Why Study Charm at HERA ?

- Charm cross sections at HERA are large, and exceed bottom production cross sections by $> \times 50$.
- Samples of D^* or J/ψ at HERA are of $\mathcal{O}(100)$.
- m_{charm} provides intermediate scale in transition region between non-perturbative $\Longleftrightarrow$ perturbative regimes.

- What is the origin of charm production ?
  - ▷ Is photon-gluon fusion process + HO (BGF) dominant?
  - ▷ How are bound states e.g. J/ψ produced?
  - ▷ Non-perturbative generation of charm ?

- Test predictions of pQCD in terms of σ_{tot}, d$\sigma/d\eta$ ... validity of factorization theorem in γp?
- Study non-perturbative phenomena and approaches (i.e. VDM, ..)

- Obtain direct access to gluon density in the proton - independent of quark densities.
- Access to parton density in photon in γp (resolved processes).