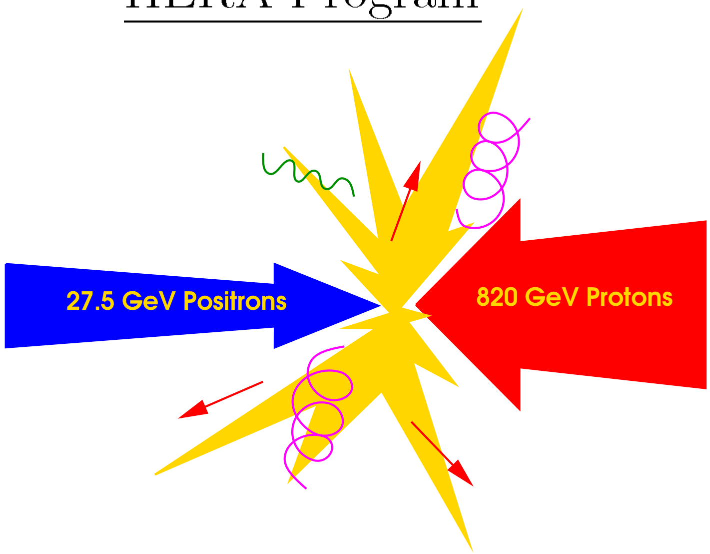
HERA Program



Center-of-mass energy ten times higher than previous analogous experiments $\Rightarrow$ probe proton to $2 \cdot 10^{-16}$ cm

Discoveries to date:

- 820 GeV proton contains large number of slow quarks, antiquarks, and gluons. This allows the study of QCD in a new domain of weak coupling but high densities.
- About 10 % of interactions leave proton intact even though point-like quark knocked free. Understanding this phenomena is a primary goal in the study of the strong force.

QCD studies: Fundamental ! Strongest force in nature (binds quarks and gluons in nuclei).

New Physics: Unique possibilities at HERA: lepton-quark unification, new symmetries (e.g., SUSY), new levels of substructure, ...

Future: Factor 20 increase in data expected in next few years. Complementary and unique tests of strong, weak and electromagnetic forces.

Columbia: Strong leadership roles, including spokesman of large international collaboration (ZEUS). Columbia provides leadership in most important measurements.