# Geography · GS - I

**What are aurora australis and aurora borealis? How are these triggered?**

| EXAM YEAR | PAPER | SUBJECT |
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| 2024 | GS - I | Geography |

| MARKS | WORD LIMIT |
|---|---|
| 15 | ~250 words |

## Answer Hint

**Aurora Borealis, Aurora Australis, Northern Lights, Southern Lights, solar wind, charged particles, magnetosphere, magnetic field, ionosphere, oxygen, nitrogen, geomagnetic storms**

## Model Answer

### Introduction

Auroras are spectacular luminous phenomena observed mainly at high latitudes. They result from the interaction between energetic charged particles associated with solar activity and gases in Earth's upper atmosphere.

### Types of Auroras

**Aurora Borealis:** It is the auroral display occurring predominantly in the **Northern Hemisphere**, commonly known as the Northern Lights.

**Aurora Australis:** It occurs predominantly in the **Southern Hemisphere** and is commonly known as the Southern Lights.

### Triggering Mechanism

**1. Solar activity:** The Sun continuously releases charged particles through the solar wind. Solar flares and coronal mass ejections can substantially increase this particle flux.

**2. Interaction with Earth's magnetic field:** Earth's magnetosphere deflects most charged particles. During periods of enhanced solar activity, however, disturbances in the solar wind interact strongly with the magnetosphere.

**3. Movement towards polar regions:** Earth's magnetic field guides some energetic charged particles towards the polar upper atmosphere.

**4. Collision with atmospheric gases:** These particles collide with oxygen and nitrogen atoms and molecules in the upper atmosphere, transferring energy to them.

**5. Emission of light:** Excited atmospheric particles release the absorbed energy in the form of light, producing the characteristic auroral glow.

The colours depend upon the atmospheric gas, altitude and particle energy. Oxygen commonly produces green and red colours, while nitrogen contributes to blue and violet shades.

## Conclusion

Auroras are therefore a visible manifestation of **Sun–Earth interaction**, linking solar activity, Earth's magnetic field and the physical properties of the upper atmosphere.

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