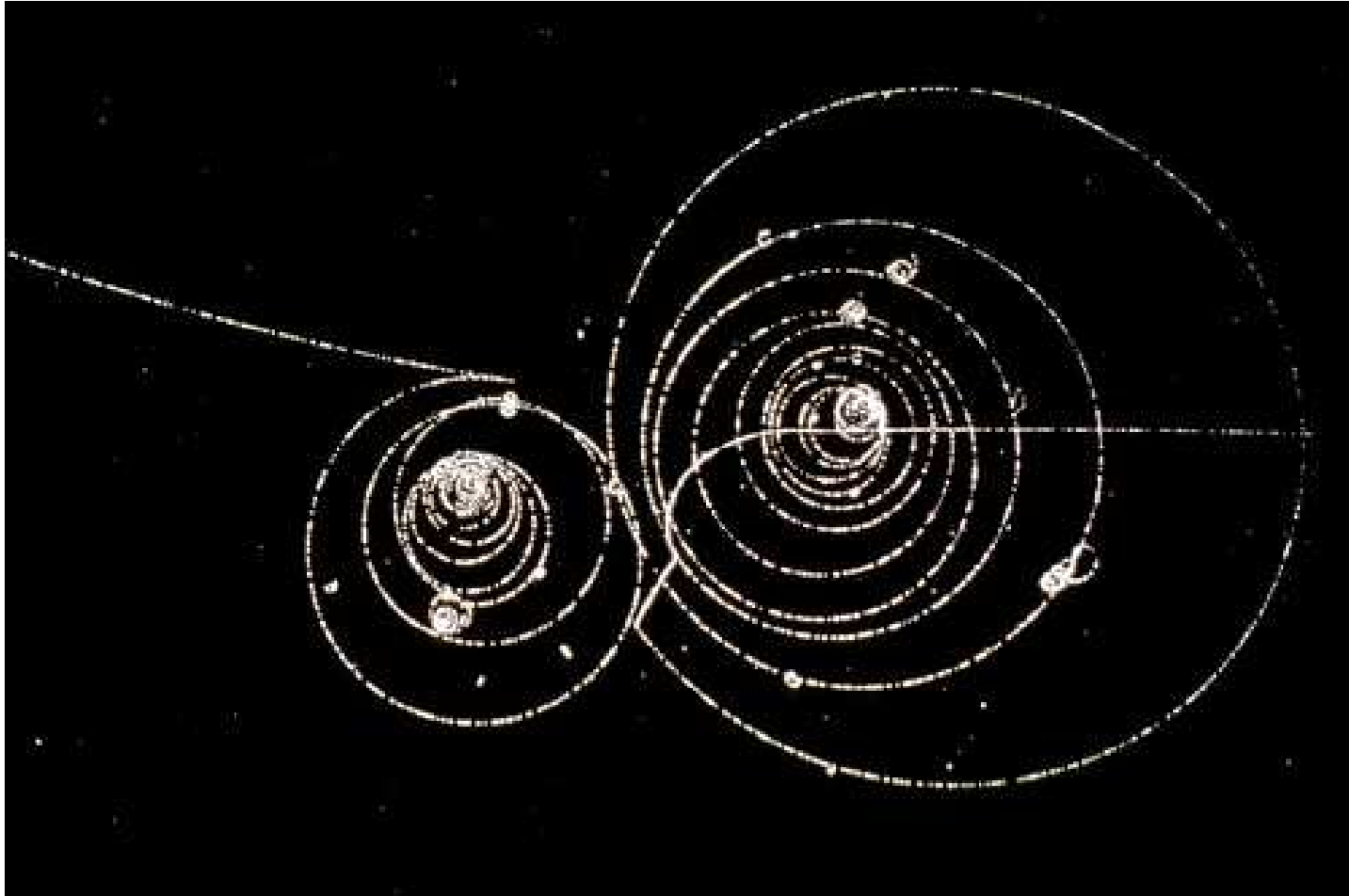


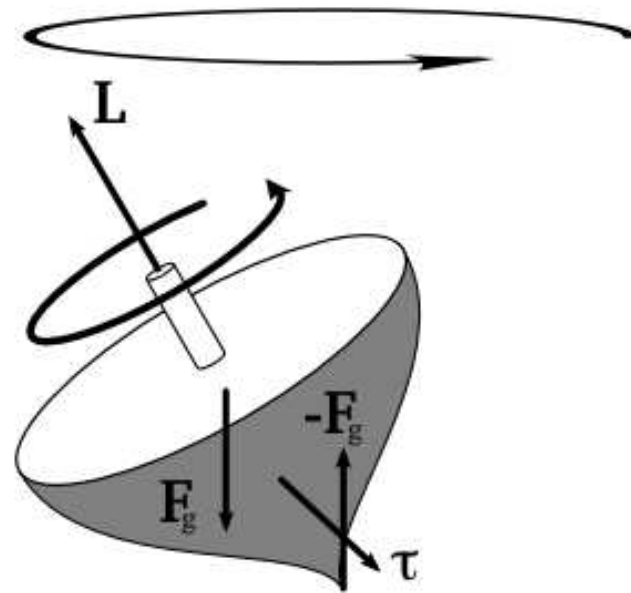
The Structure of the Nucleon



Brian Hannafious

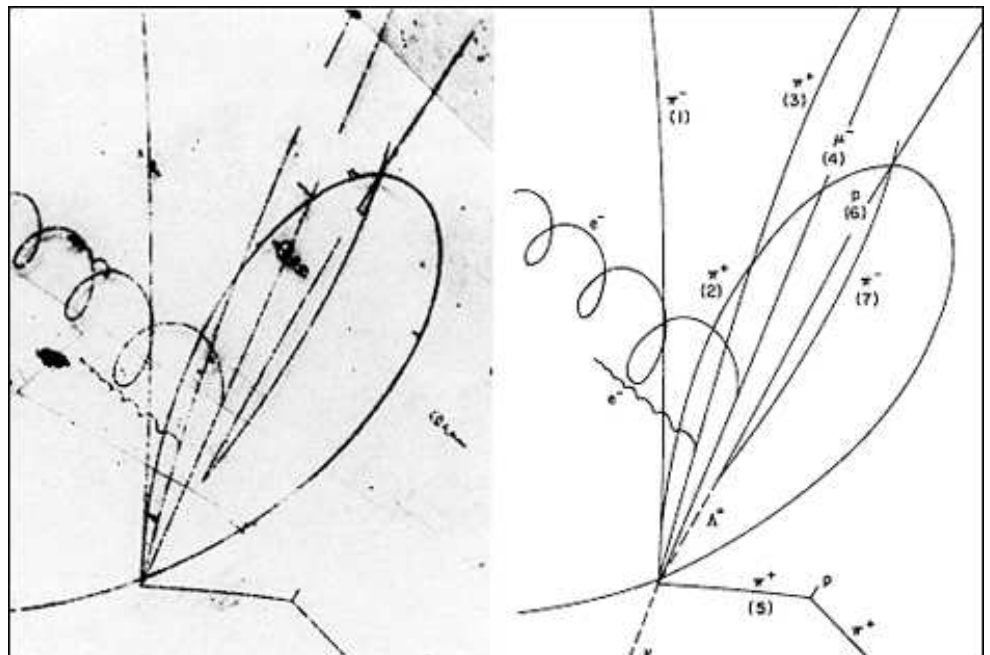
Angular Momentum and Spin

- Quantum Mechanics
- Little Magnets
- Polarization



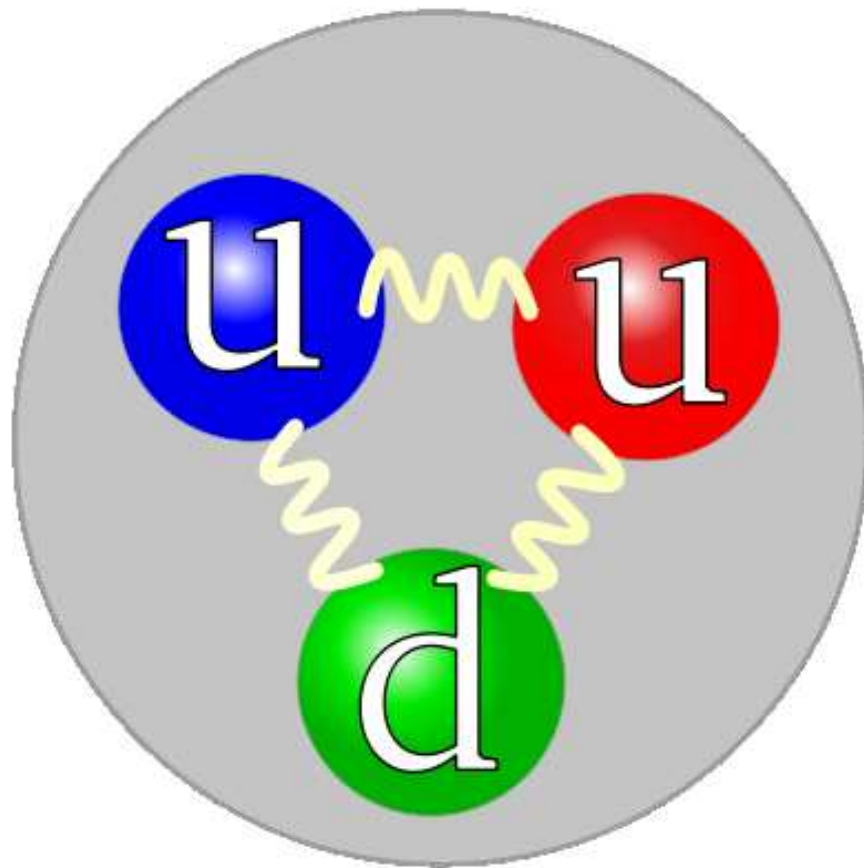
Probing the Nucleon

- Not Just a Point
- The Particle Zoo
- Hard Leptonic Probes



Partons

- Quarks
- Flavor
- Gluons



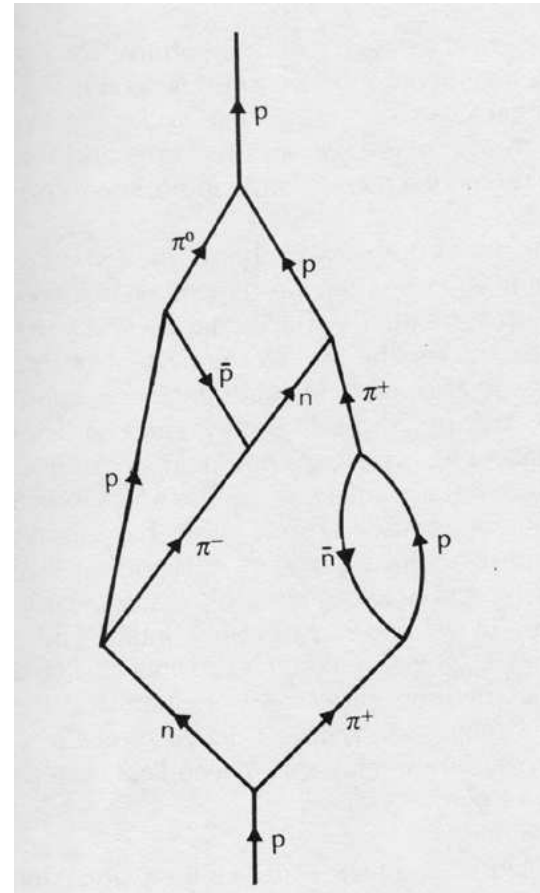
The Theory of the Nucleon

- Quantum Field Theory
- Quantum Chromodynamics
- Color Charge

$$\mathcal{L}_{QCD} = \bar{q} (i\gamma^\mu D_\mu - m) q - \frac{1}{4} G_{\mu\nu}^a G_a^{\mu\nu}$$
$$G_{\mu\nu}^a = \partial_\mu G_\nu^a - \partial_\nu G_\mu^a - gf_{abc} G_\mu^b G_\nu^c$$

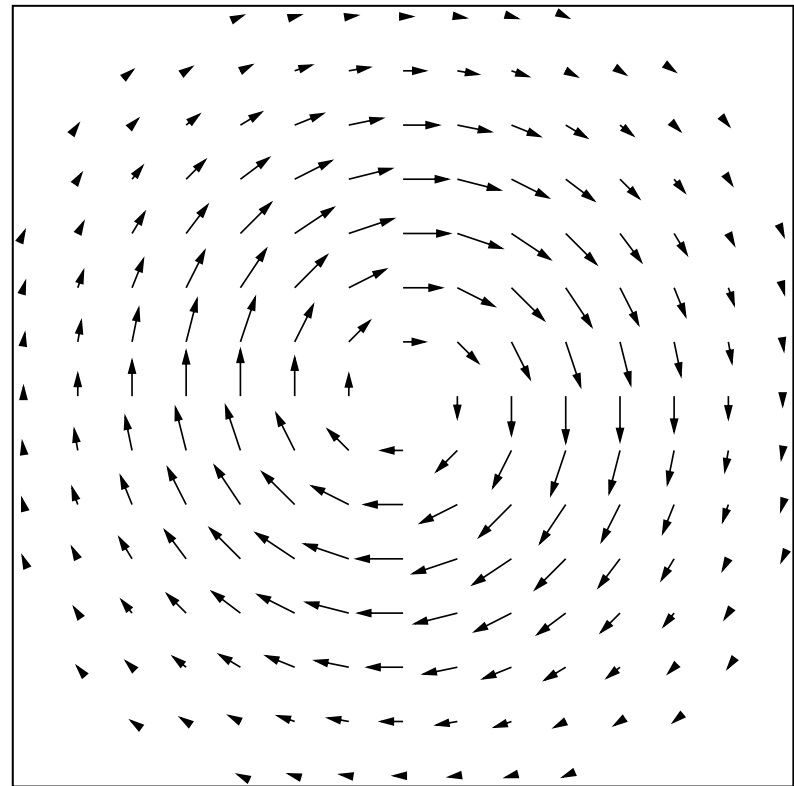
The Structure of the Nucleon 1

- Parton Structure
- Valence Quarks
- Sea Quarks
- Glue



The Structure of the Nucleon 2

- Spin Structure
- Transversity
- Sivers
- Boer-Mulders



Summary

- The Proton has Rich Structure
- Still More to Learn

