

Appendix B

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Catalog of space science launches 1957–2000

Most accounts of space science concentrate on a few famous spacecraft such as the Hubble Space Telescope or the Viking Mars missions. Here I present a comprehensive survey of space science satellites and probes. There are interesting stories behind even those satellites which carried quite minor or unsuccessful experiments, and I hope this will serve as a useful finding list for future historians, as well as providing an indication of the total extent of the space science effort as a function of nation and scientific discipline.

Unfortunately, the list does not include satellites which were lost in launch failures, and it does not include sub-orbital sounding rockets. It does include planetary probes, life science missions, microgravity missions, most geodesy flights, secondary experiments on piloted spaceships, secondary experiments on spy satellites, as well as the core space physics, astronomy, and atmospheric science automated missions in Earth orbit.

Constructing the list required significant subjective decisions. For example, the boundaries between

- atmospheric science and operational meteorology,
- infrared astronomy and missile early warning satellite background measurements,
- ionospheric research and communications satellite signal propagation technology,
- geophysical research and geodesy measurements for missile targeting,
- solar physics studies and solar flux monitoring for operational flare alerts

are all rather fuzzy, and I have exercised my best judgement.

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Launch dates are Universal Time. Satellite and payload names are those assigned by the owner agency in their language, transliterated where the original is in a non-Latin alphabet. State is the nation-state in which the owner agency is located, and is usually the state which registered the satellite with the United Nations Office of Outer Space Affairs; “I/ESA” denotes International – European Space Agency. The orbital parameters are perigee and apogee in km with respect to a spherical Earth of radius 6378 km, and inclination with respect to the Earth’s equator in degrees. “Operated until” represents the last day on which the satellite transmitted, as best as I have been able to determine it (this information is often hard to come by); the end of useful scientific operations may precede this date. “Primary Mission” indicates when the payload is a piggyback experiment on a vehicle with a different primary mission; in particular, the value “Spaceship” in this field indicates the payload was carried on a space vehicle designed to operate with a human crew (including, in a few cases such as Mercury MA-5, automated test flights of such vehicles). The mission of the scientific satellite is summarized in the “Discipline” column, which contains abbreviations (tabulated below) for the main subdisciplines. Where a brief (few words) summary of the mission is possible, this is included in the Comments. However, in many cases to expand on the list of disciplines in a useful way would require an extensive description of each satellite, which is beyond the scope of this table.

The table has been compiled using a large variety of sources, including especially the NASA Special Publications series, the TRW Space Log, the Russian astronautics magazine *Novosti Kosmonavtiki*, the *Journal of Geophysical*

Research, *Spaceflight* magazine, the *Journal of the British Interplanetary Society*, the journal *Kosmicheskie Issledovania*, as well as memos and primary unpublished materials in the libraries and archives of NASA HQ, NASA KSC, the Jet Propulsion Lab, and the US National Archives. The orbital data are ultimately from United States Space Command and are made public courtesy of the Orbital Information Group at NASA's Goddard Space Flight Center.

For up-to-date information on satellite launches, the reader is invited to visit <http://hea-www.harvard.edu/~jcm/space>

Key to disciplines:

A Auroral studies
 ALT Altimeter missions
 ATM Atmospheric studies
 BIO Life sciences
 ENV Space environment

F Fields
 GEO Geodesy
 GRA Gamma ray astronomy
 ION Ionospheric beacons
 IRA IR astronomy
 M Mixed cargo of experiments
 MG Microgravity
 MM Micrometeorites
 OA Optical astronomy
 P Particles
 PL Planetary and solar wind
 RFA Radio frequency astronomy
 SMA Submillimeter astronomy
 SOL Solar observations
 SX Solar X-ray observations
 UVA UV astronomy
 XRA X-ray astronomy
 * Indicates the more significant missions

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1957 Oct 4	1-y ISZ	USSR	214 ×	938 ×	65	1957 Oct 27	ENV*	First Earth satellite
1957 Nov 3	2-y ISZ	USSR	211 ×	1659 ×	65	1957 Nov 9	BIO	First animal payload
1958 Feb 1	Explorer 1	USA	359 ×	2542 ×	33	1958 Apr 1	P*	Discovered trapped radiation
1958 Mar 17	Vanguard I	USA	657 ×	3935 ×	34	1964 Mar	GEO	First geodetic satellite
1958 Mar 26	Explorer 3	USA	195 ×	2810 ×	33	1958 May 10	P*	—
1958 May 15	3-y Sovetskii ISZ	USSR	207 ×	1247 ×	65	1958 Jun 5	P*	—
1958 Jul 26	Explorer 4	USA	258 ×	2233 ×	50	1958 Sep 19	P*	—
1958 Oct 11	Pioneer 1	USA	—100 ×	113 860 ×	29	1958 Oct 13	PL	—
1958 Dec 6	Pioneer 3	USA	—70 ×	102 200 ×	28	1958 Dec 7	PL	—
1959 Jan 2	AMS Luna-1	USSR	Solar orbit			1959 Jan 5	PL	First artificial planet
1959 Feb 17	Vanguard II	USA	564 ×	3304 ×	32	1959 Mar 7	ATM	Cloud cover photos
1959 Mar 3	Pioneer 4	USA	Solar orbit			1959 Mar 6	PL	—
1959 Aug 7	Explorer 6	USA	250 ×	42 327 ×	46	1959 Oct 6	P/F*	—
1959 Sep 12	AMS Luna-2	USSR	Lunar impact			1959 Sep 13	PL	First lunar impact
1959 Sep 18	Vanguard III	USA	521 ×	3758 ×	33	1959 Dec 12	MM/F*	—
1959 Oct 4	AMS Luna-3	USSR	500 ×	500 000 ×	55	1959 Nov 15	PL	Lunar farside photos
1959 Oct 13	Explorer 7	USA	560 ×	1087 ×	50	1961 Feb	P/F/ION*	—
1960 Mar 11	Pioneer V	USA	Solar orbit			1960 Jun 23	PL	—
1960 May 15	Korabl'-Sputnik	USSR	277 ×	674 ×	64	1960 May 19	BIO	—
1960 May 24	Midas 2	USA	482 ×	514 ×	33	1960 May 25	MM/P/ATM	—
1960 Jun 22	SR	USA	614 ×	1058 ×	66	1961 Apr 18	SOL	Solar radiation
1960 Aug 10	Discoverer 13	USA	245 ×	614 ×	82	1960 Aug 11	BIO	—
1960 Aug 19	Korabl'-Sputnik-2	USSR	307 ×	307 ×	64	1960 Aug 20	BIO	—
1960 Nov 3	Explorer 8	USA	416 ×	2286 ×	49	1960 Dec 27	P/F*	—
1960 Nov 12	Discoverer 17	USA	182 ×	923 ×	81	1960 Nov 14	BIO	—
1960 Dec 1	Korabl'-Sputnik-3	USSR	171 ×	237 ×	65	1960 Dec 2	BIO	—
1960 Dec 7	Discoverer 18	USA	272 ×	536 ×	81	1960 Dec 10	BIO	—
1961 Feb 4	Tyazholiy Sputnik	USSR	179 ×	296 ×	64	1961 Feb 4?	PL	—
1961 Feb 12	AMS Venera	USSR	Solar orbit			1961 Feb 27?	PL	—
1961 Feb 16	Explorer 9	USA	635 ×	2581 ×	38	1961 Feb 16	ATM	Air density study
1961 Feb 22	Lofti	USA	167 ×	1002 ×	28	1961 Mar 30	F	VLF study
1961 Mar 9	Korabl'-Sputnik-4	USSR	173 ×	239 ×	64	1961 Mar 9	BIO	—
1961 Mar 25	Korabl'-Sputnik-5	USSR	163 ×	229 ×	64	1961 Mar 25	BIO	—
1961 Mar 25	Explorer 10	USA	221 ×	181 000 ×	33	1961 Mar 27	P/F*	—
1961 Apr 12	Vostok	USSR	168 ×	314 ×	64	1961 Apr 12	BIO	Magnetic field probe
1961 Apr 27	Explorer 11	USA	497 ×	1777 ×	28	1961 Apr 12	GRA*	First piloted spaceship
1961 Jun 16	Discoverer 25	USA	223 ×	362 ×	82	1961 Dec 6	MM/P	—
1961 Jun 29	Injun	USA	882 ×	996 ×	66	1963 Mar 6	P*	—
1961 Jun 29	Solrad 3	USA	879 ×	984 ×	66	1962 Aug	SX	Solar X/signals intel.
1961 Jul 7	Discoverer 26	USA	229 ×	713 ×	82	1961 Jul 10	RFA/MM/P	—

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1961 Aug 6	Vostok-2	USSR	172 ×	218 ×	64	1961 Aug 7	BIO	
1961 Aug 16	Explorer 12	USA	457 ×	77 170 ×	33	1961 Dec 6	P/F*	
1961 Aug 23	Ranger 1	USA	179 ×	446 ×	32	1961 Aug 27	P	
1961 Aug 25	Explorer 13	USA	364 ×	810 ×	36	1961 Aug 28	MM*	
1961 Aug 30	Discoverer 29	USA	138 ×	511 ×	82	1961 Sep 1	A/P	
1961 Sep 12	Discoverer 30	USA	231 ×	484 ×	82	1961 Sep 14	RFA/BIO	
1961 Sep 17	Discoverer 31	USA	233 ×	380 ×	82	1961 Sep 19	A/P/RFA	
1961 Oct 13	Discoverer 32	USA	233 ×	350 ×	81	1961 Nov 13	P/ION	
1961 Nov 5	Discoverer 34	USA	225 ×	971 ×	82	1961 Nov 10?	P	
1961 Nov 15	Traac	USA	934 ×	1129 ×	32	1962 Aug 14	P	
1961 Nov 18	Ranger 2	USA	149 ×	169 ×	33	1961 Nov 19	P	
1961 Nov 29	Mercury MA-5	USA	158 ×	237 ×	32	1961 Nov 29	BIO	
1961 Dec 12	Discoverer 36	USA	223 ×	446 ×	81	1961 Dec 16	ION/BIO/P	
1962 Jan 26	Ranger 3	USA	Solar orbit			1962 Feb 2	PL	
1962 Jan 26	Ranger Capsule 12	USA	Solar orbit			1962 Feb 2	PL	Lunar lander capsule
1962 Feb 20	Friendship Seven (MA-6)	USA	149 ×	249 ×	32	1962 Feb 20	ATM	
1962 Feb 27	Discoverer 38	USA	207 ×	357 ×	82	1962 Mar 3	A/P	
1962 Mar 7	OSO 1	USA	546 ×	601 ×	32	1963 Aug 3	SOL/GRA*	
1962 Mar 16	Kosmos-1	USSR	208 ×	731 ×	49	1962 Apr?	ION/P*	
1962 Apr 6	Kosmos-2	USSR	218 ×	1449 ×	48	1962 Apr 17	ION/P*	
1962 Apr 18	Discoverer 39	USA	201 ×	504 ×	73	1962 Apr 22	P	
1962 Apr 23	Ranger 4	USA	Lunar impact			1962 Apr 26	PL	
1962 Apr 23	Ranger Capsule 14	USA	Lunar impact			1962 Apr 26	PL	Lunar lander capsule
1962 Apr 24	Kosmos-3	USSR	226 ×	632 ×	49	1962 Jul?	P*	
1962 Apr 26	Ariel 1	UK	397 ×	1202 ×	53	1964 Nov 9	P/SX*	
1962 Apr 29	FTV 1125	USA	190 ×	414 ×	73	1962 May 5	P	
1962 May 24	MA-7 Balloon Subsatellite	USA	154 ×	260 ×	32	1962 May 24	ATM	Atmospheric density, failed
1962 May 28	Kosmos-5	USSR	207 ×	1500 ×	49	1962?	to deploy	
1962 May 30	FTV 1128	USA	192 ×	315 ×	74	1962 Jun 2	ATM/MG*	
1962 Jun 2	FTV 1127	USA	196 ×	373 ×	74	1962 Jun 5	P/RFA	
1962 Jun 23	FTV 1129	USA	208 ×	267 ×	75	1962 Jun?	P/RFA	
1962 Jun 28	FTV 1151	USA	193 ×	583 ×	76	1962 Jul 2	P/RFA	
1962 Jun 30	Kosmos-6	USSR	262 ×	304 ×	48	1962 Jul 6	P	
1962 Jul 21	FTV 1130	USA	200 ×	364 ×	70	1962 Jul 26	P/RFA	
1962 Aug 2	FTV 1152	USA	193 ×	398 ×	82	1962 Aug 6	P/MM	
1962 Aug 11	Vostok-3	USSR	158 ×	200 ×	64	1962 Aug 15	P/BIO	
1962 Aug 12	Vostok-4	USSR	168 ×	221 ×	64	1962 Aug 15	P/BIO	
1962 Aug 18	Kosmos-8	USSR	259 ×	569 ×	48	1962 Aug 23	MM	
1962 Aug 25	[AMS Venera]	USSR	174 ×	248 ×	64	1962 Aug 25	PL	Venus probe, failed

1962 Aug 27	Mariner 2	USA	Solar orbit	246 X	64	1963 Jan 2	PL	Venus flyby
1962 Sep 1	[AMS Venera]	USSR	185 X	195 X	64	1962 Sep 1	PL	Venus probe, failed
1962 Sep 12	[AMS Venera]	USSR	163 X	528 X	81	1962 Sep 12	PL	Venus probe, failed
1962 Sep 17	FTV 1133	USA	192 X	339 X	64	1962 Sep 19	P	Recon
1962 Sep 27	Kosmos-9	USSR	297 X	1027 X	80	1962 Oct 1	P	Recon
1962 Sep 29	Alouette 1	Canada	999 X	96959 X	33	1971 Dec 16	ION/RFA*	
1962 Oct 2	Explorer 14	USA	915 X	286 X	32	1963 Aug 11	P/F*	
1962 Oct 3	Sigma Seven (MA-8)	USA	156 X	368 X	65	1962 Oct 3	P/ATM	
1962 Oct 17	Kosmos-10	USSR	196 X			1962 Oct 21	P	Recon
1962 Oct 18	Ranger 5	USA	Solar orbit			1962 Oct 21?	PL	Lunar probe, missed
1962 Oct 18	Ranger Capsule 18	USA	Solar orbit			1962 Oct 19	PL	Lunar lander capsule
1962 Oct 20	Kosmos-11	USSR	249 X	864 X	48	1962 Oct 28	ION/P*	
1962 Oct 24	[AMS Mars]	USSR	202 X	260 X	65	1962 Oct 24	PL	Mars probe, failed
1962 Oct 26	Starad	USA	199 X	5494 X	71	1962 Dec 13	P/F*	Studied artificial rad belt
1962 Oct 27	Explorer 15	USA	312 X	17 619 X	17	1963 Feb 9	P/F*	Studied artificial rad belt
1962 Oct 31	ANNA 1B	USA	1081 X	1179 X	50	1964?	GEO	
1962 Nov 1	AMS Mars	USSR	Solar orbit			1963 Mar 21	PL	Mars probe, failed
1962 Nov 4	[AMS Mars]	USSR	170 X	170 X	64	1962 Nov 4	PL	Mars probe, failed
1962 Nov 5	FTV 1136	USA	194 X	391 X	75	1962 Nov 10	P	Recon
1962 Nov 24	FTV 1135	USA	206 X	317 X	65	1962 Nov 29	P	Recon
1962 Dec 13	Injun 3	USA	231 X	2774 X	70	1963 Nov 20	P	
1962 Dec 16	Explorer 16	USA	759 X	1170 X	51	1963 Jul 25	MM*	
1962 Dec 22	Kosmos-12	USSR	199 X	387 X	64	1962 Dec 30	P	
1963 Jan 4	[Luna-4]	USSR	178 X	194 X	64	1963 Jan 4	PL	Lunar probe, missed
1963 Jan 4	ALS	USSR	180 X	214 X	64	1963 Jan 4	PL	Lunar lander capsule
1963 Apr 2	Luna-4	USSR	200 X	694 000 X	65	1963 Apr 15	PL	Lunar probe, missed
1963 Apr 2	ALS	USSR	200 X	694 000 X	65	1963 Apr 6?	PL	Lunar lander capsule
1963 Apr 3	Explorer 17	USA	246 X	914 X	57	1963 Oct 7	ATM*	
1963 Apr 28	Kosmos-16	USSR	195 X	384 X	65	1963 May 8	P	Recon
1963 May 9	DASH 1	USSR	3611 X	3676 X	87	1963 May 9	ATM	Calibration
1963 May 15	Faith Seven (MA-9)	USA	163 X	265 X	32	1963 May 16	ATM	Spaceship
1963 May 15	MA-9 Balloon	USA	163 X	265 X	32	1963 May 15	ATM	Atm. density study
1963 May 22	Subsatellite							
1963 May 22	Kosmos-17	USSR	265 X	751 X	48	1963 May 30	ION/P*	
1963 Jun 14	Vostok-5	USSR	158 X	164 X	64	1963 Jun 19	P/BIO	Spaceship
1963 Jun 15	SR 6A	USA	165 X	846 X	69	1963 Aug 1	SX*	Sight
1963 Jun 16	Vostok-6	USSR	163 X	191 X	64	1963 Jun 19	P/BIO	Spaceship
1963 Jun 27	Hitchhiker 1	USA	331 X	4125 X	82	1963 Sep	P/F*	
1963 Jun 28	GRS	USA	421 X	1298 X	49	1963 Jun 29	ATM/P*	
1963 Sep 28	Transit VE-1	USA	1071 X	1129 X	89	1974 Nov	P*	
1963 Oct 17	ERS 12	USA	952 X	102 375 X	35	1964?	P	
1963 Oct 29	Hitchhiker 2	USA	290 X	568 X	89	1964?	P	

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1963 Nov 11	Kosmos-21	USSR	180 ×	219 ×	64	1963 Nov 11	PL	Venus probe, failed
1963 Nov 27	IMP 1 (Explorer 18)	USA	2072 ×	194 080 ×	35	1965 Mar 25	P/F*	-
1963 Dec 5	Transit VE-3	USA	1066 ×	1119 ×	89	1964 Mar 9	P*	-
1963 Dec 19	Explorer 19	USA	588 ×	2389 ×	78	1963 Dec 19	ATM*	-
1963 Dec 21	Hitchhiker 3	USA	312 ×	389 ×	64	1964?	P*	-
1964 Jan 11	EGRS 1	USA	905 ×	932 ×	69	1965?	GEO	-
1964 Jan 11	SR 7A	USA	909 ×	934 ×	69	1966 Jul	SX*	-
1964 Jan 30	Elektron-1	USSR	394 ×	7124 ×	60	1964 Mar	ION/MM/P*	-
1964 Jan 30	Ranger 6	USA	Lunar impact			1964 Feb 2	PL	Lunar probe, failed
1964 Jan 30	Elektron-2	USSR	408 ×	68 014 ×	60	1964 Jun	ION/MM/P/F*	-
1964 Mar 18	Kosmos-26	USSR	263 ×	367 ×	48	1964 Apr 1	F*	Magnetic field study
1964 Mar 27	Ariel 2	UK	289 ×	1343 ×	51	1964 Sep?	RFA/ATM/MM*	-
1964 Mar 27	Kosmos-27	USSR	197 ×	208 ×	64	1964 Mar 27	PL	Venus probe, failed
1964 Apr 2	Zond	USSR	Solar orbit			1964 Apr	PL	Venus probe, failed
1964 Apr 27	OPS 2921	USA	175 ×	426 ×	79	1964 May 26	ION	-
1964 Jun 6	Kosmos-31	USSR	218 ×	457 ×	48	1964 Oct 20	UVA*	UV background, failed
1964 Jun 13	Starflash 1A	USA	351 ×	357 ×	115	1964?	GEO	-
1964 Jul 10	Elektron-3	USSR	401 ×	7026 ×	60	1965?	P*	-
1964 Jul 10	Elektron-4	USSR	452 ×	66 264 ×	60	1965 Feb?	MM/RFA/SX*	-
1964 Jul 17	ERS 13	USA	319 ×	104 032 ×	38	1966 Jul 1	P	-
1964 Jul 28	Ranger 7	USA	Lunar impact			1964 Jul 31	PL	Lunar impact probe
1964 Aug 14	OPS 3316	USA	271 ×	3724 ×	95	1979 Mar 8	P/F*	-
1964 Aug 21	Starflash 1B	USA	329 ×	346 ×	114	1964?	GEO	-
1964 Aug 25	Explorer 20	USA	869 ×	1018 ×	79	1966 Jul	ION*	-
1964 Sep 5	OGO 1	USA	1289 ×	148 412 ×	32	1980 Aug 10	P/F/MM/RFA*	-
1964 Sep 13	Kosmos-45	USSR	200 ×	316 ×	64	1964 Sep 18	ATM	-
1964 Oct 4	IMP 2 (Explorer 21)	USA	666 ×	94 526 ×	33	1965 Oct 13	P/F*	-
1964 Oct 10	Explorer 22	USA	886 ×	1079 ×	79	1969 Apr 17	ION*	-
1964 Oct 24	Kosmos-49	USSR	259 ×	460 ×	48	1965 Aug 21	F*	Magnetic field study
1964 Nov 5	Mariner 3	USA	Solar orbit			1964 Nov 6	PL	Mars probe, failed
1964 Nov 6	Explorer 23	USA	464 ×	978 ×	51	1983 Jun 29	MM*	-
1964 Nov 18	OPS 3360	USA	174 ×	326 ×	70	1964 Dec 6	ION	-
1964 Nov 18	ORBIS	USA	174 ×	326 ×	70	1964 Dec 6?	ION	-
1964 Nov 21	Explorer 24	USA	542 ×	2480 ×	81	1968 Oct 18	ATM*	-
1964 Nov 21	Explorer 25	USA	528 ×	2492 ×	81	1966 Jul	P*	-
1964 Nov 28	Mariner 4	USA	Solar orbit			1967 Dec 20	PL	Mars flyby
1964 Nov 30	Zond-2	USSR	Solar orbit			1965 May 5	PL	Mars probe, failed
1964 Dec 9	Kosmos-51	USSR	259 ×	530 ×	48	1965 Nov 14	UVA*	UV background
1964 Dec 13	Transit VE-5	USA	1027 ×	1084 ×	89	1965 Jun 30	UVA/F*	UV background
1964 Dec 15	San Marco 1	Italy	198 ×	782 ×	37	1965 Sep 11	ATM/ION*	Air density/ ionosphere

1964 Dec 21	Explorer 26	USA	310 X	26 202 X	20	1967 May 21	P/F*	-
1965 Jan 30	Kosmos-53	USSR	221 X	1143 X	48	1966 Aug 12	P*	-
1965 Feb 3	OSO 2	USA	549 X	628 X	32	1989 Aug 9	SOL/GR*	-
1965 Feb 16	Pegasus 1	USA	500 X	731 X	31	1978 Sep 17	MM*	-
1965 Feb 17	Ranger 8	USA	Lunar impact			1965 Feb 20	PL	Lunar impact probe
1965 Feb 25	OPS 4782	USA	176 X	350 X	75	1965 Mar 18	A/P	-
1965 Mar 9	EGRS 3	USA	907 X	939 X	70	1960s?	GEO	-
1965 Mar 9	SR 7B	USA	909 X	938 X	70	1969 Jul	SX*	-
1965 Mar 11	EGRS 2	USA	282 X	967 X	89	1968 Feb 26	GEO	-
1965 Mar 12	Kosmos-60	USSR	194 X	247 X	64	1965 Mar 17	PL	Lunar lander, failed
1965 Mar 12	ALS	USSR	194 X	247 X	64	1965 Mar 19	PL	Lunar probe, failed
1965 Mar 18	Voskhod-2	USSR	167 X	472 X	64	1965 Mar 19	BIO	-
1965 Mar 21	Ranger 9	USA	Lunar impact			1965 Mar 24	PL	Lunar impact probe
1965 Mar 23	Gemini III	USA	161 X	225 X	32	1965 Mar 23	BIO	-
1965 Mar 23	EGRS 4	USA	1265 X	1320 X	90	1965 Apr 3	GEO	-
1965 Apr 3	Kosmos-65	USSR	205 X	317 X	65	1965 Apr 25	ATM	-
1965 Apr 17	Explorer 27	USA	936 X	1316 X	41	1973 Jul 20	ION*	-
1965 Apr 29	Explorer 27	USA	Lunar impact			1965 May 12	PL	Lunar lander, failed
1965 May 9	Luna-5	USSR	Lunar impact			1965 May 12	PL	Lunar landing capsule
1965 May 9	ALS	USSR	Lunar impact			1965 May 12	PL	Lunar landing capsule
1965 May 25	Pegasus 2	USA	508 X	737 X	31	1979 Nov 3	MM*	-
1965 May 29	IMP 3 (Explorer 28)	USA	195 X	264 252 X	33	1968 Jul 5	P/F*	-
1965 Jun 3	Gemini IV	USA	165 X	289 X	32	1965 Jun 7	ATM/BIO/P	-
1965 Jun 8	Luna-6	USSR	Solar orbit			1965 Jun 11?	PL	Lunar lander, failed
1965 Jun 8	ALS	USSR	Solar orbit			1965 Jun 11?	PL	Lunar probe, failed
1965 Jul 2	Kosmos-70	USSR	225 X	1113 X	48	1966 Dec 18	P*	-
1965 Jul 16	Proton	USSR	177 X	523 X	63	1965 Oct 11	P*	Cosmic ray studies
1965 Jul 18	Zond-3	USSR	Solar orbit			1966 Dec	PL	Lunar flyby
1965 Jul 20	ERS 17	USA	566 X	111 790 X	36	1968 Jul 1	GRA,P*	-
1965 Jul 30	Pegasus 3	USA	516 X	536 X	28	1969 Aug 4	MM*	-
1965 Aug 10	Secor 5	USA	1136 X	2424 X	69	1960s?	GEO	-
1965 Aug 21	Gemini V	USA	170 X	330 X	32	1965 Aug 29	ATM, BIO	Long duration spaceflight
1965 Oct 4	Luna-7	USSR	Lunar impact			1965 Oct 7	PL	Lunar lander, failed
1965 Oct 4	ALS	USSR	Lunar impact			1965 Oct 7	PL	Lunar probe, failed
1965 Oct 5	OV1-2	USA	413 X	3453 X	144	1967 Apr	P/F*	-
1965 Oct 14	OGO 2	USA	418 X	1509 X	87	1981 Sep 17	P/F/SX/RFA*	Polar geophysics lab
1965 Oct 16	Kosmos-92	USSR	201 X	334 X	65	1965 Oct 24	BIO/ATM	-
1965 Oct 28	Kosmos-94	USSR	205 X	271 X	65	1965 Nov 5	BIO	-
1965 Oct 28	OPS 2155	USA	173 X	432 X	74	1965 Nov 17	A/P	Aurora-1965
1965 Nov 2	Proton-2	USSR	151 X	277 X	63	1966 Feb 6	P*	Cosmic ray studies
1965 Nov 6	Explorer 29	USA	1117 X	2273 X	59	1967 Dec 17	GEO	-
1965 Nov 12	Venera-2	USSR	Solar orbit			1965 Dec?	PL	Venus flyby
1965 Nov 16	Venera-3	USSR	Venus impact			1966 Jan?	PL	Venus impact
1965 Nov 16	Spuskaemiy apparat	USSR	Venus entry			1966 Jan?	PL	Venus lander capsule

Launch	Name	State	Peri X	Apo (km) X	Inc.	Operated until	Pri Mission Discipline	Comments
1965 Nov 19	SR 8 (Explorer 30)	USA	693 X	898 X	59	1967 Nov 20	SX*	—
1965 Nov 23	Kosmos-96	USSR	209 X	262 X	51	1965 Dec 9	PL	Venus probe, failed
1965 Nov 29	Alouette 2	Canada	502 X	2986 X	79	1975 Nov 29	ION/RFA*	—
1965 Nov 29	Explorer 31	USA	505 X	2983 X	79	1969 Jun 9	P	—
1965 Dec 3	Luna-8	USSR	Lunar impact			1965 Dec 6	DRV	Lunar lander, failed
1965 Dec 4	Gemini VII	USA	299 X	303 X	28	1965 Dec 18	BIO/P/F	—
1965 Dec 6	FR-1	France	746 X	759 X	75	1966 Dec 31?	P/F*	Ionospheric VLF
1965 Dec 15	Gemini VI-A	USA	270 X	274 X	28	1965 Dec 16	ATM	—
1965 Dec 16	Pioneer 6	USA	Solar orbit			Active	PL*	Solar wind monitor
1965 Dec 21	OV2-3	USA	283 X	34 649 X	26	1975 Aug 17	P/F*	—
1966 Jan 31	Luna-9	USSR	Lunar impact			1966 Feb 3	PL	Lunar probe
1966 Jan 31	ALS Luna-9	USSR	Lunar landing			1966 Feb 3	PL	Lunar lander capsule
1966 Feb 11	Kosmos-108	USSR	190 X	344 X	48	1966 Nov 21	ATM/P*	—
1966 Feb 17	Diapason D-1A	France	502 X	2735 X	34	1967?	GEO	—
1966 Feb 19	Kosmos-109	USSR	204 X	288 X	64	1966 Feb 27	BIO	—
1966 Feb 22	Kosmos-110	USSR	192 X	879 X	51	1966 Mar 16	BIO	Long duration dog flight
1966 Mar 1	Kosmos-111	USSR	182 X	194 X	51	1966 Mar 3	PL	Lunar orbiter, failed
1966 Mar 16	Gemini VIII	USA	261 X	270 X	28	1966 Mar 17	BIO/ATM	—
1966 Mar 30	OV1-4	USA	888 X	1014 X	144	1966?	BIO	—
1966 Mar 31	Luna-10	USSR	Lunar orbit			1966 May 29	PL	Lunar orbiter
1966 Apr 8	AOO 1	USA	794 X	804 X	35	1966 Apr 10	UVA/GRA/XRA*	Multi-telescope package, failed
1966 Apr 22	OV3-1	USA	351 X	5736 X	82	1967 Feb	P*	—
1966 May 24	Kosmos-119	USSR	208 X	1202 X	48	1966 Nov 30	P/F*	VLF study, failed
1966 May 25	Explorer 32	USA	283 X	2718 X	64	1985 Feb 22	ATM*	—
1966 May 30	Surveyor 1	USA	Lunar landing			1966 Jun 2	PL	Lunar soft lander
1966 Jun 3	Gemini IX-A	USA	272 X	274 X	28	1966 Jun 6	MM/BIO	—
1966 Jun 7	OGO 3	USA	905 X	121 519 X	36	1981 Sep 15	P/F/RFA*	High altitude geophysics
1966 Jun 9	EGRS 6	USA	171 X	3479 X	90	1967 Jul?	GEO	—
1966 Jun 10	OV3-4	USA	644 X	4730 X	40	1960s?	P	Radiation dose study
1966 Jun 17	Kosmos-121	USSR	203 X	325 X	72	1966 Jun 25	Recon	Carried particle spectrometer
1966 Jun 24	Pageos	USA	3978 X	4496 X	87	1975 Jul 12	GEO	Balloon satellite for geodesy
1966 Jul 1	Explorer 33	USA	79 527 X	477 380 X	21	1971 May 31	P/F*	Intended for lunar orbit
1966 Jul 6	Proton-3	USSR	174 X	490 X	63	1966 Sep 16	P*	Cosmic rays
1966 Jul 18	Gemini X	USA	299 X	757 X	28	1966 Jul 21	P/BIO/MM	Docking and spacewalk test
1966 Jul 28	Kosmos-126	USSR	207 X	338 X	51	1966 Aug 6	Recon	Particle spectra

1966 Aug 4	OV3-3	USA	358 X	4479 X	81	1968?	P/F*	Energetic particle study
1966 Aug 10	Lunar Orbiter 1	USA	Lunar orbit			1966 Oct 29	PL	Lunar mapping
1966 Aug 17	Pioneer 7	USA	Solar orbit			Active	PL*	Solar wind monitor
1966 Aug 19	EGRS 7	USA	3675 X	3700 X	90	?	GEO	-
1966 Aug 24	Luna-11	USSR	Lunar orbit			1966 Sep?	PL	Lunar orbiter
1966 Sep 12	Gemini XI	USA	298 X	1368 X	28	1966 Sep 15	UVA/BIO/ATM	-
1966 Sep 20	Surveyor 2	USA	Lunar impact			1966 Sep 23	PL	Lunar lander, failed
1966 Oct 5	EGRS 8	USA	3682 X	3704 X	90	1960s?	GEO	-
1966 Oct 22	Luna-12	USSR	Lunar orbit			1967 Jan 19	PL	Lunar orbiter
1966 Oct 28	OV3-2	USA	316 X	1589 X	81	1967?	P*	Magnetosphere
1966 Nov 3	OV4-3	USA	277 X	280 X	32	1967 Jan 9	BIO/ION/MM	Space station mockup
1966 Nov 3	OV4-1R	USA	272 X	272 X	32	1967 Jan 5	P	-
1966 Nov 3	OV4-1T	USA	276 X	300 X	32	1967 Jan 11	P	-
1966 Nov 6	Lunar Orbiter 2	USA	Lunar orbit			1967 Oct 11	PL	Lunar mapper
1966 Nov 11	Gemini XII	USA	252 X	291 X	28	1966 Nov 15	BIO/MM/ F/UVA	Docking, spacewalk tests
1966 Dec 7	ATS 1	USA	35780 X	35791 X	0	1985 Apr	P/ATM	Geostationary environment
1966 Dec 11	OV1-9	USA	635 X	769 X	93	1967?	P	Radiation dose
1966 Dec 11	OV1-10	USA	634 X	761 X	93	1967 Jun	P/SX*	-
1966 Dec 12	Kosmos-135	USSR	251 X	604 X	48	1967 Apr 12	MM*	-
1966 Dec 14	Biosatellite 1	USA	281 X	299 X	33	1967 Jan 10	-	-
1966 Dec 14	Biosatellite 1 Capsule	USA	272 X	286 X	33	1967 Feb 15	BIO	-
1966 Dec 21	Luna-13 ALS	USSR	Lunar landing			1966 Dec 24	PL	Lunar lander capsule
1966 Dec 21	Kosmos-137	USSR	221 X	1623 X	48	1967 Nov 23	P*	-
1966 Dec 21	Luna-13	USSR	Lunar impact			1966 Dec 24	PL	Lunar lander probe
1967 Feb 5	Lunar Orbiter 3	USA	Lunar orbit			1967 Oct 9	PL	Lunar mapper
1967 Feb 8	Diademe D-1C	France	569 X	1351 X	39	1968?	GEO	-
1967 Feb 14	Kosmos-142	USSR	206 X	1186 X	48	1967 Jul 6	F/RFA*	Ionospheric VLF
1967 Feb 15	Diademe D-1D	France	590 X	1882 X	39	1967 Apr 5	GEO	-
1967 Mar 8	OSO 3	USA	537 X	565 X	32	1982 Apr 4	SOL/GRA*	-
1967 Mar 21	Kosmos-149	USSR	230 X	264 X	48	1967 Apr 7	ATM*	-
1967 Apr 6	ATS 2	USA	186 X	10767 X	28	1969 Sep 2	RFA	Carried radio experiment
1967 Apr 17	Surveyor 3	USA	Lunar landing			1967 Apr 20	PL	Lunar lander
1967 Apr 26	San Marco 2	Italy	210 X	683 X	2	1967 Oct 14	ATM/ION*	Air density/ ionosphere
1967 Apr 28	ERS 18	USA	8990 X	110839 X	33	1960s?	GRA*	Gamma ray background
1967 Apr 28	ERS 27	USA	9111 X	110599 X	34	1960s?	P/SX*	Solar flares
1967 May 4	Lunar Orbiter 4	USA	Lunar orbit			1967 Oct 6	PL	Lunar mapper

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1967 May 5	Ariel 3	UK	496 ×	600 ×	80	1970 Dec 14	REFA/ATM*	—
1967 May 16	Kosmos-159	USSR	671 ×	60 294 ×	51	1977 Nov 11	PL	Lunar test launch
1967 May 24	IMP 4 (Explorer 34)	USA	242 ×	214 382 ×	67	1969 May 4	P/F*	Magnetosphere
1967 Jun 5	Kosmos-163	USSR	251 ×	549 ×	48	1967 Oct 11	MM*	—
1967 Jun 12	Venera-4	USSR	Venus impact			1967 Oct 18	PL	Venus entry
1967 Jun 12	Spuskaemiy apparat Veneri-4	USSR	Venus entry			1967 Oct 18	PL	Venus lander capsule
1967 Jun 14	Mariner 5	USA	Solar orbit			1968 Nov 5	PL	Venus flyby
1967 Jun 16	Kosmos-166	USSR	277 ×	534 ×	48	1967 Oct 25	SOL*	Solar UV/X
1967 Jun 17	Spuskaemiy apparat	USSR	187 ×	262 ×	51	1967 Jun 25	PL	Venus entry capsule
1967 Jun 17	Kosmos-167	USSR	187 ×	262 ×	51	1967 Jun 25	PL	Venus probe, failed
1967 Jun 29	EGRS 9	USA	3797 ×	3946 ×	89	1970s?	GEO	—
1967 Jun 29	Aurora 1	USA	3797 ×	3946 ×	89	1960s?	A/P*	—
1967 Jul 14	Surveyor 4	USA	Lunar impact			1967 Jul 17	PL	Lunar lander
1967 Jul 19	Explorer 35	USA	Inclined LEO			1973 Jun 24	P/F*	Lunar orbit environment
1967 Jul 27	OV1-86	USA	475 ×	603 ×	101	1972 Feb 22	ATM	—
1967 Jul 27	OV1-12	USA	538 ×	555 ×	101	1980 Jul 22	P*	—
1967 Jul 28	OGO 4	USA	411 ×	896 ×	86	1972 Aug 16	P/F/RFA/SX*	—
1967 Aug 1	Lunar Orbiter 5	USA	Lunar orbit			1968 Jan 31	PL	Lunar mapper
1967 Aug 7	OPS 4827	USA	187 ×	343 ×	79	1967 Sep 1	SX/ATM	Background radiation
1967 Sep 7	Biosatellite 2	USA	289 ×	313 ×	33	1967 Oct 4	BIO	—
1967 Sep 8	Surveyor 5	USA	Lunar landing			1967 Sep 11	PL	Lunar lander
1967 Oct 18	OSO 4	USA	539 ×	572 ×	32	1982 Jun 15	SOL*	Solar observatory
1967 Nov 7	Surveyor 6	USA	Lunar landing			1967 Nov 10	PL	Lunar lander
1967 Nov 29	WRESAT	Australia	173 ×	1119 ×	83	1968 Jan 10	ATM/F*	Upper atmosphere study
1967 Dec 5	OV3-6	USA	403 ×	434 ×	90	1969 Mar 9	ATM*	Atmospheric composition
1967 Dec 13	Pioneer 8	USA	Solar orbit			Active	P/F*	Solar wind monitor
1967 Dec 19	Kosmos-196	USSR	220 ×	810 ×	48	1968 Jul 7	ATM/P*	—
1968 Jan 7	Surveyor 7	USA	Lunar landing			1968 Jan 10	PL	Lunar lander
1968 Jan 11	Geos 2 (Explorer 36)	USA	1084 ×	1573 ×	105	1973 Mar 27	GEO	—
1968 Feb 20	Kosmos-203	USSR	1185 ×	1201 ×	74	1968?	GEO	—
1968 Mar 4	OGO 5	USA	5075 ×	141 939 ×	41	1972 Jul 14	P/F*	—
1968 Mar 5	SR 9 (Explorer 37)	USA	509 ×	882 ×	59	1990 Nov 16	SOL*	—
1968 Mar 21	Kapsula Kosmosa-208	USSR	195 ×	263 ×	64	1968 Mar 29	GRA	—
1968 Apr 6	OV1-13	USA	553 ×	9316 ×	99	1968 Jul 11	P*	—
1968 Apr 6	OV1-14	USA	554 ×	9938 ×	99	1968 Apr 13	P/F*	—
1968 Apr 7	Luna-14	USSR	Lunar orbit			1968 Jun 24	PL	Lunar orbiter
1968 Apr 15	Kosmos-213	USSR	193 ×	253 ×	51	1968 Apr 20	P/MM/ATM	—

1968 Apr 18	Kosmos-215	USSR	248 X	350 X	48	1968 Jun 30	UVA/XRA*	-
1968 Apr 26	Kosmos-219	USSR	214 X	1647 X	48	1969 Mar 2	P/F*	-
1968 May 17	ESRO 2B	I/ESRO	329 X	1075 X	97	1971 May 8	SX/P*	-
1968 Jun 4	Kosmos-224	USSR	200 X	254 X	51	1968 Jun 12	ATM	-
1968 Jun 11	Kosmos-225	USSR	250 X	492 X	48	1968 Nov 2	P*	Cosmic rays, SAA
1968 Jun 21	Kapsula Kosmosa-228	USSR	194 X	213 X	51	1968 Jul 1	P	-
1968 Jul 4	RAE 1 (Explorer 38)	USA	5840 X	5862 X	120	1972 Dec 25	RFA*	Low frequency radio observatory
1968 Jul 5	Kosmos-230	USSR	278 X	518 X	48	1968 Nov 2	SOL*	Solar X/UV
1968 Jul 11	OV1-15	USA	147 X	1544 X	89	1968 Nov 6	ATM*	-
1968 Jul 11	LOADS	USA	142 X	530 X	89	1968 Aug 19	ATM	Dense sphere
1968 Aug 8	Explorer 39	USA	684 X	2514 X	80	1981 Jun 22	ATM*	Air density balloon
1968 Aug 8	Injun 5 (Explorer 40)	USA	679 X	2531 X	80	1970s?	P/F*	-
1968 Aug 27	Kosmos-237	USSR	197 X	321 X	65	1968 Sep 4	P	-
1968 Sep 14	Zond-5	USSR	200 X	385 000 X	51	1968 Sep 21	BIO/MM/PL	Circumlunar flight
1968 Sep 23	Kapsula Kosmosa-243	USSR	199 X	274 X	71	1968 Oct 2	ATM	Microwave radiometer
1968 Sep 26	OV2-5	USA	35 064 X	35 798 X	2	1968 Sep?	ION/P/F*	-
1968 Sep 26	ERS 28	USA	174 X	34 315 X	25	1971 Feb 15	P/F*	-
1968 Oct 3	Aurorae	I/ESRO	258 X	1490 X	93	1970 Jun 26	A/P*	-
1968 Oct 25	Soyuz-2	USSR	177 X	196 X	51	1968 Oct 28	P	-
1968 Oct 26	Soyuz-3	USSR	180 X	210 X	51	1968 Oct 30	ATM	-
1968 Nov 8	Pioneer 9	USA	Solar orbit			1983 May 18	P/F*	Solar wind monitor
1968 Nov 10	Zond-6	USSR	200 X	400 000 X	51	1968 Nov 17	BIO/MM/PL	Circumlunar flight
1968 Nov 16	Proton-4	USSR	249 X	447 X	51	1969 Jul 24	P*	Cosmic rays
1968 Nov 30	Kosmos-256	USSR	1173 X	1225 X	74	1969?	GEO	-
1968 Dec 5	HEOS 1	I/ESRO	12 244 X	210 550 X	52	1975 Oct 28	P/F*	Magnetosphere study
1968 Dec 7	OAQ 2	USA	768 X	778 X	35	1973 Feb 14	UVA*	Four 0.3 m telescopes
1968 Dec 14	Kosmos-259	USSR	212 X	1210 X	48	1969 May 5	P/F*	-
1968 Dec 19	Kosmos-261	USSR	201 X	611 X	71	1969 Feb 12	A/P*	Auroral particles at solar max
1968 Dec 26	Kosmos-262	USSR	255 X	748 X	48	1969 Jul 18	SOL*	Solar UV/X
1969 Jan 5	Venera-5	USSR	Venus impact			1969 May 16	PL	Venus lander
1969 Jan 5	SA	USSR	Venus entry			1969 May 16	PL	Venus lander capsule
1969 Jan 10	Venera-6	USSR	Venus impact			1969 May 17	PL	Venus lander
1969 Jan 10	SA	USSR	Venus entry			1969 May 17	PL	Venus lander capsule
1969 Jan 14	Soyuz-4	USSR	206 X	224 X	51	1969 Jan 17	P/ATM	-
1969 Jan 15	Soyuz-5	USSR	205 X	227 X	51	1969 Jan 18	P/ATM	-
1969 Jan 22	OSO 5	USA	539 X	563 X	32	1984 Apr 2	SOL*	Solar X/UV

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1969 Jan 23	Kosmos-264	USSR	206 ×	297 ×	69	1969 Feb 5	Recon	Pigback gamma ray detector
1969 Jan 30	Isis 1	Canada	575 ×	3525 ×	88	1984 Mar	ION/RFA/P*	Ionospheric studies
1969 Feb 25	Mariner 6	USA	Solar orbit			1970 Dec	PL	Mars flyby
1969 Mar 17	Kosmos-272	USSR	1179 ×	1210 ×	73	1969?	GEO	—
1969 Mar 18	OV1-17	USA	386 ×	443 ×	99	1970 Mar 5	P/F/SX*	Solar-terrestrial study
1969 Mar 18	OV1-18	USA	461 ×	579 ×	98	1972 Aug 28	P/F*	Ionosphere
1969 Mar 18	OV1-19	USA	467 ×	5776 ×	104	1970?	P/F*	Trapped radiation
1969 Mar 18	OV1-17A	USA	176 ×	360 ×	99	1969 Mar 24	ION*	Ionosphere
1969 Mar 27	Mariner 7	USA	Solar orbit			1970 May 25	PL	Mars flyby
1969 Apr 14	Secor 13	USA	1072 ×	1131 ×	99	1980s?	GEO	—
1969 Apr 23	Kosmos-280	USSR	206 ×	246 ×	51	1969 May 6	P	—
1969 May 23	ERS 29	USA	16995 ×	111 712 ×	33	1976 Aug	P/F*	VLF and particles
1969 May 23	ERS 26	USA	16977 ×	111 583 ×	33	1976 Aug	SX/P*	Solar flare particles
1969 Jun 5	OGO 6	USA	396 ×	1085 ×	82	1979 Oct 12	P/F/SOL*	Geophysics
1969 Jun 21	IMP 5 (Explorer 41)	USA	640 ×	176 219 ×	87	1972 Dec 23	P/F*	Solar wind
1969 Jun 29	Biosatellite 3	USA	352 ×	388 ×	33	1970 Jan 20	BIO	Monkey flight
1969 Jul 13	Luna-15 KT	USSR	Lunar impact			1969 Jul 21	PL	Lunar sample return, failed
1969 Jul 13	Luna-15 VA	USSR	Lunar impact			1969 Jul 21	PL	Lunar lander probe
1969 Jul 16	EASEP	USA	Lunar landing			1969 Aug 27	PL/P	Lunar science
1969 Aug 7	Zond-7	USSR	200 ×	400 000 ×	51	1969 Aug 14	BIO/P	Circumlunar flight
1969 Aug 9	OSO 6	USA	490 ×	556 ×	32	1981 Mar 7	SOL/XRA*	Solar observatory
1969 Aug 12	ATS 5	USA	35778 ×	35 791 ×	2	1984	Comms	Communications; particles
1969 Sep 23	Kosmos-300	USSR	175 ×	179 ×	51	1969 Sep 27	PL	Lunar sample return, failed
1969 Sep 23	VA	USSR	175 ×	179 ×	51	1969 Sep 27	PL	Lunar lander probe
1969 Oct 1	Boreas	I/ESRO	289 ×	378 ×	85	1969 Nov 23	A/P*	Auroral studies
1969 Oct 14	Interkosmos-1	USSR	250 ×	528 ×	48	1970 Jan 2	SOL*	Solar UV/X
1969 Oct 22	Kosmos-305	USSR	170 ×	210 ×	51	1969 Oct 24	PL	Lunar sample return, failed
1969 Oct 22	VA	USSR	170 ×	210 ×	51	1969 Oct 24	PL	Lunar return capsule
1969 Nov 8	Azur	Germany	388 ×	3142 ×	102	1970 Jun 29	A/P/F*	Aurora and radiation belts
1969 Nov 14	ALSEP	USA	Lunar landing			1977 Sep 30	PL	Lunar science
1969 Nov 24	Kosmos-312	USSR	1142 ×	1177 ×	74	1970?	GEO	—
1969 Dec 25	Interkosmos-2	USSR	200 ×	1078 ×	48	1970 Jun 7	ION/P*	Ionospheric research
1970 Jan 16	Kosmos-320	USSR	240 ×	298 ×	48	1970 Feb 10	ATM*	Atmospheric density
1970 Jan 20	Kosmos-321	USSR	259 ×	417 ×	70	1970 Mar 23	ION/F*	Ionosphere/fields

1970 Mar 4	OPS 0440	USA	180 X	252 X	88	1970 Mar 26	Recon	GEO	Doppler geodetic beacon
1970 Mar 10	Wika	France	313 X	1607 X	5	1978 Oct 5	P/F*	P/F*	Ionospheric study
1970 Apr 8	TOPO 1	USA	1085 X	1090 X	99	1970s?	GEO	GEO	—
1970 Apr 11	ALSEP	USA	Cislunar orbit			1970 Apr 17	PL	PL	Lunar science, failed UV background?
1970 Apr 24	Kosmos-335	USSR	247 X	391 X	48	1970 Jun 22	UVA*	UVA*	—
1970 May 20	OPS 4720	USA	171 X	232 X	83	1970 Jun 17	GEO	GEO	Long duration flight
1970 Jun 1	Soyuz-9	USSR	236 X	250 X	51	1970 Jun 19	ATM/BIO/P	A/P*	Aurora/ionosphere
1970 Jun 13	Kosmos-348	USSR	199 X	589 X	71	1970 Jul 25	P/F*	P/F*	Trapped radiation
1970 Aug 7	Interkosmos-3	USSR	201 X	1154 X	48	1970 Dec 6	ION*	ION*	Ionospheric sounding
1970 Aug 10	Kosmos-356	USSR	226 X	548 X	81	1970 Oct 2	PL	PL	Venus lander
1970 Aug 17	Venera-7	USSR	Venus entry			1970 Dec 15	PL	PL	Venus lander
1970 Aug 17	SA	USSR	Venus landing			1970 Dec 15	PL	PL	Venus lander capsule
1970 Aug 22	Kosmos-359	USSR	203 X	685 X	51	1970 Nov 6	DRV	DRV	Lunar sample return
1970 Sep 12	Luna-16 KT	USSR	Lunar landing			1970 Sep 20	PL	PL	Lunar probe
1970 Sep 12	Luna-16 VA	USSR	Cislunar orbit			1970 Sep 24	PL	PL	Radiation effects
1970 Oct 8	Kosmos-368	USSR	205 X	394 X	64	1970 Oct 14	BIO	BIO	Solar X/UV
1970 Oct 14	Interkosmos-4	USSR	254 X	561 X	48	1971 Jan 17	SOL*	SOL*	Lunar photos
1970 Oct 20	Zond-8	USSR	200 X	400000 X	51	1970 Oct 27	PL/P	PL/P	Frog experiment
1970 Nov 9	OFO	USA	287 X	506 X	37	1971 May 9	BIO	BIO	—
1970 Nov 9	RM	USA	289 X	475 X	37	1971 Feb 7	P/MM	P/MM	Lunar rover
1970 Nov 10	Luna-17	USSR	Lunar landing			1970 Nov 17	PL	PL	Lunar rover
1970 Nov 10	Lunokhod-1	USSR	Lunar landing			1970 Nov 17	PL	PL	Radiation study
1970 Nov 17	Kosmos-378	USSR	233 X	1697 X	74	1972 Aug 17	P*	P*	Geodetic beacon
1970 Nov 18	OPS 4992	USA	175 X	216 X	83	1970 Dec 11	GEO	GEO	Lunar lander test
1970 Nov 24	Kosmos-379	USSR	171 X	13948 X	51	1983 Sep 21	P	P	Ionosphere
1970 Dec 2	Kosmos-381	USSR	966 X	1012 X	74	1971 Jan?	ION*	ION*	—
1970 Dec 11	CEPE	USA	1423 X	1474 X	101	1970 Dec 11	P	P	X-ray sky survey
1970 Dec 12	Uhuru (Explorer 42)	USA	534 X	573 X	3	1979 Apr 5	XRA*	XRA*	—
1970 Dec 12	Peole	France	509 X	742 X	15	1980 Jun 16	GEO	GEO	Lunar science
1971 Jan 31	ALSEP	USA	Lunar landing			1977 Sep 30	PL	PL	Lunar lander test
1971 Feb 26	Kosmos-398	USSR	203 X	10870 X	51	1995 Dec 10	P	P	Test satellite
1971 Mar 3	Shi Jian	China	264 X	1799 X	69	1979 Jun 17	P/F*	P/F*	Magnetosphere/solar wind
1971 Mar 13	IMP 6 (Explorer 43)	USA	1569 X	203825 X	30	1974 Oct 2	P/F*	P/F*	—
1971 Mar 24	OPS 5300	USA	169 X	226 X	81	1971 Apr 12	GEO	GEO	Ionosphere
1971 Apr 1	Isis 2	Canada	1356 X	1428 X	88	1984 Mar	ION/P/ F/RFA*	ION/P/ F/RFA*	Geocorona
1971 Apr 15	Tourmesol	France	457 X	696 X	46	1980 Jan 28	UVA*	UVA*	Space station
1971 Apr 19	Salyut	USSR	223 X	234 X	51	1971 Oct 11	GRA/ UVA/BIO	GRA/ UVA/BIO	—
1971 Apr 22	Soyuz-10	USSR	204 X	232 X	51	1971 Apr 24	BIO	BIO	Air density
1971 Apr 24	San Marco 3	Italy	224 X	678 X	3	1971 Nov 29	ATM*	ATM*	—
1971 Apr 28	Kosmos-409	USSR	1176 X	1213 X	74	1972?	GEO	GEO	—

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1971 May 6	Kapsula Kosmos-410	USSR	195 ×	257 ×	64	1971 May 17	P	—
1971 May 10	Kosmos-419	USSR	126 ×	191 ×	51	1971 May 12	PL	Mars probe, failed
1971 May 19	Mars-2	USSR	Mars orbit			1972 Aug 22	PL	Mars orbiter
1971 May 19	SA	USSR	Mars impact			1971 Nov 27	PL	Mars lander capsule
1971 May 28	Mars-3	USSR	Mars orbit			1972 Aug?	PL	Mars orbiter
1971 May 28	SA	USSR	Mars landing			1971 Dec 2	PL	Mars lander capsule
1971 May 30	Mariner 9	USA	Mars orbit			1972 Oct 27	PL	Mars orbiter
1971 Jun 4	Kosmos-426	USSR	388 ×	1994 ×	74	1972 Jan 12	P*	Radiation studies
1971 Jun 6	Soyuz-11	USSR	250 ×	258 ×	51	1971 Jun 29	BIO	—
1971 Jun 8	P70-1	USA	542 ×	579 ×	90	1982 Jan 31	IRA	Military IR background survey
1971 Jun 24	Kapsula Kosmos-428	USSR	199 ×	239 ×	51	1971 Jul 5	XRA	Hard X-ray bursts
1971 Jul 8	Solrad 10 (Explorer 44)	USA	435 ×	631 ×	51	1979 Dec 15	SOL*	Solar flux
1971 Jul 26	Endeavour	USA	Lunar orbit			1971 Aug 7	Spaceship PL	Lunar remote sensing
1971 Jul 26	Apollo 15 Subsatellite	USA	Lunar orbit			1973 Aug 23	P/F	Lunar satellite
1971 Jul 26	ALSEP	USA	Lunar landing			1977 Sep 30	PL	Lunar science
1971 Aug 7	LOADS 2	USA	127 ×	1762 ×	92	1972 Jan 31	ATM	Air density
1971 Aug 7	RTDS	USA	131 ×	811 ×	87	1971 Sep 19	ATM	Air density
1971 Aug 7	OV1-21	USA	787 ×	915 ×	87	1971?	ATM/F*	Atm. composition and density
1971 Aug 7	AVL-802	USA	788 ×	916 ×	87	1971 Aug 7	ATM	—
1971 Aug 7	Grid Sphere 7-1	USA	778 ×	913 ×	87	1979 Mar 18	ATM	—
1971 Aug 7	AVL-802	USA	778 ×	915 ×	87	1979 Nov 2	ATM	—
1971 Aug 7	Grid Sphere 7-2	USA	778 ×	915 ×	87	1979 Nov 2	ATM	—
1971 Aug 7	Rigid Sphere	USA	784 ×	916 ×	87	1981 Sep 1	ATM	—
1971 Aug 7	AVL-802	USA	784 ×	916 ×	87	1981 Sep 1	ATM	—
1971 Aug 12	Mylar Sphere	USA	188 ×	11 777 ×	51	1981 Aug 23	Spaceship P	Lunar sample return,
1971 Sep 2	Kosmos-434	USSR	Lunar impact			1971 Sep 11	PL	failed
1971 Sep 2	Luna-18 KT	USSR	Lunar impact			1971 Sep 11	PL	Lunar probe
1971 Sep 2	Luna-18 VA	USSR	Cislunar orbit			1971 Sep 11	PL	—
1971 Sep 10	OPS 5454	USA	146 ×	225 ×	74	1971 Oct 5	GEO	—
1971 Sep 28	Shinsei	Japan	869 ×	1867 ×	32	1972 Jan?	P/RFA*	Particles and solar radio bursts

1971 Sep 28	Luna-19	USSR	Lunar orbit	569 X	33	1972 Oct 20	PL	Lunar orbiter
1971 Sep 29	OSO 7	USA	324 X			1974 Jul 9	SOL/XRA*	Solar physics and X-ray survey
1971 Oct 7	Kapsula Kosmosa-443	USSR	198 X	288 X	65	1971 Oct 19	P	Electron flux
1971 Oct 17	P71-2	USA	772 X	800 X	92	1974?	IRA?	Military IR mapping?
1971 Oct 28	Prospero	UK	545 X	1580 X	82	1989	MM*	Only satellite launched by UK
1971 Nov 15	SSS 1 (Explorer 45)	USA	234 X	26780 X	3	1992 Jan 10	P/F*	Magnetosphere
1971 Nov 20	Kosmos-457	USSR	1183 X	1220 X	74	1972?	GEO	—
1971 Dec 2	Interkosmos-5	USSR	198 X	1044 X	48	1972 Apr 7	P/F*	Magnetosphere
1971 Dec 2	Kosmos-461	USSR	486 X	508 X	69	1979 Feb 21	GRA*	Gamma ray bursts?
1971 Dec 11	Ariel 4	UK	473 X	590 X	82	1978 Dec 12	P/F/ATM*	Ionosphere
1971 Dec 27	Aureole 1	USSR	399 X	2474 X	73	1972 Sep 1	A/P*	Auroral particles
1972 Jan 31	HEOS 2	I/ESRO	994 X	239 335 X	90	1974 Aug 2	P/F/MM*	Magnetosphere
1972 Feb 14	Luna-20 VA	USSR	Cislunar orbit			1972 Feb 25	PL	Lunar sample return
1972 Feb 14	Luna-20 KT	USSR	Lunar landing			1972 Feb 21	PL	Lunar lander
1972 Mar 3	Pioneer 10	USA	Solar escape orbit			Active	Jupiter flyby	
1972 Mar 4	Kapsula Kosmosa-477	USSR	197 X	291 X	72	1972 Mar 14	P	Electron flux
1972 Mar 12	TD-1A	I/ESRO	525 X	544 X	97	1980 Jan 9	UVA*	UV telescope
1972 Mar 25	Kosmos-480	USSR	1173 X	1201 X	82	1973?	GEO	—
1972 Mar 27	Venera-8	USSR	Venus entry			1972 Jul 22	PL	Venus lander
1972 Mar 27	SA	USSR	Venus landing			1972 Jul 22	PL	Venus probe
1972 Mar 31	Kosmos-482	USSR	205 X	9732 X	52	1981 May 5	PL	Venus lander
1972 Apr 6	Kapsula Kosmosa-484	USSR	168 X	177 X	81	1972 Apr 18	A/P	Auroral particles
1972 Apr 7	Interkosmos-6	USSR	202 X	244 X	51	1972 Apr 11	P*	Cosmic rays
1972 Apr 14	Prognoz	USSR	468 X	200 002 X	64	1981 Mar 31	P/F/SX*	Magnetosphere
1972 Apr 16	Casper	USA	Lunar orbit			1972 Apr 27	BIO/UVA/PL	Lunar remote sensing
1972 Apr 16	Apollo 16 Subsatellite	USA	Lunar impact			1972 May 29	P/F	Lunar particles and fields
1972 Apr 16	ALSEP	USA	Lunar landing			1977 Sep 30	PL	Lunar science
1972 Apr 19	OPS 5640	USA	156 X	247 X	81	1972 May 12	ATM	Atmospheric density
1972 May 17	Kapsula Kosmosa-490	USSR	209 X	258 X	65	1972 May 27	P	Trapped and cosmic ray electrons
1972 May 25	OPS 6371	USA	157 X	315 X	96	1972 Jun 4	ATM	Atmospheric density
1972 Jun 29	Prognoz-2	USSR	222 X	447 X	64	1982 Dec 15	P/F/SX*	Magnetosphere
1972 Jun 30	Interkosmos-7	USSR	255 X	508 X	48	1972 Oct 5	SOL*	Solar UV/X
1972 Jul 13	Kosmos-502	USSR	200 X	263 X	65	1972 Jul 25	MM	—

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1972 Aug 13	Explorer 46	USA	494 ×	810 ×	37	1979 Nov 2	MM*	—
1972 Aug 19	Denpa	Japan	236 ×	6273 ×	31	1980 May 19	P/F*	Ionosphere/magnetosphere 0.8-meter UV telescope
1972 Aug 21	OAO-3 Copernicus	USA	735 ×	747 ×	35	1981 Feb 15	UVA*	—
1972 Sep 15	Kapsula Kosmosa-518	USSR	196 ×	271 ×	72	1972 Sep 23	P?	—
1972 Sep 23	IMP 7 (Explorer 47)	USA	201100 ×	235600 ×	17	1978 Oct 31	P/F/RFA*	Magnetosphere
1972 Oct 2	P72-1	USA	728 ×	749 ×	98	1973 May	GRA*	Gamma ray background
1972 Oct 18	Kapsula Kosmosa-525	USSR	191 ×	258 ×	65	1972 Oct 26	P?	—
1972 Nov 15	SAS 2 (Explorer 48)	USA	444 ×	632 ×	1	1980 Aug 20	GRA*	Gamma ray telescope
1972 Nov 22	ESRO 4	IESRO	240 ×	1124 ×	91	1974 Apr 15	A/P*	Ionosphere/aurora
1972 Nov 30	Interkosmos-8	USSR	197 ×	564 ×	71	1973 Mar 2	ION/P*	Ionosphere beacon
1972 Dec 7	America	USA	Lunar orbit			1972 Dec 19	BIO/UVA/PL	Lunar remote sensing
1972 Dec 7	ALSEP	USA	Lunar landing			1977 Sep 30	PL	Lunar science
1972 Dec 16	Aeros 1	Germany	216 ×	830 ×	96	1973 Aug 22	ATM/P*	—
1972 Dec 21	Kosmos-539	USSR	1342 ×	1381 ×	74	1974?	GEO	—
1973 Jan 8	Luna-21	USSR	Lunar landing			1973 Jan 15	PL	Lunar lander
1973 Jan 8	Lunokhod-2	USSR	Lunar landing			1973 Jan 16	PL	Lunar rover
1973 Feb 15	Prognoz-3	USSR	895 ×	199442 ×	65	1976 Dec 31	SX/P*	Solar-terrestrial study
1973 Apr 6	Pioneer 11	USA	Solar escape orbit			1995 Nov	PL	Jupiter/Saturn flybys
1973 Apr 19	Interkosmos-9	USSR	193 ×	1343 ×	48	1973 Oct 15	P/RFA*	Solar radio bursts
1973 Apr 25	Kapsula Kosmosa-555	USSR	192 ×	204 ×	81	1973 May 4	P	—
1973 May 11	Kosmos-557	USSR	208 ×	237 ×	51	1973 May 22	P	Space station
1973 May 14	Skylab Orbital Workshop	USA	421 ×	444 ×	50	1979 Jul 11	SOL/ATM/BIO	Space station
1973 May 25	Skylab SL-2	USA	425 ×	440 ×	50	1973 Jun 22	BIO	Station ferry
1973 Jun 10	RAE 2 (Explorer 49)	USA	Lunar orbit			1977 Apr 30	RFA*	LF radio astronomy
1973 Jul 21	Mars-4	USSR	Solar orbit			1974 Feb?	PL	Mars orbiter, failed
1973 Jul 25	Mars-5	USSR	Mars orbit			1974 Mar 1	PL	Mars orbiter
1973 Jul 28	Skylab SL-3	USA	425 ×	439 ×	50	1973 Sep 25	BIO	Station ferry
1973 Aug 5	Mars-6	USSR	Solar orbit			1974 Mar 12	PL	Mars lander, crashed
1973 Aug 5	SA Marsa-6	USSR	Mars impact			1974 Mar 12	PL	Mars lander capsule

1973 Aug 9	Mars-7	USSR	Solar orbit					1974 Mar 9	PL	Mars lander, missed
1973 Aug 9	SA Marsa-7	USSR	Solar orbit					1974 Mar	PL	Mars lander capsule
1973 Sep 8	Kosmos-585	USSR	1374 X			74		1974?	GEO	
1973 Sep 27	Soyuz-12	USSR	329 X			51		1973 Sep 29	ATM	Station ferry test
1973 Oct 26	IMP 8 (Explorer 50)	USA	215 092 X			19		2001 Oct 26	P/F/RFA*	Magnetosphere/ solar wind
1973 Oct 30	Interkosmos-10	USSR	257 X			74		1977 Jul 1	P/F*	Ionosphere
1973 Oct 31	Kosmos-605	USSR	212 X			62		1973 Nov 22	BIO	
1973 Nov 3	Mariner 10	USA	Solar orbit					1975 Mar 24	PL	Venus/Mercury probe
1973 Nov 16	Skylab SL-4	USA	420 X			50		1974 Feb 8	UVA, BIO	Station ferry
1973 Nov 30	Kosmos-613	USSR	251 X			51		1974 Jan 29	BIO	Seeds exposure
1973 Dec 16	AE-C (Explorer 51)	USA	152 X			68		1978 Dec 12	ATM*	Atmospheric studies
1973 Dec 18	Soyuz-13	USSR	221 X			51		1973 Dec 26	UVA, BIO	Kohoutek observations
1973 Dec 26	Aureole 2	USSR	399 X			74		1974 Apr 30	A/P*	Auroral
1974 Feb 18	San Marco 4	Italy	236 X			2		1976 May 4	ATM*	Atmospheric composition/ density
1974 Apr 29	Kosmos-650	USSR	1368 X			74		1975?	GEO	
1974 May 17	Interkosmos-11	USSR	483 X			50		1979 Sep 6	SOL*	Solar UV and polarization
1974 May 29	Luna-22	USSR	Lunar orbit					1975 Nov	PL	Lunar orbiter
1974 Jun 3	Hawkeye 1 (Explorer 52)	USA	4431 X			88		1978 Apr 30	P/F*	Neutral field points
1974 Jun 24	Salyut-3	USSR	264 X			51		1975 Jan 24	BIO	Space station
1974 Jul 16	Aeros 2	Germany	218 X			97		1975 Sep 25	P/ATM*	Atmospheric studies
1974 Aug 29	Kosmos-675	USSR	1365 X			74		1975?	GEO	
1974 Aug 30	ANS	Netherlands	256 X			98		1977 Jun 14	UVA/XRA*	Dutch astronomical observatory
1974 Oct 15	Ariel 5	UK	506 X			2		1980 Mar 14	XRA*	British X-ray sky survey
1974 Oct 22	Kosmos-690	USSR	214 X			62		1974 Nov 12	BIO	
1974 Oct 28	Luna-23 KT	USSR	Lunar landing					1974 Nov	PL	Lunar lander
1974 Oct 28	Luna-23 VA	USSR	Cislunar orbit					1974 Nov 6	PL	Lunar sample return, failed
1974 Oct 29	S3-1	USA	149 X			96		1975 May 26	ATM/P/F*	Atmosphere/ ionosphere
1974 Oct 31	Interkosmos-12	USSR	240 X			74		1975 Jul 11	ION/MM/P*	Ionosphere
1974 Nov 15	Intasat	Spain	1442 X			101		1976 Oct 6	ION*	Ionosphere beacon
1974 Dec 10	Helios 1	Germany	Solar orbit					1980s?	P/F/MM*	Solar probe
1974 Dec 26	Salyut-4	USSR	336 X			51		1977 Feb 2	ATM/XRA/ SOL	Space station
1975 Jan 10	Soyuz-17	USSR	336 X			51		1975 Feb 9	BIO	Station ferry
1975 Feb 6	Starlette	France	804 X			49		1975 Feb 6	GEO	

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1975 Feb 12	Kosmos-708	USSR	1369 ×	1410 ×	69	1976?	GEO	—
1975 Feb 24	Taiyo	Japan	249 ×	3115 ×	31	1980 Jun 29	P/SOL*	Solar-terrestrial studies
1975 Mar 27	Interkosmos-13	USSR	285 ×	1679 ×	82	1980 Sep 2	P/F*	Polar ionosphere
1975 Apr 9	Geos 3	USA	821 ×	855 ×	114	1981 May	ALT/GEO*	—
1975 Apr 19	Aryabhata	India	568 ×	611 ×	50	1992 Feb 11	XRA/P*	First Indian satellite
1975 May 7	SAS 3 (Explorer 53)	USA	502 ×	509 ×	3	1979 Apr 9	XRA*	X-ray source location
1975 May 24	Soyuz-18	USSR	334 ×	348 ×	51	1975 Jul 26	BIO	Station ferry
1975 Jun 8	Venera-9	USSR	Venus orbit			1976 Jun 21	PL	Venus orbiter
1975 Jun 8	SA Veneri-9	USSR	Venus landing			1975 Oct 22	PL	Venus lander
1975 Jun 14	Venera-10	USSR	Venus orbit			1977 Mar 16	PL	Venus orbiter
1975 Jun 14	SA Veneri-10	USSR	Venus landing			1975 Oct 25	PL	Venus lander
1975 Jun 21	OSO 8	USA	540 ×	556 ×	32	1986 Jul 9	SOL/XRA*	Solar observatory
1975 Jul 15	Soyuz-19	USSR	217 ×	229 ×	51	1975 Jul 21	BIO	Docking with Apollo
1975 Jul 15	Apollo-Soyuz Test Project	USA	162 ×	224 ×	51	1975 Jul 24	BIO/ATM/UVA	Docking with Soyuz
1975 Aug 9	COS-B	I/ESA	2536 ×	96895 ×	92	1986 Jan 18	GRA*	Gamma-ray survey
1975 Aug 20	Viking Orbiter 1	USA	Mars orbit			1980 Aug 7	PL	Mars orbiter
1975 Aug 20	Mitch Memorial Station	USA	Mars landing			1976 Jul 20	PL	Mars lander
1975 Sep 9	Viking Orbiter 2	USA	Mars orbit			1978 Jul 24	PL	Mars orbiter
1975 Sep 9	Viking Lander 2	USA	Mars landing			1976 Sep 3	PL	Mars lander
1975 Sep 24	Kosmos-770	USSR	1165 ×	1207 ×	82	1976?	GEO	—
1975 Sep 27	Aura	France	501 ×	712 ×	37	1982 Sep 30	UVA*	UV astronomy
1975 Oct 6	AE-D (Explorer 54)	USA	135 ×	3569 ×	90	1976 Mar 12	ATM/P*	Atmospheric studies
1975 Nov 17	Soyuz-20	USSR	340 ×	346 ×	51	1976 Feb 16	BIO	—
1975 Nov 20	AE-E (Explorer 55)	USA	142 ×	2819 ×	19	1981 Jun 10	ATM*	—
1975 Nov 21	Kapsula Kosmosa-780	USSR	197 ×	268 ×	65	1975 Nov 30	P?	—
1975 Nov 25	Kosmos-782	USSR	216 ×	380 ×	62	1975 Dec 15	BIO	—
1975 Dec 4	S3-2	USA	233 ×	1544 ×	96	1978 May 1	P/F*	—
1975 Dec 11	Interkosmos-14	USSR	333 ×	1680 ×	73	1983 Feb 27	ION/P*	—
1975 Dec 22	Prognoz-4	USSR	231 ×	464 ×	65	1977 Dec 31	P/F*	—
1976 Jan 15	Helios 2	Germany	Solar orbit			1980 May 15	PL	Solar probe
1976 Feb 29	Ume	Japan	991 ×	1006 ×	69	1976 Apr 2	ION*	—
1976 Mar 15	SR 11A	USA	118383 ×	119180 ×	25	1977 Jun 12	SOL*	—
1976 Mar 15	SR 11B	USA	115720 ×	116645 ×	25	1979 Oct 31	SOL*	—
1976 May 4	Lageos	USA	5834 ×	5951 ×	109	1976 May 4	GEOD*	—
1976 Jul 8	S3-3	USA	232 ×	6038 ×	97	1986 Apr 24	P/F*	—
1976 Jul 21	Kosmos-842	USSR	966 ×	1007 ×	82	1978?	GEO	—

1976 Jul 27	Interkosmos-16	USSR	464 X	518 X	50	1979 Jul 10	SOL*	Solar photometer
1976 Aug 9	Luna-24 KT	USSR	Lunar landing			1976 Aug 18	PL	Lunar lander
1976 Aug 9	Luna-24 VA	USSR	Cislunar orbit			1976 Aug 23	PL	Lunar sample return
1976 Sep 22	Kapsula	USSR	199 X	290 X	65	1976 Oct 3	GRA	Gamma spectrometer
	Kosmosa-856							
1976 Nov 25	Prognoz-5	USSR	3869 X	195485 X	66	1979 Jul 12	P*	
1977 Mar 29	Kosmos-900	USSR	455 X	519 X	82	1979 Oct 11	A/P/F*	
1977 Apr 20	Geos 1	/ESA	2083 X	38294 X	26	1980 Jan?	P/F*	
1977 May 25	Kosmos-911	USSR	964 X	1001 X	82	1979?	GEO	
1977 May 31	Kapsula	USSR	200 X	291 X	65	1977 Jun 12	GRA	Gamma spectrometer
	Kosmosa-914							
1977 Jun 17	Signe 3	France	458 X	518 X	50	1979 Jun 20	GRA*	
1977 Aug 3	Kosmos-936	USSR	215 X	392 X	62	1977 Aug 22	BIO	
1977 Aug 12	HEAO 1	USA	428 X	449 X	22	1979 Mar 15	XRA*	X-ray survey
1977 Aug 20	Voyager 2	USA	Solar escape orbit			Active	PL	Outer planet probe
1977 Sep 5	Voyager 1	USA	Solar escape orbit			Active	PL	Outer planet probe
	Prognoz-6							
1977 Sep 22	Interkosmos-17	USSR	1850 X	196379 X	74	1978 Jan 26	UVA/GRB/P*	
1977 Sep 24	ISEE 1	USSR	465 X	509 X	82	1979 Nov 8	P*	
1977 Oct 22	ISEE 2	USA	764 X	137531 X	30	1987 Sep 26	P/F*	
1977 Oct 22	ISEE 2	/ESA	780 X	137511 X	30	1987 Sep 26	P/F*	
1977 Nov 24	Kosmos-963	USSR	1178 X	1207 X	82	1979?	GEO	
1977 Dec 10	Soyuz-26	USSR	333 X	352 X	51	1978 Jan 16	MG/BIO	
1978 Jan 20	Progress-1	USSR	324 X	344 X	51	1978 Feb 8	MG	
1978 Jan 26	IUE	USA	25687 X	45892 X	28	1996 Sep 30	UVA*	UV spectra
1978 Feb 4	Kyokko	Japan	642 X	3953 X	65	1979 Nov 9	A/P/F*	
1978 Feb 16	Ume-2	Japan	974 X	1220 X	69	1980s?	ION*	
1978 Mar 2	Soyuz-28	USSR	334 X	352 X	51	1978 Mar 10	BIO	
1978 Apr 26	HCOM	USA	610 X	633 X	97	1981 Dec 22	ATM*	
1978 May 20	Pioneer Venus Orbiter	USA	Venus orbit			1992 Oct 22	PL	Venus orbiter
	Seasat 1							
1978 Jun 27	Soyuz-30	USA	775 X	797 X	108	1978 Oct	ALT*	
1978 Jun 27	Kosmos-1026	USSR	255 X	305 X	51	1978 Jul 5	MG/BIO	
1978 Jul 2	Progress-2	USSR	206 X	244 X	51	1978 Jul 6	P*	Cosmic rays
1978 Jul 7	Geos 2	USSR	327 X	330 X	51	1978 Aug 4	MG/BIO	
1978 Jul 14	Progress-3	/ESA	35768 X	35801 X	0	1984 Jan 25	P/F*	Magnetosphere study
	Pioneer Venus Multiprobe							
1978 Aug 7	Sounder Probe	USSR	335 X	352 X	51	1978 Aug 23	BIO	
1978 Aug 8	North Probe	USA	Venus entry			1978 Dec 9	PL	Venus probe
1978 Aug 8	Day Probe	USA	Venus impact			1978 Dec 9	PL	
1978 Aug 8	Night Probe	USA	Venus impact			1978 Dec 9	PL	
1978 Aug 8	Night Probe	USA	Venus impact			1978 Dec 9	PL	

Launch	Name	State	Peri × Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1978 Aug 12	ISEE 3 (ICE)	USA	Earth-Sun L1		1997 May 5	P/F*	L1 and comet probe
1978 Sep 9	Venera-11	USSR	Solar orbit		1980 Feb	PL	Venus probe
1978 Sep 9	SA Veneri-11	USSR	Venus landing		1978 Dec 25	PL	Venus lander
1978 Sep 14	Venera-12	USSR	Solar orbit		1980 Apr	PL	Venus probe
1978 Sep 14	SA Veneri-12	USSR	Venus landing		1978 Dec 21	PL	Venus lander
1978 Sep 16	Jikiken	Japan	249 ×	31	1980s	P/F*	—
1978 Oct 4	Interkosmos-18	USSR	402 ×	82	1981 Mar 17	P/F*	—
1978 Oct 24	Magion	Czech SSR	758 ×	82	1981 Sep 11	P/F*	—
1978 Oct 24	CAMEO	USA	926 ×	99	1978 Nov 6	F*	Chemical release
1978 Oct 30	Prognoz-7	USSR	1127 ×	65	1980 Sep 22	P/F/UVA/ GRA* XRA*	— — First X-ray imaging observatory
1978 Nov 13	Einstein Observatory	USA	520 ×	23	1982 Mar 25	XRA*	—
1978 Dec 26	Kosmos-1067	USSR	1156 ×	82	1981?	GEO	—
1979 Jan 30	SCATHA	USA	27580 ×	7	1991 May 28	P/F*	—
1979 Feb 18	SAGE	USA	547 ×	54	1989 Apr 11	ATM*	—
1979 Feb 21	Hakucho	Japan	540 ×	29	1985 Apr 15	XRA*	—
1979 Feb 24	P78-1	USA	558 ×	97	1992 Jul 20	SOL*	Solar observatory
1979 Feb 25	Soyuz-32	USSR	279 ×	51	1979 Jun 13	BIO	—
1979 Feb 27	Interkosmos-19	USSR	474 ×	73	1980s?	ION*	—
1979 Mar 12	Progress-5	USSR	278 ×	51	1979 Apr 4	MG/GRA	—
1979 May 13	Progress-6	USSR	319 ×	51	1979 Jun 9	MG/BIO	—
1979 May 25	Kapsula	USSR	162 ×	81	1979 Jun 6	P?	—
1979 Jun 2	Ariel 6	UK	599 ×	55	1990 Sep 23	P/XRA*	—
1979 Jun 6	Soyuz-34	USSR	349 ×	51	1979 Aug 19	BIO	—
1979 Jun 12	Kapsula	USSR	197 ×	81	1979 Jun 24	XRA	—
1979 Jun 28	Kosmosa-1106	USSR	323 ×	51	1979 Jul 20	BIO	—
1979 Jun 28	Progress-7	USSR	359 ×	51	1979 Aug 15	RFA	10-m radio telescope
1979 Sep 20	KRT-10	USA	481 ×	43	1981 Dec 7	GRA*	—
1979 Oct 30	HEAO 3	USA	347 ×	96	1980 Jun 11	F*	—
1979 Nov 1	Magsat	USA	454 ×	74	1981 Mar 3	ATM*	—
1980 Feb 14	Solar Maximum Mission	USA	566 ×	28	1989 Dec 2	SOL*	Solar observatory
1980 May 26	Soyuz-36	USSR	327 ×	51	1980 Jul 31	MG/ATM	—
1980 Jun 29	Progress-10	USSR	321 ×	51	1980 Jul 19	BIO	—
1980 Jul 23	Soyuz-37	USSR	324 ×	51	1980 Oct 11	BIO/MG	—
1980 Sep 18	Soyuz-38	USSR	262 ×	51	1980 Sep 26	MG/BIO/ ATM	—
1980 Sep 28	Progress-11	USSR	303 ×	51	1980 Dec 11	F	VLF experiment
1980 Dec 25	Prognoz-8	USSR	978 ×	65	1984 Dec 28	P/F*	—

1981 Feb 6	Interkosmos-21	USSR	467 X	508 X	74	1982 Jul 7	Spaceship	ATM*	-
1981 Feb 21	Hinotori	Japan	571 X	636 X	31	1991 Jul 11	Spaceship	XRA*	-
1981 Mar 22	Soyuz-39	USSR	335 X	349 X	51	1981 Mar 30	Spaceship	BIO/ATM/P	-
1981 Aug 3	Dynamics	USA	558 X	23 300 X	89	1991 Feb 28	Spaceship	P/F*	-
1981 Aug 3	Explorer 1	USA	299 X	990 X	89	1983 Feb 19	Spaceship	P/F*	-
1981 Aug 3	Dynamics	USA	299 X	990 X	89	1983 Feb 19	Spaceship	P/F*	-
1981 Aug 7	Explorer 2	USA	299 X	990 X	89	1983 Feb 19	Spaceship	P/F*	-
1981 Aug 7	IK Bulgaria-1300	USSR	793 X	885 X	81	1980s?	Spaceship	ION*	-
1981 Sep 19	SJ-2A	China	240 X	1388 X	59	1981 Sep 26	Spaceship	P/F*	-
1981 Sep 19	SJ-2B	China	233 X	1527 X	59	1982 Oct 6	Spaceship	ATM*	-
1981 Sep 19	SJ-2	China	231 X	1503 X	59	1982 Aug 17	Spaceship	P/F*	-
1981 Sep 21	Aureole 3	USSR	398 X	1762 X	82	1980s?	Spaceship	A/P/F*	-
1981 Sep 30	Kosmos-1312	USSR	1492 X	1502 X	82	1983?	Spaceship	GEO	-
1981 Oct 6	Solar Mesosphere Explorer	USA	481 X	486 X	97	1986 Dec 15?	Spaceship	ATM*	Mesosphere study
1981 Oct 30	Venera-13	USSR	Solar orbit			1982?	Spaceship	PL	Venus probe
1981 Oct 30	SA Veneri-13	USSR	Venus landing			1982 Mar 1	Spaceship	PL	Venus lander
1981 Nov 4	Venera-14	USSR	Solar orbit			1982?	Spaceship	PL	Venus probe
1981 Nov 4	SA Veneri-14	USSR	Venus landing			1982 Mar 5	Spaceship	PL	Venus lander
1981 Nov 12	Columbia	USA	254 X	264 X	38	1981 Nov 14	Spaceship	ATM	-
1981 Nov 12	OSTA-1	USA	254 X	264 X	38	1981 Nov 14	Spaceship	ALT/ATM	SIR-A radar on Shuttle
1982 Mar 22	Columbia	USA	237 X	245 X	38	1982 Mar 30	Spaceship	BIO/MG	-
1982 Mar 22	OSS-1	USA	236 X	249 X	38	1982 Mar 30	Spaceship	ENV/P/SOL	Solar UV/X, plasma
1982 May 23	Progress-13	USSR	290 X	346 X	51	1982 Jun 6	Spaceship	MG/	-
1982 Jun 24	Soyuz T-6	USSR	282 X	305 X	51	1982 Jul 2	Spaceship	BIO/OA	-
1982 Jun 27	Columbia	USA	295 X	304 X	28	1982 Jul 4	Spaceship	MG/BIO/	-
1982 Jul 10	Progress-14	USSR	303 X	320 X	51	1982 Aug 13	Spaceship	XRA	-
1982 Sep 18	Progress-15	USSR	299 X	323 X	51	1982 Oct 16	Spaceship	BIO/MG	-
1982 Sep 24	Kosmos-1410	USSR	1493 X	1502 X	82	1984?	Spaceship	F	VLF experiment
1982 Oct 31	Progress-16	USSR	352 X	358 X	51	1982 Dec 14	Spaceship	F/ATM	-
1982 Nov 11	Columbia	USA	296 X	318 X	28	1982 Nov 16	Spaceship	GEO	-
1983 Jan 26	IRAS	USA	893 X	911 X	99	1983 Nov	Spaceship	MG	-
1983 Feb 20	Tenma	Japan	488 X	501 X	31	1988 Dec 17	Spaceship	BIO/MG/ENV	IR sky survey
1983 Mar 23	Astron	USSR	25 129 X	178 818 X	79	1988 Dec 17	Spaceship	IRA*	-
1983 Apr 4	Challenger	USA	279 X	289 X	28	1991 May 21	Spaceship	XRA*	-
1983 May 26	Exosat	I/ESA	584 X	191 510 X	72	1986 May 6	Spaceship	UVA*	-
1983 Jun 2	Venera-15	USSR	Venus orbit			1985 Mar	Spaceship	MG/BIO/ATM	-
1983 Jun 7	Venera-16	USSR	Venus orbit			1985 Mar	Spaceship	XRA*	Venus radar
1983 Jun 18	Challenger	USA	296 X	321 X	28	1983 Jun 24	Spaceship	PL	Venus radar
1983 Jun 18	SPAS 1	Germany	291 X	296 X	28	1983 Jun 22	Spaceship	PL	-
1983 Jun 18	OSTA-2	USA	296 X	321 X	28	1983 Jun 22	Spaceship	MG/BIO/UVA	-
1983 Jun 18	OSTA-2	USA	296 X	321 X	28	1983 Jun 22	Spaceship	MG	Materials experiments

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1983 Jul 1	Prognoz-9	USSR	380 ×	720 000 ×	65	1980s?	SMA/GRA*	Big Bang study
1983 Aug 30	Challenger	USA	298 ×	309 ×	28	1983 Sep 5	P/MG/BIO	—
1983 Oct 20	Progress-18	USSR	328 ×	344 ×	51	1983 Nov 16	F	VLF experiment
1983 Nov 24	Kosmos-1510	USSR	1480 ×	1524 ×	73	1985?	GEO	—
1983 Nov 28	Columbia	USA	241 ×	251 ×	57	1983 Dec 8	A/P	—
1983 Nov 28	Spacelab 1	I/ESA	242 ×	253 ×	57	1983 Dec 8	BIO/MG/ UVA/P	First Spacelab
1983 Nov 28	Spacelab 1 Pallet	I/ESA	242 ×	253 ×	57	1983 Dec 8	ATM/P/UVA	—
1983 Dec 14	Kosmos-1514	USSR	212 ×	258 ×	82	1983 Dec 19	BIO	—
1984 Feb 3	Challenger	USA	305 ×	322 ×	28	1984 Feb 11	MG/BIO/P	—
1984 Feb 3	SPAS 1A	Germany	306 ×	321 ×	28	1984 Feb 11	MG	—
1984 Feb 14	Ohzora	Japan	356 ×	858 ×	74	1989 Jul 19	P/ATM*	Stratosphere/ mesosphere
1984 Feb 21	Progress-19	USSR	303 ×	305 ×	51	1984 Apr 1	ATM	—
1984 Mar 10	Kosmos-1543	USSR	216 ×	391 ×	62	1984 Apr 5	P*	Cosmic rays
1984 Apr 6	Challenger	USA	477 ×	481 ×	28	1984 Apr 13	BIO	—
1984 Apr 6	LDEF	USA	476 ×	478 ×	28	1990 Jan 20	ENV*	Materials exposure
1984 Aug 8	Kosmos-1589	USSR	1492 ×	1503 ×	82	1980s?	GEO	—
1984 Aug 16	Charge Composition Explorer	USA	1108 ×	49 675 ×	4	1989 Jan	P/F*	Magnetosphere
1984 Aug 16	Ion Release Module	Germany	896 ×	113 396 ×	27	1987 Dec 8	P/F*	Chemical release
1984 Aug 16	UK Subsatellite	UK	1127 ×	113 291 ×	27	1988 Dec 8	P/F*	—
1984 Aug 30	Discovery	USA	296 ×	329 ×	28	1984 Sep 5	MG	—
1984 Oct 5	Challenger	USA	250 ×	261 ×	57	1984 Oct 13	MG/P	—
1984 Oct 5	ERBS	USA	596 ×	609 ×	57	Active	ATM*	—
1984 Oct 5	OSTA-3	USA	215 ×	228 ×	57	1984 Oct 13	ALT/ATM	Imaging radar
1984 Nov 8	Discovery	USA	306 ×	313 ×	28	1984 Nov 16	MG/P	—
1984 Dec 15	Vega-1	USSR	Solar orbit			1987	PL	Comet probe
1984 Dec 15	SA Vega-1	USSR	Venus landing			1985 Jun 10	PL	Venus lander
1984 Dec 15	AZ Vega-1	USSR	Venus entry			1985 Jun 10	PL	Venus balloon
1984 Dec 21	Vega-2	USSR	Solar orbit			1987	PL	Comet probe
1984 Dec 21	SA Vega-2	USSR	Venus landing			1985 Jun 14	PL	Venus lander
1984 Dec 21	AZ Vega-2	USSR	Venus entry			1985 Jun 14	PL	Venus balloon
1985 Jan 7	Sakigake	Japan	Solar orbit			1999 Jan 7	PL	Comet probe
1985 Jan 24	Discovery	USA	334 ×	375 ×	28	1985 Jan 27	BIO/P/ATM	—
1985 Mar 13	Geosat 1	USA	784 ×	788 ×	108	1990 Jan 5	ALT*	—
1985 Apr 12	Discovery	USA	314 ×	461 ×	28	1985 Apr 19	MG/BIO	—
1985 Apr 16	Kosmos-1645	USSR	214 ×	388 ×	62	1985 Apr 29	MG	—
1985 Apr 26	Prognoz-10-IK	USSR	5975 ×	194 737 ×	76	1994 Jan 12	P/F*	Magnetospheric study
1985 Apr 29	Spacelab 3	USA	345 ×	358 ×	56	1985 May 6	BIO/MG/ UVA	—

1985 Apr 29	SL 3 MPESS	USA	345 X	358 X	56	1985 May 6	ATM/P	Cosmic rays
1985 Jun 14	Kosmos-1660	USSR	1483 X	1524 X	73	1987?	GEO	
1985 Jun 17	Discovery	USA	354 X	380 X	28	1985 Jun 24	MG/BIO	
1985 Jun 17	Spartan 1	USA	354 X	390 X	28	1985 Jun 24	XRA*	
1985 Jul 2	Giotto	/ESA	Solar orbit			1992 Jul 23	PL	Comet probe
1985 Jul 10	Kosmos-1667	USSR	210 X	268 X	82	1985 Jul 17	BIO	
1985 Jul 19	Kosmos-1669	USSR	353 X	355 X	51	1985 Aug 30	BIO	
1985 Jul 29	Challenger	USA	311 X	320 X	49	1985 Aug 6	MG/BIO	
1985 Jul 29	PDP	USA	310 X	320 X	49	1985 Aug 6	P/F	
1985 Jul 29	Spacelab 2 PLT	USA	311 X	320 X	49	1985 Aug 6	SOL	Solar telescopes
1985 Jul 29	Spacelab 2 PLT	USA	311 X	320 X	49	1985 Aug 6	XRA	Hard X-ray imager
1985 Jul 29	Spacelab 2 PLT	USA	311 X	320 X	49	1985 Aug 6	IRA/P	IR telescope
1985 Jul 29	CRNE	USA	311 X	320 X	49	1985 Aug 6	P	Cosmic rays
1985 Aug 18	Suisai	Japan	Solar orbit			1991 Feb 22	PL	Comet probe
1985 Aug 27	Discovery	USA	351 X	395 X	28	1985 Sep 3	MG	
1985 Oct 3	Atlantis	USA	476 X	515 X	28	1985 Oct 7	P/BIO	
1985 Oct 30	Spacelab D-1	Germany	321 X	333 X	56	1985 Nov 6	MG/BIO	German Spacelab
1985 Oct 30	USS	Germany	321 X	333 X	56	1985 Nov 6	MG	
1985 Nov 27	Atlantis	USA	368 X	381 X	28	1985 Dec 3	MG/BIO	
1985 Dec 27	Kosmos-1713	USSR	216 X	396 X	62	1986 Jan 22	P*	
1986 Jan 12	Columbia	USA	323 X	346 X	28	1986 Jan 18	MG/UVA	Halley monitor camera
1986 Jan 12	MSL-2	USA	323 X	346 X	28	1986 Jan 18	MG	
1986 Jan 12	GBA-1	USA	323 X	346 X	28	1986 Jan 18	UVA/ATM	
1986 Feb 11	Kosmos-1732	USSR	1479 X	1526 X	73	1980s?	GEO	
1986 Feb 19	MAK-1	USSR	143 X	151 X	51	1991 Oct 18	ATM	
1986 Feb 22	Viking	Sweden	821 X	13 525 X	98	1987 May 12	A/P/F*	
1986 May 21	Kosmos-1744	USSR	218 X	371 X	62	1986 Jun 4	MG	
1986 Aug 12	Ajisai	Japan	1479 X	1497 X	50	1986 Aug 12	GEO	
1986 Dec 2	Kosmos-1803	USSR	1497 X	1503 X	82	1980s?	GEO	
1986 Dec 18	Kosmos-1809	USSR	943 X	966 X	82	?	P/F*	
1987 Feb 5	Ginga	Japan	509 X	673 X	31	1991 Nov 1	XRA*	
1987 Feb 20	Kosmos-1823	USSR	1479 X	1525 X	73	1990s?	GEO	
1987 Mar 3	Progress-28	USSR	353 X	369 X	51	1987 Mar 28	F	VLF experiment
1987 Mar 31	Kvant	USSR	343 X	364 X	51	2001 Mar 23	XRA*	Coded mask telescope
1987 Apr 24	Kosmos-1841	USSR	216 X	379 X	62	1987 May 8	MG	
1987 Sep 23	Progress-32	USSR	298 X	350 X	51	1987 Nov 19	MG	
1987 Sep 29	Kosmos-1887	USSR	215 X	383 X	62	1987 Oct 12	BIO	
1987 Nov 20	Progress-33	USSR	325 X	341 X	51	1987 Dec 19	P	
1988 Mar 25	San Marco 5	Italy	261 X	598 X	3	1988 Dec 6	ATM*	
1988 Apr 14	Foton	USSR	216 X	373 X	62	1988 Apr 28	MG	
1988 May 30	Kosmos-1950	USSR	1485 X	1521 X	73	1990s?	GEO	
1988 Jul 5	Okean	USSR	632 X	668 X	82	1990 Jun 14	ATM*	
1988 Jul 7	Fobos-1	USSR	Solar orbit			1988 Aug 28	PL	Phobos probe, failed

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1988 Jul 7	DPS	USSR	Solar orbit			1988 Aug 28	PL	Phobos lander
1988 Jul 12	Fobos-2	USSR	Mars orbit			1989 Mar 27	PL	Phobos probe, failed
1988 Jul 12	DPS	USSR	Mars orbit			1989 Mar 27	PL	Phobos lander
1988 Jul 12	PPS	USSR	Mars orbit			1989 Mar 27	PL	Phobos hopper
1988 Sep 29	Discovery	USA	302 ×	331 ×	28	1988 Oct 3	MG/ATM	
1988 Nov 26	Soyuz TM-7	USSR	326 ×	354 ×	51	1989 Apr 27	BIO/MM	
1988 Dec 2	Atlantis	USA	443 ×	454 ×	56	1988 Dec 6	A/P	
1989 Jan 10	Kosmos-1989	USSR	19 102 ×	19 149 ×	64	1989 Jan 10	GEO	
1989 Feb 21	Akebono	Japan	279 ×	10 434 ×	75	Active	ATM/P/A *	
1989 Mar 13	Discovery	USA	301 ×	333 ×	28	1989 Mar 18	BIO/MG	
1989 Apr 26	Foton	USSR	214 ×	369 ×	62	1989 May 11	MG	
1989 May 4	Atlantis	USA	296 ×	332 ×	28	1989 May 8	ATM/MG	
1989 May 4	Magellan	USA	Venus orbit			1994 Oct 12	PL	Venus radar mapper
1989 May 25	Pion	USSR	256 ×	269 ×	62	1989 Jul 23	ATM	
1989 May 25	Pion	USSR	257 ×	268 ×	82	1989 Jul 24	ATM	
1989 May 31	Kosmos-2024	USSR	19 099 ×	19 144 ×	64	1989 May 31	GEO	
1989 Jul 18	Pion	USSR	254 ×	271 ×	82	1989 Sep 19	ATM	
1989 Jul 18	Pion	USSR	254 ×	271 ×	82	1989 Sep 19	ATM	
1989 Aug 8	Columbia	USA	294 ×	308 ×	57	1989 Aug 13	P/ENV	
1989 Aug 8	Hipparcos	ESA	514 ×	35 890 ×	7	1993 Aug 15	OA *	Astrometric catalog
1989 Aug 28	Kosmos-2037	USSR	1484 ×	1525 ×	73	1990s?	GEO	
1989 Sep 5	Soyuz TM-8	USSR	373 ×	389 ×	51	1990 Feb 19	MG	
1989 Sep 15	Kosmos-2044	USSR	204 ×	261 ×	82	1989 Sep 29	BIO	
1989 Sep 28	Interkosmos-24	USSR	500 ×	2490 ×	82	1995 Oct 11	P/F*	
1989 Sep 28	Magion-2	Czech SSR	499 ×	2490 ×	82	1990 Nov 20	P/F*	
1989 Oct 18	Atlantis	USA	299 ×	333 ×	34	1989 Oct 23	BIO/MG/ATM	
1989 Oct 18	Galileo	USA	Jupiter orbit			Active	PL	Jupiter orbiter/probe
1989 Oct 18	Galileo Probe	USA	Jupiter entry			1995 Dec 7	PL	Jupiter probe
1989 Nov 18	COBE	USA	886 ×	896 ×	99	1997 May 1	SMA*	Big Bang study
1989 Nov 23	Discovery	USA	237 ×	558 ×	28	1989 Nov 28	A/P	
1989 Dec 1	Granat	USSR	1814 ×	201 796 ×	53	1999 May 25	XRA *	Coded mask telescope
1989 Dec 20	Progress M-2	USSR	390 ×	393 ×	51	1990 Feb 9	MG/P	
1990 Jan 9	Columbia	USA	319 ×	337 ×	28	1990 Jan 20	BIO/MG/ATM	
1990 Jan 24	Hiten	Japan	Lunar orbit			1993 Apr 10	PL	Lunar orbiter
1990 Jan 24	Hagoromo	Japan	Lunar orbit			1990 Mar 18	PL	Lunar test satellite
1990 Feb 28	Okean-O1	USSR	637 ×	666 ×	82	1991 Jul 18	ATM*	
1990 Feb 28	Atlantis	USA	238 ×	241 ×	61	1990 Mar 4	P	
1990 Apr 5	Pegsat	USA	460 ×	675 ×	94	1998 Nov 14	F*	
1990 Apr 11	POGS	USA	627 ×	745 ×	89	1990s?	F*	

1990 Apr 11	Foton	USSR	213 X	364 X	62	1990 Apr 27	Spaceship	MG	-
1990 Apr 24	Discovery	USA	614 X	618 X	28	1990 Apr 29	Spaceship	BIO/P/MG OA/UVA*	Large space telescope
1990 Apr 24	Hubble Space Telescope	USA	611 X	620 X	28	Active	Spaceship	MG	-
1990 May 31	Kristall	USSR	373 X	388 X	51	2001 Mar 23	Spaceship	XRA*	Soft X-ray survey
1990 Jun 1	ROSAT	Germany	562 X	584 X	52	1999 Jan	Spaceship	GRA*	-
1990 Jul 11	Gamma	USSR	411 X	430 X	51	1992 Feb 28	Spaceship	P/F*	-
1990 Jul 25	CRRES	USA	343 X	33 590 X	18	1990s?	Spaceship	GEO	-
1990 Jul 30	Kosmos-2088	USSR	1483 X	1524 X	73	1990s?	Spaceship	P/F	Active plasma experiment
1990 Aug 15	Progress M-4	USSR	368 X	403 X	51	1990 Sep 20	Spaceship	ATM	-
1990 Sep 3	Da Qui Weixing 1	China	843 X	901 X	98	1991 Mar 11	Spaceship	ATM	-
1990 Sep 3	Da Qui Weixing 2	China	860 X	900 X	98	1991 Jul 24	Spaceship	MG/BIO/P	-
1990 Oct 6	Discovery	USA	283 X	302 X	28	1990 Oct 10	Spaceship	PL	Solar polar survey
1990 Oct 6	Ulysses	USA	Solar orbit			Active	Spaceship	A	-
1990 Nov 15	Atlantis	USA	260 X	269 X	28	1990 Nov 20	Spaceship	ATM	-
1990 Dec 2	Columbia	USA	346 X	358 X	28	1990 Dec 11	Spaceship	BIO	-
1990 Dec 2	Soyuz TM-11	USSR	366 X	400 X	51	1991 May 26	Spaceship	UVA	Far UV observatory
1990 Dec 2	Astro 1 Fwd	USA	347 X	358 X	28	1990 Dec 11	Spaceship	XRA	XR observatory
1990 Dec 2	BBXRT	USA	347 X	358 X	28	1990 Dec 11	Spaceship	A/MG	-
1991 Apr 5	Atlantis	USA	445 X	458 X	28	1991 Apr 11	Spaceship	GRA*	Gamma bursts and sources
1991 Apr 5	Compton Observatory	USA	441 X	455 X	28	2000 Jun 4	Weather	ATM	-
1991 Apr 24	Meteor-3	USSR	1186 X	1213 X	82	1990s	Spaceship	XRA/IRA	IR background
1991 Apr 28	Discovery	USA	247 X	260 X	57	1991 May 6	Spaceship	BIO	-
1991 Apr 28	AFF-675	USA	247 X	260 X	57	1991 May 6	Spaceship	P	-
1991 May 18	Soyuz TM-12	USSR	390 X	392 X	51	1991 Oct 10	Spaceship	ATM	-
1991 May 30	Progress M-8	USSR	391 X	394 X	51	1991 Aug 16	Recon	ATM*	-
1991 May 30	Naduvaniy gazovoy ballon	USSR	187 X	198 X	51	1991 Aug 29	Spaceship	ATM	-
1991 Jun 4	Okean	USSR	632 X	665 X	82	1994 Jan 4	Spaceship	BIO	-
1991 Jun 5	Columbia	USA	278 X	296 X	39	1991 Jun 14	Spaceship	MG/BIO	-
1991 Jun 5	Spacelab SLS 1	USA	279 X	299 X	39	1991 Jun 14	Spaceship	P/F*	-
1991 Jun 5	GBA-2	USA	279 X	299 X	39	?	Active	ATM/ALT*	-
1991 Jun 29	REX	USA	771 X	875 X	89	Active	RFA*	ATM/A/MG	-
1991 Jul 17	ERS-1	I/ESA	776 X	778 X	98	1990s?	Weather	ATM	-
1991 Jul 17	SARA	France	770 X	777 X	98	1991 Aug 11	Spaceship	MG	-
1991 Aug 2	Atlantis	USA	299 X	331 X	28	Active	Spaceship	SX*	-
1991 Aug 15	Meteor-3	USSR	1186 X	1207 X	82	1991 Sep 30	Spaceship	MG/BIO/P	-
1991 Aug 20	Progress M-9	USSR	379 X	396 X	51	Active	Active	ATM*	-
1991 Aug 30	Yohkoh	Japan	521 X	788 X	31	1991 Sep 18	Spaceship	BIO	-
1991 Sep 12	Discovery	USA	563 X	575 X	56	Active	Spaceship	MG	-
1991 Sep 12	UARS	USA	573 X	580 X	56	1992 Mar 25	Spaceship	MG	-
1991 Oct 2	Soyuz TM-13	USSR	390 X	399 X	51	1991 Oct 20	Spaceship	BIO	-
1991 Oct 4	Foton	USSR	211 X	377 X	62		Spaceship	MG	-

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1991 Nov 24	Atlantis	USA	361 ×	367 ×	28	1991 Dec 1	Spaceship	—
1991 Dec 18	Interkosmos-25	Russia	437 ×	3070 ×	82	?		—
1991 Dec 18	Magion-3	Czech Rep.	437 ×	3071 ×	82	1992 Sep 9		—
1992 Jan 22	Discovery	USA	292 ×	304 ×	56	1992 Jan 30	Spaceship	—
1992 Jan 22	Spacelab IML-1	USA	293 ×	305 ×	56	1992 Jan 30	Spaceship	—
1992 Jan 22	GBA-3	USA	293 ×	305 ×	56	1992 Jan 30	BIO/MG/ UVA	Australian UV telescope
1992 Jan 25	Progress M-11	USSR	375 ×	394 ×	51	1992 Mar 13	Spaceship	—
1992 Feb 11	Fuyo 1	Japan	569 ×	572 ×	97	Active	MG/BIO ALT/ATM*	—
1992 Mar 17	Soyuz TM-14	USSR	375 ×	396 ×	51	1992 Aug 10	Spaceship	—
1992 Mar 24	Atlantis	USA	291 ×	300 ×	57	1992 Apr 2	Spaceship	—
1992 Mar 24	Atlas 1 Fwd	USA	291 ×	301 ×	57	1992 Apr 2	ATM/MG/P ATM/P	—
1992 Mar 24	Atlas 1 Aft	USA	291 ×	301 ×	57	1992 Apr 2	ATM/UVA	FAUST UV telescope
1992 May 7	Endavour	USA	275 ×	350 ×	28	1992 May 16	Spaceship	—
1992 May 20	ROSS-C	India	250 ×	413 ×	46	1992 Jul 14		—
1992 Jun 7	EUVE	USA	514 ×	527 ×	28	2001 Jan 31		EUV sky survey
1992 Jun 25	Columbia	USA	299 ×	304 ×	28	1992 Jul 9	Spaceship	—
1992 Jun 25	USML-1	USA	299 ×	304 ×	28	1992 Jul 9	Spaceship	—
1992 Jun 30	Progress M-13	USSR	387 ×	410 ×	51	1992 Jul 24	Spaceship	—
1992 Jul 3	SAMPEX	USA	514 ×	690 ×	81	Active		—
1992 Jul 24	Geotail	Japan	3906 ×	104552 ×	22	Active		Explored magnetotail
1992 Jul 24	DUVE	USA	217 ×	1482 ×	27	1993 Mar 16		Diffuse UV background
1992 Jul 31	Atlantis	USA	421 ×	433 ×	28	1992 Aug 8	Spaceship	—
1992 Jul 31	Eureca 1	I/ESA	500 ×	504 ×	28	1993 Jul 1		—
1992 Jul 31	TSS-1	Italy	295 ×	301 ×	28	1992 Aug 8		Tether
1992 Jul 31	TSS-1 PLT	USA	295 ×	301 ×	28	1992 Aug 8		—
1992 Jul 31	TSS-1 MPES	USA	295 ×	301 ×	28	1992 Aug 8		—
1992 Jul 31	EOIM-3/TEMP2A-3	USA	227 ×	234 ×	28	1992 Aug 8		—
1992 Aug 9	FSW-2 1	China	170 ×	335 ×	63	1992 Sep 1		—
1992 Aug 10	Topex-Poseidon	USA	1331 ×	1341 ×	66	Active		—
1992 Aug 19	Pion-Germes-1	USSR	223 ×	233 ×	82	1992 Sep 25		—
1992 Aug 19	Pion-Germes-2	USSR	221 ×	232 ×	82	1992 Sep 24		—
1992 Sep 12	Endavour	USA	298 ×	309 ×	57	1992 Sep 20	Spaceship	—
1992 Sep 12	Spacelab J LM	Japan	298 ×	311 ×	57	1992 Sep 20	Spaceship	Japanese Spacelab
1992 Sep 12	GAS Bridge	USA	298 ×	311 ×	57	1992 Sep 20		—
1992 Sep 25	Mars Observer	USA	Solar orbit			1993 Aug 21		Mars orbiter, failed
1992 Oct 6	Freja	Sweden	596 ×	1761 ×	63	1996 Oct 14		—
1992 Oct 8	Foton	USSR	217 ×	352 ×	62	1992 Oct 24		—

1992 Oct 22	Columbia	USA	285 X	293 X	28	1992 Nov 1	Spaceship	MG/ENV/ ATM	-
1992 Oct 22	Lageos 2	Italy	5616 X	5950 X	52	1992 Oct 23		GEOD*	-
1992 Oct 22	USMP-1 Fwd	USA	285 X	293 X	28	1992 Nov 1		MG	-
1992 Oct 22	USMP-1 Aft	USA	285 X	293 X	28	1992 Nov 1		MG	-
1992 Oct 27	Progress M-15	USSR	396 X	399 X	51	1993 Feb 7	Spaceship	P	-
1992 Oct 27	MAK-2	USSR	389 X	393 X	51	1993 Apr 1		ATM	-
1992 Nov 15	Resurs-500	USSR	179 X	238 X	82	1992 Nov 22	Spaceship	MG	-
1992 Dec 2	Discovery	USA	317 X	331 X	57	1992 Dec 9		P/MG	-
1992 Dec 22	Kosmos-2226	Russia	1478 X	1525 X	73	1990s?		GEO	-
1992 Dec 29	Kosmos-2229	USSR	217 X	373 X	62	1993 Jan 10		BIO	Diffuse X-ray spectrometer
1993 Jan 13	Endeavour	USA	300 X	308 X	28	1993 Jan 19	Spaceship	XRA/ MG/BIO	-
1993 Feb 20	Asuka	Japan	537 X	646 X	31	2001 Mar 2		XRA*	-
1993 Apr 8	Discovery	USA	292 X	298 X	57	1993 Apr 17	Spaceship	ATM/ BIO/MG	-
1993 Apr 8	Spartan-201	USA	292 X	298 X	57	1993 Apr 13		SOL*	-
1993 Apr 8	Atlas-2	USA	292 X	298 X	57	1993 Apr 17		ATM/SOL	-
1993 Apr 25	Alexis	USA	747 X	835 X	69	Active		XRA*	-
1993 Apr 26	Columbia	USA	295 X	305 X	28	1993 May 6	Spaceship	MG	-
1993 Apr 26	Spacelab D-2 LM	Germany	296 X	303 X	28	1993 May 6	Spaceship	MG/BIO	German Spacelab
1993 Apr 26	USS	Germany	296 X	303 X	28	1993 May 6		MG/UVA	-
1993 May 22	Progress M-18	USSR	388 X	390 X	51	1993 Jul 4	Spaceship	MG/BIO	-
1993 Jun 21	Spacehab SH-01	USA	472 X	481 X	28	1993 Jul 1	Spaceship	MG	-
1993 Jun 21	GBA-5	USA	472 X	481 X	28	1993 Jul 1		BIO	-
1993 Sep 12	Discovery	USA	271 X	307 X	28	1993 Sep 22	Spaceship	UVA*	-
1993 Sep 12	ORFEUS-SPAS	Germany	266 X	342 X	28	1993 Sep 22		GEO	-
1993 Sep 26	Stella	France	797 X	805 X	98	1993 Sep 26	Spaceship	MG	-
1993 Oct 11	Progress M-20	USSR	387 X	397 X	51	1993 Nov 21	Spaceship	MG	-
1993 Oct 18	Spacelab SLS 2 LM	USA	282 X	289 X	39	1993 Nov 1	Spaceship	BIO	-
1994 Jan 25	Meteor-3	Russia	1185 X	1208 X	82	1990s	Weather	ATM	-
1994 Jan 25	Clementine 1	USA	Lunar orbit			1995 May 4		PL	Lunar mapper
1994 Jan 25	ISA	USA	397 X	126958 X	65	1994 May 12		P/F*	-
1994 Feb 3	Discovery	USA	346 X	358 X	56	1994 Feb 11	Spaceship	A/P	-
1994 Feb 3	BREMSAT	Germany	339 X	356 X	56	1995 Feb 12		MM/ATM*	-
1994 Feb 3	Spacehab SH-02	USA	347 X	358 X	56	1994 Feb 11		BIO/MG	-
1994 Feb 3	Wake Shield Facility	USA	347 X	358 X	56	1994 Feb 11		MG	-
1994 Feb 3	GBA-6	USA	347 X	358 X	56	1994 Feb 11		MG	-
1994 Feb 8	Shi Jian 4	China	179 X	36133 X	28	1990s?		P/F*	-
1994 Mar 2	Koronas-1	Russia	486 X	528 X	82	2001 Mar 4		SOL*	-
1994 Mar 4	Columbia	USA	296 X	305 X	39	1994 Mar 18	Spaceship	ATM/MG/A	-
1994 Mar 4	USMP-2 Fwd	USA	296 X	305 X	39	1994 Mar 18		MG	-
1994 Mar 4	USMP-2 Aft	USA	296 X	305 X	39	1994 Mar 18		MG	-
1994 Mar 4	OAST-2	USA	296 X	305 X	39	1994 Mar 18		MG	-
1994 Apr 9	Endeavour	USA	211 X	226 X	56	1994 Apr 20	Spaceship	MG	-

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1994 Apr 9	MAPS	USA	211 ×	225 ×	57	1994 Apr 20	ATM	—
1994 Apr 9	SRL-1	USA	211 ×	225 ×	57	1994 Apr 20	ALT	Imaging radar
1994 May 4	SROSS-C2	India	431 ×	920 ×	46	2001 Jul 12	GRA/P*	—
1994 Jun 14	Foton	USSR	220 ×	358 ×	62	1994 Jul 2	MG	—
1994 Jul 3	FSW-2.2	China	207 ×	350 ×	62	1994 Sep 13	MG	—
1994 Jul 8	Columbia	USA	298 ×	302 ×	28	1994 Jul 23	BIO/MG	—
1994 Jul 8	Spacelab IML 2	USA	299 ×	303 ×	28	1994 Jul 23	BIO/MG	—
1994 Sep 9	Discovery	USA	253 ×	265 ×	57	1994 Sep 20	SOL*	—
1994 Sep 9	Spartan-201	USA	252 ×	265 ×	57	1994 Sep 20	ATM	Lidar experiment
1994 Sep 9	LITE	USA	253 ×	265 ×	57	1994 Sep 20	ATM/MG	—
1994 Sep 9	GBA-7	USA	253 ×	265 ×	57	1994 Sep 20	MG/BIO	—
1994 Sep 30	Endavour	USA	212 ×	224 ×	57	1994 Oct 11	ATM	—
1994 Sep 30	MAPS	USA	211 ×	223 ×	57	1994 Oct 11	ALT	Imaging radar
1994 Sep 30	SRL-2	USA	211 ×	223 ×	57	1994 Oct 11	P/F*	Deep space explorer,
1994 Nov 1	WIND	USA	186 ×	470 310 ×	28	Active		lunar flybys
1994 Nov 3	Atlantis	USA	294 ×	311 ×	56	1994 Nov 14	ATM	—
1994 Nov 3	CRISTA-SPAS	Germany	294 ×	309 ×	57	1994 Nov 14	ATM*	—
1994 Nov 3	Atlas-3	USA	296 ×	310 ×	56	1994 Nov 14	ATM/SOL	—
1994 Nov 29	Geo-IK	Russia	1479 ×	1527 ×	73	?	GEO	—
1995 Jan 15	EXPRESS	Germany	110 ×	250 ×	33	1995 Jan 15	MG	—
1995 Jan 24	Astrid	Sweden	965 ×	1025 ×	82	1995 Mar 1	P/F*	—
1995 Feb 3	Spartan-204	USA	388 ×	388 ×	51	1995 Feb 11	UVA*	—
1995 Feb 3	Spacehab SH-03	USA	388 ×	389 ×	51	1995 Feb 11	MG	—
1995 Feb 3	CGP/ODERACS	USA	388 ×	389 ×	51	1995 Feb 11	MG	—
1995 Feb 16	Foton	USSR	217 ×	363 ×	62	1995 Mar 3	MG	—
1995 Mar 2	ASTRO-2 Fwd	USA	345 ×	359 ×	28	1995 Mar 18	UVA	—
1995 Mar 18	SFU	Japan	470 ×	492 ×	28	1996 Jan 20	MG/IRA/ BIO*	—
1995 Apr 3	OrbView-1	USA	733 ×	748 ×	69	Active	Imaging	—
1995 Apr 9	GFZ-1	Germany	383 ×	393 ×	51	1999 Jun 23	GEO	—
1995 May 20	Spektr	USSR	392 ×	400 ×	51	2001 Mar 23	ATM/MG	—
1995 Jun 27	Spacelab-Mir LM	USA	393 ×	398 ×	51	1995 Jul 7	MG	—
1995 Jul 7	UPM/SAT 1	Spain	664 ×	676 ×	98	?	MG	—
1995 Jul 13	Discovery	USA	286 ×	315 ×	28	1995 Jul 22	MG/BIO	—
1995 Aug 2	Interbol-1	USSR	1443 ×	191 214 ×	63	2000 Oct 16	P/F*	—
1995 Aug 2	Magion-4	Czech Rep.	14 777 ×	178 122 ×	71	?	P/F*	—
1995 Aug 31	Fasat-Alfa	Chile	631 ×	668 ×	82	1995 Aug 31	ATM	—
1995 Sep 7	Endavour	USA	369 ×	377 ×	28	1995 Sep 18	BIO	—
1995 Sep 7	Spartan 201	USA	369 ×	382 ×	28	1995 Sep 18	SOL*	—
1995 Sep 7	Wake Shield Facility	USA	396 ×	404 ×	28	1995 Sep 18	MG	—

1995 Sep 7	GBA-8/CAPL	USA	396 X	403 X	28	1995 Sep 18	MG	-
1995 Sep 7	IEH-1	USA	396 X	403 X	28	1995 Sep 18	UVA	-
1995 Oct 8	Progress M-29	USSR	391 X	395 X	51	1995 Dec 19	MG	-
1995 Oct 20	Spacelab USML-2	USA	267 X	278 X	39	1995 Nov 5	MG	-
1995 Nov 12	Atlantis	USA	345 X	394 X	51	1995 Nov 20	MG/ATM	-
1995 Nov 17	ISO	I/ESA	1110 X	70504 X	5	1998 May 16	IRA*	IR observatory
1995 Dec 2	SOHO	I/ESA	Earth-Sun L1			Active	SOL*	-
1995 Dec 18	Progress M-30	USSR	390 X	397 X	51	1996 Feb 22	MG	Time variability
1995 Dec 30	Roski X-ray	USA	564 X	583 X	22	Active	XRA*	-
1996 Feb 17	Timing Explorer	USA	Eros orbit			2001 Feb 28	PL	Asteroid orbiter
1996 Feb 22	NEAR	USA	297 X	302 X	28	1996 Feb 26	P/F	Tether experiment
1996 Feb 22	TSS-1R Deployer	USA	297 X	302 X	28	1996 Mar 9	P/F	Tether measurements
1996 Feb 22	TSS-1R MPSS	USA						
1996 Feb 22	USMP-3 Fwd	USA	280 X	291 X	28	1996 Mar 9	MG	-
1996 Feb 22	USMP-3 Aft	USA	280 X	291 X	28	1996 Mar 9	MG	-
1996 Feb 24	Polar	USA	5157 X	50591 X	85	Active	P/F*	-
1996 Mar 9	REX II	USA	803 X	832 X	89	Active	P/F*	-
1996 Mar 21	IRS-P3	India	816 X	849 X	98	Active	XRA	-
1996 Apr 23	Priroda	Russia	389 X	396 X	51	2001 Mar 23	ATM	-
1996 Apr 24	MSX	USA	896 X	906 X	99	?	IRA*	IR survey
1996 Apr 30	BeppoSAX	Italy	581 X	604 X	3	Active	XRA*	Broad band spectra
1996 May 19	Endeavour	USA	278 X	289 X	39	1996 May 29	BIO	-
1996 May 19	Spacehab SH-05 (CMAM-4)	USA	280 X	290 X	39	1996 May 29	MG/BIO	-
1996 May 19	GBA-9	USA	280 X	290 X	39	1996 May 29	MG/GRA	-
1996 Jun 20	Columbia	USA	264 X	274 X	39	1996 Jul 7	BIO	-
1996 Jun 20	Spacelab LMS	USA	268 X	278 X	39	1996 Jul 7	BIO/MG	Spacelab
1996 Jul 2	TOMS-EP	USA	493 X	511 X	97	Active	ATM*	-
1996 Jul 31	Progress M-32	USSR	375 X	391 X	51	1996 Nov 21	MG/BIO	-
1996 Aug 17	Midori	Japan	799 X	800 X	98	1997 Jun 30	ATM*	-
1996 Aug 21	FAST	USA	351 X	4164 X	83	Active	A/P/F*	-
1996 Aug 29	Interbol-2	Russia	771 X	19207 X	62	Active	P/F*	-
1996 Aug 29	Magion-5	Czech Rep.	777 X	19205 X	62	Active	P/F*	-
1996 Sep 5	UNAMSAT-B	Mexico	966 X	1010 X	82	1996 Sep 7	ATM	Meteor echo
1996 Oct 20	FSW-2 No. 3	China	170 X	340 X	63	1996 Dec 3	BIO?	-
1996 Nov 4	HETE	USA	488 X	554 X	37	1996 Nov 4	GRA/XRA*	-
1996 Nov 4	SAC-B	Argentina	488 X	555 X	38	1996 Nov 4	XRA*	X-ray background, failed
1996 Nov 7	Mars Global Surveyor	USA	Solar orbit			Active	PL	Mars orbiter
1996 Nov 16	Mars-8	Russia	80 X	1500 X	51	1996 Nov 16	PL	Mars probe, failed
1996 Nov 16	MAS 1	Russia	80 X	1500 X	51	1996 Nov 16	PL	Mars lander, lost
1996 Nov 16	MAS 2	Russia	80 X	1500 X	51	1996 Nov 16	PL	Mars lander, lost
1996 Nov 16	Penetrator 1	Russia	80 X	1500 X	51	1996 Nov 16	PL	Mars penetrator, lost

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1996 Nov 16	Penetrator 2	Russia	80 ×	1500 ×	51	1996 Nov 16	PL	Mars penetrator, lost
1996 Nov 19	ORFEUS-SPAS	Germany	346 ×	358 ×	28	1996 Dec 7	UVA*	—
1996 Nov 19	Wake Shield Facility	USA	347 ×	358 ×	28	1996 Dec 7	MG	—
1996 Nov 19	Progress M-33	Russia	371 ×	388 ×	51	1997 Mar 12	BIO	—
1996 Dec 4	Sagan Memorial Station	USA	Mars landing			1997 Oct 7	PL	Mars lander
1996 Dec 4	Sojourner	USA	Mars landing			1997 Nov	PL	Mars mini-rover
1996 Dec 24	Bion No. 11	Russia	217 ×	378 ×	62	1997 Jan 7	BIO	—
1997 Feb 11	ORUC	USA	598 ×	608 ×	28	1997 Feb 21	UVA	STIS, FGS-IR for HST
1997 Feb 12	Haruka	Japan	574 ×	21 401 ×	31	Active	RFA*	VLBI observatory
1997 Mar 4	Zeya	Russia	466 ×	478 ×	97	1999 Oct <	GEO	—
1997 Apr 4	Columbia	USA	298 ×	303 ×	28	1997 Apr 8	MG	—
1997 Apr 4	Spacelab MSL-1	USA	298 ×	303 ×	28	1997 Apr 8	MG	Spacelab MSL
1997 Apr 21	Minisat-01	Spain	562 ×	581 ×	150	Active	UVA/GRA*	—
1997 May 15	Spacehab SH-08	USA	384 ×	394 ×	51	1997 May 24	MG	—
1997 Jul 1	Columbia	USA	298 ×	303 ×	28	1997 Jul 17	MG	—
1997 Jul 1	Spacelab Long Module 1	USA	297 ×	303 ×	28	1997 Jul 17	MG	Spacelab MSL
1997 Aug 7	Discovery	USA	289 ×	300 ×	56	1997 Aug 19	UVA/MG/BIO	Hale-Bopp imaging
1997 Aug 7	CRISTA-SPAS	Germany	290 ×	299 ×	57	1997 Aug 19	ATM*	—
1997 Aug 7	TAS-1	USA	284 ×	295 ×	57	1997 Aug 19	ALT/SOL/MG	Laser altimeter
1997 Aug 7	IEH-2	USA	284 ×	295 ×	57	1997 Aug 19	UVA/SOL	Io torus imager
1997 Aug 23	Lewis	USA	294 ×	317 ×	97	1997 Sep 28	UVA	—
1997 Aug 25	ACE	USA	Earth-Sun L1			Active	P*	Solar wind at L1
1997 Aug 29	FORTE	USA	800 ×	833 ×	69	Active	F*	Lightning studies
1997 Sep 26	Atlantis	USA	384 ×	389 ×	51	1997 Oct 6	MG	—
1997 Oct 9	Foton	Russia	218 ×	373 ×	62	1997 Oct 23	MG/BIO	—
1997 Oct 9	Mirka	Germany	2300 ×	360 ×	62	1997 Oct 23	MG	Microgravity RV test
1997 Oct 15	Cassini	USA	Solar orbit			Active	PL	Saturn probe
1997 Oct 15	Huygens	I/ESA	Solar orbit			Active	PL	Titan probe
1997 Oct 22	STEP M4	USA	432 ×	501 ×	44	1997 Oct 22	ATM/P*	—
1997 Oct 30	TEAMSAT	USA	530 ×	26633 ×	7	1997 Nov	ATM	—
1997 Nov 19	Columbia	USA	276 ×	282 ×	28	1997 Dec 5	MG/BIO	—
1997 Nov 19	Spartan 201	USA	277 ×	283 ×	28	1997 Dec 5	SOL*	—
1997 Nov 19	USMP-4 Forward	USA	279 ×	283 ×	28	1997 Dec 5	MG	—
1997 Nov 19	USMP-4 Aft	USA	279 ×	283 ×	28	1997 Dec 5	MG	—
1997 Nov 27	TRMM	USA	345 ×	347 ×	34	Active	ATM*	—

1997 Dec 2	Equator-S	Germany	564 X	67 070 X	3	1998 May 1	P/F*	Lunar mapping
1998 Jan 7	Lunar Prospector	USA	Lunar orbit			1999 Jul 31	PL	
1998 Jan 23	Endeavour	USA	377 X	387 X	51	1998 Jan 31	BIO/P	
1998 Jan 23	Spacehab SH-10	USA	378 X	384 X	51	1998 Jan 31	MG	Mir cargo
1998 Jan 29	Soyuz TM-27	Russia	377 X	384 X	51	1998 Aug 25	BIO	
1998 Feb 10	GFO	USA	781 X	876 X	107	Active	GEO	Altimeter satellite
1998 Feb 26	SNOE	USA	535 X	579 X	97	Active	ATM*	Nitric oxide survey
1998 Apr 2	TRACE	USA	597 X	642 X	97	Active	SOL*	Hi Res solar imaging
1998 Apr 17	Columbia	USA	252 X	281 X	39	1998 May 3	BIO	
1998 Apr 17	NeuroLab	USA	252 X	281 X	39	1998 May 3	BIO	Spacelab mission
1998 Jun 2	Discovery	USA	342 X	373 X	51	1998 Jun 12	MG/P	
1998 Jun 2	Spacehab SH-11	USA	342 X	373 X	51	1998 Jun 12	MG/BIO	Mir cargo
1998 Jun 2	AMS	France	342 X	373 X	51	1998 Jun 12	P	Antimatter detector
1998 Jul 3	Nozomi	Japan	Solar orbit			Active	PL	Mars probe
1998 Jul 10	Resurs-O1	Russia	816 X	818 X	98	Active	P/ATM	
1998 Jul 10	WESTPAC	Australia	817 X	818 X	98	1998 Jul 10	GEO	
1998 Oct 29	Spartan 201	USA	549 X	560 X	28	1998 Nov 7	SOL*	
1998 Oct 29	Spacehab SH-12	USA	550 X	559 X	28	1998 Nov 7	MG	Research mission
1998 Dec 6	SWAS	USA	638 X	650 X	69	Active	SMA*	Star formation studies
1998 Dec 10	Astrid-2	Sweden	978 X	1013 X	82	Active	P/F*	Auroral studies
1999 Jan 3	Mars Polar Lander	USA	Mars impact			1999 Dec 3	PL	Mars lander crashed
1999 Jan 3	DS2 Scott Probe	USA	Mars impact			1999 Dec 3	PL	Mars surface penetrator
1999 Jan 3	DS2 Amundsen Probe	USA	Mars impact			1999 Dec 3	PL	Mars surface penetrator
1999 Jan 27	ROCSAT-1	Taiwan	586 X	604 X	34	Active	P/F/ATM*	
1999 Feb 7	Stardust	USA	Solar orbit			Active	PL	Comet dust retrieval
1999 Feb 7	Sample Return Capsule	USA	Solar orbit			Active	PL	Stardust return capsule
1999 Feb 20	Soyuz TM-29	Russia	341 X	357 X	51	1999 Aug 28	BIO/MG	
1999 Feb 23	ARGOS	USA	828 X	845 X	98	Active	A/P/F/XRA*	
1999 Feb 23	Orsted	Denmark	646 X	864 X	96	Active	F*	Magnetic field
1999 Mar 5	WIRE	USA	539 X	592 X	97	Active	IRA*	IR survey, failed
1999 Apr 2	Progress M-41	Russia	336 X	361 X	51	1999 Jul 17	BIO	
1999 Apr 28	ABRIXAS	Germany	554 X	602 X	48	1999 May 1	XRA*	Hard XR survey, failed
1999 May 10	Shi Jian 5	China	844 X	868 X	98	Active	P*	
1999 May 18	TERRIERS	USA	540 X	554 X	97	1999 May 18	P/F*	
1999 May 27	Starshine	USA	375 X	393 X	51	1999 Jun 5	ATM	
1999 Jun 20	QuikScat	USA	804 X	807 X	98	Active	ATM*	
1999 Jun 24	FUSE	USA	753 X	770 X	24	Active	UVA*	Far UV spectra
1999 Jul 16	Progress M-42	Russia	340 X	348 X	51	2000 Feb 4	MG/BIO	

Launch	Name	State	Peri ×	Apo (km) ×	Inc.	Operated until	Pri mission discipline	Comments
1999 Jul 23	Columbia	USA	272 ×	297 ×	28	1999 Jul 28	Spaceship	—
1999 Jul 23	Chandra X-ray Observatory	USA	9999 ×	138 826 ×	28	Active		High res X-ray imaging
1999 Sep 9	Foton	Russia	215 ×	376 ×	62	1999 Sep 24	MG	—
1999 Oct 14	SACI-1	Brazil	733 ×	744 ×	98	1999 Oct	P/F/ATM*	—
1999 Dec 10	XMM	ESA	7079 ×	114 028 ×	38	Active	XRA*	European X-ray Observatory
1999 Dec 18	Terra	USA	655 ×	686 ×	98	Active	Imaging	Earth Observing System
1999 Dec 21	Arirang-1	KOREA	687 ×	708 ×	98	Active	Imaging	—
1999 Dec 21	ACRIMSAT	USA	682 ×	727 ×	98	Active	SOL*	—
2000 Jan 27	ASUSAT	USA	750 ×	805 ×	100	2000 Feb	P/F	—
2000 Feb 3	Thelma	USA	752 ×	803 ×	100	2000 Feb 12	F	—
2000 Feb 3	Louise	USA	748 ×	804 ×	100	2000 Feb 12	F	—
2000 Feb 11	SRL-3 (SRTM)	USA	226 ×	241 ×	57	2000 Feb 22	ALT	Radar mapping
2000 Mar 12	MTI	USA	573 ×	613 ×	97	Active	SX	—
2000 Mar 25	IMAGE	USA	1055 ×	45 925 ×	89	Active	P/F*	Magnetosphere studies
2000 Jul 15	MITA	Italy	415 ×	473 ×	87	Active	P*	Cosmic rays
2000 Jul 15	CHAMP	Germany	421 ×	475 ×	87	Active	P/F*	—
2000 Jul 16	Samba	I/ESA	17 008 ×	120 923 ×	90	Active	P/F*	—
2000 Jul 16	Salsa	I/ESA	16 809 ×	120 768 ×	90	Active	P/F*	—
2000 Aug 9	Rumba	I/ESA	17 240 ×	120 715 ×	90	Active	P/F*	—
2000 Aug 9	Tango	I/ESA	17 313 ×	120 961 ×	90	Active	P/F*	—
2000 Sep 8	Atlantis (STS-106)	USA	158 ×	324 ×	51	2000 Sep 20	MG	—
2000 Sep 26	Megsat-1	Italy	640 ×	646 ×	64	Active	A/MG	—
2000 Sep 26	Unisat	Italy	639 ×	644 ×	64	Active	ENV	—
2000 Oct 9	HETE 2	USA	595 ×	636 ×	1	Active	XRA/GRA*	Gamma ray bursts
2000 Nov 16	STRV 1c	UK	609 ×	39 255 ×	6	Active	MM/P	—
2000 Nov 16	STRV 1d	UK	613 ×	39 277 ×	6	Active	ATM/F	—
2000 Nov 21	SAC-C	USA	687 ×	707 ×	98	Active	F*	—
2000 Nov 21	Munin	Sweden	697 ×	1800 ×	95	Active	A/P*	—