09
60.	Soyuz 7K-LOK	7K-LOK.No.6A	-	9500	9850	9500	9850	0.00124	704	716	01
61.	Luna 23	E-8-5M.No.410	04	1360	5800	3480	4930.5	12	353	348	12
62.	Luna 1975A	Luna E-8-5.No.412	04	5600	5800	5600	5800	07	7405	6379	07
63.	Hiten	MUSES-A	02	143	197	146	191.2	1172	700	3369	1172
64.	Hagoromo		02	08	08	08	12	1172	700	3369	1172
65.	HGS-1	Asiasat-3/PAS-22	-	1822	3480	2611	3472.5	1644	191	526	1650
66.	Nozomi	Planet-B	14	262	540	260	538	1980	3764	2089	1985
67.	Chandrayaan 1		14	560	1380	528	1380	306.8	3497	3188	494
68.	Longjiang 1	DSWLP-A1/LO-93	-	45	45	46	45	-	278	318	-
69.	Beresheet		02	150	585	150	585	47.7	150	155	440
70.	Vikram/Pragyan		-	626	1471	612.5	1471	-	-	-	46

Table-6 Mission Objectives of Failed Lunar Missions

S.No	Spacecraft	Distinct Name	Power	Objective of the Mission	Outcome	Failed Stage	Reason
01.	Pioneer 0	Able-1	60-100	Launch Probe into Deep Space	Failed to enter Lunar Orbit	LNH	Launcher Exploded
02.	Luna E-1 No.1		-	Intended to Impact Moon	Failed to Orbit	BSB	Launcher Malfunctioned
03.	Pioneer 1	Able-2	60-100	Orbit around the Moon	Failed to enter Lunar Orbit	SS	Guidance Failure
04.	Luna E-1.No.2		-	Intended to Impact Moon	Failed to Orbit	BSB	Launcher Malfunctioned
05.	Pioneer 2	Able-3	60-100	Lunar and Cislunar Probe	Failed to Orbit	BSB	Failed Ignition
06.	Luna E-1.No.3		-	Intended to Impact Moon	Failed to Orbit	BSB	Launcher Malfunctioned
07.	Pioneer 3		60-100	Flyby around the Moon	Failed to enter Lunar Orbit	BSB	Failed Ignition
08.	Mechta / Luna 1	Luna E-1.No.4	-	Intended to Impact Moon	Failed to Orbit	CRC-2 TLI	Failed Ignition
09.	Pioneer 4		60-100	Flyby around the Moon	Spacecraft Dead	MCCM	Unable to turn on Photoelectric Sensor
10.	Luna E-1A.No.1	Luna E-1A.No.5	-	Intended to Impact Moon	Failed to Orbit	BSB	Launcher Malfunctioned
11.	Pioneer P-1		-	Orbit around the Moon	Failed to Launch	LNH	Launcher Exploded
12.	Pioneer P-3	Able-IVB	-	Orbit around the Moon	Failed to Orbit	BSB	Loss of Telemetry
13.	Luna 1960A	Luna E-3.No.1	-	Flyby around the Moon	Failed to Orbit	BSB	Launcher Malfunctioned
14.	Luna 1960B	Luna E-3.No.2	-	Flyby around the Moon	Failed to Orbit	BSB	Launcher Malfunctioned
15.	Pioneer P-30	Able-VA	-	Place in Lunar Orbit	Failed to Launch	BSB	Launcher Malfunctioned
16.	Pioneer P-31	Able-VB	-	Place in Lunar Orbit	Failed to Launch	BSB	Loss of Telemetry
17.	Ranger 3	P-34	150W	First attempt to land on Moon	Missed the Moon	MCCM	Communication Ceased
18.	Ranger 4	P-35	135W	Intended to Impact Moon	Failed before impact	CRC-2 TLI MCCM	Radio transponder Ceased
19.	Ranger 5	P-36	135W	Intended to Impact Moon	Ran out of power	CRC-3	Radio transponder Ceased
20.	Sputnik 25	Luna E-6.No.2	-	Landing Attempt	Never left LEO	BSB	Failed Ignition
21.	Luna E-6.No.3	Luna E-6.No.3	-	Soft-landing attempt	Failed to Orbit	BSB SS	Launch Failure
22.	Luna 4	Luna E-6.No.4	-	Soft-landing attempt	Failed to enter Lunar Orbit	MCCM	Spacecraft failed
23.	Kosmos 21	Cosmos 21	-	Technology Test Deep Space	Never left LEO	VSS	Loss of Telemetry Signal
24.	Ranger 6	P-53	240W	Achieve Lunar Impact Trajectory	Mission Unaccomplished	CRC-7	Failure of Camera System
25.	Luna 1964A	Luna E-6.No.6	-	Soft-landing attempt	Failed to Orbit	BSB	Launch Failure
26.	Luna E-6.No.5	Luna E-6.No.5	-	Soft-landing attempt	Failed to Orbit	BSB	Launch Failure
27.	Kosmos 60	Luna E-6.No.9	-	Soft-landing attempt	Failed to left Orbit	OMB	Failed Ignition
28.	Luna 1965A	Luna E-6.No.8	-	Soft-landing attempt	Failed to Orbit	BSB	Launch Failure
29.	Luna 5	Luna E-6.No.10	-	Soft-landing attempt	Failed to Land	DEI	Retrorocket Failure
30.	Luna 6	Luna E-6.No.7	-	Soft-landing attempt	Failed to Land	DEI	Ignition Failure
31.	Luna 7	Luna E-6.No.11	-	Soft-landing attempt	Failed to Land	DEI	Premature Retrorocket Shutdown
32.	Luna 8	Luna E-6.No.12	-	Soft-landing attempt	Impacted on the Surface	LD	Delayed Retrorocket Ignition
33.	Kosmos 111	Luna E-6S.No.204	-	Orbit around Moon	Failed to Orbit	VSS	Launcher Failure
34.	Luna 1966A		-	Orbit around the Moon	Never reached LEO	LNH	Launcher Failure
35.	Explorer 33	AIMP-D	-	Intended for Lunar Orbit	Failed to Capture Moon	LOI	Abnormal Velocity
36.	Lunar Orbiter 1	Luna Orbiter-A	-	Orbit around the Moon	Crashed on the Surface	TOI	Attitude Control System
37.	Luna 11	E-6LF.No.101	-	Orbit around the Moon	Spacecraft failed	SSC	Attitude Control System
38.	Surveyor 2	Surveyor-B	-	Lunar Landing attempt	Crashed on the surface	MCCM	Contact lost
39.	Kosmos 154	7K-L1.No.3P	-	Test Spacecraft	Failed to left Orbit	VSS	Ignition Failure
40.	Surveyor 4	Surveyor-D	-	Lunar Landing attempt	Failed to Land	CRC-6	Lost Contact before landing
41.	Zond 1967A	Soyuz 7K-L1.No.4L	-	Perform Circumlunar Flyby	Failed to Orbit	BSB	Launch Failure
42.	Zond 1967B	Soyuz 7L-L1.No.5L	-	Perform Circumlunar Flyby	Failed to Orbit	BSB	Launch Failure

S.No	Spacecraft	Distinct Name	Power	Objective of the Mission	Outcome	Failed Stage	Reason
43.	Luna 1968A	Luna E-6LS.No.112	-	Orbit around the Moon	Failed to Orbit	BSB	Launch Failure
44.	Zond 4	7K-L1.No.6L	-	Crewed Flyby Spacecraft Test	Failed to enter Lunar Orbit	LD	Guidance System Failure
45.	Zond 1968A	Soyuz 7K-L1.7L	-	Crewed Lunar Flyby Test	Failed to enter Lunar Orbit	BSB	Launcher Explosion
46.	Zond 6	7K-L1.No.12L	-	Crewed Lunar Flyby Test	Crashed on the Earth Surface	VSS	Parachute Failure
47.	Zond 1969A	Soyuz 7K-L1.No.13L	-	Lunar Flyby	Failed to Orbit	BSB	Launch Failure
48.	Luna 1969A	Luna E-8.No.201	-	Lunar Landing Attempt	Failed to Orbit	BSB	Launch Failure
49.	Zond L1S-1	Soyuz 7K-L1S.No.3S	-	NI Launch Test	Failed to Orbit	LNH	Launcher Exploded
50.	Luna 1969B		-	Sample Return Attempt	Failed to Orbit	LNH	Launch Failure
51.	Luna 1969C	Luna E-8-5.No.402	-	Sample Return Attempt	Failed to Orbit	LNH	Launch Failure
52.	Zond L1S-2	Soyuz 7L-L1S.No.5L	-	NI Launch Test	Failed to Orbit	LNH	Launcher Exploded
53.	Luna 15	E-8-5.No.401	-	Orbiter and Landing Attempt	Failed to land	EPOI	Failed Ignition
54.	Kosmos 300	E-8-5.No.403	-	Lunar Sample Return Attempt	Never Left LEO	OMB	Failed Ignition
55.	Kosmos 305	E-8-5.No.404	-	Lunar Sample Return Attempt	Never Left LEO	OMB	Failed Ignition
56.	Luna 1970A	Luna E-8-5.No.405	-	Lunar Sample Return Attempt	Failed to Orbit	BSB	Launch Failure
57.	Luna 1970B		-	Orbit around the Moon	Failed to Orbit	LNH	Launch Failure
58.	Soyuz 7K-LOK	7K-L1E.No.1	-	Crewed Lunar Flyby Test	Failed to Orbit	BSB	Launch Failure
59.	Luna 18	E-8-5.No.407	-	Lunar Sample Return Attempt	Failed to Land	LD	Contact Lost
60.	Soyuz 7K-LOK	7K-LOK.No.6A	-	Crewed Lunar Flyby Test	Failed to Orbit	LNH	Launch Failure
61.	Luna 23	E-8-5M.No.410	-	Lunar Sample Return Attempt	Spacecraft Damaged	LL CRC-6 LGTD	Spacecraft Malfunctioned
62.	Luna 1975A	Luna E-8-5.No.412	-	Lunar Sample Return Attempt	Failed to Orbit	BSB	Launch Failure
63.	Hiten	MUSES-A	110W	Flyby around Moon	Decayed	CRC-4	Lack of Fuel
64.	Hagoromo		110W	Lunar Impact on the Moon	Crashed into the surface	CRC-4	-
65.	HGS-1	Asiasat-3/PAS-22	-	Gravity Assist Probes	-	VSS	-
66.	Nozomi	Planet-B	-	Gravity Assist Probes	-	CRC-2	Thruster Failure
67.	Chandrayaan 1		700W	Orbit around the Moon	Spacecraft Failure	LOI	Thermal Shielding
68.	Longjiang 1	DSWLP-A1/LO-93	-	Microsatellite Mission	Never Left LEO	LOI	Spacecraft Malfunctioned
69.	Beresheet		-	Soft-landing attempt	Crashed into the Surface	LD LL	Gyroscope Malfunction
70.	Vikram/Pragyan		650W	Soft-landing attempt	Crashed into the Surface	LD LL	Telemetry Lost

Table-7 Chronology of Mars Exploration Missions (1960-2020)

S.No	Spacecraft	Distinct Name	Type	Instruments	Launch Date	Launcher	Launch Site	Country	Manufacturer
01.	1M No.1	Marsnik-1	Flyby	03	10 Oct 1960	Molniya 8K78/L1-4	Baikonur 1/5	USSR	OKB-1
02.	1M No.2	Marsnik-2	Flyby	03	14 Oct 1960	Molniya 8K78/L1-5	Baikonur 1/5	USSR	OKB-1
03.	2 MV-4 No.1	Sputnik-22	Flyby	02	24 Oct 1962	Molniya 8K78/T-103-15	Baikonur 1/5	USSR	OKB-1
04.	2 MV-4 No.4	Mars-1	Flyby	02	01 Nov 1962	Molniya 8K78/T103-16	Baikonur 1/5	USSR	OKB-1
05.	2 MV-3 No.1	Sputnik-24	Lander	-	04 Nov 1962	Molniya 8K78/T103-17	Baikonur 1/5	USSR	OKB-1
06.	Mariner 3		Flyby	08	05 Nov 1964	Atlas LV-3 Agena D	CC-LC-13	USA	NASA/JPL
07.	Mariner 4		Flyby	08	28 Nov 1964	Atlas LV-3 Agena D	CC-LC-12	USA	NASA/JPL
08.	Zond 2	3MV-4A No.2	Flyby	08	30 Nov 1964	Molniya 8K78	Baikonur 1/5	USSR	OKB-1
09.	Mariner 6		Flyby	06	25 Feb 1969	Atlas SLV-3C Centaur D	CC-LC-36B	USA	NASA/JPL
10.	2M No.521	1969A / M-69	Orbiter	09	27 Mar 1969	Proton K/D UR-500	Baikonur 81/24	USSR	NPO Lavochkin
11.	Mariner 7		Flyby	06	27 Mar 1969	Atlas SLV-3C Centaur D	CC-LC-36A	USA	NASA/JPL
12.	2M No.522	1969B / M-69	Orbiter	09	02 Apr 1969	Proton K/D UR-500	Baikonur 81/23	USSR	NPO Lavochkin
13.	Mariner 8		Orbiter	06	09 May 1971	Atlas SLV-3C Centaur D	Baikonur 81/24	USA	NASA/JPL
14.	Kosmos 419		Orbiter	11	10 May 1971	Proton K/D UR-500	Baikonur 81/24	USSR	GSMZ Lavochkin
15.	Mars 2 (M-71)	4M No.171	Orbiter	11	19 May 1971	Proton K/D UR-500	Baikonur 81/24	USSR	OKB-1
16.	Mars 2 (M-71)	SA 4M No.171	Lander	08	19 May 1971	Proton K/D UR-500	Baikonur 81/24	USSR	OKB-1
17.	Prop-M Rover	M-71 - Rover	Rover	02	19 May 1971	Proton K/D UR-500	Baikonur 81/24	USSR	OKB-1
18.	Mars 3 (M-71)	4M No.172	Orbiter	10	28 May 1971	Proton K/D UR-500	Baikonur 81/24	USSR	GSMZ Lavochkin
19.	Mars 3 (M-71)	SA 4M No.172	Lander	08	28 May 1971	Proton K/D UR-500	Baikonur 81/24	USSR	GSMZ Lavochkin
20.	Prop-M Rover	M-71 - Rover	Rover	02	28 May 1971	Proton K/D UR-500	Baikonur 81/24	USSR	GSMZ Lavochkin
21.	Mariner 9		Orbiter	06	30 May 1971	Atlas SLV-3C Centaur D	CC-LC-36B	USA	NASA/JPL
22.	Mars 4	3MS No.52S	Orbiter	15	21 Jul 1973	Proton K/D UR-500	Baikonur 81/23	USSR	GSMZ Lavochkin
23.	Mars 5	3MS No.53S	Orbiter	15	25 Jul 1973	Proton K/D UR-500	Baikonur 81/24	USSR	GSMZ Lavochkin
24.	Mars 6	3MP No.50P	Flyby	05	05 Aug 1973	Proton K/D UR-500	Baikonur 81/23	USSR	GSMZ Lavochkin
25.	Mars 6	3MP No.50P	Lander	06	05 Aug 1973	Proton K/D UR-500	Baikonur 81/23	USSR	GSMZ Lavochkin
26.	Mars 7	3 MP No.51P	Flyby	06	09 Aug 1973	Proton K/D UR-500	Baikonur 81/24	USSR	GSMZ Lavochkin
27.	Mars 7	3 MP No.51P	Lander	06	09 Aug 1973	Proton K/D UR-500	Baikonur 81/24	USSR	GSMZ Lavochkin
28.	Viking 1		Orbiter	03	20 Aug 1975	Titan IIIE Centaur D1T	CC-LC-41	USA	NASA/JPL
29.	Viking 1		Lander	09	20 Aug 1975	Titan IIIE Centaur D1T	CC-LC-41	USA	Martin Marietta
30.	Viking 2		Orbiter	03	09 Sep 1975	Titan IIIE Centaur D1T	CC-LC-41	USA	NASA/JPL
31.	Viking 2		Lander	09	09 Sep 1975	Titan IIIE Centaur D1T	CC-LC-41	USA	Martin Marietta
32.	Phobos 1	1F No.101	Orbiter	22	07 Jul 1988	Proton K/D UR-500	Baikonur 200/40	USSR	NPO Lavochkin
33.	Phobos 1	1F No.101	Lander	-	07 Jul 1988	Proton K/D UR-500	Baikonur 200/40	USSR	NPO Lavochkin
34.	Phobos 2	1F No.102	Orbiter	22	12 Jul 1988	Proton K/D UR-500	Baikonur 200/40	USSR	NPO Lavochkin
35.	Phobos 2	1F No.102	Lander	-	12 Jul 1988	Proton K/D UR-500	Baikonur 200/40	USSR	NPO Lavochkin
36.	Mars Observer		Orbiter	08	25 Sep 1992	Titan III	CC-LC-40	USA	NASA/JPL
37.	Mars GS		Orbiter	06	07 Nov 1996	Delta-II 7925	CC-LC-17A	USA	NASA/JPL
38.	Mars 96	M1 No.520	Orbiter	22	16 Nov 1996	Proton K/D-2 UR-500	Baikonur 200/39	USSR	NPO Lavochkin
39.	Mars 96	M1 No.520	Lander	06	16 Nov 1996	Proton K/D-2 UR-500	Baikonur 200/39	USSR	NPO Lavochkin
40.	Mars 96	M1 No.520	Penetrator	10	16 Nov 1996	Proton K/D-2-UR-500	Baikonur 200/39	USSR	NPO Lavochkin
41.	Mars Pathfinder		Lander	02	04 Dec 1996	Delta-II 7925	CC-SLC-17	USA	NASA/JPL
42.	Sojourner		Rover	06	04 Dec 1996	Delta-II 7925	CC-SLC-17	USA	NASA/JPL

S.No	Spacecraft	Distinct Name	Type	Instruments	Launch Date	Launcher	Launch Site	Country	Manufacturer
43.	Nozomi	Planet-B	Orbiter	14	03 Jul 1998	MV	USC	Japan	JAXA
44.	MCO	MS-98	Orbiter	03	11 Dec 1998	Delta II 7425	CC-LC-17A	US	LMSS
45.	MPL	MS-98	Lander	03	03 Jan 1999	Delta II 7425	CC-LC-17A	US	Martin Marietta
46.	Deep Space 2		Penetrators	-	03 Jan 1999	Delta II 7425	CC-LC-17A	US	Martin Marietta
47.	Mars Odyssey		Orbiter	03	07 Apr 2001	Delta II 7925	CC-LC-17A	US	LMSS
48.	Mars Express		Orbiter	09	02 Jun 2003	Soyuz-FG/Fregat	Baikonur 31/6	Europe	ESA
49.	Beagle 2		Lander	04	02 Jun 2003	Soyuz-FG/Fregat	Baikonur 31/6	Europe	ESA
50.	Spirit	MER-A	Rover	09	10 Jun 2003	Delta II 7925	CC-LC-17A	US	NASA/JPL
51.	Opportunity	MER-B	Rover	09	08 Jul 2003	Delta II 7925-H	CC-LC-17A	US	NASA/JPL
52.	Rosetta		Gravity Assist	11	02 Mar 2004	Ariane 5G+	Kourou ELA-3	Europe	Astrium/ESA
53.	MRO		Orbiter	06	12 Aug 2005	Atlas V 401	CC-SLC-41	US	LMSS
54.	Phoenix		Lander	11	04 Aug 2007	Delta II 7925	CC-SLC-17A	US	LMSS
55.	Dawn		Gravity Assist	03	27 Sep 2007	Delta II 7925-H	CC-SLC-17B	US	NASA/JPL
56.	Fobos-Grunt		Orbiter	16	08 Nov 2011	Zenit-2M/2FG	Baikonur 45/1	USSR	NPO Lavochkin
57.	Fobos-Grunt		Sample Return	-	08 Nov 2011	Zenit-2M/2FG	Baikonur 45/1	USSR	NPO Lavochkin
58.	Yinguo-1		Orbiter	04	08 Nov 2011	Zenit-2M/2FG	Baikonur 45/1	China	CNSA
59.	Curiosity	MSL	Rover	12	26 Nov 2011	Atlas V 541	CC-LC-41	US	NASA/JPL
60.	Mangalyaan	MOM	Orbiter	05	05 Nov 2013	PSLV-XL	SHAR	India	ISRO
61.	MAVEN		Orbiter	08	18 Nov 2013	Atlas V 401	CC-SLC-41	US	NASA/GSFC
62.	ExoMars TGO		Orbiter	04	14 Mar 2016	Proton-M/Briz-M	Baikonur 200/39	Europe	TAS/ESA
63.	Schiaparelli EDM		Lander	-	14 Mar 2016	Proton-M/Briz-M	Baikonur 200/39	Europe	TAS/ESA
64.	InSight		Lander	04	05 May 2018	Atlas V 401	Vandenberg SLC-3E	US	LMSS
65.	MarCo-A		Flyby	-	05 May 2018	Atlas V 401	Vandenberg SLC-3E	US	NASA/JPL
66.	MarCo-B		Flyby	-	05 May 2018	Atlas V 401	Vandenberg SLC-3E	US	NASA/JPL
65.	Tianwen-1	Huoxing-1	Orbiter	-	23-Jul-2020	Long March 5	Wenchang-LC-101	CHINA	CNSA
66.	Tianwen-1		Lander	-	23-Jul-2020	Long March 5	Wenchang-LC-101	CHINA	CNSA
67.	Tianwen-1		Rover	-	23-Jul-2020	Long March 5	Wenchang-LC-101	CHINA	CNSA
68.	Perseverance Rover	Mars 2020	Rover	-	30-Jul-2020	Atlas V 541 (AV-088)	CC-SLC-41	US	NASA/JPL
69	Ingenuity		Helicopter	-	30-Jul-2020	Atlas V 541 (AV-088)	CC-SLC-41	US	NASA/JPL

Table-8 Spacecraft Parameters of Mars Missions

S.No	Spacecraft Name	Period	Probe Type	Launch Date	Decay Date	Spacecraft Mass (kg)	Launch Mass (kg)	Mission Duration (Days)	Mission Intermission between		Mission Degradation (Days)
									Launch Date (Days)	Decay Date (Days)	
01.	1M No.1	1960s-1970s	Flyby	10 Oct 1960	10-Oct-1960	480	650	0.0036	04	04	01
02.	1M No.2		Flyby	14 Oct 1960	14-Oct-1960	480	650	0.0034	740	865	01
03.	2 MV-4 No.1		Flyby	24 Oct 1962	26-Feb-1963	893	900	0.0034	08	113	125
04.	2 MV-4 No.2		Flyby	01 Nov 1962	19-Jun-1963	893	900	140	03	657	230
05.	2 MV-3 No.1		Lander	04 Nov 1962	19-Jan-1963	890	900	0.0030	732	657	227
06.	Mariner 3		Flyby	05 Nov 1964	06-Nov-1964	260	397	0.36	23	1140	01
07.	Mariner 4		Flyby	28 Nov 1964	21-Dec-1967	244	260	1118	02	1098	1118
08.	Zond 2		Flyby	30 Nov 1964	18-Dec-1964	890	996	249	1548	2196	249
09.	Mariner 6		Flyby	25 Feb 1969	23-Dec-1970	381	411.8	666	30	636	666
10.	2M No.521		Orbiter	27 Mar 1969	27-Mar-1969	3800	4850	0.0050	30	641	01
11.	Mariner 7		Flyby	27 Mar 1969	28-Dec-1970	381	411.8	640	06	635	641
12.	2M No.522		Orbiter	02 Apr 1969	02-Apr-1969	3800	4850	0.00048	767	767	01
13.	Mariner 8	1970s-1980s	Orbiter	09 May 1971	09-May-1971	558.8	997.9	0.0032	01	03	01
14.	Kosmos 419		Orbiter	10 May 1971	12-May-1971	4549	-	0.0625	09	468	02
15.	Mars 2 (M-71)		Orbiter	19 May 1971	22-Aug-1972	2265	3440	461	09	269	461
16.	Mars 2 (M-71)		Lander	19 May 1971	27-Nov-1971	358	1210	192	09	269	192
17.	Prop-M Rover		Rover	19 May 1971	27-Nov-1971	4.5	-	-	09	269	192
18.	Mars 3 (M-71)		Orbiter	28 May 1971	22-Aug-1972	2265	3440	452	02	264	452
19.	Mars 3 (M-71)		Lander	28 May 1971	02-Dec-1971	358	1210	188	02	330	188
20.	Prop-M Rover		Rover	28 May 1971	02-Dec-1971	4.5	-	-	02	330	188
21.	Mariner 9		Orbiter	30 May 1971	27-Oct-1972	558.8	997.9	514	783	471	516
22.	Mars 4		Orbiter	21 Jul 1973	10-Feb-1974	2265	3440	195	04	18	204
23.	Mars 5		Orbiter	25 Jul 1973	28-Feb-1974	2265	3440	218	11	12	218
24.	Mars 6		Flyby	05 Aug 1973	12-Mar-1974	1900	3260	219	04	13	219
25.	Mars 6		Lander	05 Aug 1973	12-Mar-1974	635	3260	219	04	13	219
26.	Mars 7		Flyby	09 Aug 1973	25-Mar-1974	1900	3260	214	741	16	228
27.	Mars 7		Lander	09 Aug 1973	09-Mar-1974	635	3260	214	741	3169	212
28.	Viking 1		Orbiter	20 Aug 1975	17-Sep-1980	883	3530	1824	20	2305	1846
29.	Viking 1		Lander	20 Aug 1975	11-Nov-1982	572	3530	2040	20	1362	2640
30.	Viking 2		Orbiter	09 Sep 1975	25-Jul-1973	883	3530	1050	4685	1317	1050
31.	Viking 2		Lander	09 Sep 1975	12-Apr-1980	572	3530	1677	4685	4444	1677
32.	Phobos 1	1980s-1990s	Orbiter	07 Jul 1988	03-Nov-1988	2420	6220	52	05	144	56
33.	Phobos 1		Lander	07 Jul 1988	03-Nov-1988	570	3800	52	05	144	56
34.	Phobos 2		Orbiter	12 Jul 1988	27-Mar-1989	2420	6220	258	1536	19	258
35.	Phobos 2		Lander	12 Jul 1988	15-Apr-1989	570	3800	258	1536	1589	277
36.	Mars Observer	1990s-2000s	Orbiter	25 Sep 1992	21-Aug-1993	1018	2565	330	1504	4821	340
37.	Mars GS		Orbiter	07 Nov 1996	02-Nov-2006	1030	1062	3647	09	3636	3700
38.	Mars 96		Orbiter	16 Nov 1996	18-Nov-1996	3780	6700	0.0062	18	313	02
39.	Mars 96		Lander	16 Nov 1996	18-Nov-1996	75	-	-	18	313	02
40.	Mars 96		Penetrator	16 Nov 1996	18-Nov-1996	120	-	-	18	313	02
41.	Mars Pathfinder		Lander	04 Dec 1996	27-Sep-1997	210	295	297	576	78	297
42.	Sojourner		Rover	04 Dec 1996	11-Jul-1997	11	11	219	576	2342	219
43.	Nozomi		Orbiter	03 Jul 1998	09-Dec-2003	258	356	1983	161	1538	1985
44.	MCO		Orbiter	11 Dec 1998	23-Sep-1999	338	638	286	23	71	288
45.	MPL		Lander	03 Jan 1999	03-Dec-1999	290	583	334	825	1483	379
46.	Deep Space 2		Penetrators	03 Jan 1999	03-Dec-1999	2.4	-	334	825	1483	379

S.No	Spacecraft Name	Period	Type	Launch Date	Decay Date	Spacecraft Mass (kg)	Launch Mass (kg)	Mission Duration (Days)	Mission Intermission between		Mission Degradation (Days)
									Launch Date (Days)	Decay Date (Days)	
47.	Mars Odyssey	2000s-2010s	Orbiter	07 Apr 2001	<i>Operational</i>	376	758	6964	786	-	-
48.	Mars Express		Orbiter	02 Jun 2003	<i>Operational</i>	637	1120	6178	08	-	-
49.	Beagle 2		Lander	02 Jun 2003	25-Dec-2003	09	33.2	206	08	2279	244
50.	Spirit		Rover	10 Jun 2003	22-Mar-2010	174	1063	2477	28	3002	2906
51.	Opportunity		Rover	08 Jul 2003	10-Jun-2018	185	1063	5452	766	3507	5700
52.	MRO		Orbiter	12 Aug 2005	<i>Operational</i>	984	2180	5376	722	-	-
53.	Phoenix		Lander	04 Aug 2007	02-Nov-2008	350	680	456	1557	456	1024
54.	Fobos-Grunt	2010s-2020s	Orbiter	08 Nov 2011	15-Jan-2012	1560	2300	0.00155	18	68	68
55.	Fobos-Grunt		Sample Return	08 Nov 2011	15-Jan-2012	106	296	-	18	68	68
56.	Yinguo-1		Orbiter	08 Nov 2011	15-Jan-2012	115	-	-	18	68	68
57.	Curiosity		Rover	26 Nov 2011	<i>Operational</i>	899	-	3079	710	-	-
58.	Mangalyaan		Orbiter	05 Nov 2013	<i>Operational</i>	482	1337	2369	13	-	-
59.	MAVEN		Orbiter	18 Nov 2013	<i>Operational</i>	809	2454	2356	847	-	-
60.	ExoMars TGO		Orbiter	14 Mar 2016	<i>Operational</i>	690.8	4332	1509	71	-	-
61.	Schiaparelli EDM		Lander	14 Mar 2016	19-Oct-2016	280	600	219	71	219	219
62.	InSight		Lander	05 May 2018	<i>Operational</i>	358	694	727	810	-	-
63.	MarCo-A		Flyby	05 May 2018	04-Jan-2019	13.5	13.5	244	810	244	638
64.	MarCo-B		Flyby	05-May-2018	29-Dec-2019	13.5	13.5	238	810	603	638
65.	Tianwen-1		Orbiter	23-Jul-2020	<i>In Trajectory Phase</i>	3175	5000	-	07	-	-
66.	Tianwen-1		Lander	23-Jul-2020	<i>In Trajectory Phase</i>	1585	5000	-	07	-	-
67.	Tianwen-1		Rover	23-Jul-2020	<i>In Trajectory Phase</i>	240	5000	-	07	-	-
68.	Perseverance Rover		Rover	30-Jul-2020	<i>In Trajectory Phase</i>	1050	-	-	-	-	-
69.	Ingenuity		Helicopter	30-Jul-2020	<i>In Trajectory Phase</i>	1.8	-	-	-	-	-

Table-9 Spaceflight Sequence Chart - Failed Lunar Missions

S.No	Spacecraft	Distinct Name	LNH	BSB	SS	CRC-1	EPOI	VSS	OMB	CRC-2	TLI	MCCM	LA	CRC-3	OIB	LOI	LMS	CRC-4	EITOI	TOI	SSC	DEI	CRC-5	LD	LL	CRC-6	LGTD	CRC-7
01.	Pioneer 0	Able-1	⊗																									
02.	Luna E-1 No.1		•	⊗																								
03.	Pioneer 1	Able-2	•	•	⊗																							
04.	Luna E-1.No.2		•	⊗																								
05.	Pioneer 2	Able-3	•	⊗																								
06.	Luna E-1.No.3		•	⊗																								
07.	Pioneer 3		•	⊗																								
08.	Mechta / Luna 1	Luna E-1.No.4	•	•	•	•	•	•	•	⊗	⊗																	
09.	Pioncer 4		•	•	•	•	•	•	•	•	•	⊗																
10.	Luna E-1A.No.1	Luna E-1A.No.5	•	⊗																								
11.	Pioneer P-1		⊗																									
12.	Pioneer P-3	Able-IVB	•	⊗																								
13.	Luna 1960A	Luna E-3.No.1	•	⊗																								
14.	Luna 1960B	Luna E-3.No.2	•	⊗																								
15.	Pioneer P-30	Able-VA	•	⊗																								
16.	Pioneer P-31	Able-VB	•	⊗																								
17.	Ranger 3	P-34	•	•	•	•	•	•	•	•	•	⊗																
18.	Ranger 4	P-35	•	•	•	•	•	•	•	⊗	⊗	⊗																
19.	Ranger 5	P-36	•	•	•	•	•	•	•	•	•	•	•	⊗														
20.	Sputnik 25	Luna E-6.No.2	•	⊗																								
21.	Luna E-6.No.3	Luna E-6.No.3	•	⊗	⊗																							
22.	Luna 4	Luna E-6.No.4	•	•	•	•	•	•	•	•	•	⊗																
23.	Kosmos 21	Cosmos 21	•	•	•	•	•	⊗																				
24.	Ranger 6	P-53	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	⊗	
25.	Luna 1964A	Luna E-6.No.6	•	•	⊗																							
26.	Luna E-6.No.5	Luna E-6.No.5	•	•	⊗																							
27.	Kosmos 60	Luna E-6.No.9	•	•	•	•	•	•	⊗																			
28.	Luna 1965A	Luna E-6.No.8	•	•	⊗																							
29.	Luna 5	Luna E-6.No.10	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	⊗						
30.	Luna 6	Luna E-6.No.7	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	⊗						
31.	Luna 7	Luna E-6.No.11	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	⊗						
32.	Luna 8	Luna E-6.No.12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	⊗				
33.	Kosmos 111	Luna E-6S.No.204	•	•	•	•	•	⊗																				
34.	Luna 1966A		⊗																									
35.	Explorer 33	AIMP-D	•	•	•	•	•	•	•	•	•	•	•	•	•	⊗												

S.No	Spacecraft	Distinct Name	LNH	BSB	SS	CRC-1	EPOI	VSS	OMB	CRC-2	TLI	MCCM	LA	CRC-3	OIB	LOI	LMS	CRC-4	EITOI	TOI	SSC	DEI	CRC-5	LD	LL	CRC-6	LGTD	CRC-7
36.	Lunar Orbiter 1	Luna Orbiter-A	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
37.	Luna 11	E-6LF.No.101	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
38.	Surveyor 2	Surveyor-B	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
39.	Kosmos 154	7K-L1.No.3P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
40.	Surveyor 4	Surveyor-D	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
41.	Zond 1967A	Soyuz 7K-L1.No.4L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
42.	Zond 1967B	Soyuz 7L-L1.No.5L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
43.	Luna 1968A	Luna E-6LS.No.112	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
44.	Zond 4	7K-L1.No.6L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
45.	Zond 1968A	Soyuz 7K-L1.7L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
46.	Zond 6	7K-L1.No.12L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
47.	Zond 1969A	Soyuz 7K-L1.No.13L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
48.	Luna 1969A	Luna E-8.No.201	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
49.	Zond L1S-1	Soyuz 7K-L1S.No.3S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
50.	Luna 1969B		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
51.	Luna 1969C	Luna E-8-5.No.402	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
52.	Zond L1S-2	Soyuz 7L-L1S.No.5L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
53.	Luna 15	E-8-5.No.401	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
54.	Kosmos 300	E-8-5.No.403	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
55.	Kosmos 305	E-8-5.No.404	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
56.	Luna 1970A	Luna E-8-5.No.405	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
57.	Luna 1970B		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
58.	Soyuz 7K-LOK	7K-L1E.No.1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
59.	Luna 18	E-8-5.No.407	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
60.	Soyuz 7K-LOK	7K-L1OK.No.6A	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
61.	Luna 23	E-8-5M.No.410	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
62.	Luna 1975A	Luna E-8-5.No.412	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
63.	Hiten	MUSES-A	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
64.	Hagoromo		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
65.	HGS-1	Asiasat-3/PAS-22	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
66.	Nozomi	Planet-B	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
67.	Chandrayaan 1		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
68.	Longjiang 1	DSWLP-A1/LO-93	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
69.	Beresheet		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
70.	Vikram/Pragyan		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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