

## 2.2: Energy Function

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

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

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

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

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.

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