

# Standard Model of Elementary Particles

three generations of matter (fermions)						interactions / force carriers (bosons)	
I		II		III			
QUARKS	mass charge spin	$\approx 2.2 \text{ MeV}/c^2$ $\frac{2}{3}$ $\frac{1}{2}$ <b>u</b> up	$\approx 1.28 \text{ GeV}/c^2$ $\frac{2}{3}$ $\frac{1}{2}$ <b>c</b> charm	$\approx 172.76 \text{ GeV}/c^2$ $\frac{2}{3}$ $\frac{1}{2}$ <b>t</b> top		0 0 1 <b>g</b> gluon	$\approx 124.97 \text{ GeV}/c^2$ 0 0 0 <b>H</b> higgs
		$\approx 4.7 \text{ MeV}/c^2$ $-\frac{1}{3}$ $\frac{1}{2}$ <b>d</b> down	$\approx 96 \text{ MeV}/c^2$ $-\frac{1}{3}$ $\frac{1}{2}$ <b>s</b> strange	$\approx 4.18 \text{ GeV}/c^2$ $-\frac{1}{3}$ $\frac{1}{2}$ <b>b</b> bottom		0 0 1 $\gamma$ photon	
		$< 1.0 \text{ eV}/c^2$ 0 $\frac{1}{2}$ <b><math>\nu_e</math></b> electron neutrino	$< 0.17 \text{ MeV}/c^2$ 0 $\frac{1}{2}$ <b><math>\nu_\mu</math></b> muon neutrino	$< 18.2 \text{ MeV}/c^2$ 0 $\frac{1}{2}$ <b><math>\nu_\tau</math></b> tau neutrino		$\approx 91.19 \text{ GeV}/c^2$ 0 1 <b>Z</b> Z boson	
LEPTONS		$\approx 0.511 \text{ MeV}/c^2$ -1 $\frac{1}{2}$ <b>e</b> electron	$\approx 105.66 \text{ MeV}/c^2$ -1 $\frac{1}{2}$ <b><math>\mu</math></b> muon	$\approx 1.7768 \text{ GeV}/c^2$ -1 $\frac{1}{2}$ <b><math>\tau</math></b> tau		$\approx 80.39 \text{ GeV}/c^2$ $\pm 1$ 1 <b>W</b> W boson	
						GAUGE BOSONS VECTOR BOSONS	
						SCALAR BOSONS	