

TABLE 4-1 | SPACE NUCLEAR SYSTEMS LAUNCHED BY THE U.S. (1961-2014)

Mission	Mission Type	Launch Date	Nuclear Source (# sources/Nominal Output)	Status
TRANSIT 4A	Navigational	Jun 61	SNAP-3B7 (1/2.7 W <sub>e</sub> )	Successfully achieved orbit; ops terminated 1966
TRANSIT 4B	Navigational	Nov 61	SNAP-3B8 (1/2.7 W <sub>e</sub> )	Successfully achieved orbit; ops terminated 1967
TRANSIT 5BN-1	Navigational	Sep 63	SNAP-9A (1/25 W <sub>e</sub> )	Successfully achieved orbit; ops terminated 1970
TRANSIT 5BN-2	Navigational	Dec 63	SNAP-9A (1/25 W <sub>e</sub> )	Successfully achieved orbit; ops terminated 1971
TRANSIT 5BN-3	Navigational	Apr 64	SNAP-9A (1/25 W <sub>e</sub> )	Failed to achieve orbit; SNAP-9A burned up on reentry as then designed/intended
SNAPSHOT	Experimental	Apr 65	SNAP-10A (1/500 W <sub>e</sub> )	Successfully achieved orbit; S/C voltage regulator failed after 43 days; SNAP-10A reactor shutdown permanently in 3000+ year orbit
NIMBUS B-1	Meteorological	May 68	SNAP-19B2 (2/40 W <sub>e</sub> each)	Vehicle destroyed during launch; SNAP-19B2s retrieved intact; fuel used on later mission
NIMBUS III	Meteorological	Apr 69	SNAP-19B3 (2/40 W <sub>e</sub> each)	Successfully achieved orbit; ops terminated 1979
APOLLO 11	Lunar exploration	Jul 69	RHU (2/15 W <sub>th</sub> each)	Successfully placed on moon, served to provide heat for the solar-powered Early Apollo Science Experiment Package (EASEP) batteries; ops terminated 1969
APOLLO 12	Lunar exploration	Nov 69	SNAP-27 (1/70 W <sub>e</sub> )	Successfully placed on moon; ops terminated 1977
APOLLO 13	Lunar exploration	Apr 70	SNAP-27 (1/70 W <sub>e</sub> )	Mission aborted en route to moon; SNAP-27 survived reentry & in 7000+ ft of water in deep ocean
APOLLO 14	Lunar exploration	Jan 71	SNAP-27 (1/70 W <sub>e</sub> )	Successfully placed on moon; ops terminated 1977
APOLLO 15	Lunar exploration	Jul 71	SNAP-27 (1/70 W <sub>e</sub> )	Successfully placed on moon; ops terminated 1977
PIONEER 10	Solar system exploration	Mar 72	SNAP-19 (4/40 W <sub>e</sub> each) RHU (12/1 W <sub>th</sub> each)	Successfully placed on interplanetary trajectory; ops terminated 2003
APOLLO 16	Lunar exploration	Mar 72	SNAP-27 (1/70 W <sub>e</sub> )	Successfully placed on moon; ops terminated 1977
TRIAD-01-1X	Navigational	Sep 72	TRANSIT-RTG (1/30 W <sub>e</sub> )	Successfully achieved orbit; ops terminated 1977
APOLLO 17	Lunar exploration	Dec 72	SNAP-27 (1/70 W <sub>e</sub> )	Successfully placed on moon; ops terminated 1977
PIONEER 11	Solar system exploration	Apr 73	SNAP-19 (4/40 W <sub>e</sub> each) RHU (12/1 W <sub>th</sub> each)	Successfully placed on interplanetary trajectory; ops terminated 1995
VIKING 1	Mars exploration	Aug 75	SNAP-19 (2/40 W <sub>e</sub> each)	Successfully placed on Mars; ops terminated 1982
VIKING 2	Mars exploration	Sep 75	SNAP-19 (2/40 W <sub>e</sub> each)	Successfully placed on Mars; ops terminated 1982
LES 8	Communications	Mar 76	MHW-RTG (2/150 W <sub>e</sub> each)	Successfully achieved orbit for ops
LES 9	Communications	Mar 76	MHW-RTG (2/150 W <sub>e</sub> each)	Successfully achieved orbit for ops
VOYAGER 2	Solar system exploration	Aug 77	MHW-RTG (3/150 W <sub>e</sub> each) RHU (9/1 W <sub>th</sub> each)	Successfully placed on interplanetary trajectory; still operational
VOYAGER 1	Solar system exploration	Sep 77	MHW-RTG (3/150 W <sub>e</sub> each) RHU (9/1 W <sub>th</sub> each)	Successfully placed on interplanetary trajectory; still operational
GALILEO	Jovian exploration	Oct 89	GPHS-RTG (2/275 W <sub>e</sub> each) LWRHU (120/1 W <sub>th</sub> each)	Successfully placed in orbit around Jupiter; deorbited into atmosphere of Jupiter following end-of-mission
ULYSSES	Solar polar exploration	Oct 90	GPHS-RTG (1/275 W <sub>e</sub> )	Successfully placed in orbit around Sun; ops terminated 2009
MARS PATHFINDER	Mars rover exploration	Dec 96	LWRHU (3/1 W <sub>th</sub> each)	Successfully placed on Mars; rover ceased ops in 1997
CASSINI	Saturnian exploration	Oct 97	GPHS-RTG (3/275 W <sub>e</sub> each) LWRHU (117/1 W <sub>th</sub> each)	Successfully placed in orbit around Saturn; still operational
MER-A (Spirit)	Mars rover exploration	Jun 03	LWRHU (8/1 W <sub>th</sub> each)	Successfully placed on Mars; ops ended 2010
MER-B (Opportunity)	Mars rover exploration	Jul 03	LWRHU (8/1 W <sub>th</sub> each)	Successfully placed on Mars; still operational
NEW HORIZONS	Pluto/Kuiper Belt Exploration	Jan 06	GPHS-RTG (1/245 W <sub>e</sub> )	En-route to Pluto w/arrival in 2015
MSL (Curiosity)	Mars rover exploration	Nov 11	MMRTG (1/110 W <sub>e</sub> )	Successfully placed on Mars; still operational