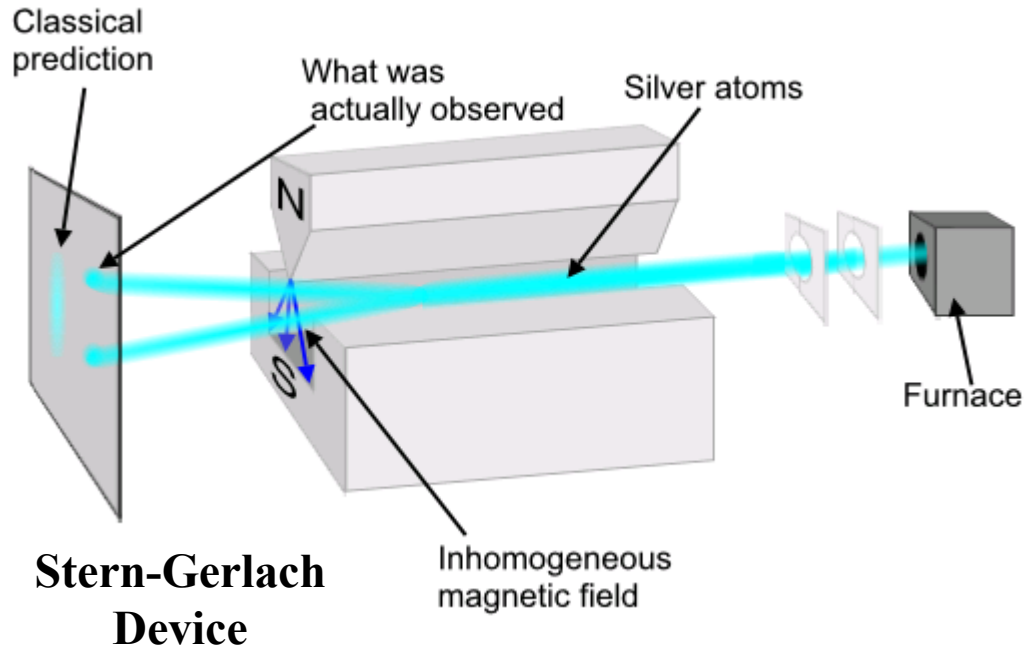


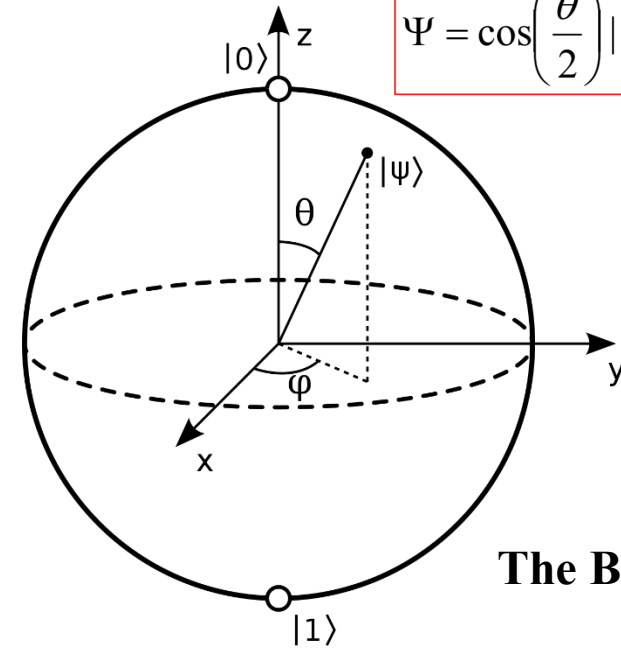
Examples of Two-State Quantum Systems

Spin-1/2 particle in a magnetic field



Qubits

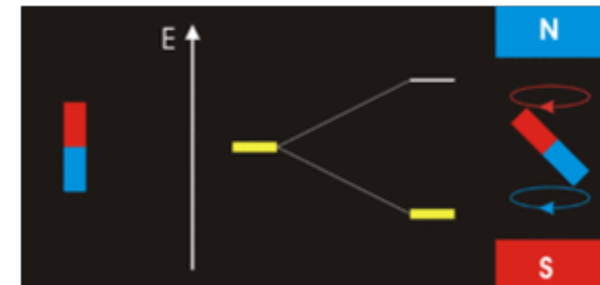
$$\Psi = \cos\left(\frac{\theta}{2}\right)|0\rangle + e^{i\phi}\sin\left(\frac{\theta}{2}\right)|1\rangle$$



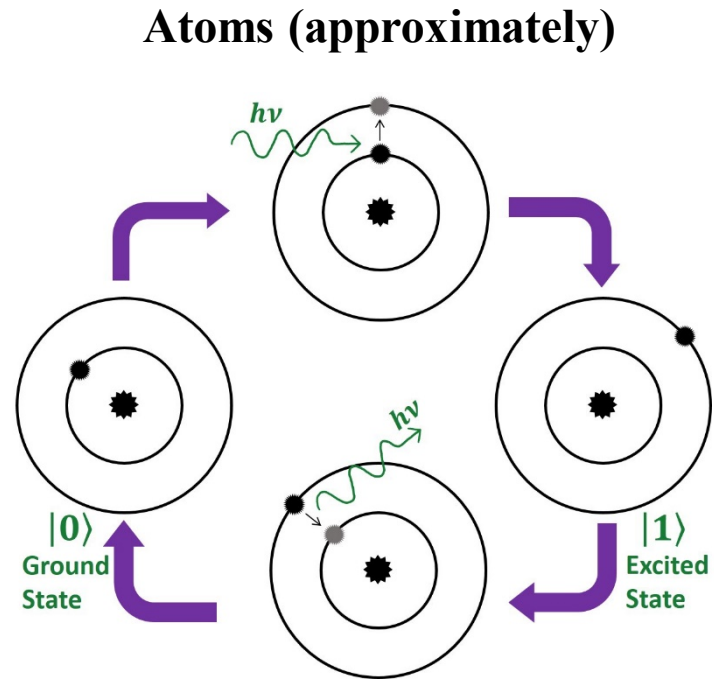
Neutrino [oscillations](#)

Neutral [K-Meson](#) oscillation

Nuclear Magnetic Resonance



Examples of Two-State Quantum Systems



Photon Polarization

States of photon polarisation

	Horizontal	$ 0\rangle$
	Vertical	$ 1\rangle$
	Diagonal up	$\frac{1}{\sqrt{2}}(0\rangle + 1\rangle)$
	Diagonal down	$\frac{1}{\sqrt{2}}(0\rangle - 1\rangle)$
	Left circular	$\frac{1}{\sqrt{2}}(0\rangle + i 1\rangle)$
	Right circular	$\frac{1}{\sqrt{2}}(0\rangle - i 1\rangle)$