CHAPTER OVERVIEW

10: The Kinetic Theory of Gas

When studying the world we measure inputs that originate from single molecules. However, our eyes and ears and ∼million dollar spectrometers typically signal average over large populations, generally on the order of a mole (6.022×10^{23}). We would like to understand how to unpack a measurement on a large population to discern the nature of the single species. To do so, we have to learn how to average the properties of molecules using the mathematics of probability. In this chapter we will focus on determining the average translational velocity of a perfect gas. Mostly because it's tractable, and you can do some neat things like derive the Equipartition theorem from Chapter 2. You will also make an interesting observation about the speed of sound and how the observer's relation to a system can alter measurements of the same.
