

Chandrayaan-3 Lands On Moon

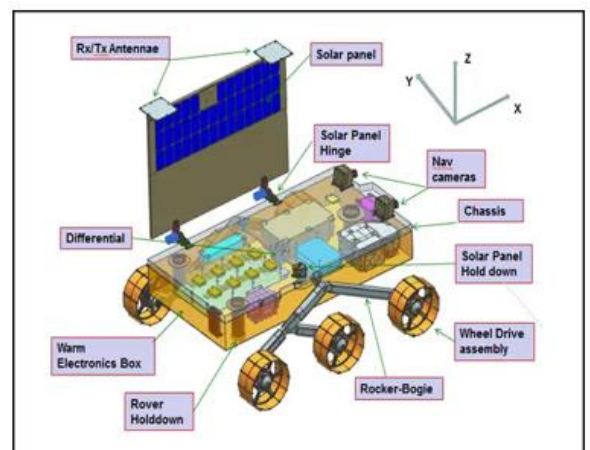
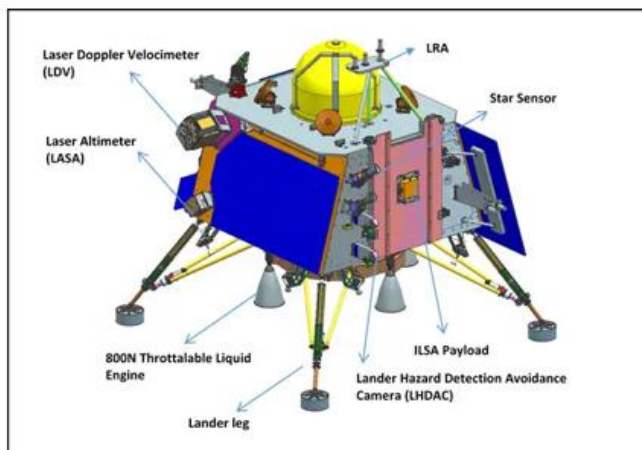
What's Next For ISRO?

Why In The News?

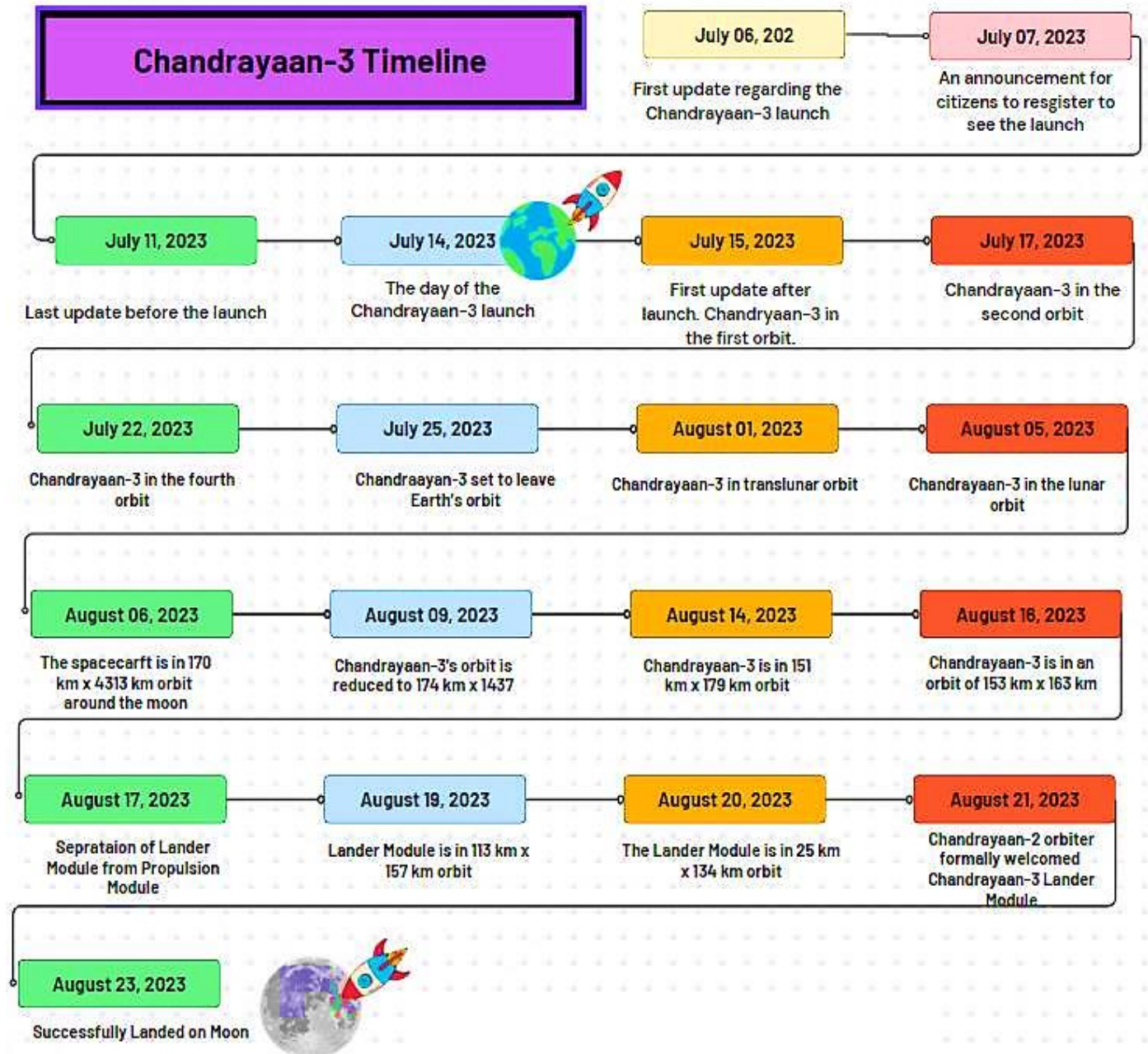
- **India's Chandrayaan-3 Landed On The Moon's South Pole.** The Successful Moon Mission Made India The **4th Country To Achieve A Soft Landing On The Lunar Surface** After The US, China, Russia & **1st Country To Land On South Pole.**



- After 40 Days Of Wait, Chandrayaan-3 Made A Successful Soft-landing On Moon's South Pole Region. **Vikram Lander** With A Mass Of 1749.86 Kg Including **Rover Pragyan** Inside It, Has A Mission Life Of **One Lunar Day**, Which Is Equivalent To **14 Earth Days**.



Tracing The Timeline Of Chandrayaan-3



Objectives Of Chandrayaan-3 Mission

- The Indian Spacecraft Will Measure The **Near-Surface Plasma (Ions And Electrons) Density Of The Moon's Soil**. The Chandrayaan-3 Will Also Measure **Seismicity Around The Landing Site Of The Moon**.
- The Mission Will Help In Discovering **What Kinds Of Chemicals Are Found On Moon's Soil**. AN Alpha Particle X-ray Spectrometer (APXS) Will Determine The **Elemental Composition** Such As Magnesium, Aluminium, Silicon, Potassium, Calcium, Titanium, And Iron) Of **Lunar Soil And Rocks**.

Companies In Making Of Chandrayaan-3 Spacecraft

- **Larson And Tubro:** It Supplied Critical Booster Segments, Namely The Head End Segment, Middle Segment, And Nozzle Bucket Flange, Among Other Things.
- **Mishra Dhatu Nigam:** The State-owned Firm Supplied Critical Materials Such As Cobalt Base Alloys, Nickel Base Alloys, Titanium Alloys, And Special Steels For The Launch Vehicle Of The Chandrayaan3 Spacecraft
- **BHEL:** The Government-owned Firm Supplied Bi-metallic Adaptors For Chandrayaan 3.
- **Godrej Aerospace:** It Produced Key Engines And Thrusters Including L110 For The Core Stage And CE20 Engine Thrust Chamber For The Upper Stage.
- **Ankit Aerospace:** The Company Claims To Have Supplied Alloy Steel, Stainless Steel Fasteners, And Specially crafted Titanium Bolts
- **Walchandnagar Industries:** The Firm Helped With Booster Segments S200 Used In The Launch Vehicle, Flex Nozzle Control Tankages, And S200 Flex Nozzle Hardware.



People Behind The Making Of Chandrayaan-3

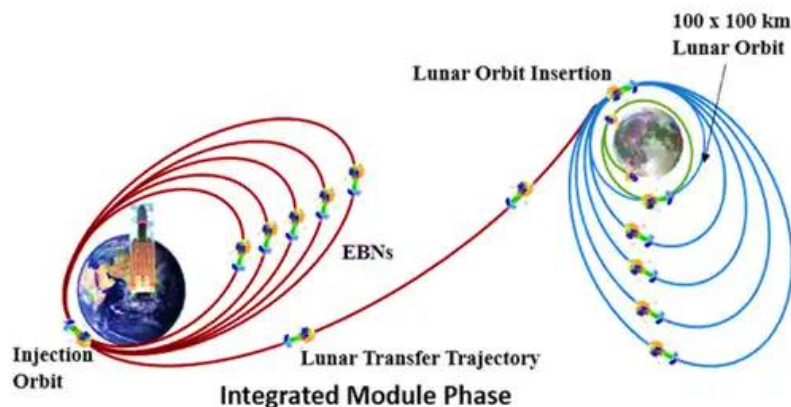
- **ISRO Chairman S Somanath** Assumed Leadership Of ISRO In January 2022 And Became A Pivotal Figure In India's Ambitious Moon Mission. He Is Overseeing Missions Like **Chandrayaan-3, Aditya-L1 (A Mission To Study The Sun), And Gaganyaan (India's First Manned Mission).**

- Other Significant People Behind Chandrayaan-3 Are: **Project Director, P Veeramuthuvel; Unnikrishnan Nair, Director Of Vikram Sarabhai Space Centre; M Sankaran, Director Of U R Rao Satellite Centre (URSC).**



Cost Of Chandrayaan-3 Mission

- ISRO's Chandrayaan-3 Mission Cost Is Roughly **₹650 Crore** Which Is Far Lower Than Those Of Other Countries, And A Testament To India's Frugal Space Engineering.



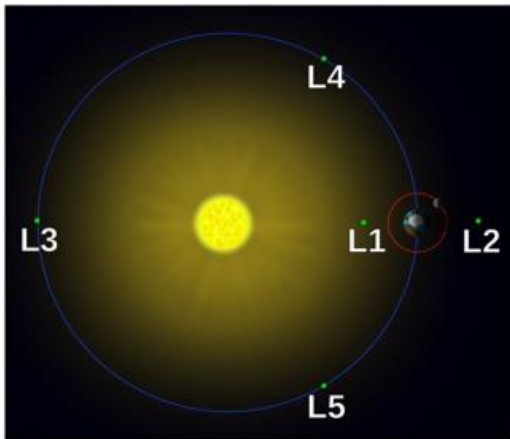
Significance Of Earlier Chandrayaan Missions

- India Found **Frozen Water Deposits** In The Darkest And Coldest Parts Of The Moon's Polar Regions For The First Time Using Data From The **Chandrayaan-1 Spacecraft In 2009**. Chandrayaan-1, India's First Mission To The Moon, Was Launched On **October 22, 2008**, From Sriharikota In Andhra Pradesh.

- A Decade Later, ISRO Launched **Chandrayaan-2 In 2019**. However, The Lander With A Rover In Its Belly Crash-landed On The Lunar Surface In The Final Lap, Failing In Its Objective To Touch Down Gently.

ISRO's Upcoming Missions After Chandrayaan-3

- **Aditya-L1 (2023):** With An Expected Cost Of Rs 378 Crore It Will Be The First Space-based Observatory Class **Indian Solar Mission** To Study The Sun. The Spacecraft Is Planned To Be Placed In A Halo Orbit Around Lagrangian Point 1 (L1) Of The Sun-earth System, Which Is About 1.5 Million Km From The Earth.



- **NASA-ISRO SAR (NISAR) Satellite (Jan 2024):** With An Expected Cost Of Rs 12,296 Crore It Is A **Low-Earth Orbit (LEO) Observatory** Being Jointly Developed By NASA And ISRO.
- It Will **Map The Entire Globe In 12 Days** And **Provide Spatially And Temporally Consistent Data For Understanding Changes In Earth's Ecosystems**, Ice Mass, Vegetation Biomass, Sea Level Rise, Groundwater, And Natural Hazards, Including Earthquakes, Tsunamis, Volcanoes, And Landslides.



- **Space Docking Experiment 'SPADEX' (Oct 2024):** With An Expected Cost Of **Rs 124 Crore** It Is A **Twin Spacecraft Mission** Being Developed By ISRO To Mature Technologies Related To Orbital Rendezvous, Docking, Formation Flying, And Other Proximity Operations With A Scope Of Applications In Human Spaceflight, In-space Satellite Servicing, And Other Proximity Operations.



- **Mangalyaan-2 (2024):** Mars Orbiter Mission 2, Also Called Mangalyaan-2, Is India's **Second Interplanetary Mission** Planned By ISRO. ISRO Plans To Launch This Mission By 2024. It Had Been Mentioned That Mangalyaan-2 Would Be Launched After Moon Mission Chandrayaan-3.



- **Gaganyaan (2024):** With An Expected Cost Of **Rs 9023 Crore** It Will Be **India's 1st Human Space Mission**. The Unmanned 'G1 Mission' Will Launch In The 4th Quarter Of 2023, The 2nd Unmanned 'G2 Mission' Will Launch In The Second Quarter Of 2024, And The **Final Human Space Flight 'H1 Mission' Will Launch In The Fourth Quarter Of 2024.**



- **Shukrayaan 1 (2031):** With An Expected Cost Of Rs 500 Crore To Rs 1,000 Crore It Was ISRO's Venus Mission Was Expected To Be Launched In December 2024 But Has Been **Pushed To 2031** As Optimal Launch Windows From Earth To Venus Occur Once **Every 19 Months**.
- Both The U.S. And The European Space Agencies Have Venus Missions Planned For 2031 - **VERITAS And Envision**, Respectively - While China May Launch Around 2026 Or 2027.

