



NASA's IXPE Mission

Why in News

Recently, [National Aeronautics and Space Administration \(NASA\)](#) launched a new mission named **Imaging X-ray Polarimetry Explorer (IXPE)**.

Key Points

▪ About:

- **IXPE observatory is a joint effort of NASA and the Italian Space Agency.**
- It will study **“the most extreme and mysterious objects in the universe - [supernova remnants](#), [supermassive black holes](#), and dozens of other high-energy objects.”**
- Its primary length is **two years and the observatory will be at 600 kilometers altitude**, orbiting around Earth's equator.
- It is expected to **study about 40 celestial objects** in its first year in space.
- It will complement other X-ray telescopes such as the Chandra X-ray Observatory and the European Space Agency's X-ray observatory, XMM-Newton.

▪ Significance:

- It will help observe **polarized X-rays from neutron stars and supermassive black holes**. By measuring the polarization of these X-rays, we can study where the light came from and understand the geometry and inner workings of the light source.
- It will help scientists understand how black holes spin and their location in the past.
- It will help unravel how [pulsars](#) shine so brightly in X-rays.
- It will help learn what powers the jets of energetic particles that are ejected from the region around the supermassive black holes at the centers of galaxies.

▪ NASA's Other Recent Missions:

- [Double Asteroid Redirection Test \(DART\)](#).
- [Mission Lucy](#) (Jupiter Trojan Asteroids).
- [Near-Earth Asteroid Scout](#)

Supernova

- A supernova is an extremely powerful explosion that accompanies the death of a massive star.

Black Hole

- A black hole is a **place in space where gravity pulls so much that even light can not get out**. The gravity is so strong because matter has been squeezed into a tiny space.
- [Gravitational waves](#) are created when two black holes orbit each other and merge.

Neutron Stars

- Neutron stars **comprise one of the possible evolutionary end-points of [high mass stars](#)**.
- Once the core of the star has completely burned to iron, energy production stops and the core

rapidly collapses, squeezing electrons and protons together to form neutrons and neutrinos.

- A **star supported by neutron degeneracy pressure is known as a 'neutron star'**, which may be seen as a pulsar if its magnetic field is favourably aligned with its spin axis.

[Source: IE](#)

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