

PARTICLE DATA

(Mass in MeV/c²; Lifetime in Seconds; Charge in Units of Proton Charge.)

QUARKS (Spin $\frac{1}{2}$)

	Flavor	Charge	Mass (speculative)		
			Bare	Effective	
				In baryons	In mesons
First generation	d	$-\frac{1}{3}$	7.5	} 363	310
	u	$+\frac{2}{3}$	4.2		
Second generation	s	$-\frac{1}{3}$	150	538	483
	c	$+\frac{2}{3}$	1100		
Third generation	b	$-\frac{1}{3}$	4200	>23,000	1500 4700
	t	$+\frac{2}{3}$			

LEPTONS (Spin $\frac{1}{2}$)

	Lepton	Charge	Mass	Lifetime	Principal decays
First generation	e	-1	0.511003	∞	—
	ν_e	0	0	∞	—
Second generation	μ^-	-1	105.659	2.197×10^{-6}	$e\nu_\mu\bar{\nu}_e$
	ν_μ	0	0	∞	—
Third generation	τ	-1	1784	3.3×10^{-13}	$\mu\nu_\tau\bar{\nu}_\mu, e\nu_\tau\bar{\nu}_e, \rho\nu_\tau$
	ν_τ	0	0	∞	—

MEDIATORS (Spin 1)

Mediator	Charge	Mass	Lifetime	Force
gluon	0	0	∞	strong
photon (γ)	0	0	∞	electromagnetic
$W^\pm$	± 1	81,800	unknown	(charged) weak
Z^0	0	92,600	unknown	(neutral) weak
				} electroweak

BARYONS (Spin $\frac{1}{2}$)

Baryon	Quark content	Charge	Mass	Lifetime	Principal decays
$N \begin{cases} p \\ n \end{cases}$	uud udd	+1 0	938.280 939.573	∞ 900	—
Λ	uds	0	1115.6	2.63×10^{-10}	$p\bar{e}\bar{\nu}_e$
Σ^+	uus	+1	1189.4	0.80×10^{-10}	$p\pi^-, n\pi^0$
Σ^0	uds	0	1192.5	6×10^{-20}	$p\pi^0, n\pi^+$
Σ^-	dds	-1	1197.3	1.48×10^{-10}	$\Delta\gamma$
Ξ^0	uss	0	1314.9	2.90×10^{-10}	$n\pi^-$
Ξ^-	dss	-1	1321.3	1.64×10^{-10}	$\Delta\pi^0$
Λ_c^+	udc	+1	2281	2×10^{-13}	$\Delta\pi^-$
					not established

BARYONS (Spin $\frac{3}{2}$)

Baryon	Quark content	Charge	Mass	Lifetime	Principal decays
Δ	uuu, uud, udd, ddd	+2, +1, 0, -1	1232	0.6×10^{-23}	$N\pi$
Σ^*	uus, uds, dds	+1, 0, -1	1385	2×10^{-23}	$\Lambda\pi, \Sigma\pi$
Ξ^*	uss, dss	0, -1	1533	7×10^{-23}	$\Xi\pi$
Ω^-	sss	-1	1672	0.82×10^{-10}	$\Lambda K^-, \Xi^0\pi^-, \Xi^-\pi^0$

PSEUDOSCALAR MESONS (Spin 0)

Meson	Quark content	Charge	Mass	Lifetime	Principal decays
$\pi^\pm$	$u\bar{d}, d\bar{u}$	+1, -1	139.569	2.60×10^{-8}	$\mu\nu_\mu$
π^0	$(u\bar{u} - d\bar{d})/\sqrt{2}$	0	134.964	8.7×10^{-17}	$\gamma\gamma$
$K^\pm$	$u\bar{s}, s\bar{u}$	+1, -1	493.67	1.24×10^{-8}	$\mu\nu_\mu, \pi^\pm\pi^0, \pi^\pm\pi^\pm\pi^\mp$
$K^0, \bar{K}^0$	$d\bar{s}, s\bar{d}$	0, 0	497.72	$\left\{ \begin{array}{l} K_S^0 0.892 \times 10^{-10} \\ K_L^0 5.18 \times 10^{-8} \end{array} \right.$	$\pi^+\pi^-, \pi^0\pi^0$
η	$(u\bar{u} + d\bar{d} - 2s\bar{s})/\sqrt{6}$	0	548.8	7×10^{-19}	$\pi e\nu_e, \pi\mu\nu_\mu, \pi\pi\pi$
η'	$(u\bar{u} + d\bar{d} + s\bar{s})/\sqrt{3}$	0	957.6	3×10^{-21}	$\gamma\gamma, \pi^0\pi^0\pi^0, \pi^+\pi^-\pi^0$
$D^\pm$	$c\bar{d}, d\bar{c}$	+1, -1	1869	9×10^{-13}	$\eta\pi\pi, \rho^0\gamma$
$D^0, \bar{D}^0$	$c\bar{u}, u\bar{c}$	0, 0	1865	4×10^{-13}	$K\pi\pi$
$F^\pm$ (now $D_s^\pm$)	$c\bar{s}, s\bar{c}$	+1, -1	1971	3×10^{-13}	$K\pi\pi$
$B^\pm$	$u\bar{b}, b\bar{u}$	+1, -1	5271	$\left. \vphantom{\begin{matrix} 14 \times 10^{-13} \end{matrix}} \right\}$	not established
$B^0, \bar{B}^0$	$d\bar{b}, b\bar{d}$	0, 0	5275		$D + ?$
η_c	$c\bar{c}$	0	2981	6×10^{-23}	$KK\pi, \eta\pi\pi, \eta'\pi\pi$

VECTOR MESONS (Spin 1)

Meson	Quark content	Charge	Mass	Lifetime	Principal decays
ρ	$u\bar{d}, d\bar{u}, (u\bar{u} - d\bar{d})/\sqrt{2}$	+1, -1, 0	770	0.4×10^{-23}	$\pi\pi$
K^*	$u\bar{s}, s\bar{u}, d\bar{s}, s\bar{d}$	+1, -1, 0, 0	892	1×10^{-23}	$K\pi$
ω	$(u\bar{u} + d\bar{d})/\sqrt{2}$	0	783	7×10^{-23}	$\pi^+\pi^-\pi^0, \pi^0\gamma$
ϕ	$s\bar{s}$	0	1020	20×10^{-23}	$K^+K^-, K^0\bar{K}^0$
J/ψ	$c\bar{c}$	0	3097	1×10^{-20}	$e^+e^-, \mu^+\mu^-, 5\pi, 7\pi$
D^*	$c\bar{d}, d\bar{c}, c\bar{u}, u\bar{c}$	+1, -1, 0, 0	2010	$>1 \times 10^{-22}$	$D\pi, D\gamma$
Υ	$b\bar{b}$	0	9460	2×10^{-20}	$\tau^+\tau^-, \mu^+\mu^-, e^+e^-$