

The Standard Model

Matter Particles (Fermions)

Spin = 1/2

Leptons:

$$\begin{pmatrix} \nu_e \\ e \end{pmatrix}$$

Quarks:

$$\begin{pmatrix} u \\ d \end{pmatrix}$$

Interactions “Force carriers” (Bosons)

Spin = 1

Gauge bosons:

γ

W

Z

g

Beautiful (complicated) mathematics governs nature interactions

Dictated by principles of symmetry (*Much direct consequence QM + R*)