CHAPTER OVERVIEW

11: Black Holes

Chapter 11 centers on black holes, including their properties and how we know they exist. Motivated by groundbreaking observations of our own Milky Way's supermassive black hole, active galaxies, as well as solar mass black holes, you will examine the physical characteristics that result from the strong gravitational fields of these not-so-uncommon exotic objects. You will also engage in calculations of black hole sizes, temperatures, densities, and lifetimes.

The supermassive black hole at the core of supergiant elliptical galaxy Messier 87, with a mass about 7 billion times that of the Sun, as depicted in the first false-colour image in radio waves released by the Event Horizon Telescope (10 April 2019). Visible are the crescent-shaped emission ring and central shadow,[19] which are gravitationally magnified views of the black hole's photon ring and the photon capture zone of its event horizon. The crescent shape arises from the black hole's rotation and relativistic beaming; the shadow is about 2.6 times the diameter of the event horizon. (CC BY 4.0; Event Horizon Telescope)
