CHAPTER OVERVIEW

3: Hydrodynamics and Light Scattering

Hydrodynamics describes the low-frequency, long-wavelength behavior of a system that is disturbed from equilibrium. When a system is disturbed from equilibrium, some quantities and parameters decay very quickly back to their equilibrium state, while others take a long time to relax [1]. Conserved quantities, such as particle number, momentum, and energy, take a long time to relax to equilibrium, while non-conserved quantities decay quickly [1]. Similarly, order parameters, such as average magnetization, take a long time to relax to equilibrium, while parameters which are not order parameters decay quickly [1]. Therefore, at long times, a non-equilibrium system can be completely described by order parameters and the densities of conserved quantities [1]. Hydrodynamic equations are the equations of motion for these quantities and parameters.

For further information on the subjects covered in this chapter, please consult books by Reichl[1], Hansen and McDonald[2], and McQuarrie[3].

Thumbnail: Scheme of Rayleigh scattering.

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