

$$i\hbar \frac{\partial c_\alpha(\mathbf{R}, t)}{\partial t} = \left[-\frac{\hbar^2}{2M} \frac{\partial^2}{\partial \mathbf{R}^2} + E_\alpha(\mathbf{R}) \right] c_\alpha(\mathbf{R}, t) - \frac{\hbar^2}{2M} \sum_\beta \langle \phi_\alpha(\mathbf{R}) | \frac{d\phi_\beta(\mathbf{R})}{d\mathbf{R}} \rangle \frac{\partial}{\partial \mathbf{R}} c_\beta(\mathbf{R}, t) - \frac{\hbar^2}{M} \sum_\beta \langle \phi_\alpha(\mathbf{R}) | \frac{d^2\phi_\beta(\mathbf{R})}{d\mathbf{R}^2} \rangle c_\beta(\mathbf{R}, t)$$