A brief history of colliders

- Colliders have driven particle physics forward over the last 40 years.
- This required synergy of
 - hadron hadron colliders
 - lepton hadron colliders &
 - lepton lepton colliders
- Experiments at colliders discovered *W*boson, *Z*-boson, gluon, tau-lepton, charm, bottom and top-quarks.
- Colliders provided full verification of the Standard Model.



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SppS at CERN & HERA at DESY



LEP at CERN & Tevatron at Fermilab

LEP = Large Electron Positron Collider

- The world's highest energy e^+e^- collider: $\sqrt{s} = 89$ to 206 GeV
 - 27 km circumference.
 - Ran from 1989 to 2000
 - Four collision points: Aleph, Delphi, L3, Opal

LEP tunnel now used for LHC





- Proton anti-proton collider Run 1: 1987 - 1995
 - ECM = 1.80 TeV
- Run 2: 2000 2008
 - ECM = 1.96 TeV
 - ~40% increase in interesting cross

Highlight: discovery of top quark