

$$(f|g) = (g|f) = \int_{-\infty}^{\infty} \psi^*(x) x \cdot \left( -i\hbar \frac{d}{dx} \right) \psi(x) dx$$

$$e^{-ip \cdot r / \hbar} \Phi(\mathbf{p}, s_1, s_2, t) d^3 p_n$$

$\int_{\text{all space}}$

$$|\psi\rangle = \sum_{s_1, s_2} \psi(r, s_1, s_2)$$

$$\sum_{r_1, r_2} \psi(r_1, r_2)$$

$$\int_{r_1} \int_{r_2} \dots \int_{r_N} dr_1 dr_2 \dots dr_N \psi(r_1, r_2, \dots, r_N)$$

$$\hat{H} = \sum_{n=1}^N \frac{\hat{p}_n^2}{2m_n} + V(x_1, x_2, \dots, x_N)$$

$$= -\frac{\hbar^2}{2} \sum_{n=1}^N \frac{1}{m_n} \frac{\partial^2}{\partial x_n^2} + V(x_1, x_2, \dots, x_N)$$