

$$i\hbar \frac{\partial}{\partial t} |\Psi(\mathbf{r}, \mathbf{R}, t)\rangle = \left( \sum_{i=1}^N \frac{P_i^2}{2M} + \sum_{\alpha=1}^n \frac{p_{\alpha}^2}{2m} + V(\mathbf{R}, \mathbf{r}) \right) |\Psi(\mathbf{r}, \mathbf{R}, t)\rangle$$