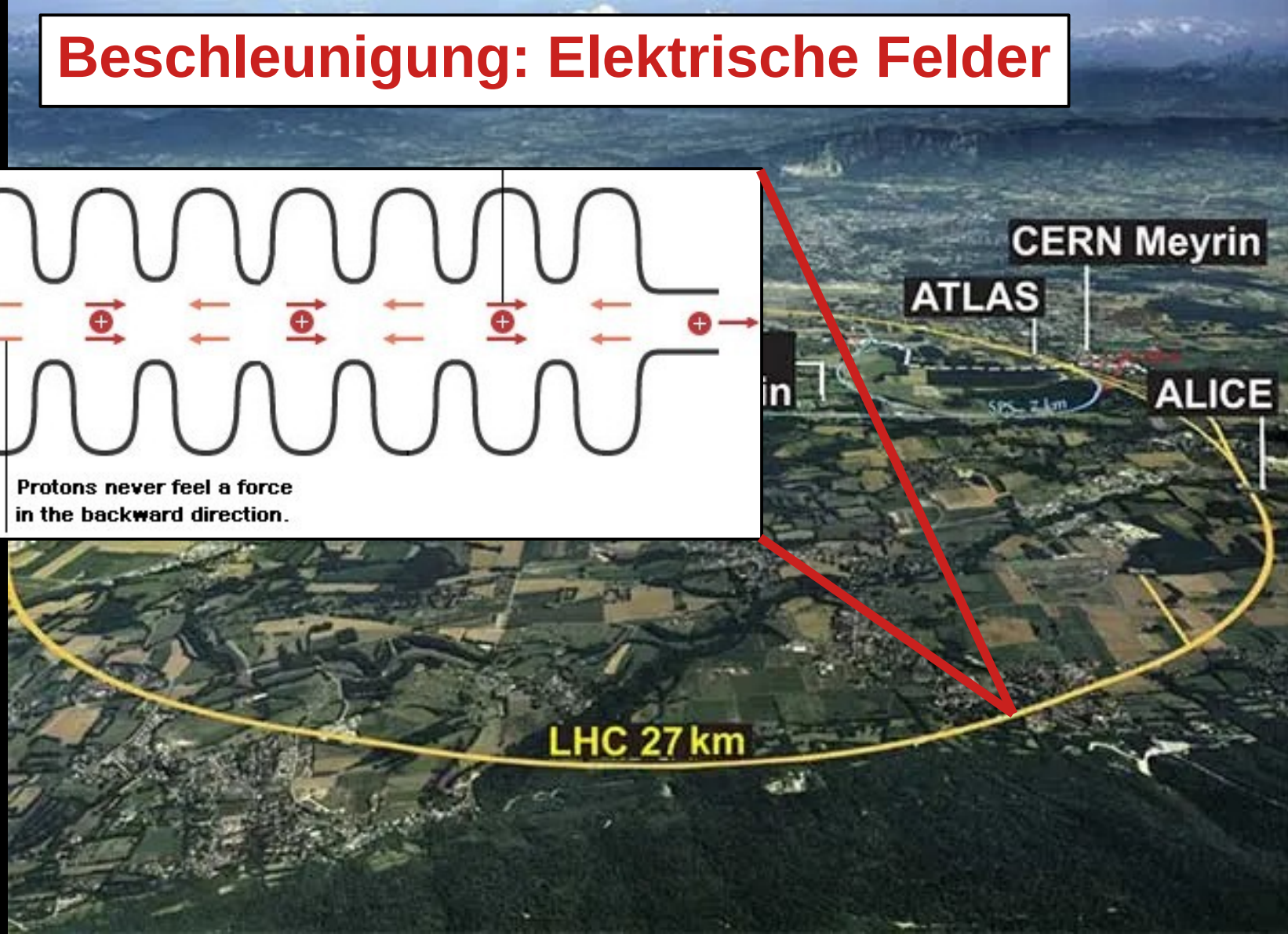
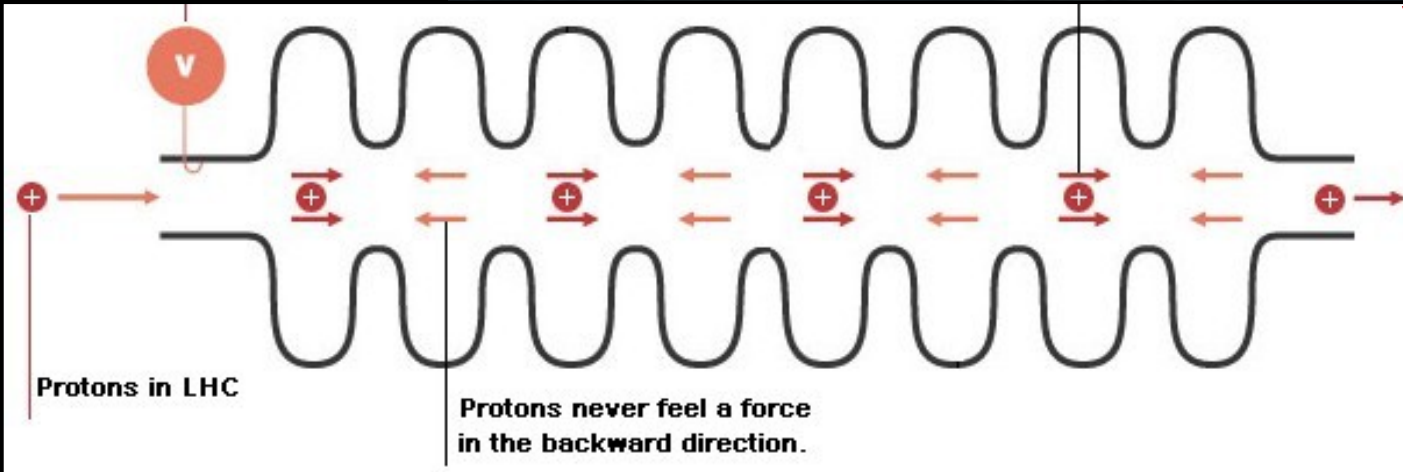
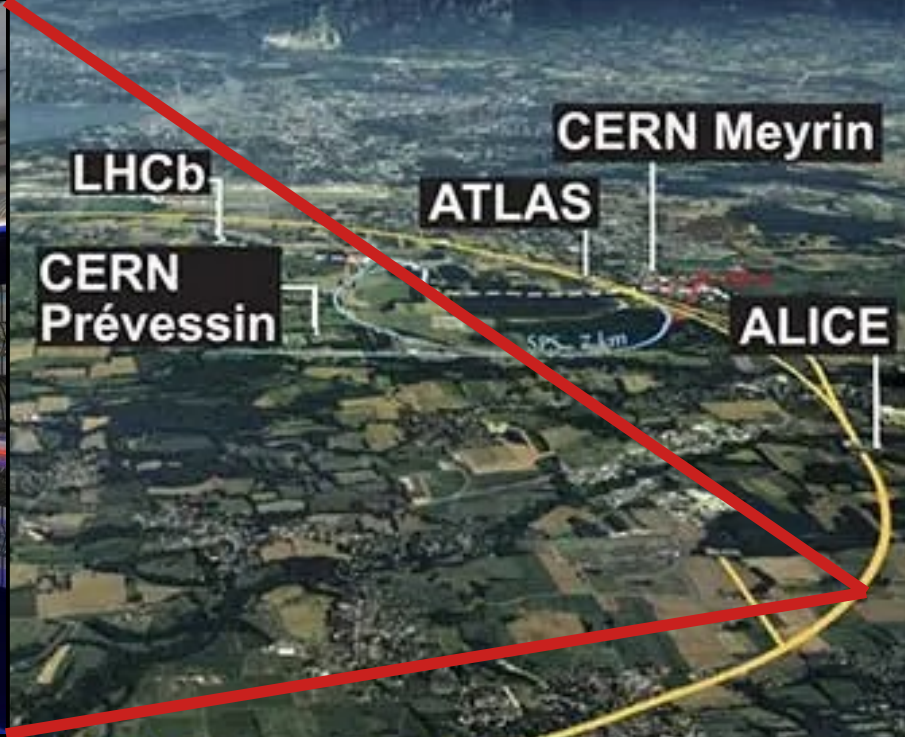
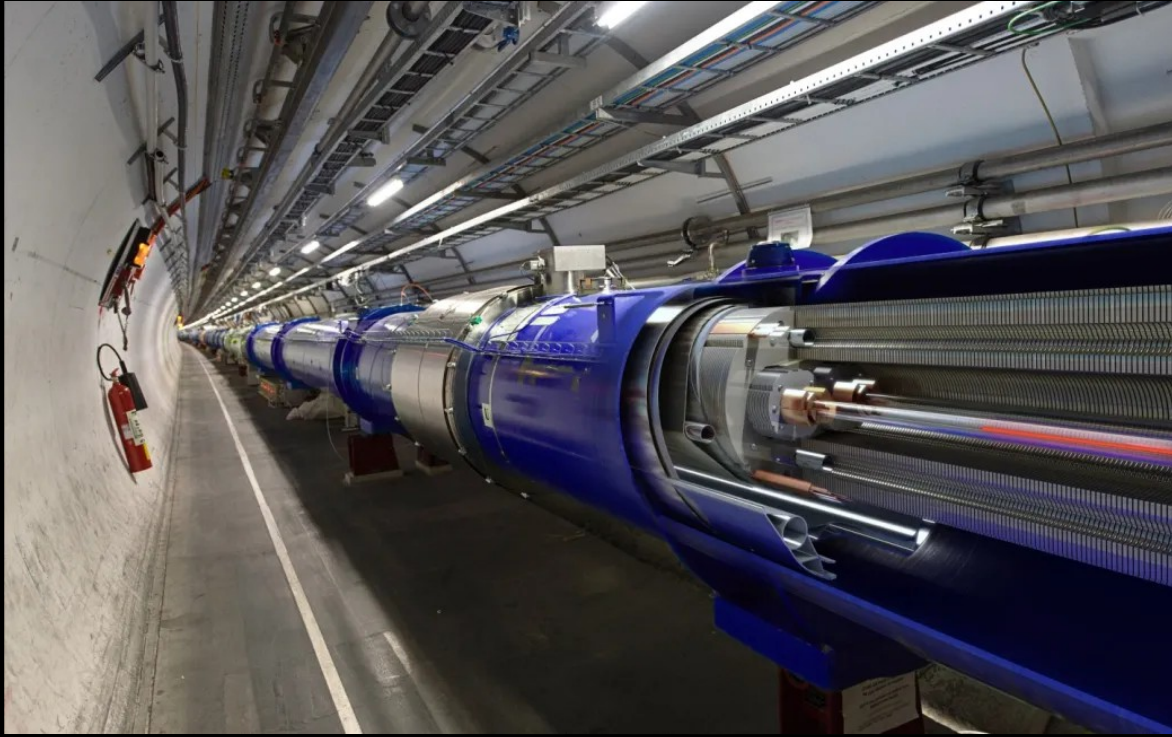




Beschleunigung: Elektrische Felder



Kreisbahn: Magnetfelder



LHC 27 km

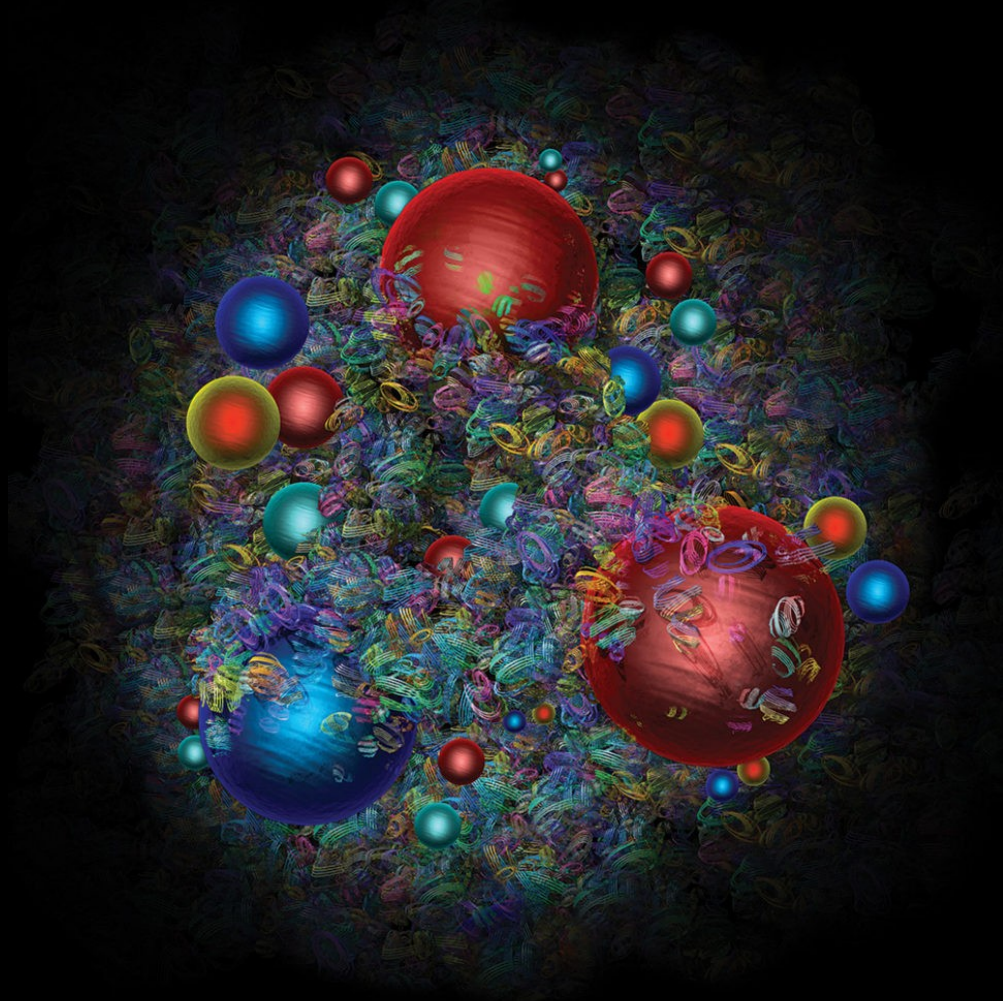
Elementare Teilchen

Three Generations of Matter (Fermions)

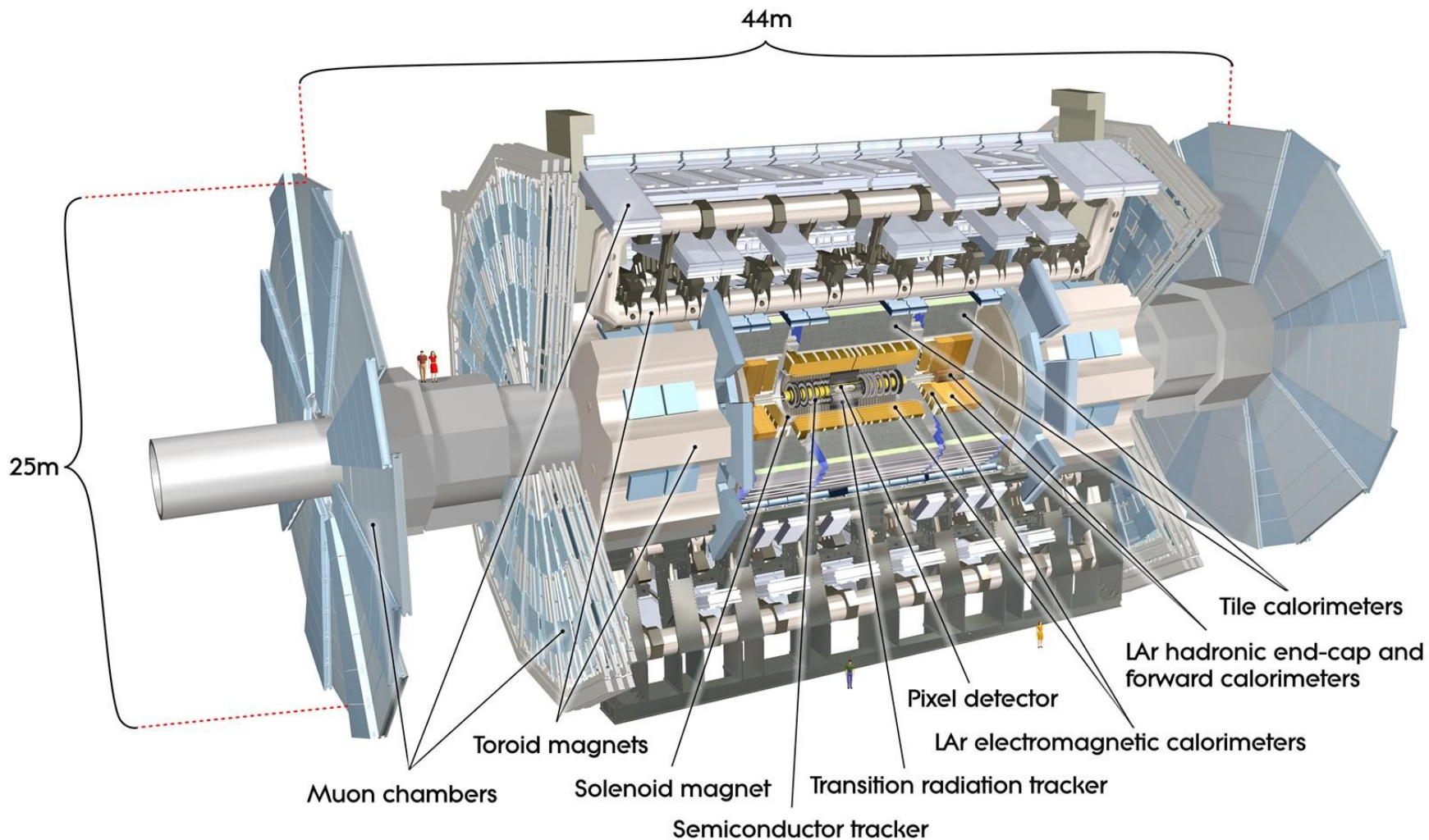
	I	II	III	
mass→	2.4 MeV	1.27 GeV	171.2 GeV	0
charge→	$\frac{2}{3}$	$\frac{2}{3}$	$\frac{2}{3}$	0
spin→	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1
name→	u up	c charm	t top	γ photon
Quarks	4.8 MeV	104 MeV	4.2 GeV	0
	$-\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	0
	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1
	d down	s strange	b bottom	g gluon
Leptons	<2.2 eV	<0.17 MeV	<15.5 MeV	91.2 GeV ⁰
	0	0	0	0
	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1
	ν_e electron neutrino	ν_μ muon neutrino	ν_τ tau neutrino	Z⁰ weak force
	0.511 MeV	105.7 MeV	1.777 GeV	80.4 GeV ⁺
	-1	-1	-1	± 1
	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1
	e electron	μ muon	τ tau	W⁺ weak force

Bosons (Forces)

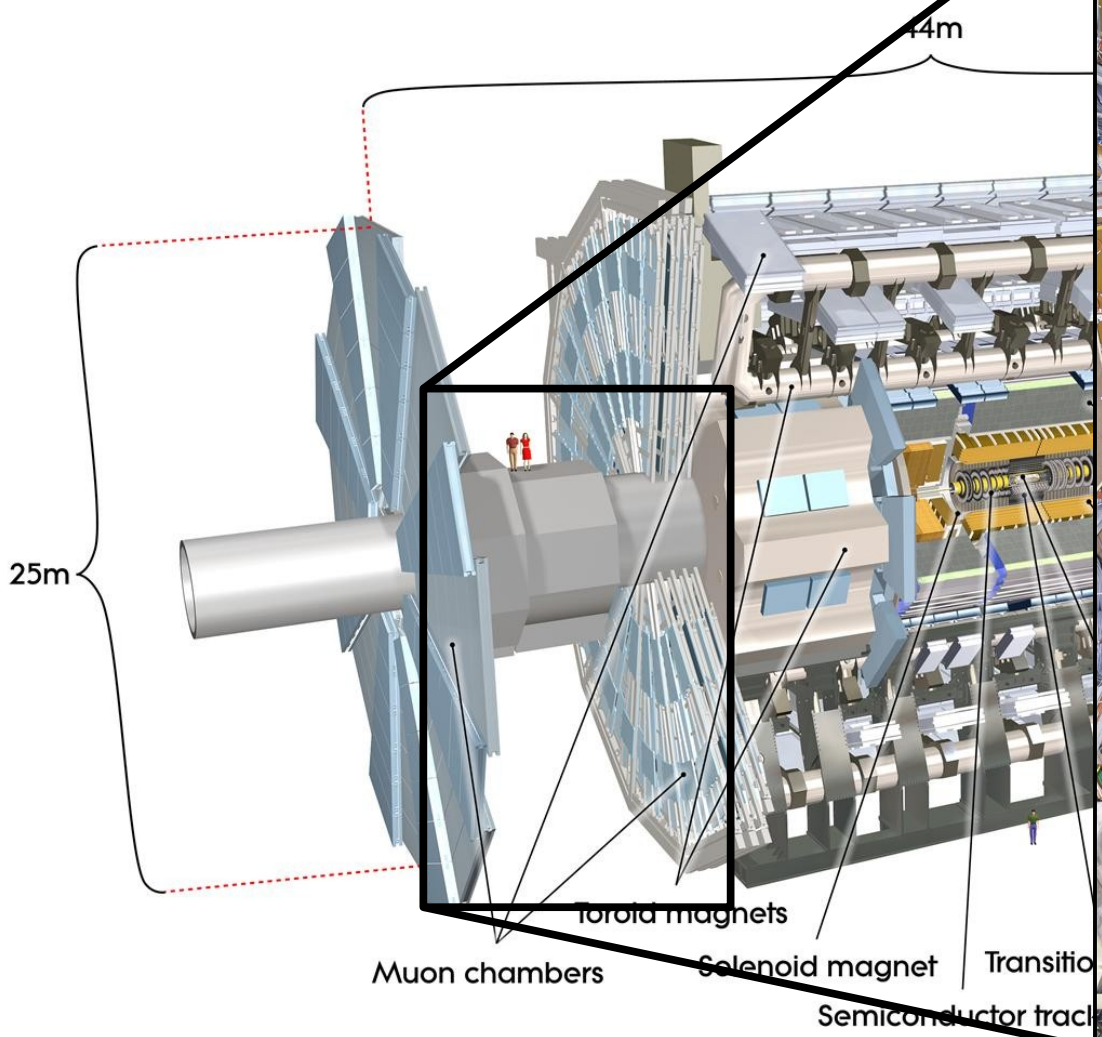
Das Proton



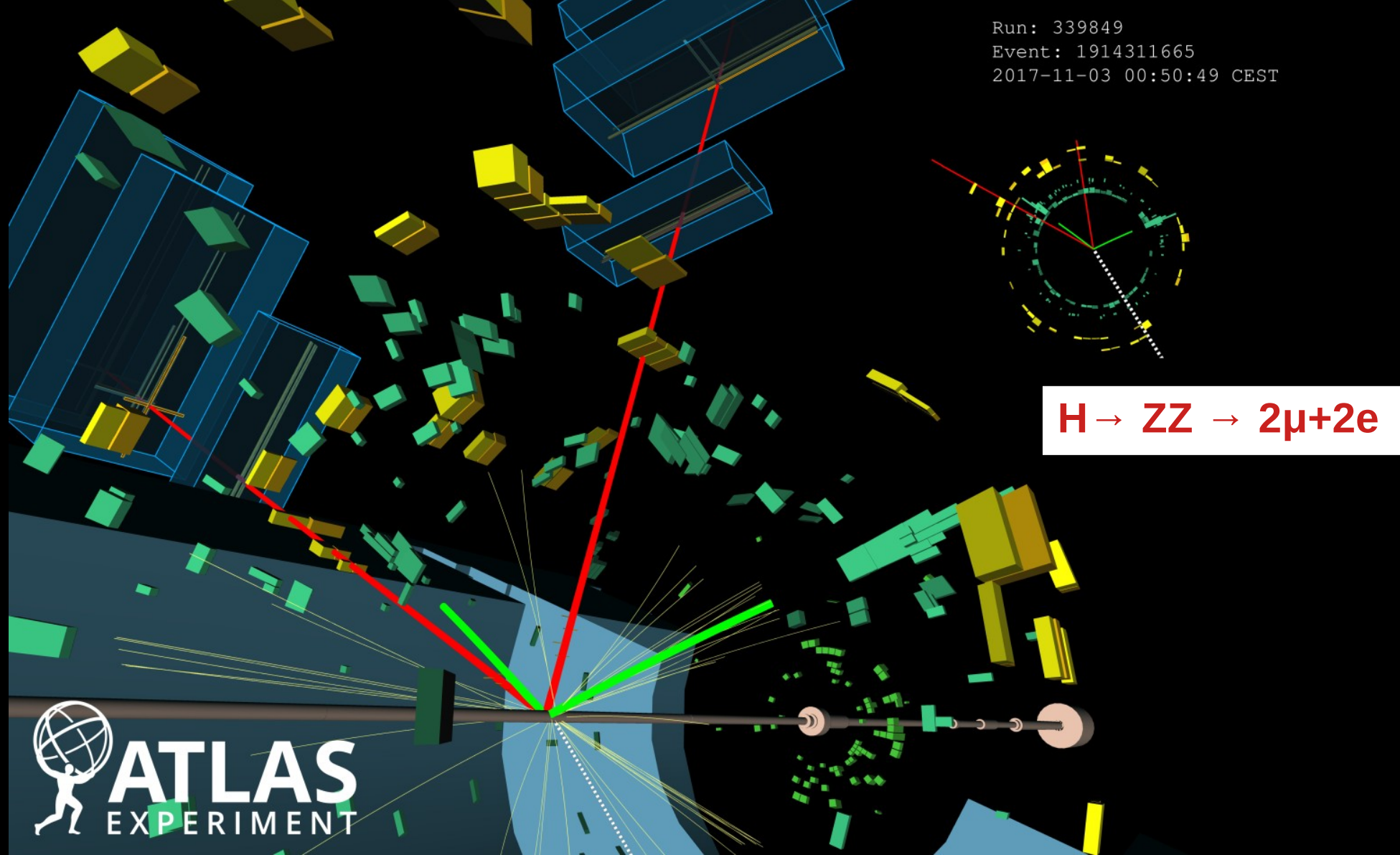
Der ATLAS Detektor



Der ATLAS Detektor



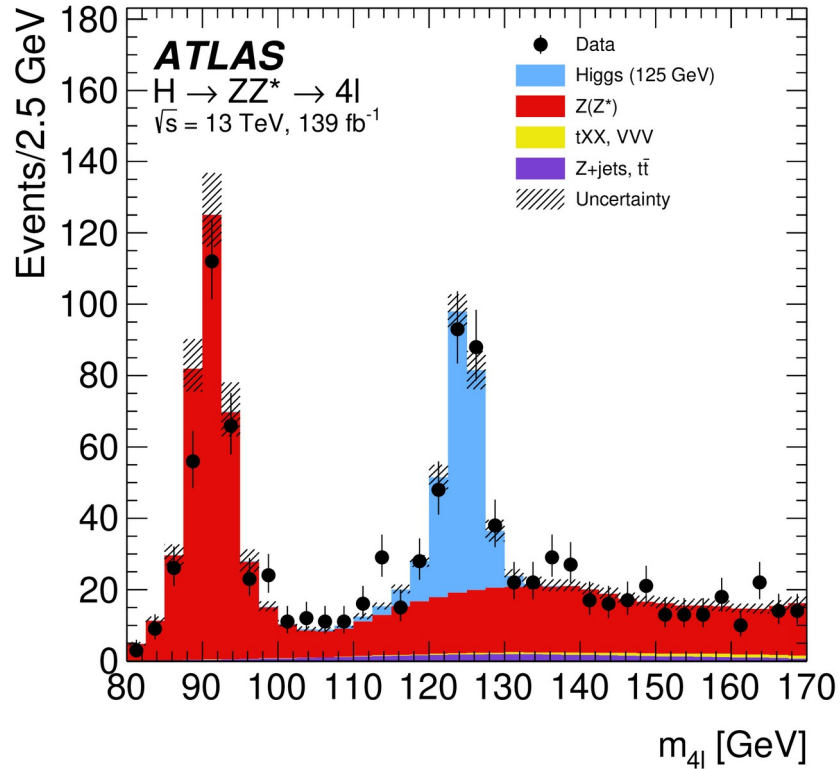
Run: 339849
Event: 1914311665
2017-11-03 00:50:49 CEST



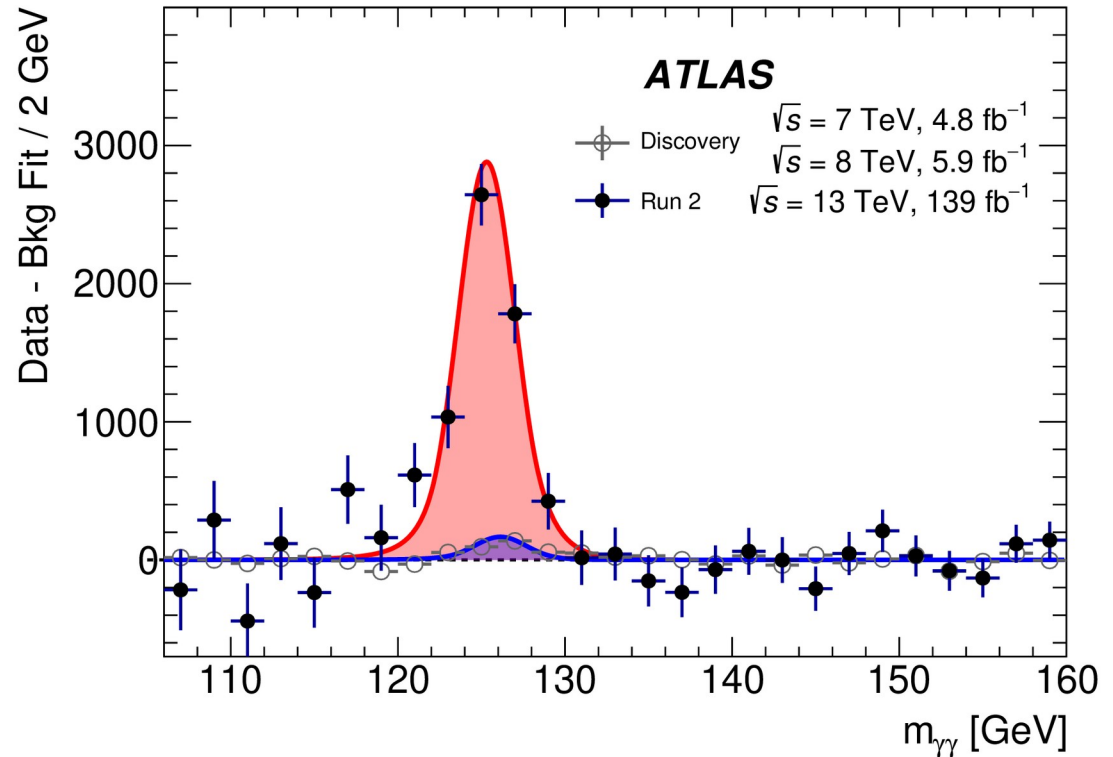
$H \rightarrow ZZ \rightarrow 2\mu + 2e$

Die Entdeckung und Vermessung des Higgs-Bosons

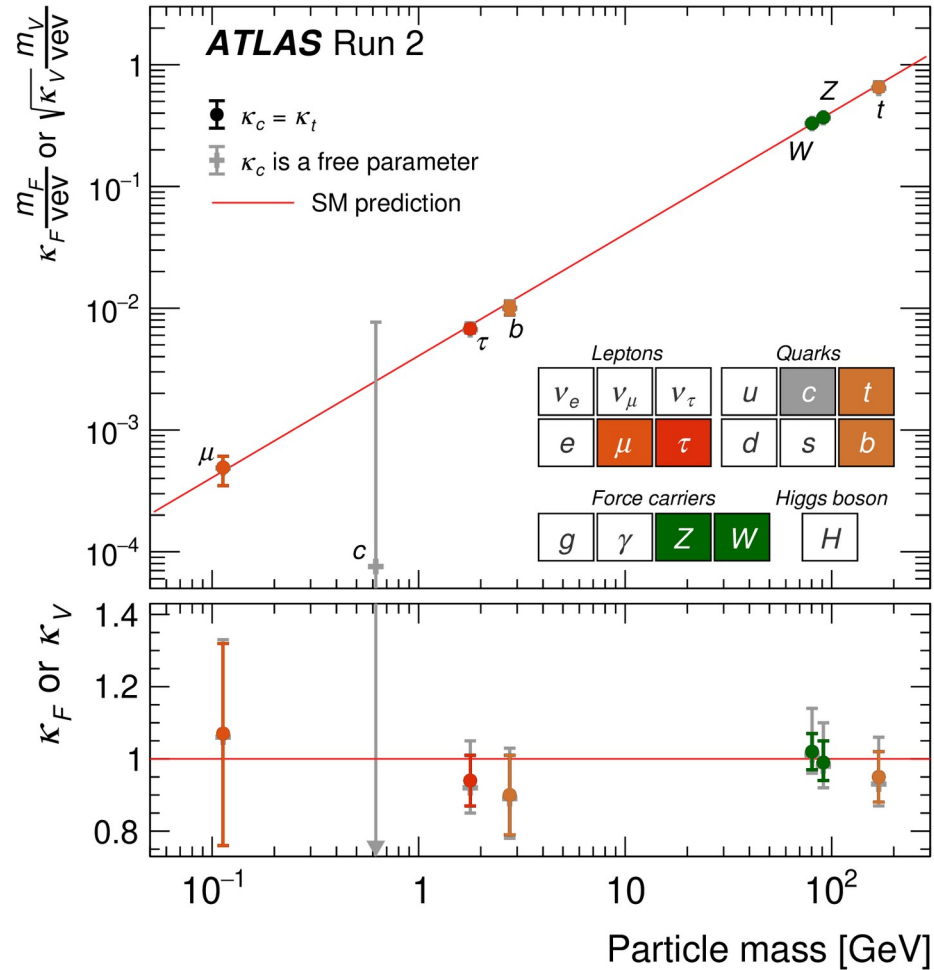
H → ZZ → 4l



H → $\gamma\gamma$



Der Higgs-Mechanismus ist real!



Unsichtbare Higgs-Zerfälle und fehlende Energie



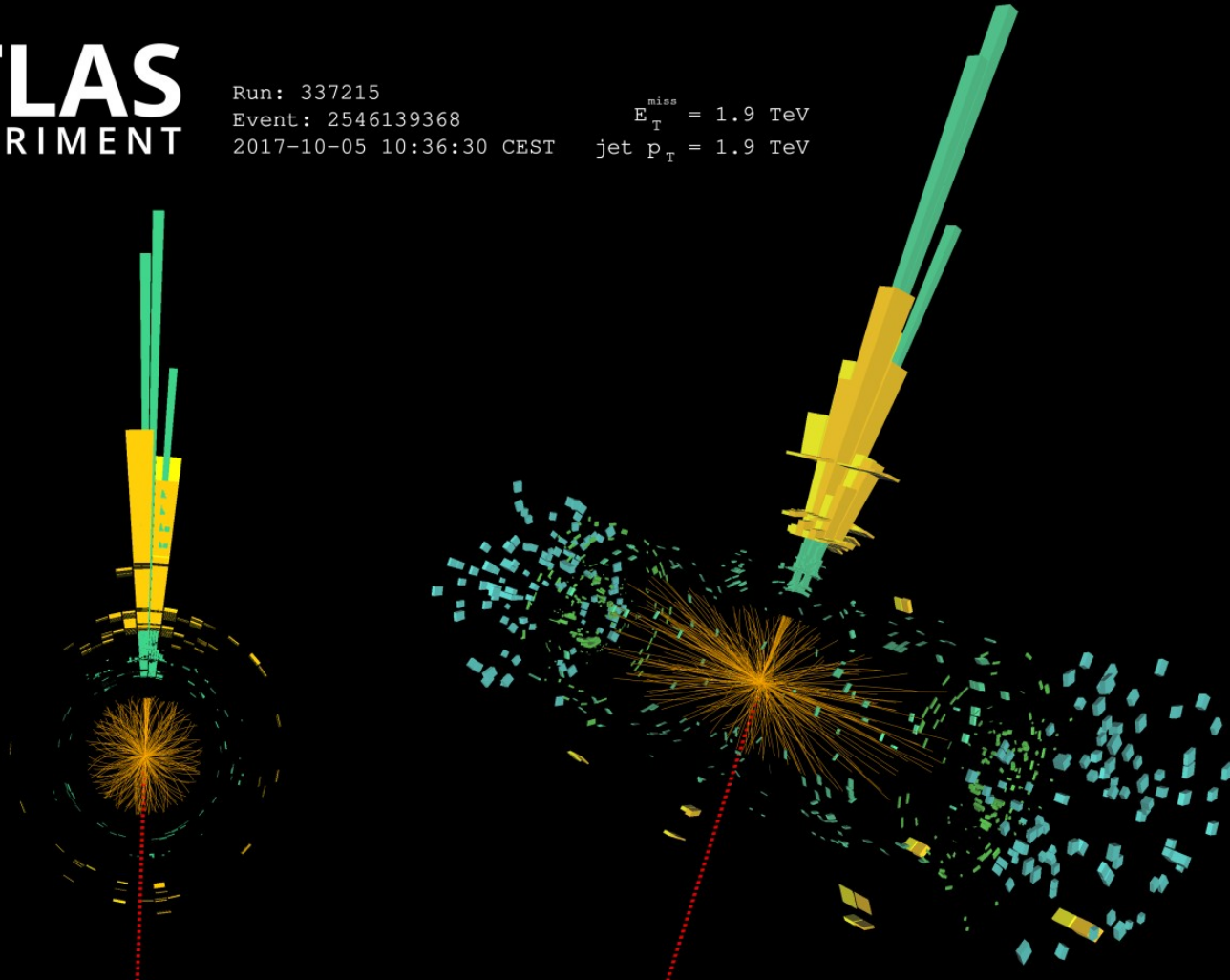
Run: 337215

Event: 2546139368

2017-10-05 10:36:30 CEST

$E_T^{\text{miss}} = 1.9 \text{ TeV}$

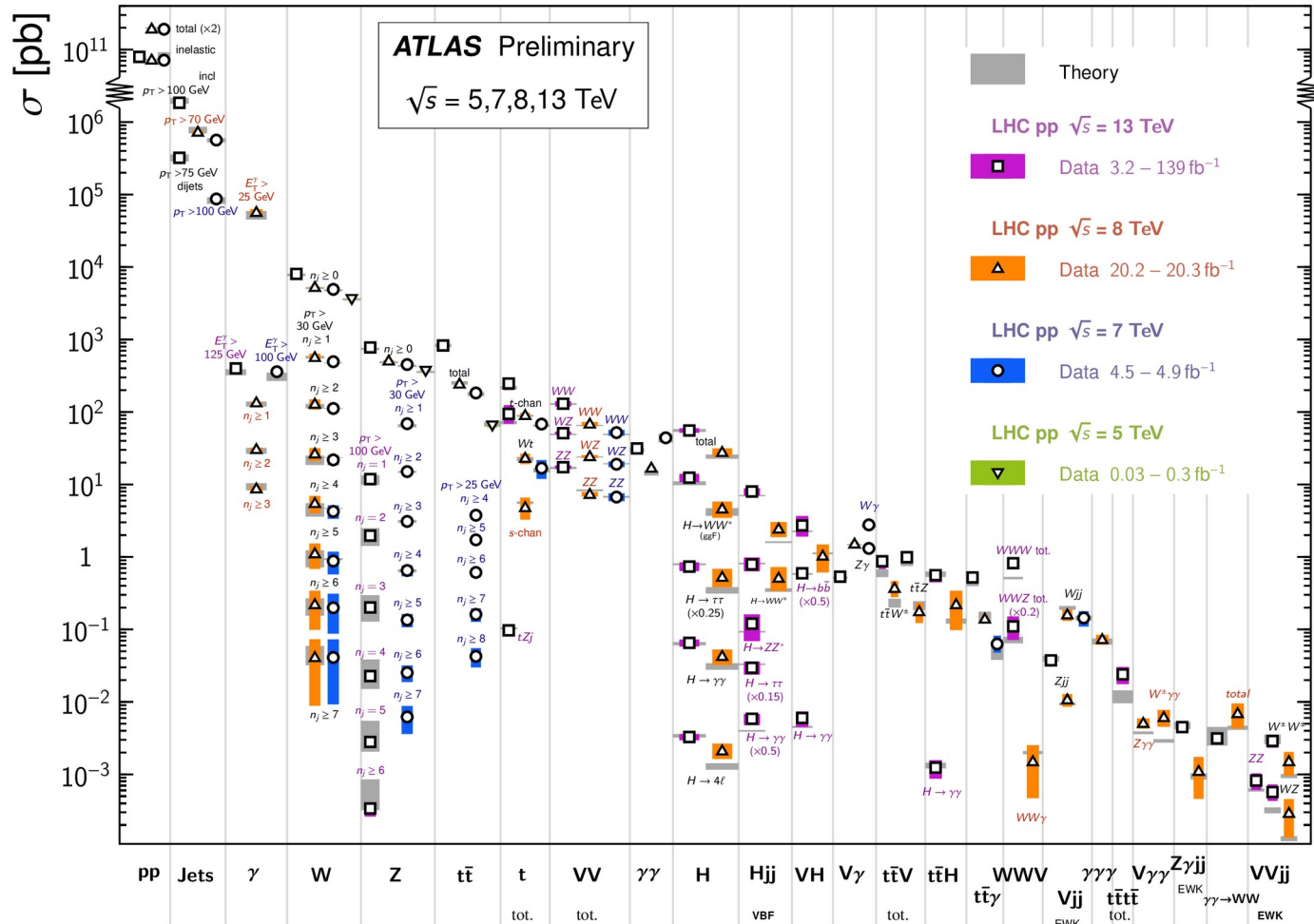
jet $p_T = 1.9 \text{ TeV}$



Die Suche nach der Nadel im Heuhaufen

Standard Model Production Cross Section Measurements

Status: February 2022



Der neue ATLAS-Trigger aus Mainz



Der neue ATLAS-Trigger aus Mainz



Das Higgs-Portal zum dunklen Sektor

Unsichtbare Higgs-Zerfälle

