



LEOSTAR™-3

SPECIFICATIONS

SPACECRAFT FEATURES

Design Life: Fully Redundant, 5-year design life Ps 0.97

Structure: Aluminum frame with honeycomb panels.

Attitude Control System: Wheel based 3-axis Zero Momentum Bias with magnetic momentum desaturation. Star tracker, IMU, and coarse sun sensors. Instrument in the loop accommodated

Standard ACS performance:

Pointing accuracy	21 arcsec three sigma
Pointing knowledge	5 arcsec three sigma
Pointing Stability	0.7 arcsec/sec over 2.5 sec
Jitter	1.2 arcsec three sigma
	below 500Hz
Slew	180 degrees in 9.5 minutes

Propulsion: Hydrazine monopropellant blowdown

Tank capacity:	438 kg
Delta V:	322 m/s based on 3030 kg launch wet mass

Command & Data Handling: Fully redundant cPCI Integrated Electronics Module for spacecraft component interfaces and instrument state of health telemetry interfaces. Separate Payload Interface Electronics (PIE) for instrument science data interfaces. Separate solid-state recorder.

Power system: Series switched direct energy transfer. Solar array 4180W at 5 years.

Communication:

Command (NEN):	1 kbps or 32kbps S-Band
Command (SN):	1 kbps S-Band
SOH telemetry (NEN)	32 kbps or 1 Mbps S-Band
SOH telemetry (SN)	4, 8, 16, 32 kbps S-Band
Mission data:	384 Mbps X-Band

Thermal: Cold-biased passive thermal control design with thermostatically or software-controlled and FPGA-controlled heater circuits for precision temperature stability.

Additional Capabilities: Larger launch mass and instrument size (Launch Vehicle dependent)

Higher instrument power

Improved pointing with instrument in the loop

Higher rate communications at Ka-Band

Mission operations



GEOEye-1 Commercial Earth Imaging Satellite



NASA's Fermi Gamma Ray Telescope Observatory

MORE INFORMATION

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LEOSTAR™-3

Our LEOStar-3 spacecraft is a high performance, versatile and expandable vehicle for space and earth science missions, remote sensing, and commercial applications. LEOStar-3 spacecraft have flown on Pegasus®, Minotaur, Delta II and Atlas V, and are compatible with other launch vehicles including Falcon 9 and Antares™. The spacecraft, most often flown in low earth orbit, is readily adaptable to HEO, GEO, MEO, lunar, earth trailing or lagrange points. The scalability of the LEOStar-3 allows expansion of the standard capacity, higher mass, higher power, or larger instruments or suites of instruments. We have accommodated instrument suites with masses to 3000 kg and as many as seven different instruments.

FACILITIES AND SERVICES

We manufacture spacecraft in our Dulles, Virginia; Gilbert Arizona; and Redondo Beach California facilities. Each facility possesses the floor space to integrate the spacecraft and observatory including the capability to maintain contamination sensitive instruments under purge and to operate at a class 10k level. Each site is able to perform EMI/EMC, thermal vacuum, acoustic and vibration testing to qualify an observatory environmentally. Additionally our Dulles Mission Control Center can provide mission operations for LEOStar-3 missions.

PAYLOAD ACCOMMODATION

Mass: 850 kg standard. Up to 3000kg flown.

Power: 580W orbit-average-power standard. The scalable spacecraft power system can accommodate higher power payloads.

Data interface: Two LVDS at 588 Mbps standard. RS422, 1553, SpaceWire available.

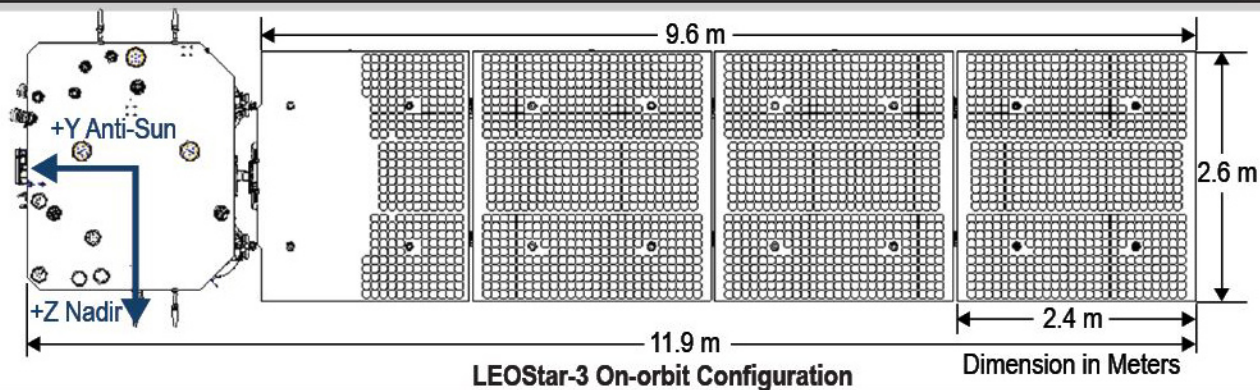
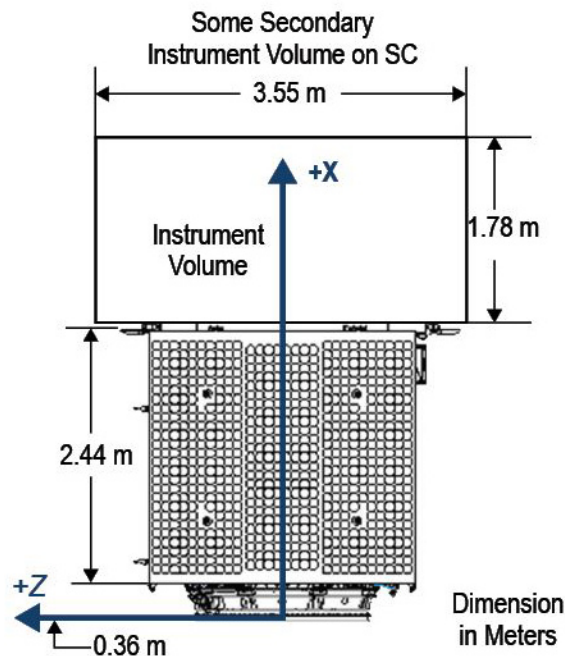
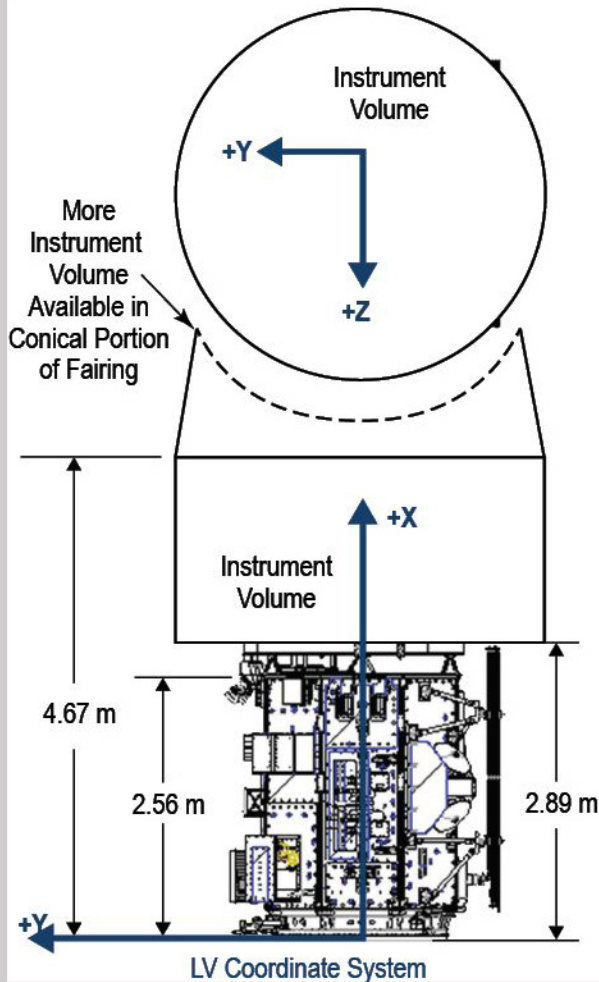
Mission data storage: Up to 4Tb

Thermal: Instrument deck thermally isolated from spacecraft. Cold side unobstructed with two-pi steradian view to space.

Instrument Mounting: Instrument deck on top of spacecraft.

Instrument volume: 2.11m high by 3.55m diameter standard excluding instrument deck in an 4m Atlas fairing. Other configurations possible. Launch Vehicle fairing dependent.

LEOSTar-3 Stowed Configuration With Instrument Volume



Months	4	8	12	16	20	24	28	32	36	40	44	48	52	56	
SRR/MDR	▼	▼	PDR	▼	CDR				IIRR	▼	▼	PER	▼	PSR	▼
OAR															
Preliminary Design	█														
Detail Design			█												
Spacecraft AI&T				█											
Observatory I&T										█					
Ship and Launch												█			
On-orbit Test													█		

* Task durations include schedule reserves

LEOSTAR™-3 MISSIONS

LANDSAT 9

Mission: Earth resources monitoring

Launch: 2021

Status: In development

JPSS-2, 3, & 4 - JOINT POLAR SATELLITE SYSTEM-2, 3, & 4

Mission: Earth science

Launch: 2022, 2024, 2026; ATLAS-V, Falcon 9 or Delta IV

Status: In development

ICESAT-2 - ICE, CLOUD AND LAND ELEVATION SATELLITE-2

Mission: Earth science

Launch: September 15, 2018; Delta II

Status: Operational. Performing baseline mission

LANDSAT 8

Mission: Earth resources monitoring

Launch: February 11, 2013; Atlas V

Status: Baseline mission complete, currently in extended operations

GEOEYE-1

Mission: Commercial Earth imaging

Launch: September 6, 2008; Delta II

Status: Baseline mission complete, currently in extended operations

FERMI GAMMA-RAY SPACE TELESCOPE

Mission: Gamma-ray observation

Launch: June 11, 2008; Delta II

Status: Baseline mission complete, currently in extended operations

C/NOPS - COMMUNICATION/NAVIGATION OUTAGE FORECASTING SYSTEM

Mission: Technical demonstration

Launch: April 16, 2008; Pegasus XL

Status: Retired and re-entered 11/25/15

NFIRE - NEAR FIELD INFRARED EXPERIMENT

Mission: Technical demonstration

Launch: April 24, 2007; Minotaur I

Status: Retired and re-entered 11/4/15

SWIFT

Mission: Gamma-ray burst detection

Launch: November 20, 2004; Delta II

Status: Baseline mission complete, currently in extended operations

CORIOLIS

Mission: Meteorological science

Launch: January 6, 2003; Titan II

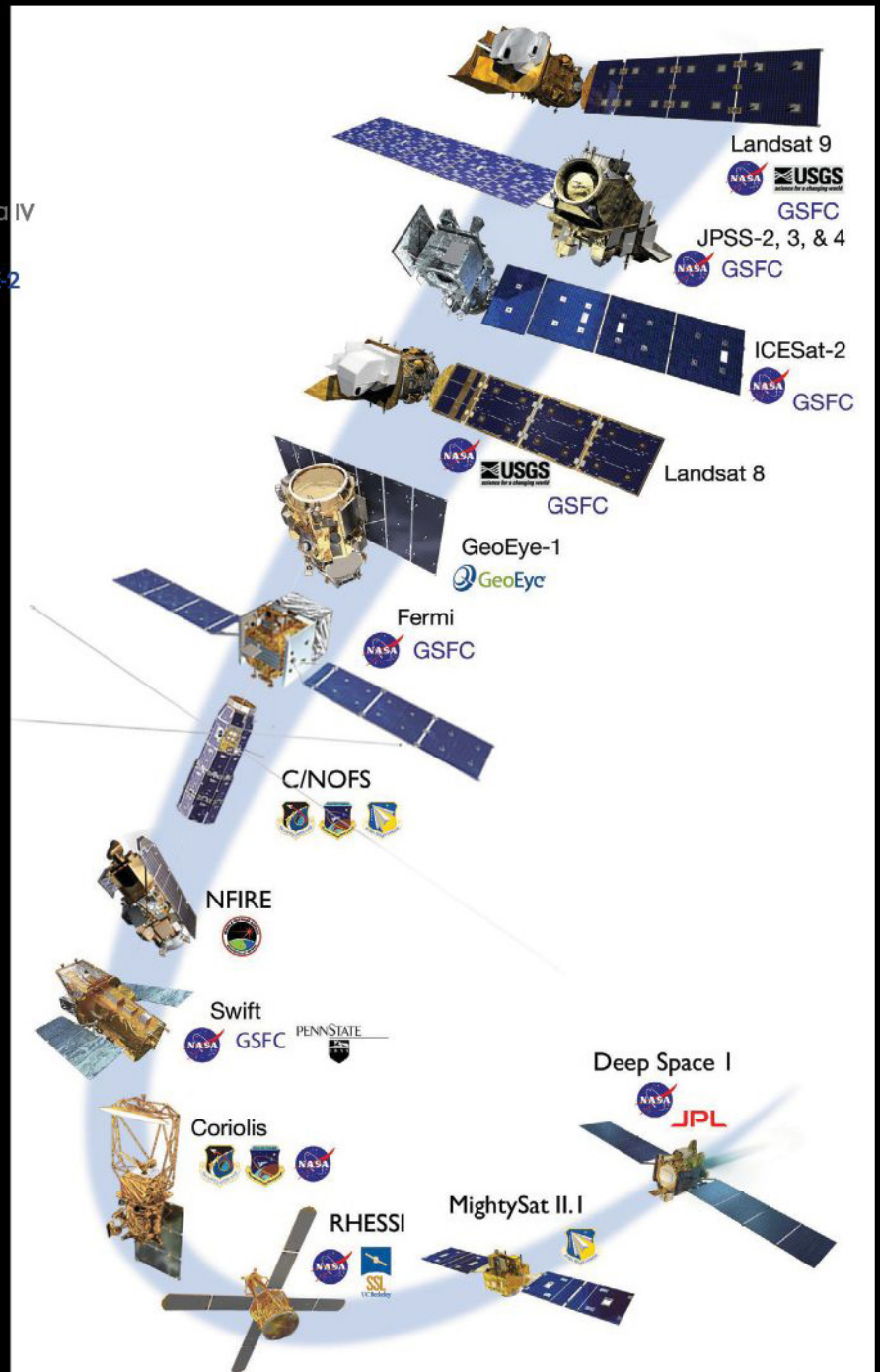
Status: Baseline mission complete, currently in extended operations

RHESSI - REUVEN RAMATY HIGH ENERGY SOLAR SPECTROSCOPIC IMAGER

Mission: High energy solar physics

Launch: February 2, 2002; Pegasus XL

Status: Retired August 16, 2018



*Unclassified Missions Only

MIGHTYSAT II.1

Mission: Technology demonstration

Launch: July 19, 2000; Minotaur I

Status: Mission completed

DSI - NEW MILLENNIUM DEEP SPACE I

Mission: Technology demonstration and planetary exploration

Launch: October 24, 1998; Delta II

Status: Mission completed