

CHAPTER OVERVIEW

14: Diffraction

In the preceding chapter, we implicitly regarded slits as objects with positions but no size. The widths of the slits were considered negligible. When the slits have finite widths, each point along the opening can be considered a point source of light—a foundation of Huygens’s principle. Because real-world optical instruments must have finite apertures (otherwise, no light can enter), diffraction plays a major role in the way we interpret the output of these optical instruments. For example, diffraction places limits on our ability to resolve images or objects. This is a problem that we will study later in this chapter.

[14.1: Prelude to Diffraction](#)

[14.2: Single-Slit Diffraction](#)

[14.3: Intensity in Single-Slit Diffraction](#)

[14.4: Double-Slit Diffraction](#)

[14.5: Diffraction Gratings](#)

[14.6: Circular Apertures and Resolution](#)

[14.7: X-Ray Diffraction](#)

[14.8: Holography](#)

[14.A: Diffraction \(Answers\)](#)

[14.E: Diffraction \(Exercises\)](#)

[14.S: Diffraction \(Summary\)](#)

Thumbnail: X-ray diffraction from the crystal of a protein (hen egg lysozyme) produced this interference pattern. Analysis of the pattern yields information about the structure of the protein. (credit: “Del45”/Wikimedia Commons)

Contributors and Attributions

- Samuel J. Ling (Truman State University), Jeff Sanny (Loyola Marymount University), and Bill Moebs with many contributing authors. This work is licensed by OpenStax University Physics under a [Creative Commons Attribution License \(by 4.0\)](#).

This page titled [14: Diffraction](#) is shared under a [CC BY](#) license and was authored, remixed, and/or curated by [OpenStax](#).