4. Geomagnetic Storm

Why in News?

- Earth has recently been hit by a powerful Geomagnetic Storm, having a severity grade of G4 according to the US National Ocean and Atmospheric Administration (NOAA).

Highlights

- A geomagnetic storm refers to the disruptions to the Earth's magnetic field caused by solar emissions.
- When a Coronal Mass Ejection (CME) or a high-speed solar stream reaches our planet, it slams into the magnetosphere.
- The Earth's magnetosphere Is created by its magnetic fields and it usually protects us from the particles emitted by the Sun.
- When a CME or a high-speed stream arrives at Earth, it peels open the planet's magnetosphere, kind of like an onion. This allows energetic solar wind particles to stream down and hit our atmosphere over the poles.
- Solar weather events like this can also supercharge auroras, sometimes making them visible in places where they wouldn't have been otherwise.
- Solar physicists and other scientists use computer models to predict solar storms and solar activities in general.
- Current models are capable of predicting a storm's time of arrival and its speed.
- But the storm's structure or orientation still cannot be predicted.
- Certain orientations of the magnetic field can produce a more intense response from the magnetosphere, and trigger more intense magnetic storms.
- With the increasing global dependence on satellites for almost every activity, there is a need for better space weather forecasts and more effective ways to protect satellites.