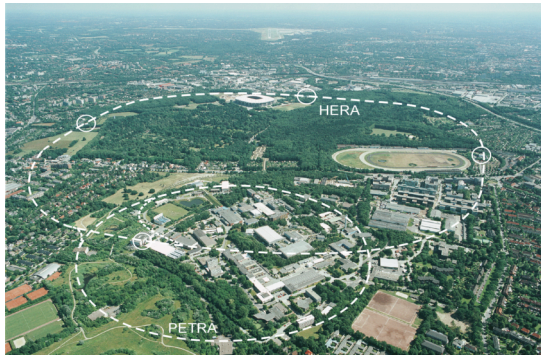
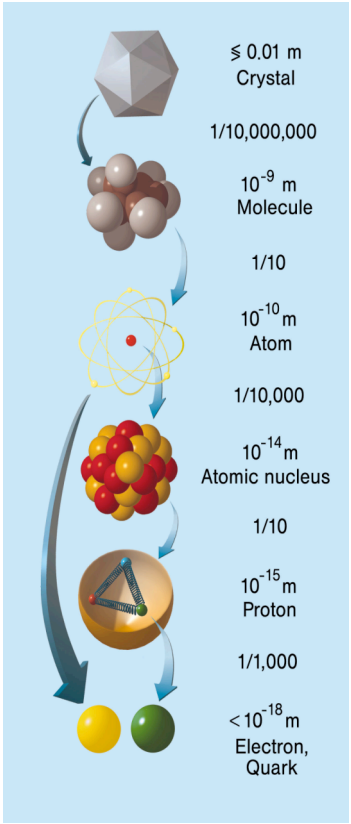
Probing proton structure with the ZEUS experiment

The HERA collider

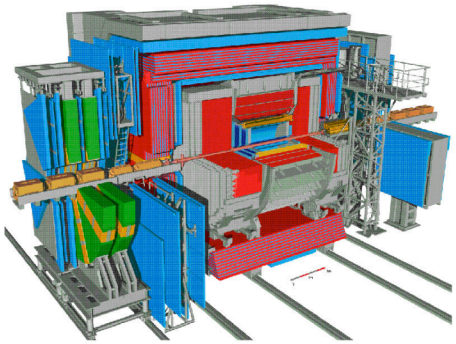
The HERA collider in Hamburg is the world's largest electron microscope. By colliding high energy electrons and protons, HERA can see deep inside the proton and resolve the rich substructure consisting of quarks and gluons.





The ZEUS experiment

The ZEUS detector measures the particles produced in electron-proton collisions, allowing the structure of the proton to be determined down to distances of 10^{-18} m or 1/1000 of the size of the proton.



Proton structure

Colliding electrons and protons allows us to probe the structure of the proton at different distance scales. These results give the probabilities for finding each flavour of quark or a gluon inside the proton and give new insight into the strong force. At the smallest distance scales the effects of the heavy W and Z bosons can be observed, testing predictions of the electroweak force.