

CHAPTER OVERVIEW

5: Photons and Matter Waves

In this chapter, you will learn about the energy quantum, a concept that was introduced in 1900 by the German physicist Max Planck to explain blackbody radiation. We discuss how Albert Einstein extended Planck's concept to a quantum of light (a "photon") to explain the photoelectric effect. We also show how American physicist Arthur H. Compton used the photon concept in 1923 to explain wavelength shifts observed in X-rays. After a discussion of Bohr's model of hydrogen, we describe how matter waves were postulated in 1924 by Louis-Victor de Broglie to justify Bohr's model and we examine the experiments conducted in 1923–1927 by Clinton Davisson and Lester Germer that confirmed the existence of de Broglie's matter waves.

[5.1: Prelude to Photons and Matter Waves](#)

[5.2: Blackbody Radiation](#)

[5.3: Photoelectric Effect](#)

[5.4: The Compton Effect](#)

[5.5: Bohr's Model of the Hydrogen Atom](#)

[5.6: De Broglie's Matter Waves](#)

[5.7: Wave-Particle Duality](#)

[5.A: Photons and Matter Waves \(Answer\)](#)

[5.E: Photons and Matter Waves \(Exercise\)](#)

[5.S: Photons and Matter Waves \(Summary\)](#)

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