

## CHAPTER OVERVIEW

### 1: Introduction to Quantum Mechanics

One normally makes a distinction between quantum mechanics and quantum physics. Quantum physics is concerned with those processes that involve discrete energies, and quanta (such as photons). Quantum Mechanics concerns the study of a specific part of quantum physics, those quantum phenomena described by Schrödinger's equation.

Quantum physics plays a rôle on small (atomic and subatomic) scales (say length scales of the order of  $10^{-9}$  m) and below. You can see whether an expression has a quantum-physical origin as soon as it contains Planck's constant in one of its two guises

$$\begin{aligned}h &= 6.626 \cdot 10^{-34} \text{ Js} \\ \hbar &= h/2\pi = 1.055 \cdot 10^{-34} \text{ Js.}\end{aligned}\tag{1.1}$$

Here we shall shortly review some of the standard examples for the break-down classical physics, which can be described by introducing quantum principles.

[1.1: Black-body radiation](#)

[1.2: Photo-electric effect](#)

[1.3: Hydrogen Atom](#)

[1.4: Wave particle duality](#)

[1.5: Uncertainty](#)

[1.6: Tunneling](#)

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