

Atmospheric Perturbations around the Eclipse Path (APEP) mission

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About Atmospheric Perturbations around the Eclipse Path (APEP) mission

- The mission will involve **launching three rockets** equipped with scientific instruments.
- **Objective:** To know how **the upper atmosphere will change during the eclipse**, especially the moment when there would be a sudden reduction in light.
- During an eclipse, the **sudden drop in sunlight causes changes in the ionosphere**, creating waves that ripple through this atmospheric layer.
- It will measure changes in **electric and magnetic fields, density, and temperature**.
- This launch will take place at the **White Sands Missile Range in New Mexico**, with a specific focus on the ionosphere.
- According to NASA, the ionosphere's temperature and density are projected to decrease during the eclipse, resulting in a wave-like disturbance that has the potential to disrupt GPS and other satellite communications.

The process:

- The rockets will be **positioned just outside the path of annularity**, where the Moon moves directly in front of the Sun. Each rocket will deploy **four small scientific instruments** designed to record changes in electric and magnetic fields, density, and temperature.
 - NASA's goal is to achieve the first-ever simultaneous measurements from multiple locations in the ionosphere during a solar eclipse.
 - Rockets can be launched precisely at the right moment and can investigate lower altitudes inaccessible to satellites.
 - Sounding rockets were chosen by the team due to their ability to **pinpoint and measure specific regions** of space with great accuracy.
 - These rockets can also record changes occurring at various altitudes as they ascend and descend from suborbital flights.
 - The rockets will **gather data at altitudes ranging from 45 to 200 miles** (70 to 325 kilometres) **above the Earth's surface** along their flight path.
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Q1: What is ionosphere?

The ionosphere is a region of Earth's upper atmosphere that contains a high concentration of ions and free electrons. It starts approximately 48 kilometers above the Earth's surface and extends upwards to several hundred miles (about 1,000 kilometers). The ionosphere plays a crucial role in various atmospheric and radio propagation phenomena, including the reflection and refraction of radio waves.

Source: [Indian-origin NASA scientist to lead rocket mission to 'ring of fire' eclipse. Explained](#)

Source: <https://vajiramandravi.com/current-affairs/atmospheric-perturbations-around-the-eclipse-path-apep-mission/>

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