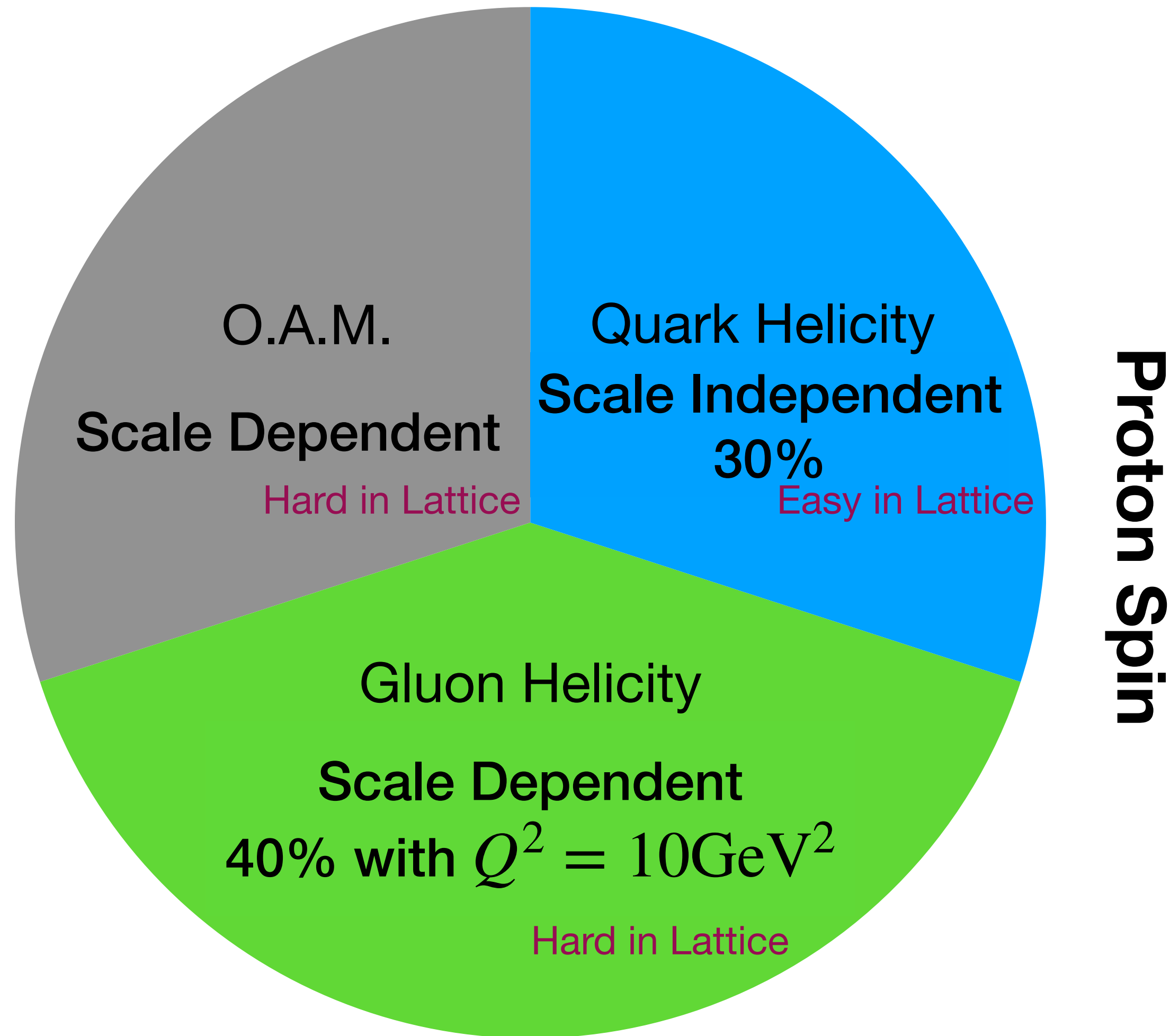


Introduction on proton spin



Quark helicity in lattice QCD

$$\Delta q = \langle \text{PS} | \bar{q} \gamma_5 \vec{\gamma} \cdot \vec{S} q | \text{PS} \rangle$$

$$\int d^3x (\bar{q} \gamma_\mu \gamma_5 q)(x) = 2m_f \int d^3x \vec{x} P(x) - 2i \int d^3x \vec{x} q(x)$$

$$\Delta u = 0.835(15), \quad \Delta d = -0.435(15),$$

$$\Delta s = -0.095(15), \quad \Delta c \simeq 0.00$$

$$\Delta \Sigma = \frac{1}{2} \sum \Delta q = 0.155(25)$$

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