4. SOHO Mission

Prelims Level: Science and Technology.

Mains Level: GS-III Awareness in the fields of Space, Science and Technology.

Context:

- Scientists from Centre for Excellence in Space Sciences (CESSI), IISER Kolkata, have successfully predicted the shape of Sun's corona during the recent annular solar eclipse on December 25.
- The scientists used the images from SOHO satellite (a joint project of NASA and ESA) that carried an instrument called LASCO to predict the shape of solar corona.

Why the Findings are Important?

- The Corona which is the outermost region of the Sun's atmosphere ejects millions of tonnes of high-speed solar wind that engulfs the entire solar system including earth.
- These solar winds are composed of electrons and nuclei of hydrogen and helium atoms.
- The earth's magnetic field acts as a protective shield against the solar wind, when they enter the earth's upper atmosphere these electrons and nuclei interact with earth's atmosphere. (Aurorae seen in northern or southern latitudes are as a result of this phenomenon)
- While the magnetic field acts as a protective shield for earth's atmosphere these solar winds can be harmful to space-based instruments like satellites and thus to our communication networks, GPS etc.

About SOHO:

- SOHO, the Solar and Heliospheric Observatory, is a joint project between ESA and NASA to study the Sun, from its deep core to the outer corona, and the solar wind.

About LASCO:

- Large Angle and Spectrometric Coronagraph Experiment (LASCO) is an instrument on the joint NASA/ESA SOHO (Solar and Heliospheric Observatory) spacecraft that image the solar corona.
- It is basically a telescope that is designed to block light coming from the solar disk, in order to see the emissions from corona.
- It primarily studies how the corona heated and where and how the solar wind is accelerated.

Objectives of SOHO:

- The major objective is to study the fundamental scientific questions about the Sun including:
  - ✓ Structure and dynamics of the Solar Interior.
  - ✓ Reasons behind existence of Solar corona and how is it heated to the extremely high temperature of about 10 Lakh° C.
  - ✓ Where is the solar wind produced and how is it Accelerated?