

## Addition of angular momentum

Review from 37.3 lecture

- ⊗ Based on the previous calculations for each individual axis  $S_x, S_y, S_z$  [spin of every axis]

$$S_x = \frac{\hbar}{2} \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}, \quad S_y = \frac{\hbar}{2} \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}, \quad S_z = \frac{\hbar}{2} \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$$

Simply put

$$\vec{S} = \frac{\hbar}{2} \vec{\sigma} \rightarrow \text{eigen function}$$

eigen value

$$\vec{S} = \frac{\hbar}{2} \begin{bmatrix} \sigma_x \\ \sigma_y \\ \sigma_z \end{bmatrix} \rightarrow \text{eigen function for spin value } \frac{\hbar}{2} \text{ axis}$$

$$\frac{\hbar}{2} \sigma_z$$

Pauli spin matrices