

CHAPTER OVERVIEW

12: Gravitational Lenses

Chapter 12 delves into the phenomenon of gravitational lensing. Light from distant sources is deflected by the curved spacetime around massive objects, providing astrophysicists with the ability to map out mass, both seen and unseen. In the first part of the chapter you will examine the geometric properties of simple gravitational lenses. In the second part, you will use astrophysical gravitational lenses as instruments for studying dark matter, weighing galaxy clusters, and finding extra-solar planets.

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Thumbnail: Einstein cross: four images of the same astronomical object, produced by a gravitational lens. Image used with permission (Public Domain; [NASA](#) and [ESA](#)).

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