Einstein Ring

Why in News?

Recently, the Euclid space mission of the European Space Agency (ESA) spotted an Einstein ring in the galaxy NGC 6505, just 590 million light-years from the earth.

> *NGC 6505 is an elliptical galaxy in the Draco constellation, about 608 million light years away from the Milky Way, discovered in 1884 by Lewis A. Swift.*

- Bruno Altieri (Astronomer) 1st noticed the Einstein ring (Nicknamed as Alteri's Ring) in galaxy NGC 6505 in 2023 in a blurry image captured by Euclid mission of European Space Agency.
- **Einstein Ring -** An Einstein ring is a ring-shaped image that occurs when light from a distant galaxy is bent around a massive object in the foreground. This phenomenon is called ***gravitational lensing.***
- Albert Einstein's general ***theory of relativity*** predicted this phenomenon.

> *General relativity predicts that the path of light will follow the curvature of space time as it passes near a massive object.*

- The gravity of the foreground object bends light rays, similar to how a magnifying lens bends light.
- If the background galaxy, the lensing galaxy, and the telescope are perfectly aligned, the image appears as a ring.
- **Significance** - Einstein rings are a valuable tool for scientists to study the expansion of the universe, dark matter, and dark energy.
- They also help scientists learn about the background source of the light that is bent by dark matter.
- An Einstein ring is also known as an ***Einstein–Chwolson ring or Chwolson ring.***
- Astronomers discovered the first Einstein ring in 1998.
- The largest and one of the most complete Einstein rings ever discovered is GAL-CLUS-022058s.

Reference

The Hindu | Einstein ring

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