

Standard Model of Elementary Particles

| three generations of matter (fermions) | | | interactions / force carriers (bosons) | |
|---|---|--|---|---|
| I | II | III | | |
| mass $\frac{2}{3}$ $\frac{1}{2}$ | $\approx 2.2 \text{ MeV}/c^2$ $\frac{2}{3}$ $\frac{1}{2}$ | $\approx 1.28 \text{ GeV}/c^2$ $\frac{2}{3}$ $\frac{1}{2}$ | $\approx 173.1 \text{ GeV}/c^2$ $\frac{2}{3}$ $\frac{1}{2}$ | |
| charge spin | u up | c charm | t top | g gluon |
| | | | | $\approx 124.97 \text{ GeV}/c^2$ 0 0 0 H higgs |
| QUARKS | | | | SCALAR BOSONS |
| | d down | s strange | b bottom | |
| | | | | photon |
| LEPTONS | | | | GAUGE BOSONS VECTOR BOSONS |
| | e electron | μ muon | τ tau | Z boson |
| | | | | $\approx 91.19 \text{ GeV}/c^2$ 0 1 Z |
| | ν_e electron neutrino | ν_μ muon neutrino | ν_τ tau neutrino | $\approx 80.39 \text{ GeV}/c^2$ ± 1 1 W W boson |