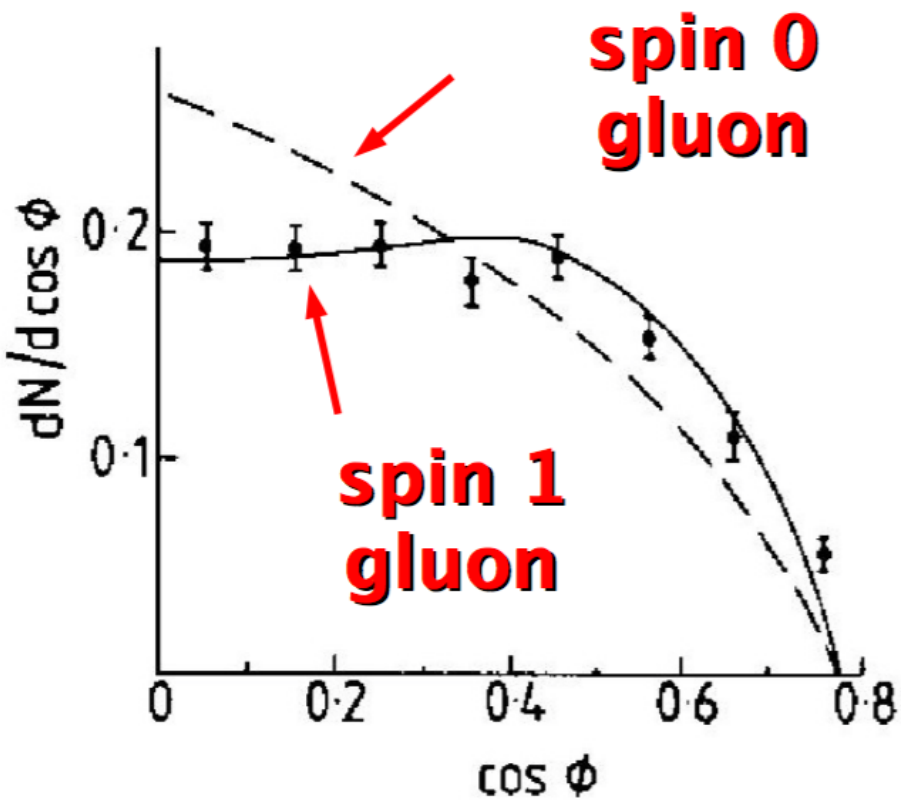
Content

2 Criticism of the Standard Model

2.1 Experimental

2.2 Theoretical (philosophical)

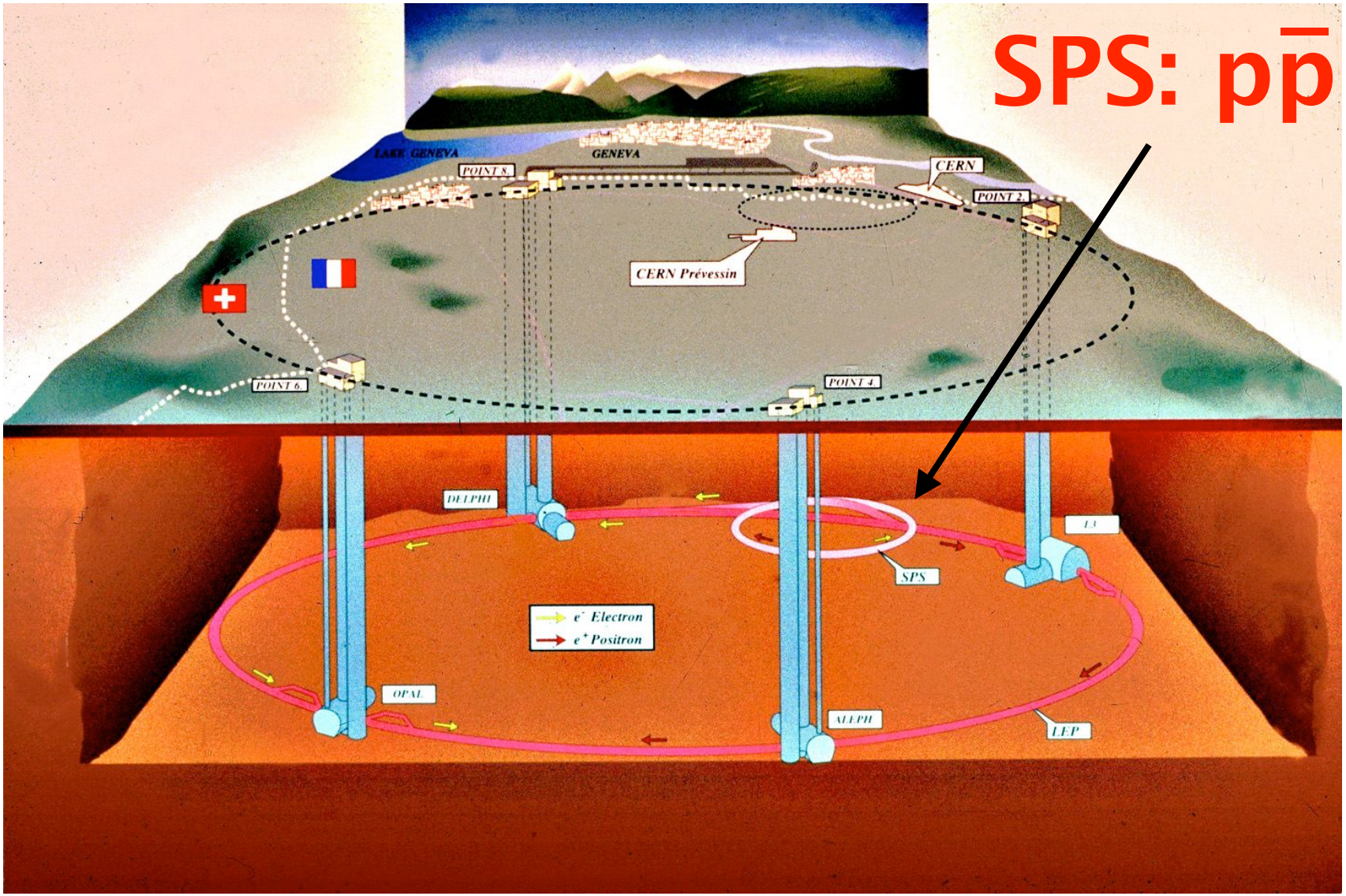
Gluon Discovery



3 jet event and angular distribution at e^+e^- accelerator PETRA

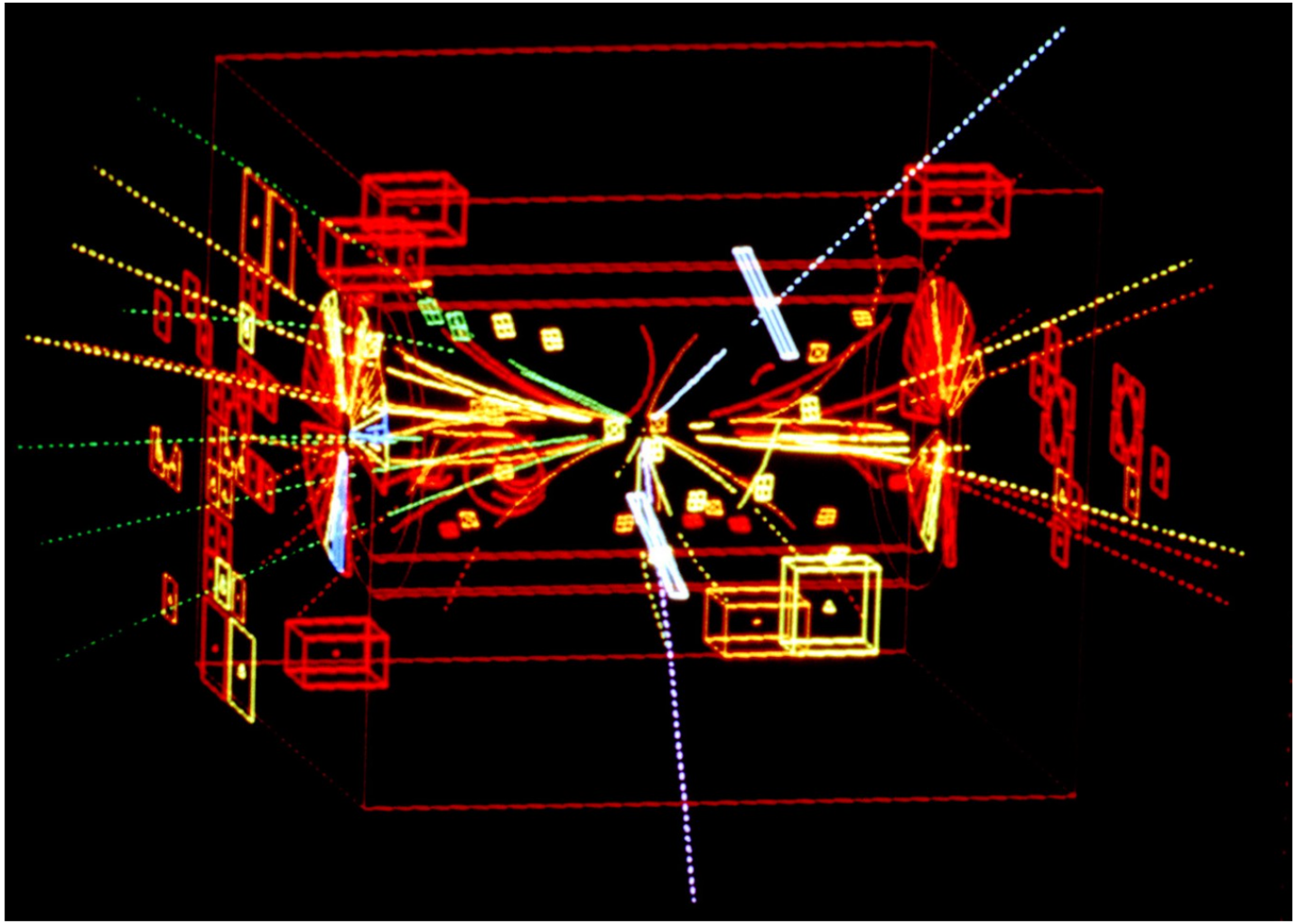
Colliders at CERN

$\sqrt{s} = 540$ GeV



Discovery of the Z boson

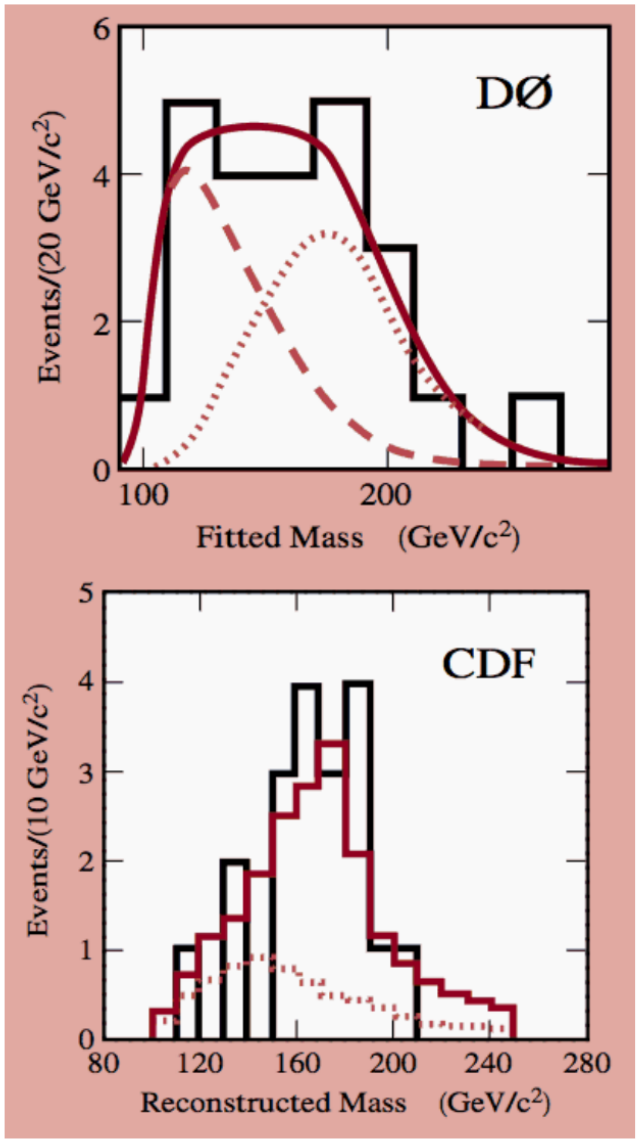
$\bar{p}p$ accelerator SPS (CERN, Geneva)



1983, UA1 experiment, $\sqrt{s}$=540 GeV

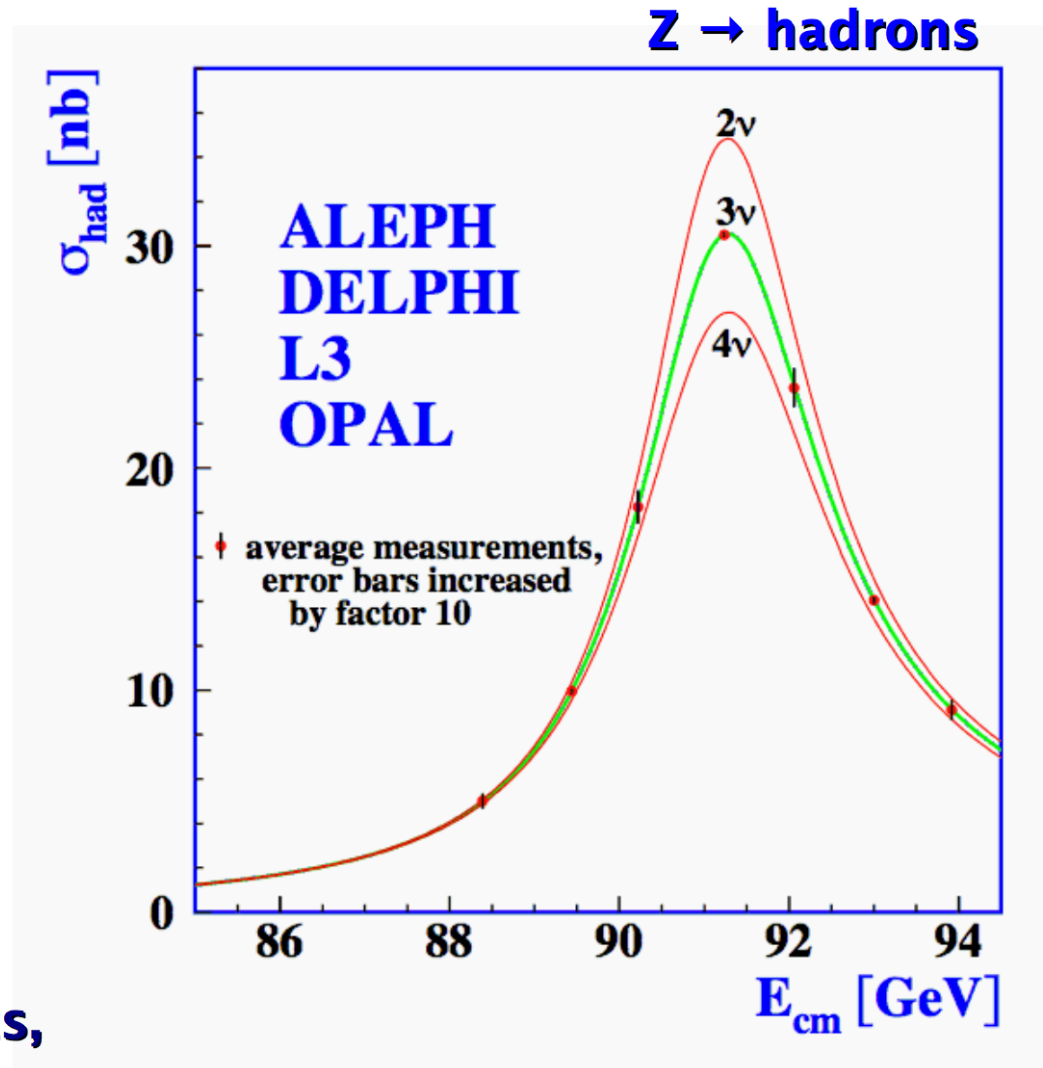
Discovery of the top quark

$p\bar{p}$ accelerator
Tevatron
(Fermilab, Batavia)



1995, CDF and DØ experiments, $\sqrt{s}$=1.8 TeV

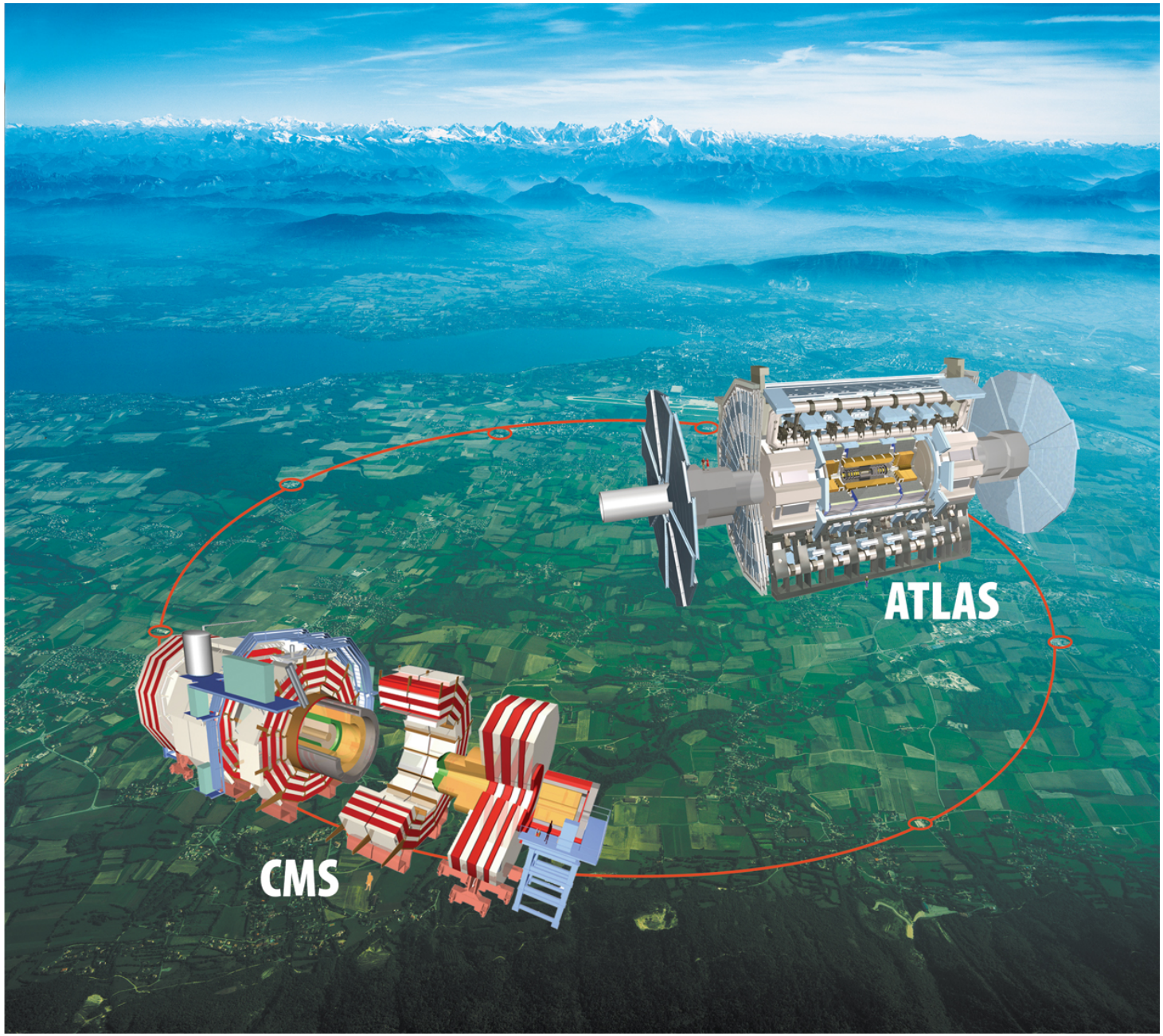
Neutrino generations



LEP experiments, CERN

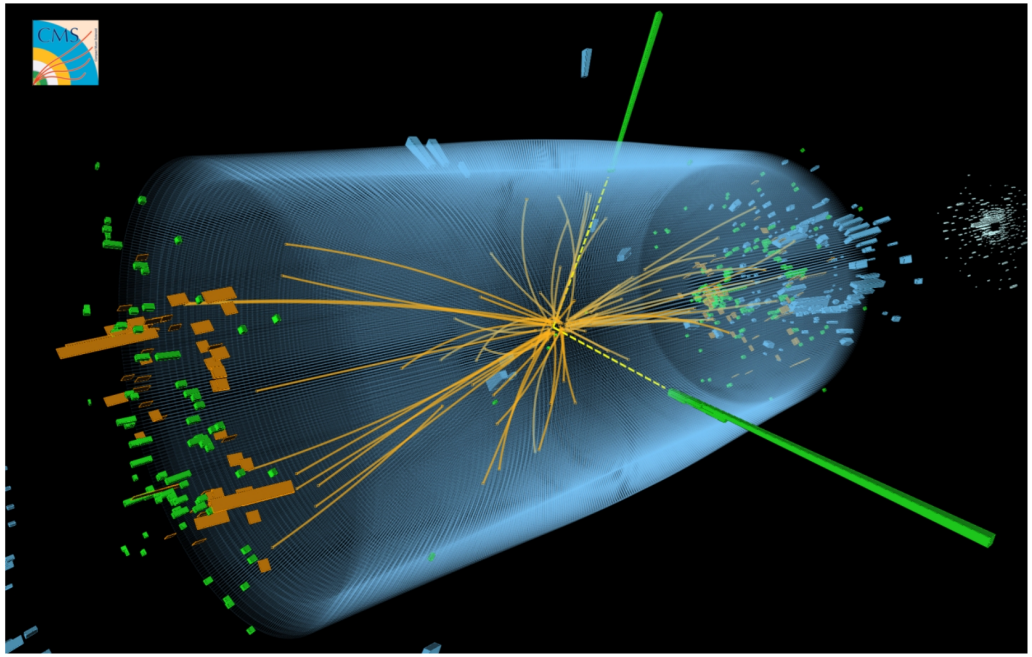
Z mass distribution with calculations for 2, 3 and 4 neutrino types by all 4 experiments at LEP

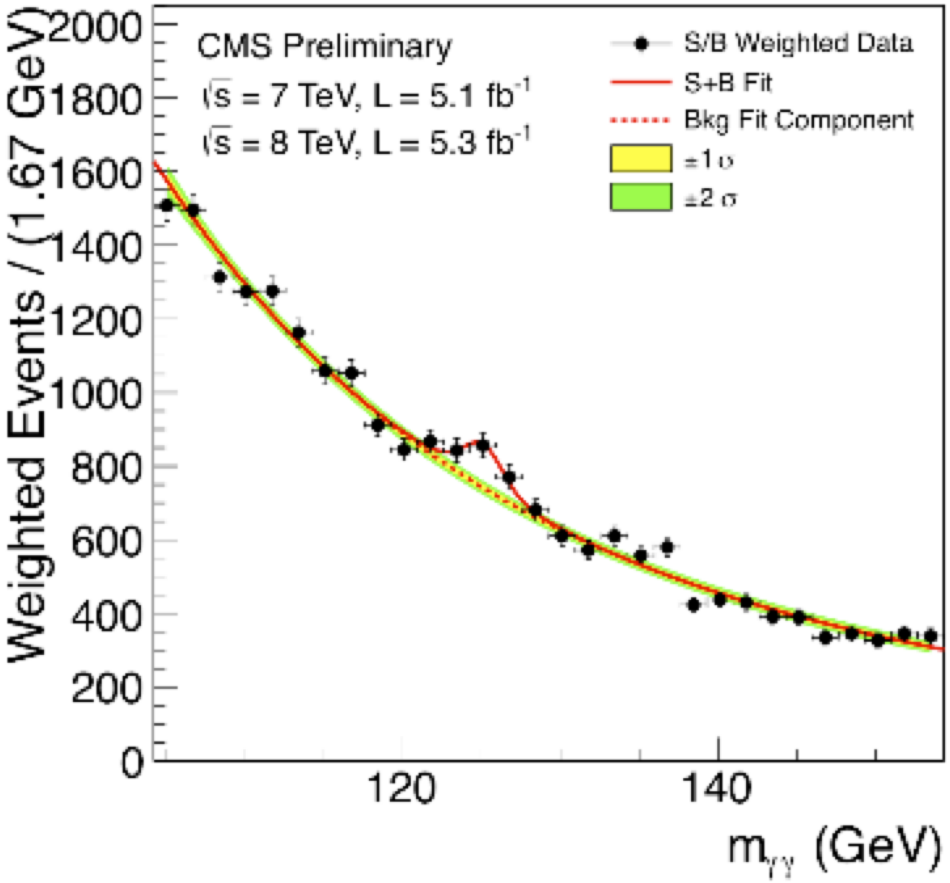
The LHC pp Collider at CERN



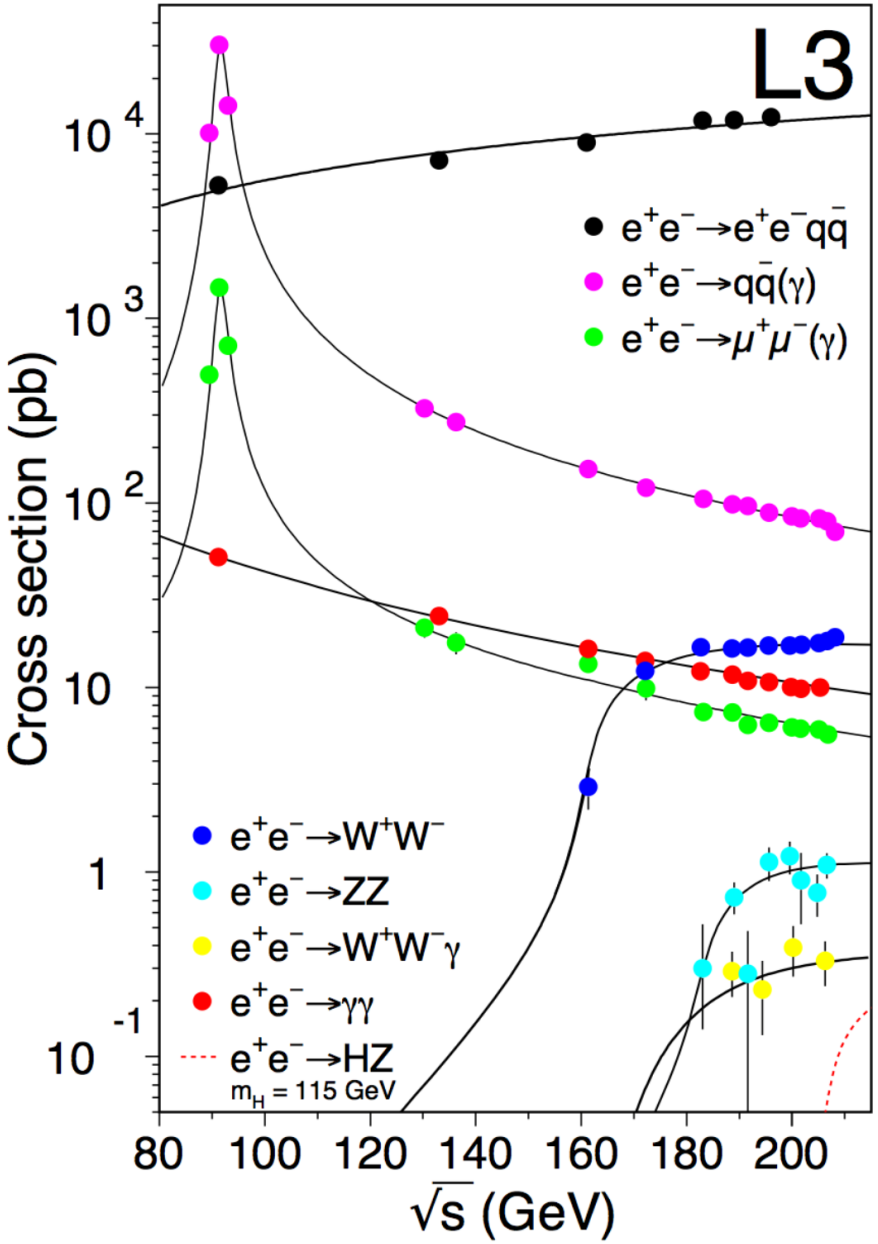
	Vs [TeV]	years	Ldt (rec.)
pp	7	2010-11	5.1 fb-1
pp	8	2012	21.3 fb-1
Pb+Pb	2.76	2010-11	160 µb-1
Pb+p	5	2013	30 nb-1

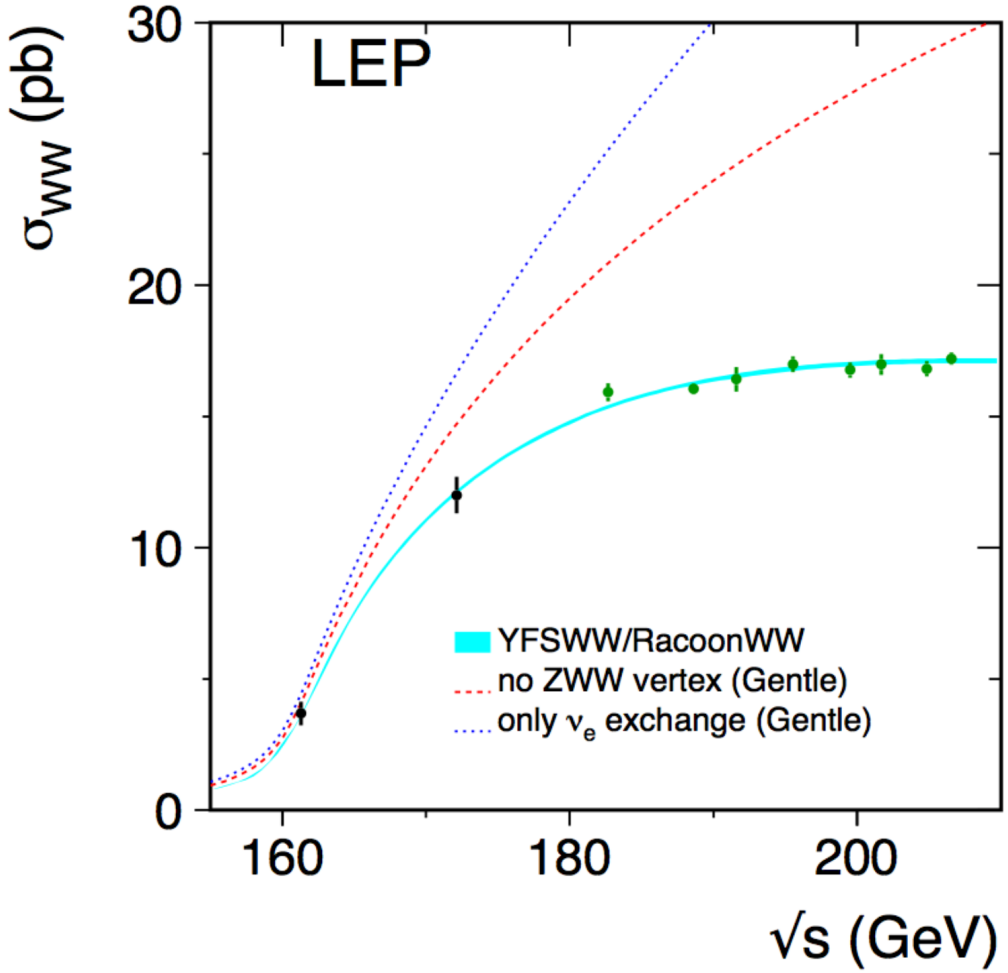
Higgs discovery: H→γγ



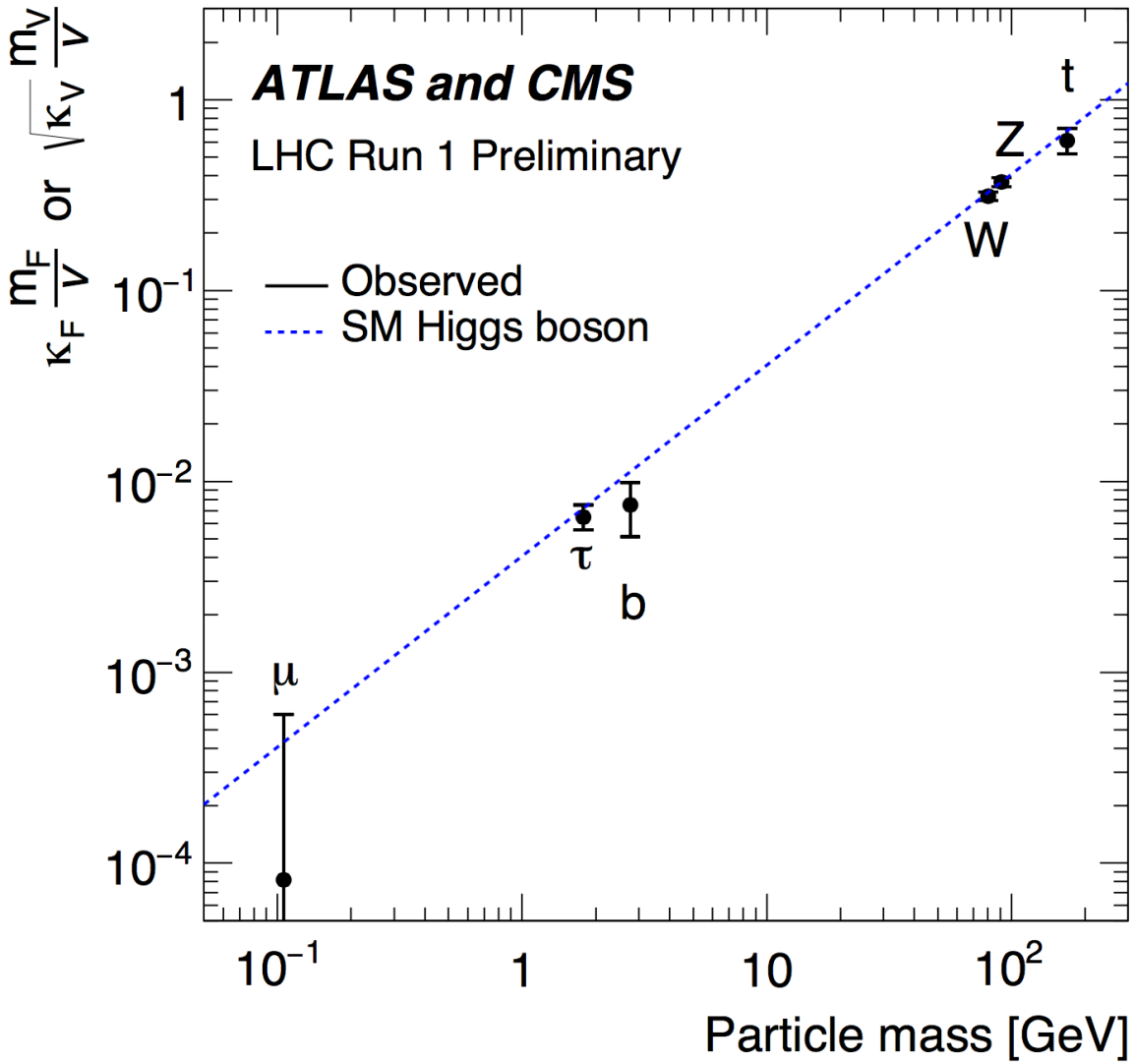


Electoweak cross sections at LEP II



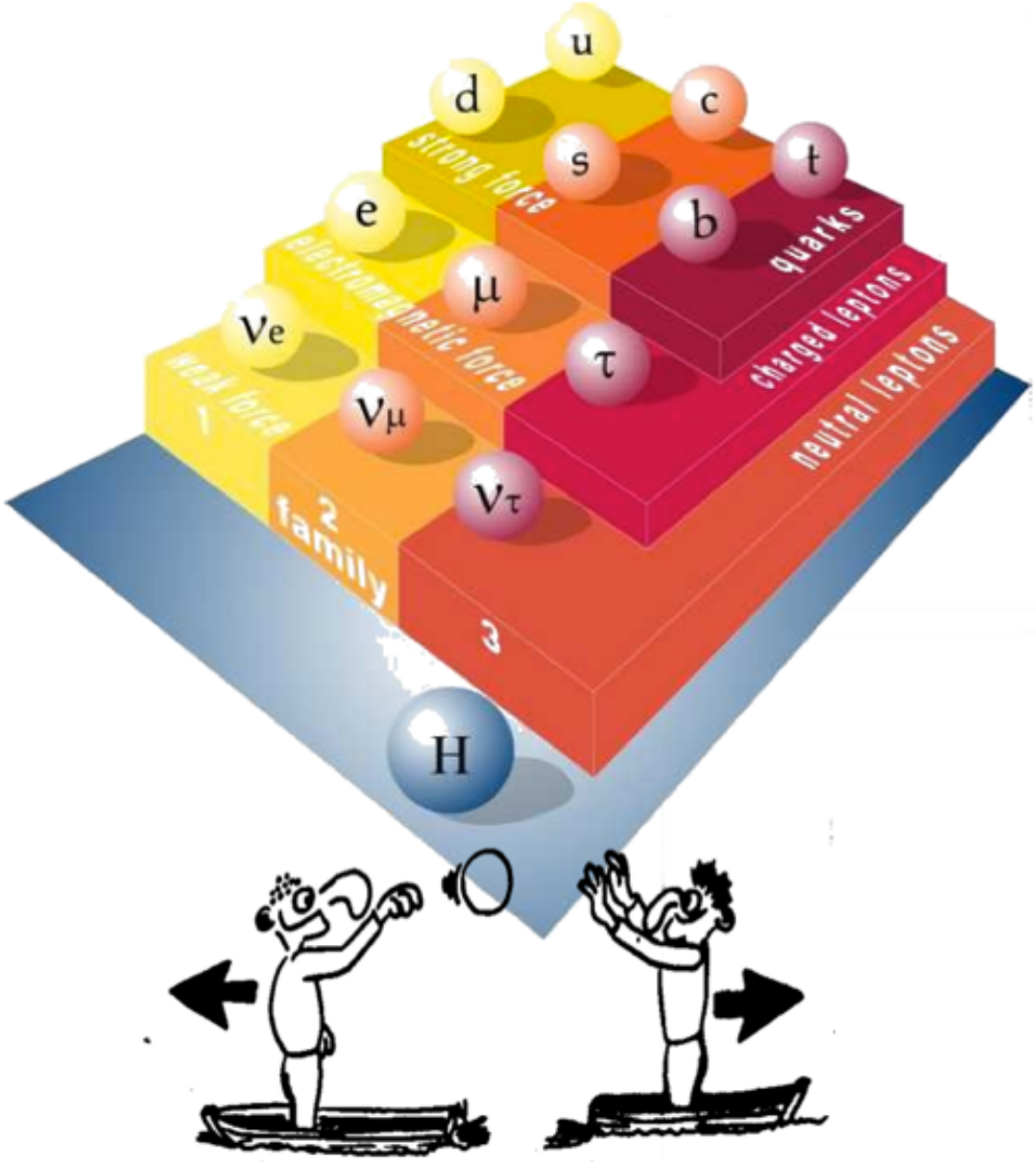


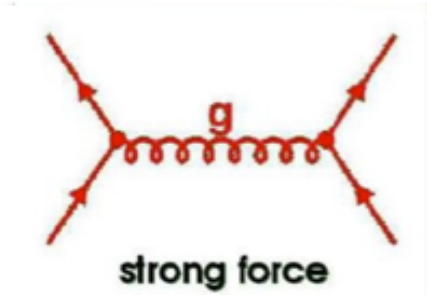
Higgs Couplings

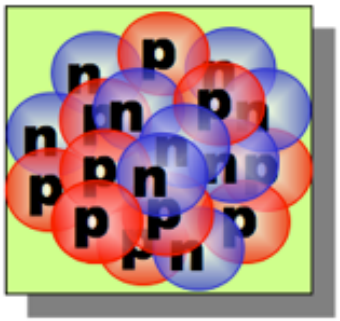


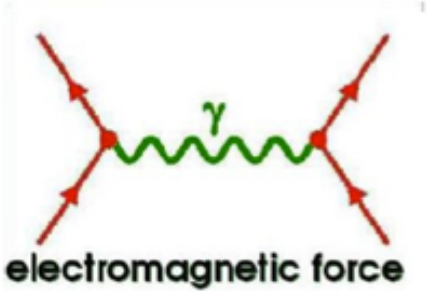
→ **in agreement with SM prediction**

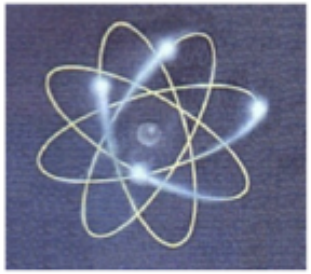
The Standard Model of Particle Physics

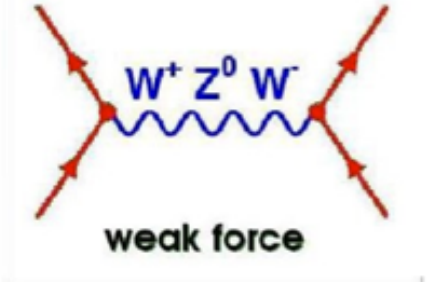


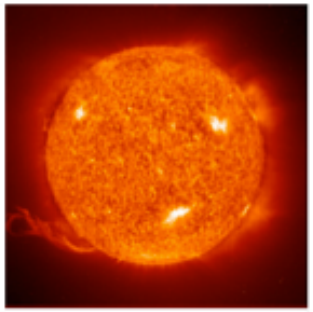


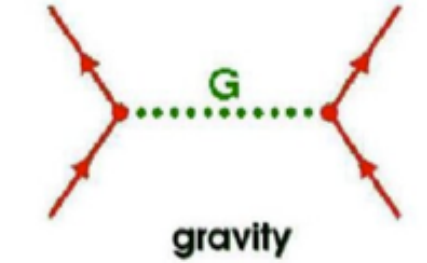


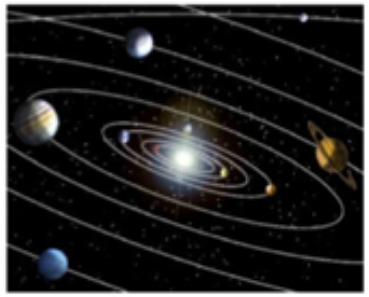




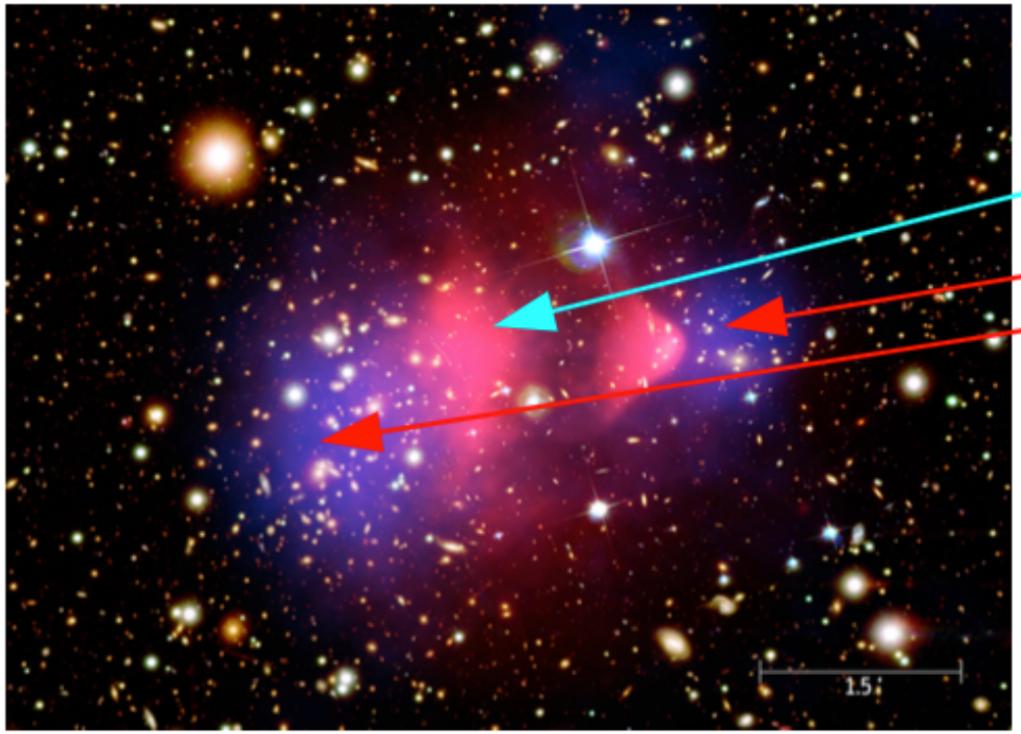


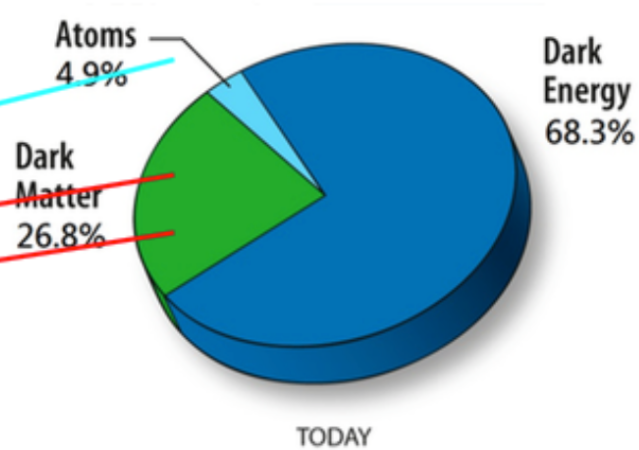


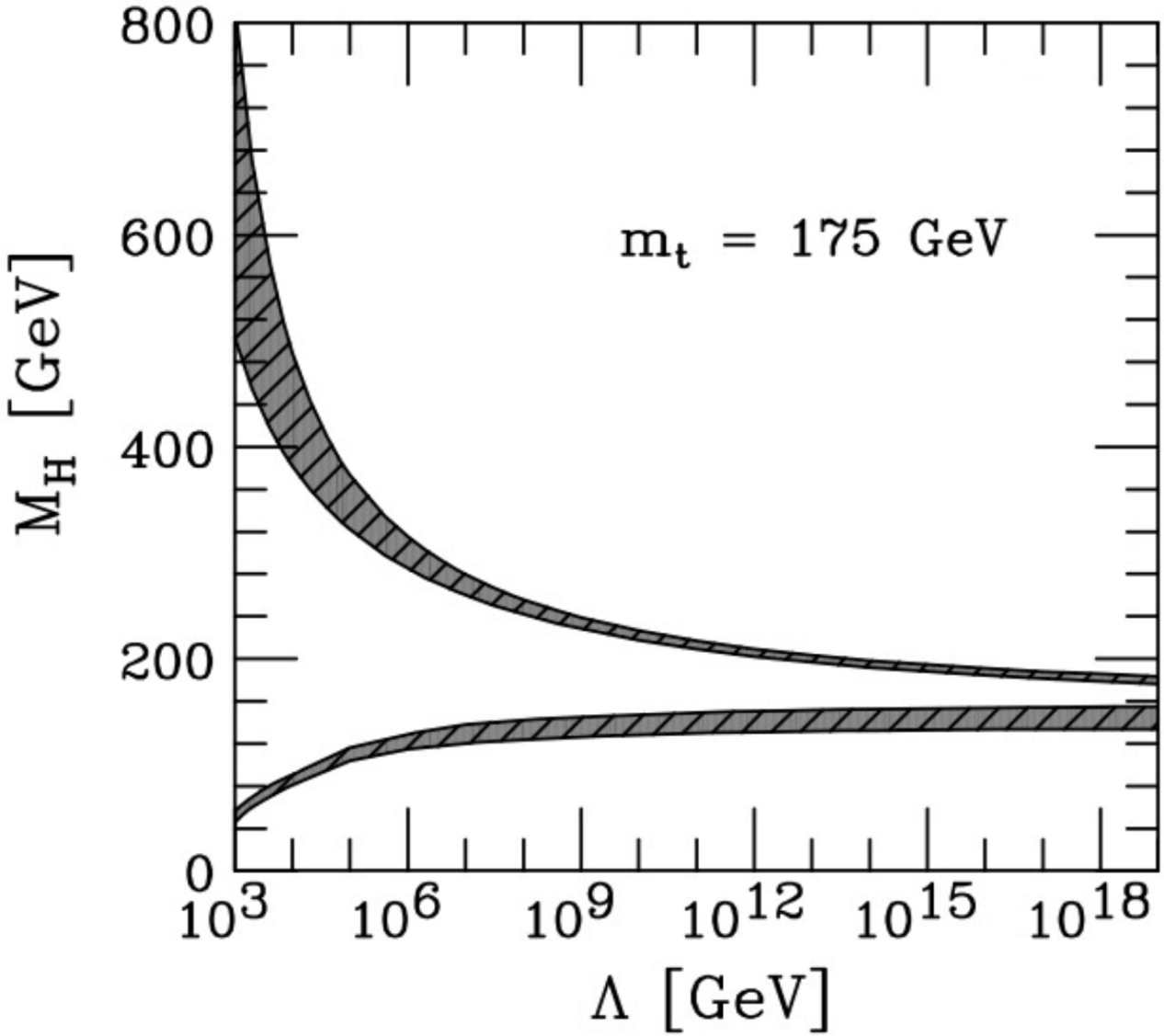




Dark Matter





Dark matter inferred from star motion and gravitational lensing

Bounds on SM Higgs mass