

Imaging X-ray Polarimetry Explorer (IXPE)

Imaging X-ray Polarimetry Explorer (IXPE) is NASA's mission that aims to **explore mysterious objects of the Universe**. IXPE was sent to its orbit on **SpaceX's Falcon 9 rocket**.

Why is it in News?

NASA launched the **Imaging X-ray Polarimetry Explorer or IXPE mission** on December 9 from Florida.

Overview of IXPE

- IXPE is a **space observatory, which** will be at 600 kilometers altitude, orbiting around Earth's equator.
- IXPE is a collaboration between NASA and the Italian Space Agency (ASI).
- The new mission will complement other X-ray telescopes such as the European Space Agency's X-ray observatory, XMM-Newton and the Chandra X-ray Observatory.
- Also, this is NASA's first mission to study the **polarization of X-rays** from various types of celestial objects.

What will IXPE study?

- IXPE mission will study the **most extreme and mysterious objects** in the universe – ranging from supermassive black holes, supernova remnants, and some other high-energy objects.
- IXPE's "first-light" target will be **Cassiopeia A**, the supernova remnant which was also Chandra's first-light observation.

What is the length of the IXPE mission?

The primary length of the mission is **2 years**. In its first year in space, IXPE is expected to study approximately 40 celestial objects.

What are the instruments on IXPE?

- It carries **3 telescopes**. These three identical telescopes host one light-weight X-ray mirror and one detector unit.
- These telescopes will help in observing **polarized X-rays from neutron stars and supermassive black holes**.
- Measuring the polarization of the X-rays will help in studying **where the light came from** and understand the geometry and inner workings of the light source.

How will the new IXPE mission help scientists?

As per NASA, polarization measurements of IXPE will help scientists answer the following questions:

- What is the mechanism behind the spinning of black holes?
- What powers the jets of energetic particles that are ejected from the region around the supermassive black holes at the centers of galaxies?
- Was the black hole at the center of the Milky Way actively feeding on surrounding material in the past?
- How do pulsars shine so brightly in X-rays?