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### **1. Aurora lights in India: What caused them to be visible even from Ladakh?**

#### **Why in News?**

Aurora lights in red hues were visible from Ladakh's pristine skies late at night recently. Astronomers of the Indian Institute of Astrophysics, Bengaluru (IIA) captured the auroras through all-sky cameras positioned around the Indian Astronomical Observatory (IAO) in Hanle, Ladakh. Owned and operated by the IIA, IAO is equipped with these cameras capable of constantly imaging the sky.



Red aurora lights decked the skies over the Indian Astronomical Observatory (IAO) in Hanle, Ladakh. (Photo via IIA)

These lights, called auroras, are usually seen in high-latitude regions, namely the North and the South Pole. When witnessed near the North they are called Aurora Borealis, while those in the South are called Aurora Australis. Why were they seen across a wider region recently, including India?

#### **First, what are auroras?**

Auroras are bright and colourful lights, formed due to an active interaction in Space between charged solar winds and the Earth's magnetosphere. Solar winds are ejections of charged particles from the Sun's atmosphere, mostly composed of protons and electrons.

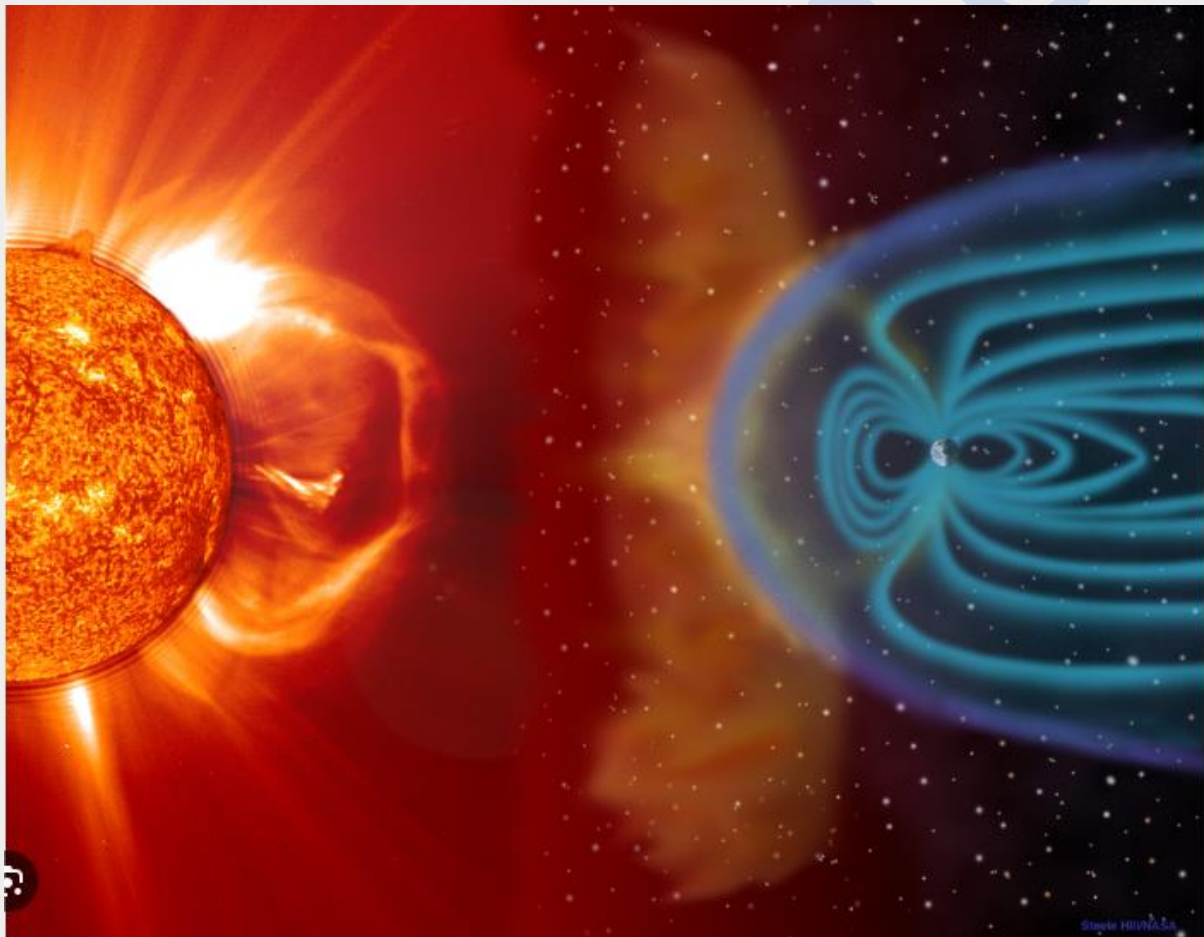
The magnetosphere is the region surrounding the Earth. It protects the Earth against solar winds and is strongest at the poles. However, sometimes solar wind particles flow down the

Earth's magnetic field. Auroras are produced when these particles collide with atoms and molecules in the Earth's upper atmosphere. The collisions produce light, much like how electrons flowing through gas in a neon light collide with neon and other gasses to produce different colored light bulbs.

### **So why were auroras visible from Ladakh?**

It has to do with heightened solar flare activity in Space. Solar physicists at the Centre of Excellence in Space Science India, at the Indian Institutes of Science Education and Research (IISER) Kolkata, said that at least four strong solar storms arrived over Earth recently.

The source of these storms was Coronal Mass Ejections (CMEs), which are large ejections of magnetic particles and plasma from the Sun's corona – the outermost part of its atmosphere. According to Indian solar physicists, the intensity of these incoming solar storms was much higher than average.



One of the manifestations of the solar storm's interactions with the Earth's atmosphere was the emergence of auroras in red, violet and blue colours. So strong were the storms that the aurora lights were visible from many lower-latitude regions. The auroras were also visible in parts of the US and the UK. Scientists said that a solar storm with a similar intensity had earlier affected Earth in November 2003.

### **What is happening to the Sun?**

Currently, there are several magnetically active regions on the visible solar disk, producing multiple high-energy flares. These continuous solar storms hold a strong potential for disturbing Space weather and causing major disturbances to the Earth's magnetosphere, lasting for the next two days.

### **How hazardous are solar storms?**

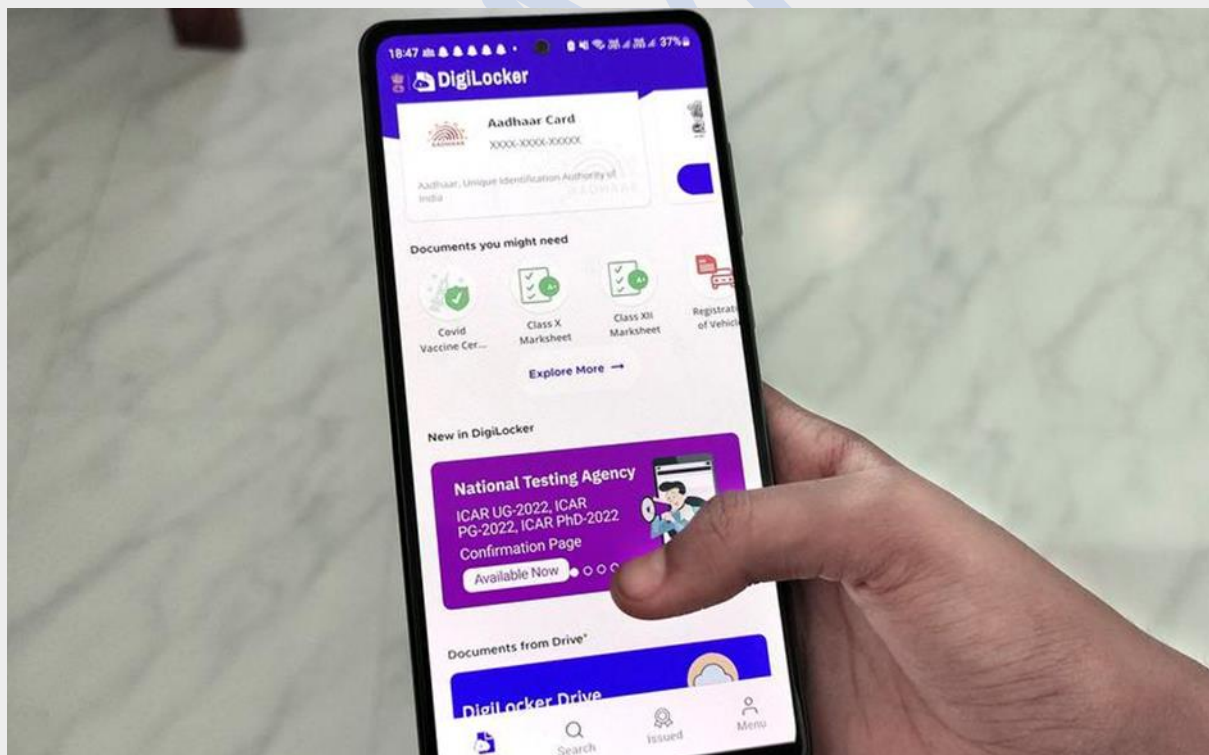
Intense solar storms can be harmful as they can interfere with and threaten the smooth operations of satellites operating in the Low Earth Orbit or LEO (an altitude ranging between 200-1,600km).

The highly energetic particle environment created by these solar storms can also induce heating in the upper atmosphere. This increases the risk of radiation hazards, causing a drag effect on satellites positioned at LEO. An excessive drag can mean satellites facing intolerable amounts of friction, which in extreme cases can ignite and burn down the satellites, ceasing their operations completely.

Relevance: GS Prelims

Source: Indian Express

## **2. What is DigiLocker and does it keep your data and documents safe?**



### **Why in News?**

As thousands of students across the country rush to their computers to check their board exam results, many of them now have the option of viewing their scores and even obtaining their verified marksheets through the Indian government's DigiLocker platform. While 10th standard students from the State Board of Tamil Nadu can get their 2024 results from DigiLocker, this facility is coming soon to the students of the CBSE board.

### **What is DigiLocker and who uses it?**

The DigiLocker platform, launched in 2015, operates as an app to store users' digital records. The app can be used when applying for a passport, reviewing marksheets, or proving one's identity during travel. The app is part of the Indian government's paper-free initiative aimed at letting users access, verify, and store essential documents in a digital wallet so that they are easy to retrieve and present to officials when required.

As per DigiLocker's website: "The issued documents in DigiLocker system are deemed to be at par with original physical documents as per Rule 9A of the Information Technology (Preservation and Retention of Information by Intermediaries providing Digital Locker facilities) Rules, 2016 notified on February 8, 2017 vide G.S.R. 711(E)."

### **Why are users adopting DigiLocker?**

DigiLocker is a paperless solution meant to ensure that a user can access the latest and updated versions of their documents online in order to prove their identity and their credentials at any given moment. To the verifying officials, this helps in keeping at bay fake, poor quality print copies, and outdated documents that miss key details.

Also, for the user, this app helps eliminate the need to carry separate sets of documents while they are on the move. Instead, the documents can be fetched or stored in a local device. In theory, these digital documents are no less valid than their originals. Additionally, the DigiLocker website noted that using the app can help with faster service delivery.

### **How secure is DigiLocker?**

DigiLocker is a flagship initiative of the Ministry of Electronics & IT (MeitY) under the Digital India programme, meaning it is a government approved application and is ideally maintained with strict security protocols framed by officials.

According to DigiLocker's own website, it has standard security measures in place including encryption, multi-factor authentication (OTP verification), timed log outs, and security audits. However, any government database that stores citizens' information and documents is inevitably an attractive target for hackers who steal user data and sell it on the dark web.

### **What are some issues with DigiLocker?**

People who are not used to smartphones or those find it difficult to navigate apps may struggle to download DigiLocker, use OTPs, and fetch their credentials unless they have assistance. Those who cannot read are also at a disadvantage.

Another hurdle is that people with multiple names, aliases, inconsistent spellings, or even slightly mismatched certificates may not be able to smoothly fetch their documents via DigiLocker as the app needs the submitted details to match the issuer's data exactly. Users have in the past complained that even subtle changes such as capitalised letters and initials can lead to failure.

Furthermore, there is no uniformity in how different government authorities and law enforcement bodies in India review official documents. While some insist on being shown virtual documents through DigiLocker, others claim the original hard copies are mandatory.



Relevance: GS Prelims & Mains Paper II; Governance  
Source: The Hindu

### 3. Fuelled by Pakistan's economic crisis: why is PoK on the boil?

#### Introduction

Violent street protests in Pakistan Occupied Kashmir (PoK) have left a police officer dead and more than 90 people injured recently.

The violence erupted after about 70 members of the Joint Awami Action Committee, an organisation led by traders in the region, were arrested during a strike to protest the rising costs of food, fuel, and utilities. Pakistan's economic crisis and high inflation have resulted in hardships for its people, and a section of traders have been additionally hit by the stopping of trade with India.



#### The protests in PoK

The traders took to the streets to protest against high electricity and food prices. There were similar protests against high electricity bills in August 2023 as well.

A general strike halted Muzaffarabad, the capital and largest city of PoK, as public transport, shops, markets, and businesses shut down. As large numbers of protesters broke barricades and clashed with police in the Mirpur and Muzaffarabad divisions. The paramilitary Rangers were called in to secure government buildings such as the legislative assembly and the courts.

Pakistan's economy has been witnessing extremely high inflation and dismal economic growth for more than two years due to rising energy costs. Consumer inflation has been above 20% since May 2022, and touched 38% in May 2023.

### **Alleged discrimination**

Leaders in PoK have been protesting alleged discrimination by the government in Islamabad in the distribution of power to the area. The region's premier Chaudhry Anwarul Haq has complained about not receiving the fair share of the 2,600MW of hydropower produced by the Neelum-Jhelum project.

Haq has also said that his request for resources to increase salaries of government employees in the recent budget was not accepted, and that he had been forced to divert development funds to pay them.

### **Collapse of India trade**

Traders in PoK were hit hard after India raised customs duty to 200% on Pakistani products such as dry dates, rock salt, cement, and gypsum following the Pulwama terror attack of February 2019. As a result, Pakistan's exports to India fell from an average of \$45 million per month in 2018 to only \$2.5 million per month between March and July 2019.

The situation was made more difficult after Pakistan stopped all trade following the constitutional changes carried out by India in Jammu and Kashmir in August 2019. India-Pakistan trade has shrunk to a low of about \$2 billion annually over the last five years, a small fraction of the \$37 billion trade potential estimated by the World Bank.

### **Pakistan's economic crisis**

Pakistan's foreign exchange reserves have fallen drastically ever since global food and fuel prices rose in the aftermath of the Russia-Ukraine war. A similar balance of payments crisis crippled Sri Lanka as well in 2022-23, leading India to extend support measures.

According to the State Bank of Pakistan, the country's forex reserves fell from a peak of \$20.1 billion in August 2021 to \$2.9 billion in February 2023, enough to cover only a month's imports. Pakistan imports nearly 40% of its total primary energy supply.

Pakistan's largely aid-dependent economy has an underdeveloped private sector, and its stock market has shown very little growth over the years. The country's Gross Domestic Product (GDP) shrank by 0.17% during FY23. The International Monetary Fund (IMF) recently said Pakistan needed gross financing worth \$123 billion over the next five years, and that the country was expected to seek \$21 billion in the fiscal year 2024-25 and \$23 billion in 2025-26.

Relevance: GS Prelims & Mains Paper II; Bilateral Relations

Source: Indian Express