2.2: Energy Function

Of course the kinetic energy is $\frac{1}{2}mv^2$, with $v = r$

$$E = \frac{1}{2}mv^2 + V(r) \tag{2.2.1}$$

Actually, this form is not very convenient for quantum mechanics. We rather work with the so-called momentum variable $p = mv$. Then the energy functional takes the form

$$E = \frac{1}{2}\frac{p^2}{m} + V(r) \tag{2.2.2}$$

The energy expressed in terms of p and r is often called the (classical) Hamiltonian, and will be shown to have a clear quantum analog.