

Aditya-L1

First Space-Based Indian Observatory To Study The Sun

Why In The News

- The ISRO Is All Set To Launch The Latest Spacecraft After The Successful Landing Of Chandrayaan 3. ISRO Is Going To Launch Aditya L1 Mission Which Is **The 1st Solar Mission By ISRO**. As Per Details Available With Us, Aditya L-1 Launch Date Is **2nd September 2023 From Sriharikota**.
- The **Aditya L1 Mission 2023** Is Announced By The Indian Space & Research Organization As Per Which This Spacecraft Will Carry The Payload Till **Lagrangian Point** And It Will Read The Behavior Of Sun.



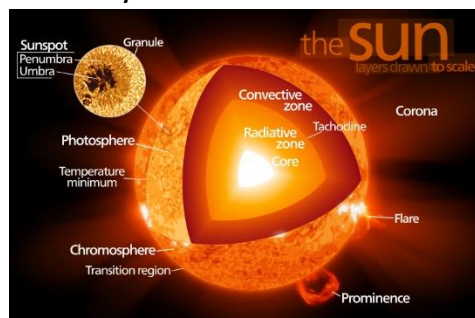
ISRO @isro · 18h ·
PSLV-C57/ Aditya-L1 Mission:

The launch of **Aditya-L1**, the first space-based Indian observatory to study the Sun ☀️, is scheduled for September 2, 2023, at 11:50 Hrs. IST from Sriharikota.



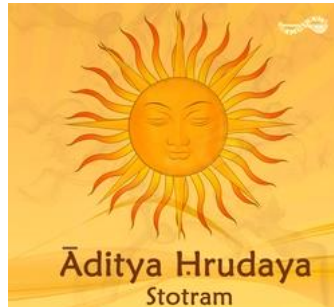
Why Studying Sun Is Important

- The Sun Is A Made Of **Super-Hot Ionized Gas - Plasma**. The Sun's Atmosphere Change Continually, Driven By The Magnetic Forces. We Study The Sun To Understand **Ever-changing Conditions Can Influence Earth**, Radiations Which Are Emitted By The Sun But They Do Not Reach The Earth's Surface.



Why Name Aditya

- **Aditya L1** (Sanskrit: आदित्य, Lit: Sun). Aditya-L1, Named After The Sun's Core, Aims To Provide Unprecedented Insights Into The **Sun's Behavior** By Placing Itself In A Halo Orbit Around **The Lagrange Point 1 (L1)** Of The Sun-earth System, Approximately 1.5 Million Kilometers From Earth.

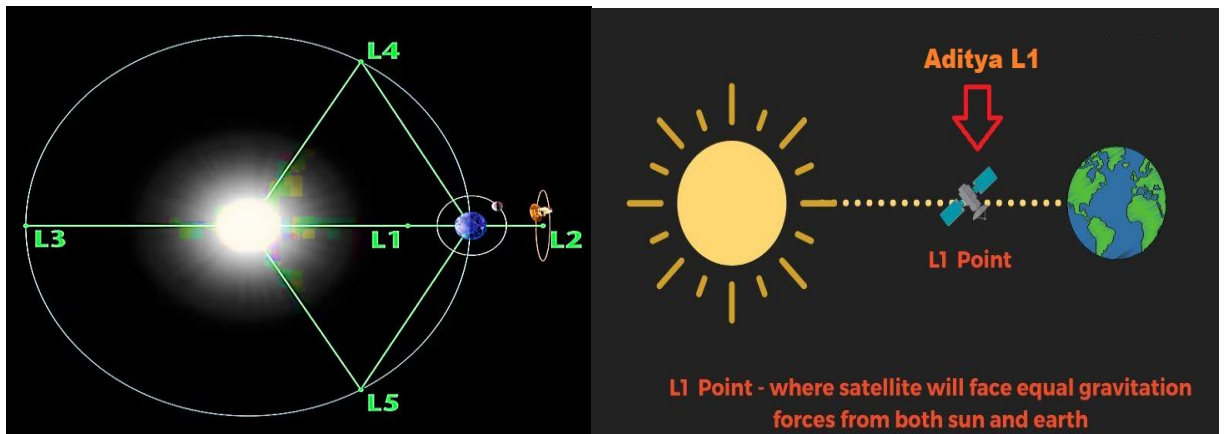


Aditya L1 Mission Budget

- Budget Of **3 Crore** INR Was Allocated Previously when it was only for studying corona. But Now ISRO Aditya L1 Mission Budget is **Rs 400 Crore** and ISRO Started working on Aditya L1 from December 2019.

What Is Lagrange Point

- It Is A Position In Space Where **“The Gravitational Pull Of Two Large Masses Precisely Equals** The Centripetal Force Required For A Small Object To Move With Them”. Basically, An Object Placed At This Point Will Effectively **Stay In The Same Relative Position** While Moving.
- Lagrange Points Named After **Italian-French Mathematician Joseph-Louis Lagrange** & There Are 5 Points **L1, L2, L3, L4 & L5**. According To NASA, “The L1 Point Of The Earth-sun System Affords An Uninterrupted View Of The Sun And Is Currently Home To The **Solar And Heliospheric Observatory Satellite SOHO.**”



History

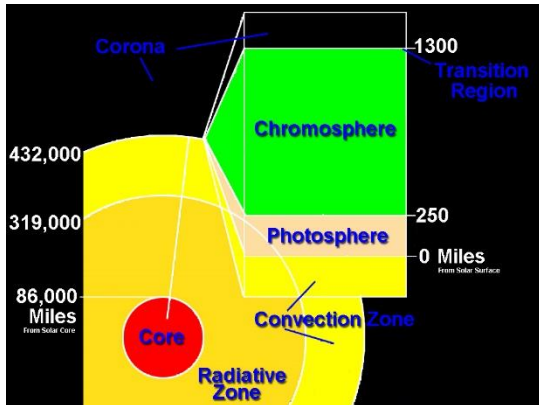
- Aditya Was Conceptualized In **January 2008** By The Advisory Committee For Space Research. It Was Initially Envisaged As A **Small 400 Kg**, LEO(800 Km) Satellite With A Coronagraph To **Study The Solar Corona**. An Experimental Budget Of **3 Crore INR** Was Allocated For The Financial Year 2016–2017.
- The Scope Of The Mission Has Since Been Expanded & Now Planned To Be A Comprehensive Solar And Space Environment Observatory To Be Placed At **The Lagrange Point L1**. The Mission Was Renamed "**Aditya-L1**". **As Of July 2019**, The Mission Has An Allocated Cost Of ₹378.53 Crore Excluding Launch Costs.



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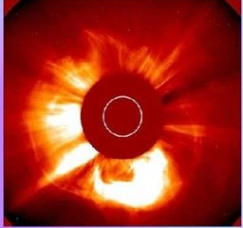
Objectives Of Aditya L1

- Observe The **Photosphere** (The Deepest Layer Of The Sun), **Chromosphere** (The Layer About 400 Km And 2,100 Km Above The Photosphere), & **Corona** (The Outermost Layers Of The Sun), Using Electromagnetic And Particle And Magnetic Field Detectors.
- The Suits Of **Aditya L1 Payloads** Are Expected To Provide Most Crucial Informations To Understand The Problem Of **Coronal Heating, Coronal Mass Ejection, Pre-flare And Flare Activities** And Their Characteristics, Dynamics Of Space Weather, Propagation Of Particle And Fields Etc.



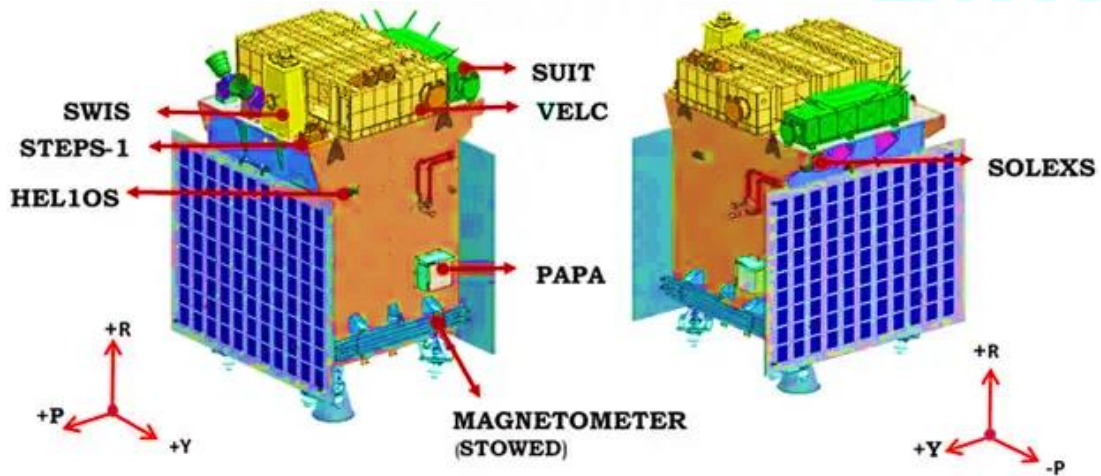
Coronal Mass Ejection

- Also known as CME
- CMEs are huge bubbles of gas with magnetic field lines that are ejected from the Sun over the course of several hours



Payloads Aditya-L1 Mission Will Carry

- **Visible Emission Line Coronagraph- Corona/Imaging, Solar Ultraviolet Imaging Telescope- Photosphere And Chromosphere Imaging, Solar Low Energy X-ray Spectrometer- Which Is A Soft X-ray Spectrometer For Sun, High Energy L1 Orbiting X-ray Spectrometer- Hard X-ray Spectrometer For Sun.**
- **Aditya Solar Wind Particle Experiment- Solar Wind/Particle Analyzer Protons And Heavier Ions, Plasma Analyzer Package For Aditya- Solar Wind/Particle Analyzer Electrons & Advanced Tri-axial High Resolution Digital Magnetometers For In Situ Magnetic Field Study.**



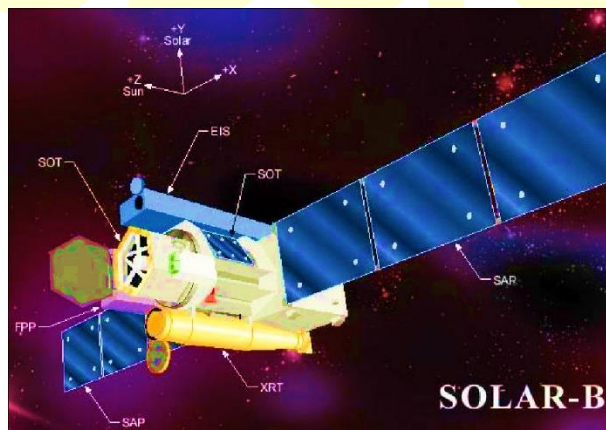
Aditya L1 Launch Vehicle

The Aditya L1 Launch Vehicle Is **PSLV-XL** And It Will Carry The Spacecraft In Space. The Launch Site Is **Sriharikota**. Aditya L-1 Is 2nd Consecutive Mission Of ISRO After The Launch Of Chandrayaan 3.



Other Solar Mission

- **Active Solar Missions By NASA-** Advanced Composition Explorer Launched In August-1997, Solar Terrestrial Relations Observatory In October, 2006, Solar Dynamics Observatory In February, 2010, & Interface Region Imaging Spectrograph Launched In June, 2013
- In 2006, **Hinode (SOLAR-B)** Was Launched, Which Was The Successor To Yohkoh (SOLAR-A), The Orbiting Solar Observatory By Japan, Launched In Collaboration With The U.S. And The U.K.



Future Solar Mission

- Launching In 2024, ESA's **Proba-3** Consists Of Two Spacecraft That Will Fly In Formation To Create A Coronagraph That Will Study The Inner Layers Of The Sun's Atmosphere.

