

1.2: A Timeline of Particle Physics

Year	Experiment	Theory
1927	β decay discovered	
1928		Paul Dirac: Wave equation for electron
1930		Wolfgang Pauli suggests existence of neutrino
1931	Positron discovered	
1931		Paul Dirac realises that positrons are part of his equation
1931	Chadwick discovers neutron	
1933/4		Fermi introduces theory for β decay
1933/4		Hideki Yukawa discusses nuclear binding in terms of pions
1937	μ discovered in cosmic rays	
1938	Baryon number conservation	
1946		μ is not Yukawa's particle
1947	π^+ discovered in cosmic rays	
1946-50		Tomonaga, Schwinger and Feynman develop QED
1948	First artificial π 's	
1949	K^+ discovered	
1950	$\pi^0 \rightarrow \gamma\gamma$	
1951	"V-particles" Λ^0 and K^0	
1952	Δ : excited state of nucleon	
1954		Yang and Mills: Gauge theories
1956		Lee and Yang: Weak force might break parity!
1956	CS Wu and Ambler: Yes it does.	
1961		Eightfold way as organising principle
1962	ν_μ and ν_e	
1964		Quarks (Gell-man and Zweig) u, d, s
1964		Fourth quark suggested (c)
1965		Colour charge all particles are colour neutral!
1967		Glashow-Salam-Weinberg unification of electromagnetic and weak interactions. Predict Higgs boson.
1968-69	DIS at SLAC constituents of proton seen!	

Year	Experiment	Theory
1973		QCD as the theory of coloured interactions. Gluons.
1973		Asymptotic freedom
1974	J/ψ ($c\bar{c}$) meson	
1976	D^0 meson ($\bar{u}c$) confirms theory.	
1976	τ lepton!	
1977	b (bottom quark). Where is top?	
1978	Parity violating neutral weak interaction seen	
1979	Gluon signature at PETRA	
1983	W^\pm and Z^0 seen at CERN	
1989	SLAC suggests only three generations of (light!) neutrinos	
1995	t (top) at 175 GeV mass	
1997	New physics at HERA (200 GeV)	

This page titled [1.2: A Timeline of Particle Physics](#) is shared under a [CC BY-NC-SA 2.0](#) license and was authored, remixed, and/or curated by [Niels Walet](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.