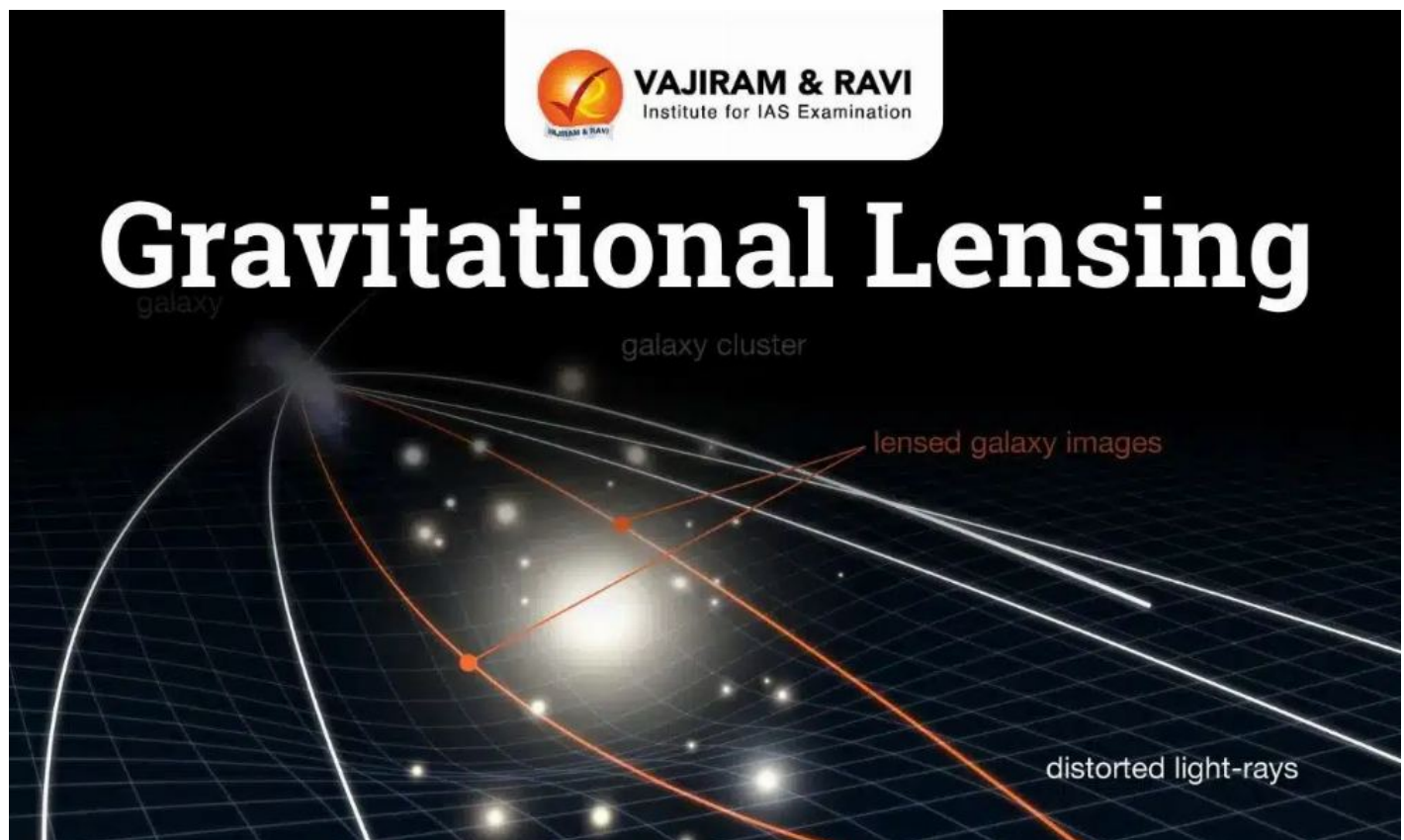


What is Gravitational Lensing?

January 9, 2025 • vajiramandravi.com



About Gravitational Lensing:

- Gravitational Lensing is an **effect on light from a background source** that **arises as a result of the curvature of spacetime**, the three dimensions of space and time united into a single entity, caused by mass.
- Gravitational Lensing **causes the light to bend, distort, and magnify** as it passes around the massive object.
- **Gravitational Lensing Theory:**
 - Gravitational Lensing was **first predicted in 1915 by Albert Einstein**, which involves the bending of light by objects of great mass.
 - According to **Einstein's general theory of relativity**, **time and space are fused together** in a quantity known as **spacetime**.
 - Within this theory, **massive objects cause spacetime to curve**, and **gravity is simply the curvature of spacetime**.
 - **As light travels through spacetime**, the theory predicts that the **path taken by the light** will **also be curved by an object's mass**.

- Gravitational Lensing is a dramatic and observable example of Einstein's theory in action.
 - The effect is **most observable when light** from a bright background source, like a star, a quasar, or an entire galaxy, **passes a very massive object** like another galaxy or a cluster of galaxies, **described as a lensing object** or just a **gravitational lens**.
 - This can have **several results**; it can **make an object shift its apparent position** in the sky over Earth, or it can **cause a single object to appear at multiple points** in the sky, occasionally giving rise to spectacular formations like rings and crosses made from the same object.
 - More than this, Gravitational Lensing **can actually cause the light from a background object to be amplified**.
 - That means that **astronomers can use the Gravitational Lensing** arising from galactic clusters **as natural cosmic magnifying glasses**.
 - This has made it an important tool for the investigation of the universe when it was in its infancy, making light from the earliest galaxies that would usually be too faint to see observable by instruments like the James Webb Space Telescope and the Hubble Space Telescope.
-

Q1: What is the James Webb Space Telescope?

The James Webb Space Telescope (JWST) is a monumental leap in space exploration and astrophysics. Launched on December 25, 2021, it is the largest and most powerful space telescope ever built, serving as the premier space-based observatory for the next decade. Developed by NASA with contributions from the European and Canadian space agencies, JWST is designed to observe the universe primarily in the infrared spectrum.

Source: [MSN](#)

Source: <https://vajiramandravi.com/current-affairs/what-is-gravitational-lensing/>

© Vajiram & Ravi. For personal use only.