Mystery of a powerful cosmic source in a nearby galaxy

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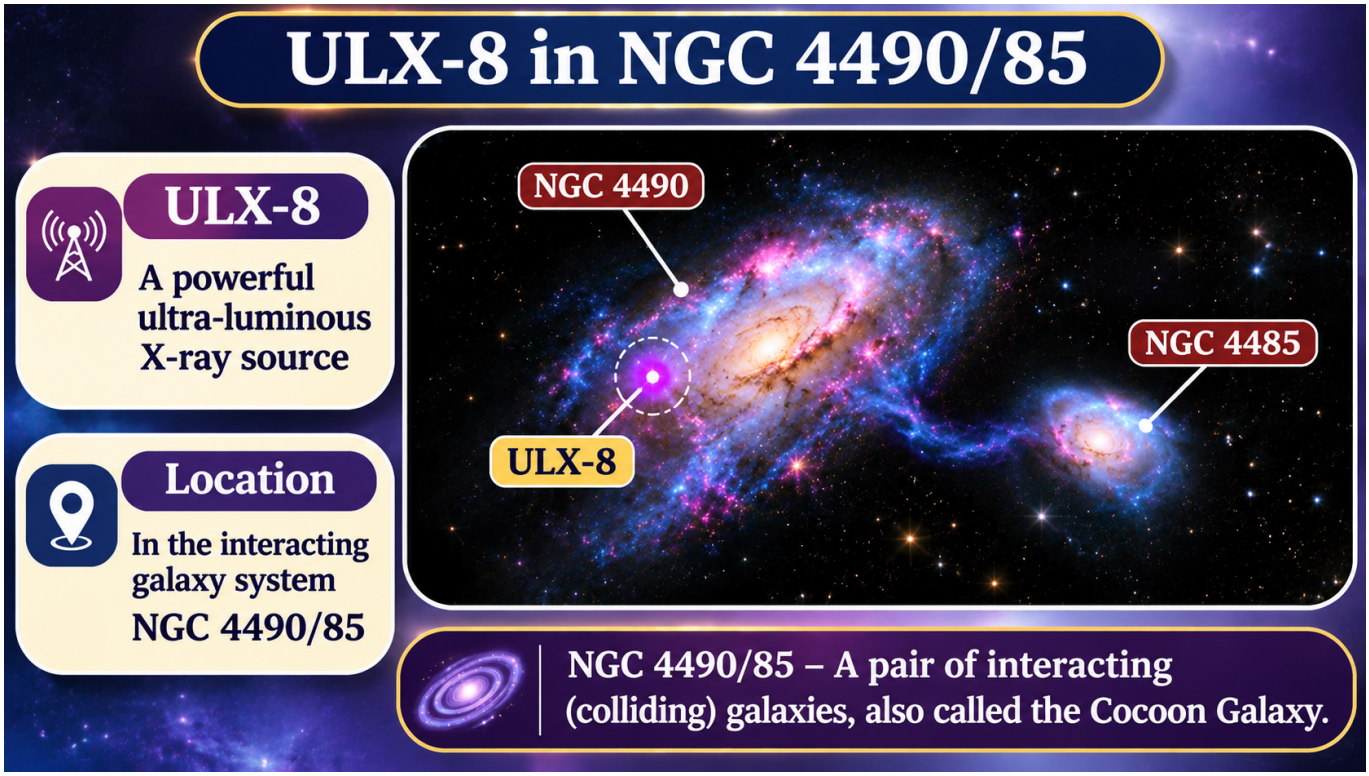
A team of astronomers analyzed 24 years of archival and recent X-ray data to unravel the complex behavior of an extreme cosmic source in a nearby galaxy.

Key Highlights

- The study focuses on an exceptional **Ultraluminous X-ray Source (ULX)** designated as **ULX-8** located in the interacting galaxy system **NGC 4490/85**.
- **Multi-Mission Long-Term Tracking -** The researchers combined historical and current data spanning over two decades captured by 3 space-based X-ray observatories
  - **NASA's Chandra X-ray Observatory**,
  - The **European Space Agency's (ESA) XMM-Newton**, and
  - **NASA's Neil Gehrels Swift Observatory**.
- **Decoding Super-Eddington Accretion -** ULXs emit radiation at rates that dramatically exceed the standard Eddington limit (the theoretical maximum luminosity for a body of a given mass, where gravity balances radiation pressure).
- The study sheds light on how compact objects such as black holes or neutron stars sustain such intense matter-accumulation (accretion) rates without blowing themselves apart.
- **Uncovering Gas Outflows-** The multi-decade temporal analysis helped trace the intricate relationship between intense accretion flows and the generation of powerful gas outflows/winds that sculpt the surrounding interstellar medium.

Ultraluminous X-ray Sources (ULXs)

- ULXs are non-stellar nuclear point sources that shine with X-ray luminosities greater than 10^39 erg/s, outshining typical X-ray binaries by orders of magnitude.
- They typically emit more energy than the theoretical Eddington limit for a standard stellar-mass black hole, making them prime laboratories for studying **intermediate-mass black holes (IMBHs)** or extreme super-Eddington accretion physics.



Reference

PIB | Brightest X-ray emitters in nearby galaxies

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