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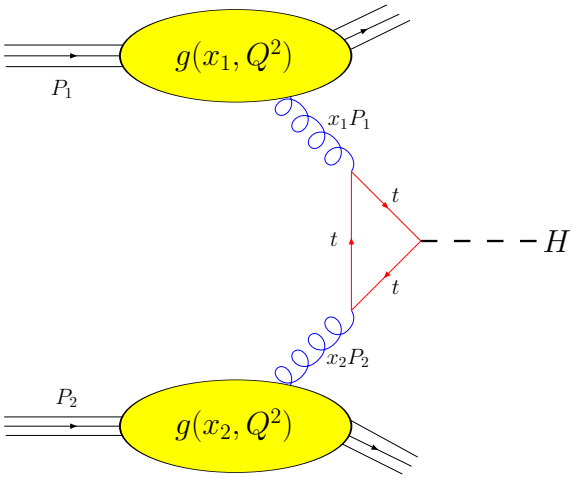
Research Area: QCD Phenomenology
— Parton Distribution Functions (PDFs)

What are PDFs?

- $q(x, Q^2)$ and $g(x, Q^2)$: density of quarks and gluons in proton with momentum fraction x at scale Q^2.
- Extract from e.g. deep-inelastic scattering (DIS) data taken at HERA (ep collider).
- Predict e.g. cross sections at LHC (pp collider).



Research Interests:

1. Unintegrated PDFs: transverse momentum dependent.

$$xg(x, Q^2) = \int_0^{Q^2} \frac{\mathrm{d}k_t^2}{k_t^2} f_g(x, k_t^2, Q^2)$$

   Use f_g to calculate P_T distribution of final state particles.

2. Diffractive DIS: DIS off a Pomeron target.
   - Problem: Gluon distribution of proton, $g(x, Q^2)$, goes negative at small x and Q^2 in current NLO fits.
   - Solution(?): Constrain using new HERA diffractive DIS data. Perturbative Pomeron exchange $\propto \left[xg(x, Q^2)\right]^2$, related to absorptive corrections.