CHAPTER OVERVIEW

18: Measuring the Very Small

To begin our study of matter we discuss experiments in the late 19th and early 20th centuries that led to proof of the existence of atoms and their constituents. We then introduce a fundamental idea about the scattering of waves using the diffraction of light by small particles as a prototype. The famous Geiger-Marsden experiment that led to the idea of the atomic nucleus is discussed. Finally, we examine some of the crucial experiments done with modern particle accelerators and the physical principles behind them.[1]

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)
