



KAMARAJ IAS ACADEMY
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Coronal Mass Ejection (CME)

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In News

A recent study has revealed that even a **subtle Coronal Mass Ejection (CME)** from the Sun can trigger **intense geomagnetic storms** on Earth, highlighting the need for improved **space weather monitoring and disaster preparedness**.

What is a Coronal Mass Ejection (CME)?

1A CME is a **large-scale expulsion of plasma and magnetic fields** from the Sun's corona.

2It carries **billions of tons of solar material** into space at speeds ranging from **250 km/s to 3000 km/s**.

3Often linked with **solar flares** and **active sunspot regions**.

How CMEs Affect Earth

1Disturb the **Earth's magnetosphere**, causing **geomagnetic storms**.

2Potential impacts include:

o**Satellite malfunctions** or degradation

o**Disruption of power grids** and transformers

o**Interference with navigation systems** (GPS)

o**Radio communication blackouts**

oEnhanced **auroral activity** near polar regions

Scientific Significance

1Even **small-scale CMEs** can have **outsized effects** depending on the **orientation of their magnetic fields**.

2Understanding CME dynamics helps in:

o**Predicting space weather events**

o**Mitigating technological and infrastructural risks**

Supporting **satellite operations, aviation, and power grid resilience**

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