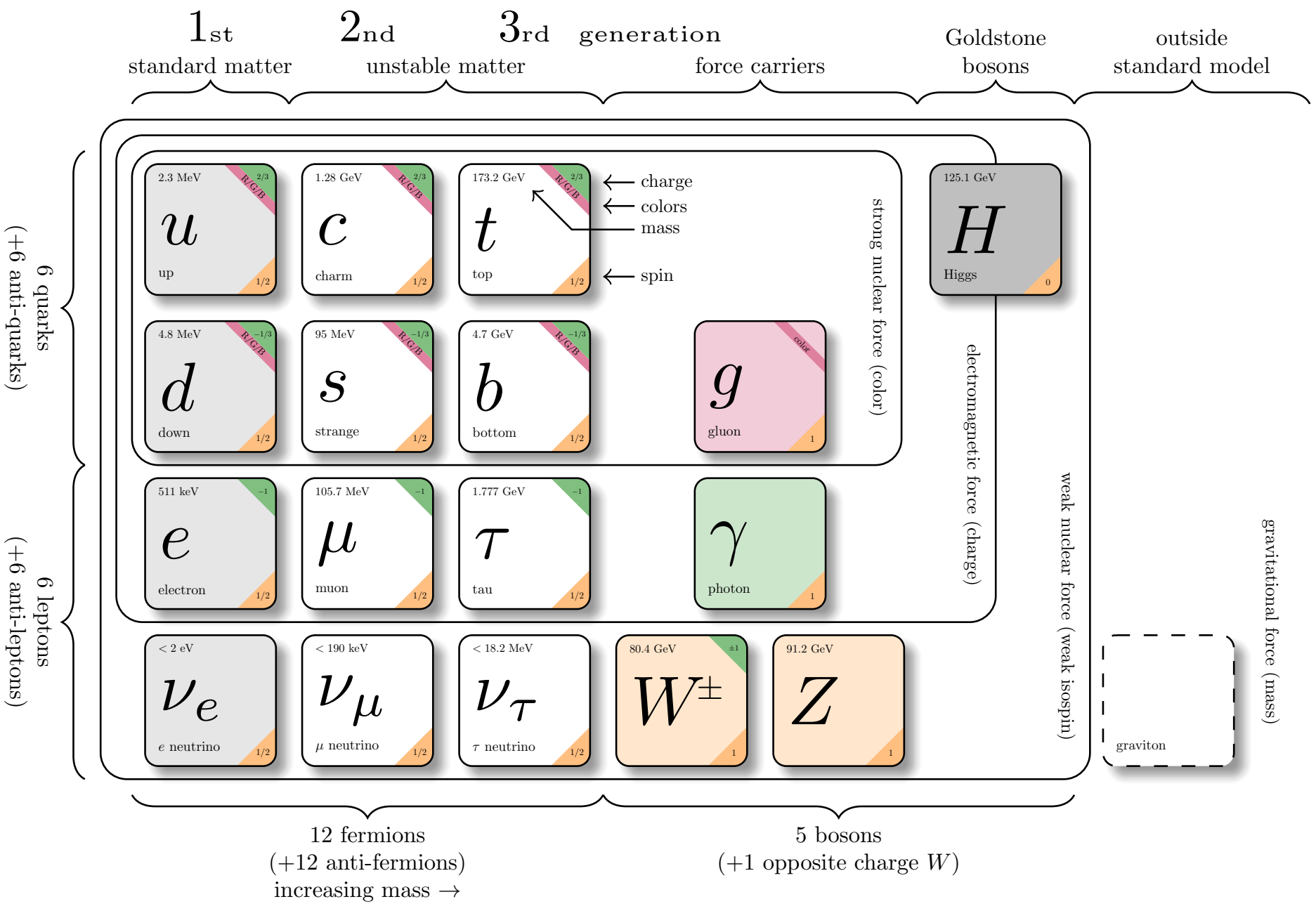
1st
2nd
3rd generation
standard matter
unstable matter
force carriers
Goldstone bosons
outside standard model
2.3 MeV
2/3
R/G/B
u
up
1/2
1.28 GeV
2/3
R/G/B
c
charm
1/2
173.2 GeV
2/3
R/G/B
t
top
1/2
charge
colors
mass
spin
125.1 GeV
H
Higgs
0
4.8 MeV
−1/3
R/G/B
d
down
1/2
95 MeV
−1/3
R/G/B
s
strange
1/2
4.7 GeV
−1/3
R/G/B
b
bottom
1/2
g
gluon
1
color
strong nuclear force (color)
electromagnetic force (charge)
weak nuclear force (weak isospin)
511 keV
−1
e
electron
1/2
105.7 MeV
−1
μ
muon
1/2
1.777 GeV
−1
τ
tau
1/2
γ
photon
1
< 2 eV
ν_e
e neutrino
1/2
< 190 keV
ν_μ
μ neutrino
1/2
< 18.2 MeV
ν_τ
τ neutrino
1/2
80.4 GeV
±1
$W^\pm$
1
91.2 GeV
Z
1
graviton
gravitational force (mass)
6 quarks
(+6 anti-quarks)
6 leptons
(+6 anti-leptons)
12 fermions
(+12 anti-fermions)
increasing mass →
5 bosons
(+1 opposite charge W)