
इसरो isro
PSLV C57
INDIA
PSOMXL4
PSOMXL5
PSLV-C57/
ADITYA-L1
MISSION

PSLV-C57 / ADITYA-L1 MISSION

PSLV-C57 is the 59th flight of PSLV and 25th mission using PSLV-XL configuration. It is planned from Second Launch Pad (SLP), SDSC, SHAR. PSLV-C57 will launch Aditya-L1 spacecraft in a highly eccentric Earth bound orbit. The spacecraft will perform orbital maneuvers by using its LAM to reach Sun-Earth Lagrange point L1 (1.5 million kilometers from Earth, in a halo orbit).

PSLV-C57 Characteristics

Vehicle Height	44.4 m
Lift off Mass	321 t
Propulsion Stages	
First Stage	6PSOM-XL + S139
Second Stage	PL40
Third Stage	HPS3
Fourth Stage	L2.5 (Ti)

PSLV-C57 Mission Specifications

Apogee (Altitude wrt. Equatorial Earth Radius)	19500 km
Perigee (Altitude wrt. Equatorial Earth Radius)	235 km
Inclination	19.2^0
Argument of Perigee	346.6^0
Launch Pad	SLP
Launch Azimuth	104^0
Aditya-L1 Spacecraft Mass	1480.7 kg

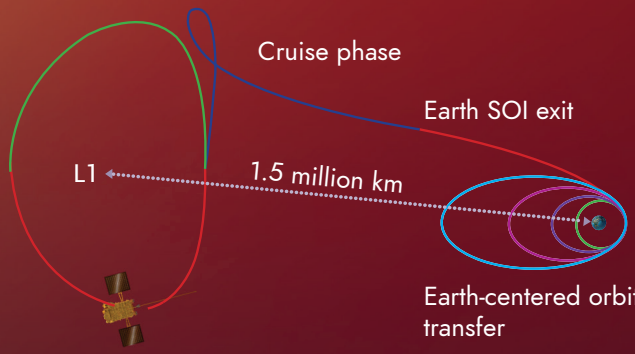
PSLV-C57 Stages at a Glance

	Stage 1		Stage 2	Stage 3	Stage 4
	PS1	PSOM-XL	PS2	HPS3	PS4
Length (m)	20	12	12.8	3.6	3.0
Diameter (m)	2.8	1	2.8	2	1.34
Propellant	Solid (HTPB based)		Liquid (UH25+N_2O_4)	Solid (HTPB based)	Liquid (MMH+MON3)
Propellant Mass (t)	139	12.2	41	7.65	2.5

PSLV-C57 / ADITYA-L1 MISSION

ISRO ventures into the study of solar activities and its effect on space weather. The scientific objectives of Aditya-L1 mission includes, study of coronal heating, solar wind acceleration, Coronal Mass Ejections (CME), dynamics of solar atmosphere and temperature anisotropy.

Aditya-L1 Mission Trajectory



Aditya-L1 spacecraft - stowed view

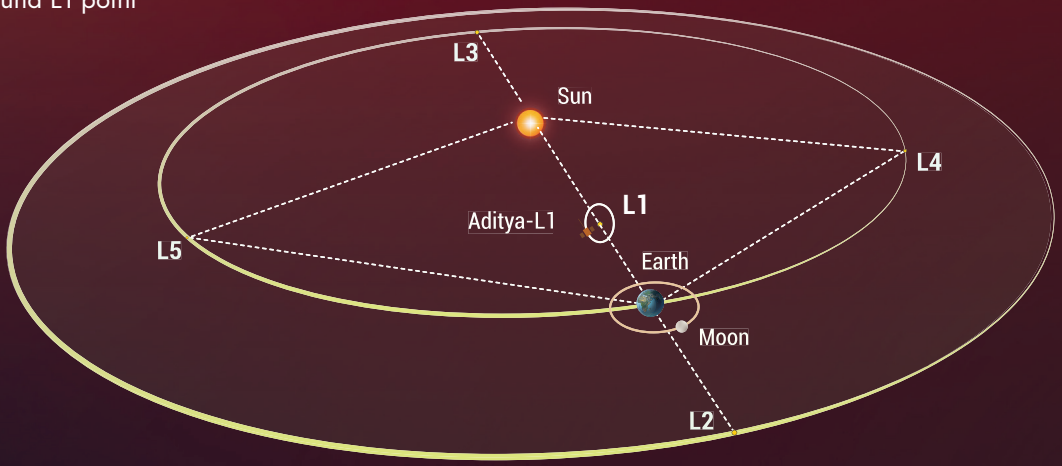
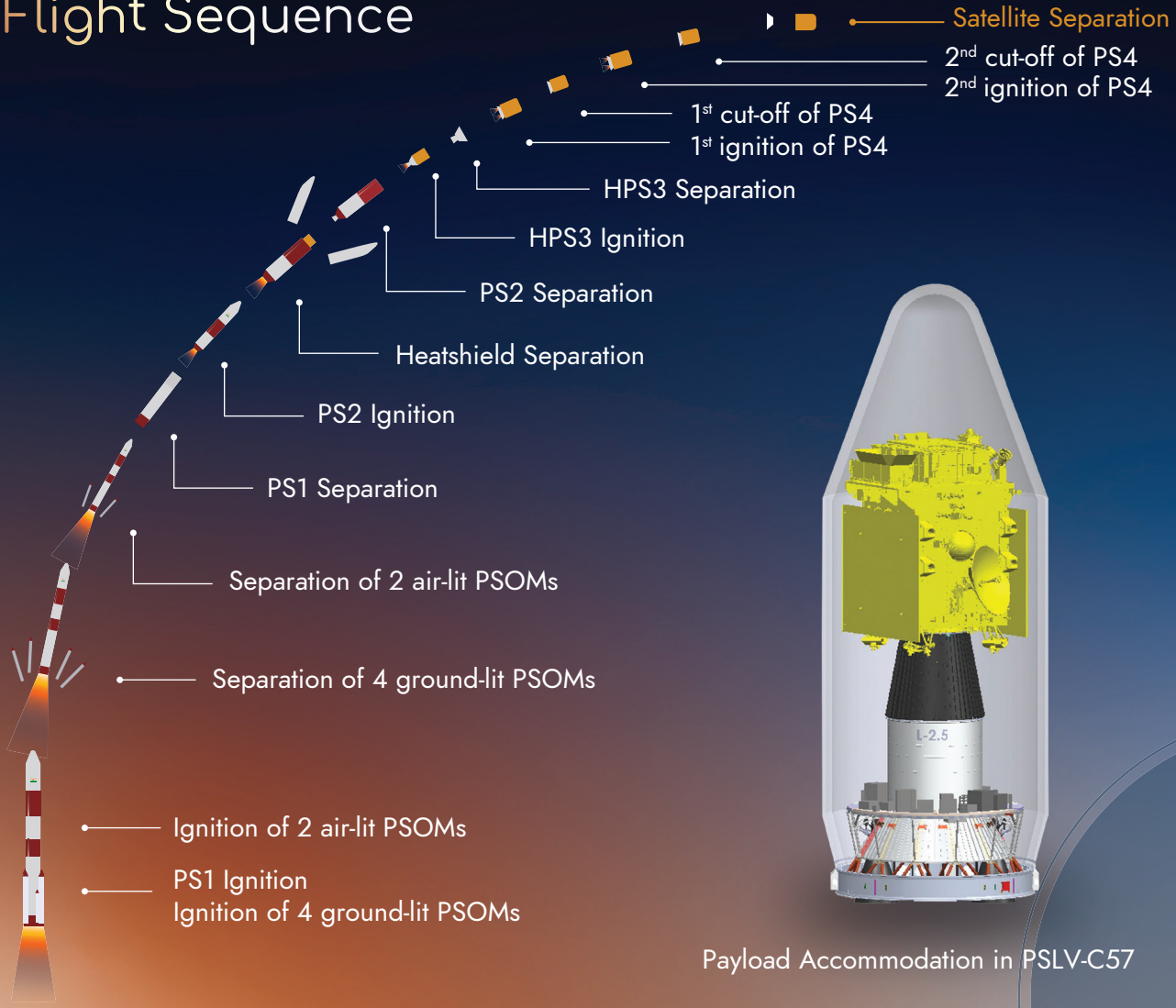


Illustration of all five Lagrange points of Sun-Earth system. The spacecraft will be placed around Largrange point 1.

PSLV-C57
Flight Sequence



Payload Accommodation in PSLV-C57

PSLV-C57 Typical Flight Profile

Event	Time (s)	Local Altitude (km)	Inertial Velocity (m/s)
RCT Ignition	-3	0.025	451.9
PS1 Ignition	0	0.025	451.9
PSOM XL 1,2 (GL) Ignition	0.42	0.025	451.9
PSOM XL 3,4 (GL) Ignition	0.62	0.025	451.9
PSOM XL 5, 6 (AL) Ignition	25.0	2.725	625.9
PSOM XL 1,2 (GL) Separation	69.9	24.196	1479.5
PSOM XL 3,4 (GL) Separation	70.1	24.326	1484.5
PSOM XL 5,6 (AL) Separation	92.0	40.558	2094.5
PS1 Separation	109.40	55.496	2407.3
PS2 Ignition	109.60	55.663	2406.8
CLG Initiation	114.60	59.745	2435.0
PLF Separation	204.40	113.220	3756.5
PS2 Separation	262.38	130.372	5400.7
PS3 Ignition	263.58	130.597	5400.3
PS3 Separation	581.42	192.868	7728.3
PS4 Burn-1 Ignition	1493.52	313.067	7587.5
PS4 Burn-1 Cut-off	1523.38	313.070	7677.8
PS4 Burn-2 Ignition	3127.52	217.614	7793.6
PS4 Burn-2 Cut-off	3599.52	342.650	9695.0
Aditya-L1 Separation	3799.52	648.781	9429.2
MON Passivation Start	4042.52	1232.269	8956.9
MMH Passivation Start	4382.52	2298.785	8212.3

PAYLOADS

The spacecraft carries seven scientific payloads for systematic study of the Sun. All payloads are indigenously developed in collaboration with various ISRO Centres and Scientific Institutes.

VELC
Corona/ Imaging, Spectropolarimetry & Spectroscopy, IIA, LEOS, URSC, IISU, SAC

SUIT
Photosphere and Chromosphere / Imaging, IUCAA, LEOS, URSC, IISU

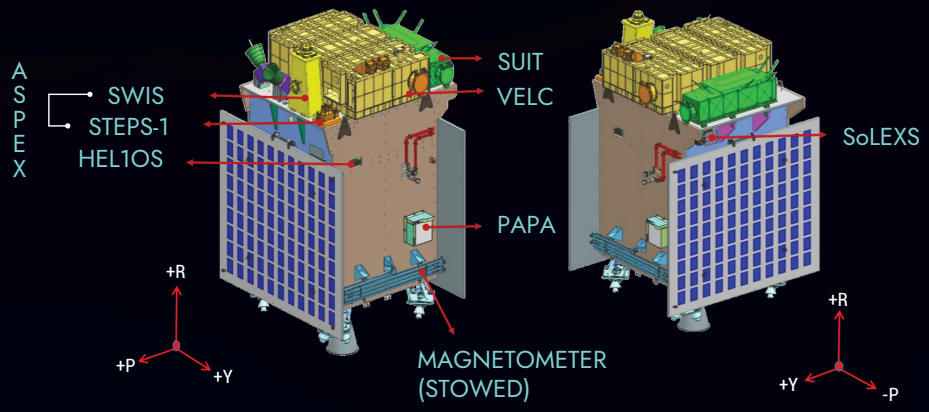
SoLEXS
Soft X-ray spectrometer, URSC

HEL1OS
Hard X-ray spectrometer, URSC

ASPEX
Solar wind / Particle Analyzer/ In-situ measurement, PRL (SAC)

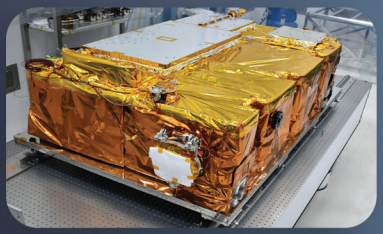
PAPA
Solar wind / Particle Analyzer/ In-situ measurement, VSSC

MAG
Measure magnetic field / In-situ measurement, LEOS



The location of all seven payloads.

R, P, and Y indicate the Raw, Pitch, and Roll axis of the spacecraft.

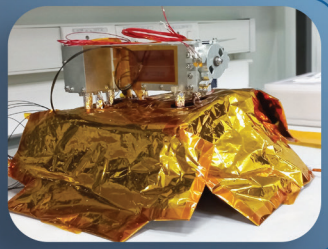


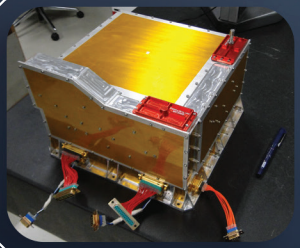
Visible Emission Line Coronagraph

VELC is the prime payload designed as a reflective coronagraph with a multi-slit spectrograph.

Solar Low Energy X-ray Spectrometer

SoLEXS is a soft X-ray spectrometer designed to measure the solar soft X-ray flux to study solar flares.



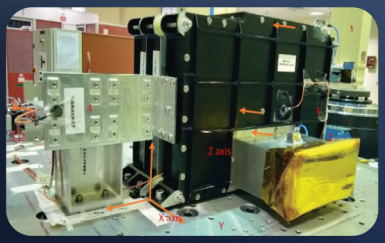


Plasma Analyser Package for Aditya

PAPA is designed to understand solar winds and its composition and, do mass analysis of solar wind ions.

High Energy L1 Orbiting X-ray Spectrometer

HEL1OS is a hard X-ray spectrometer designed to study solar flares in the high energy X-rays.

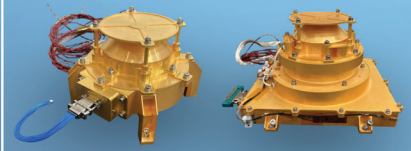


Solar Ultra-violet Imaging Telescope

SUIT is a UV telescope to image the solar disk in the near ultra-violet wavelength range.

Aditya Solar wind Particle EXperiment

ASPEX payload comprises 2 Subsystems: SWIS and STEPS



Solar Wind Ion Spectrometer is a low-energy spectrometer designed to measure the proton and alpha particles of the solar wind.

Suprathermal and Energetic Particle Spectrometer is a high-energy spectrometer designed to measure high-energy ions of the solar wind.

Magnetometer

MAG will measure the low intensity interplanetary magnetic field in space. It has two sets of Magnetic Sensors: one at the tip of a 6 meter deployable boom, and the other in the middle of the boom, 3 meters away from the spacecraft.

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