Solar Magnetic Field Research

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Recently, **Astronomers** at the **Indian Institute of Astrophysics (IIA)** have found a new way to study the **Sun's magnetic field** by studying the **magnetic field** at different layers of the **solar atmosphere.** The astronomers have done this using data from **IIA's Kodaikanal Tower Tunnel Telescope.**

- **Research Details: The study focused on an** active sunspot **region characterised by complex features, including multiple umbrae (dark central regions) and a penumbra (outer lighter region).**
  - Observations were conducted using the **Hydrogen-alpha line** and the **Calcium II line**. These lines help infer the **magnetic field's stratification** at various heights in the solar atmosphere.
  - **Significance:** The findings are significant in advancing our understanding of the **Sun's magnetic field**, setting the stage for **future studies** to explore **solar magnetic phenomena** in greater detail.
- **Kodaikanal Tower Tunnel Telescope:** It is a three-mirror based Solar telescope owned and operated by the Indian Institute of Astrophysics.
  - British astronomer **John Evershed** first observed the **Evershed Effect** in **1909** at the **Kodaikanal Observatory in India.**
    - **Evershed Effect** is a phenomenon that describes the flow of gas across the surface of sunspots.
- **About Solar Atmosphere:** The solar atmosphere consists of **interconnected layers** through **magnetic fields**. These fields play a crucial role in transferring energy and mass, which helps address the **"coronal heating problem"** and drives the solar wind.
  - The coronal heating problem is a mystery in **solar physics** that involves understanding why the **Sun's corona** **(outermost layer of the Sun's atmosphere) is much hotter than the layers below it.**

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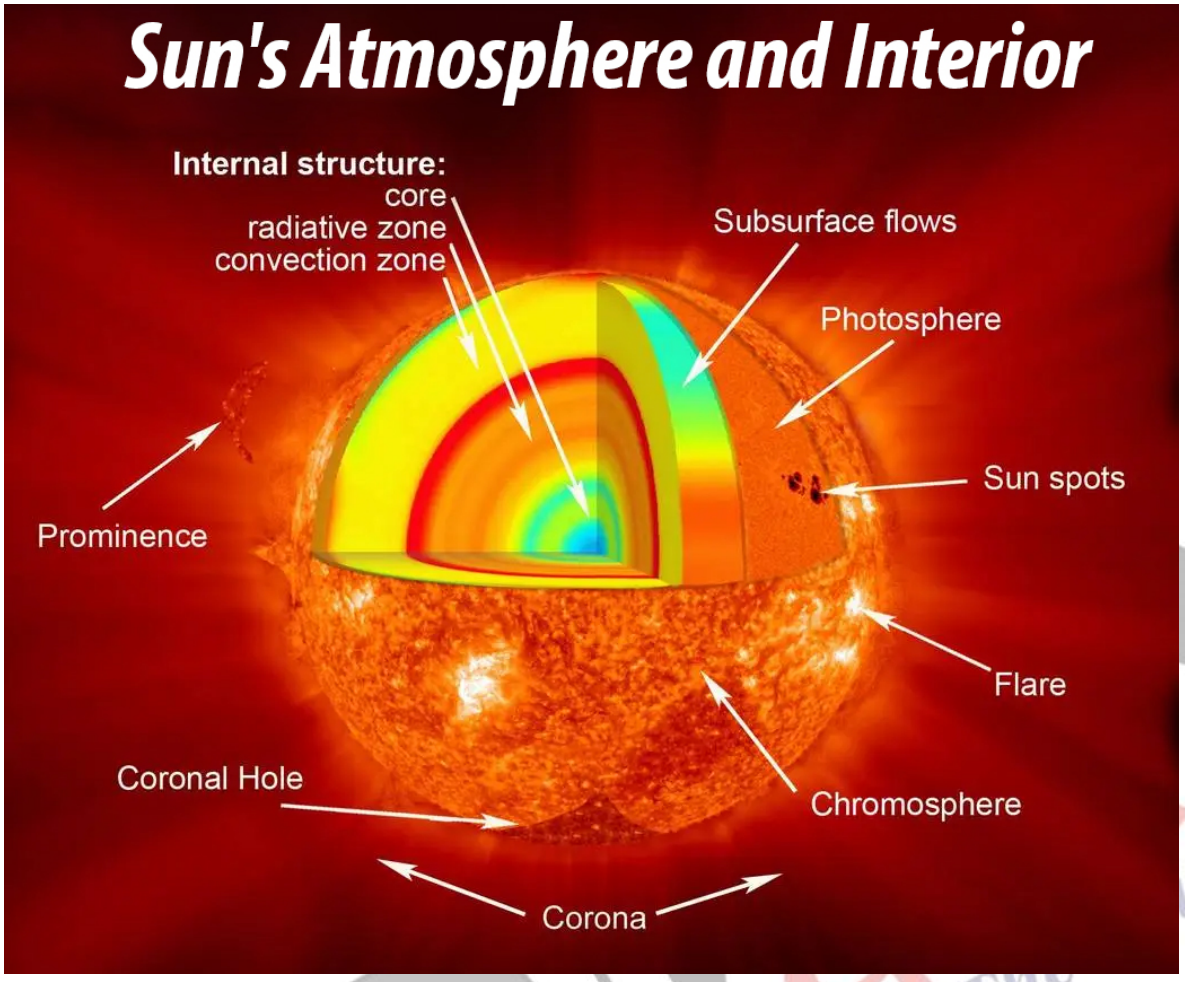

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