

# Aditya-L1

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## Aditya-L1: Advancing Solar Research

### Context

- The Sun influences **space weather**, affecting satellites, communication, and power grids.
  - **Aditya-L1**, India's first solar observatory at L1 (1.5 million km from Earth), ensures uninterrupted solar studies.
  - Recently, its **SUIT telescope captured the first-ever detailed image of a solar flare 'kernel'**, marking a major breakthrough.
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### Solar Corona: The Sun's Outer Layer

- The **corona** extends millions of kilometers, with temperatures **1-10 million K**, much hotter than the surface (~5,800 K).
  - Made of **highly ionized plasma**, emitting **ultraviolet and X-ray radiation**.
  - Key for **understanding coronal heating and solar wind formation**.
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### Solar Flares: Intense Solar Energy Bursts

- Sudden energy release due to **magnetic field reconnection**.
  - Classified into **A, B, C, M, and X-class**, with **X-class being the most powerful**.
  - Impacts **satellites, GPS, power grids, and astronauts**.
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### SUIT (Solar Ultraviolet Imaging Telescope)

- **First telescope to capture full-disk solar images in near-UV (2000-4000 Å).**
  - Helps study **ozone, solar radiation, and high-energy solar activity**.
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### Aditya-L1's Breakthrough Observation

- **SUIT recorded an X6.3-class solar flare**, one of the strongest observed.
- Captured **NUV brightening (200-400 nm)**, confirming how flare energy spreads across solar layers.
- Strengthens theories linking **lower atmosphere activity to corona heating**.

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## Conclusion

- **Aditya-L1 enhances India's space research, improving solar physics and space weather predictions.**
- **Its findings help protect satellites, astronauts, and communication systems from solar disruptions.**



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