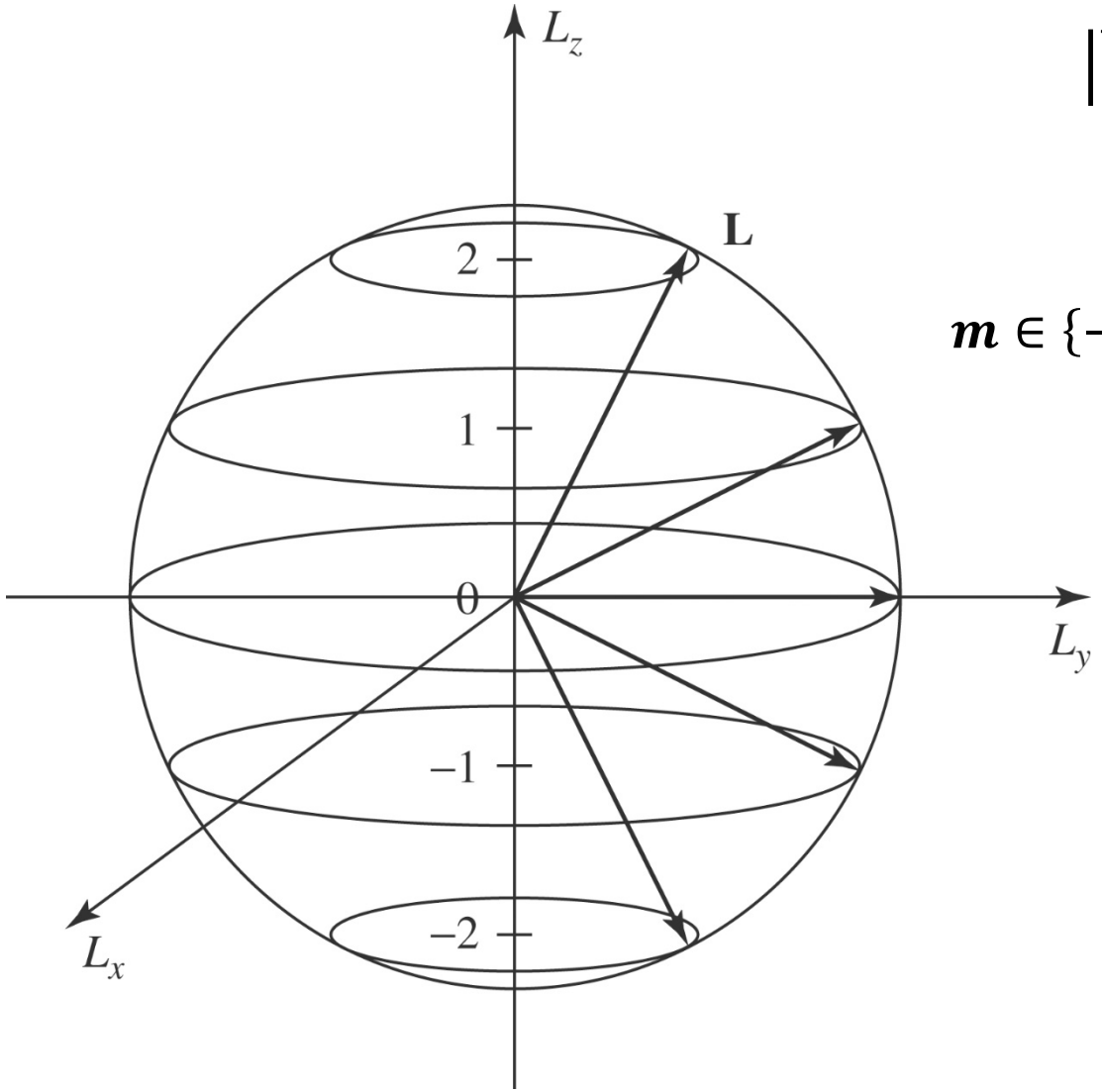
Angular Momentum States for $\ell = 2$



$$\left|\vec{L}\right|^2 Y_\ell^m = \ell(\ell+1)\hbar^2 Y_\ell^m$$
$$= 6\hbar^2 Y$$

$$m \in \{-\ell, -\ell+1, \ldots, 0, \ldots, , \ell-1, \ell\}$$

$$m \in \{-2, -1, 0, 1, 2\}$$

$$L_z Y_\ell^m = m\hbar Y_\ell^m$$

$$\sqrt{\ell(\ell+1)} = \sqrt{6} \cong 2.45$$