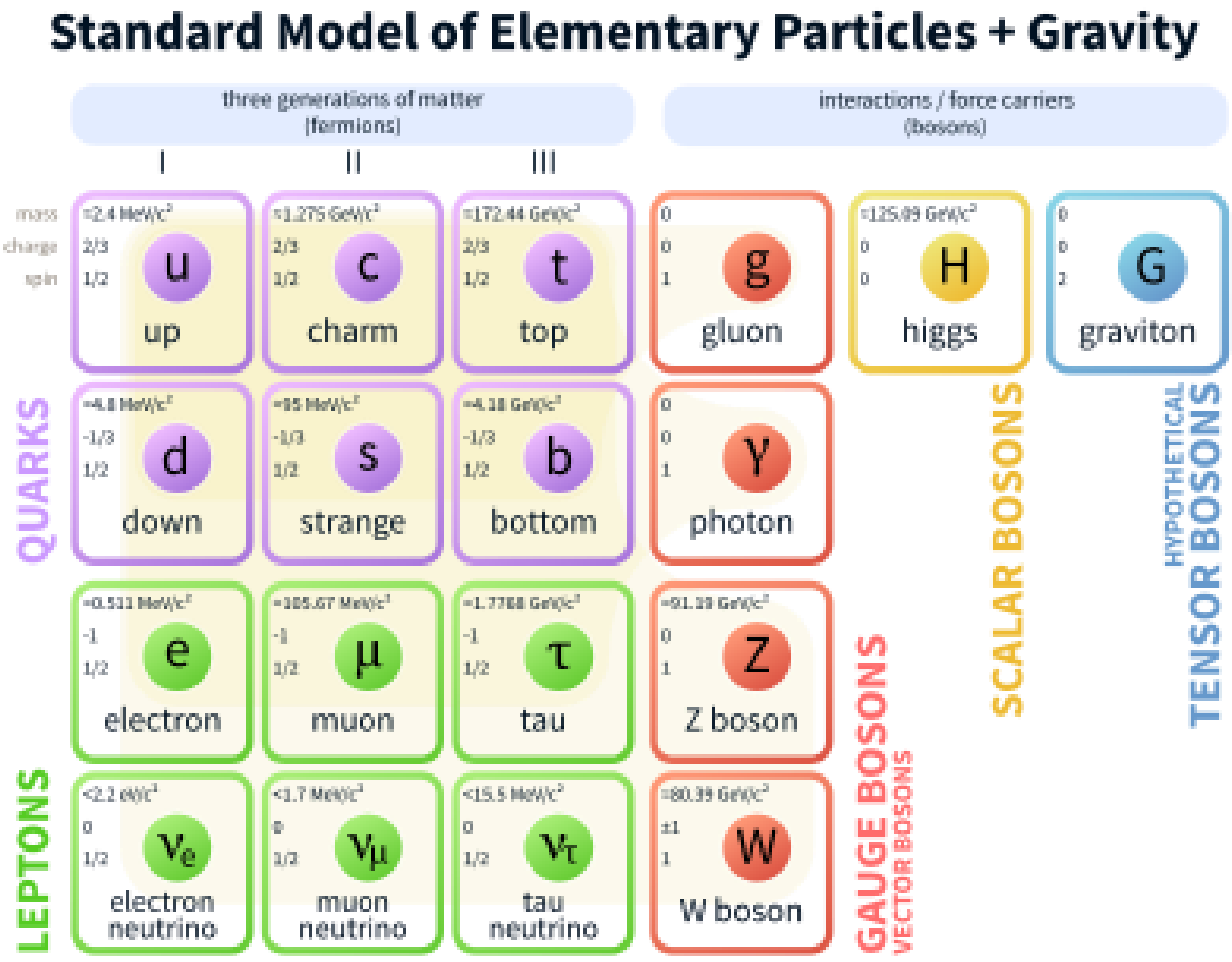
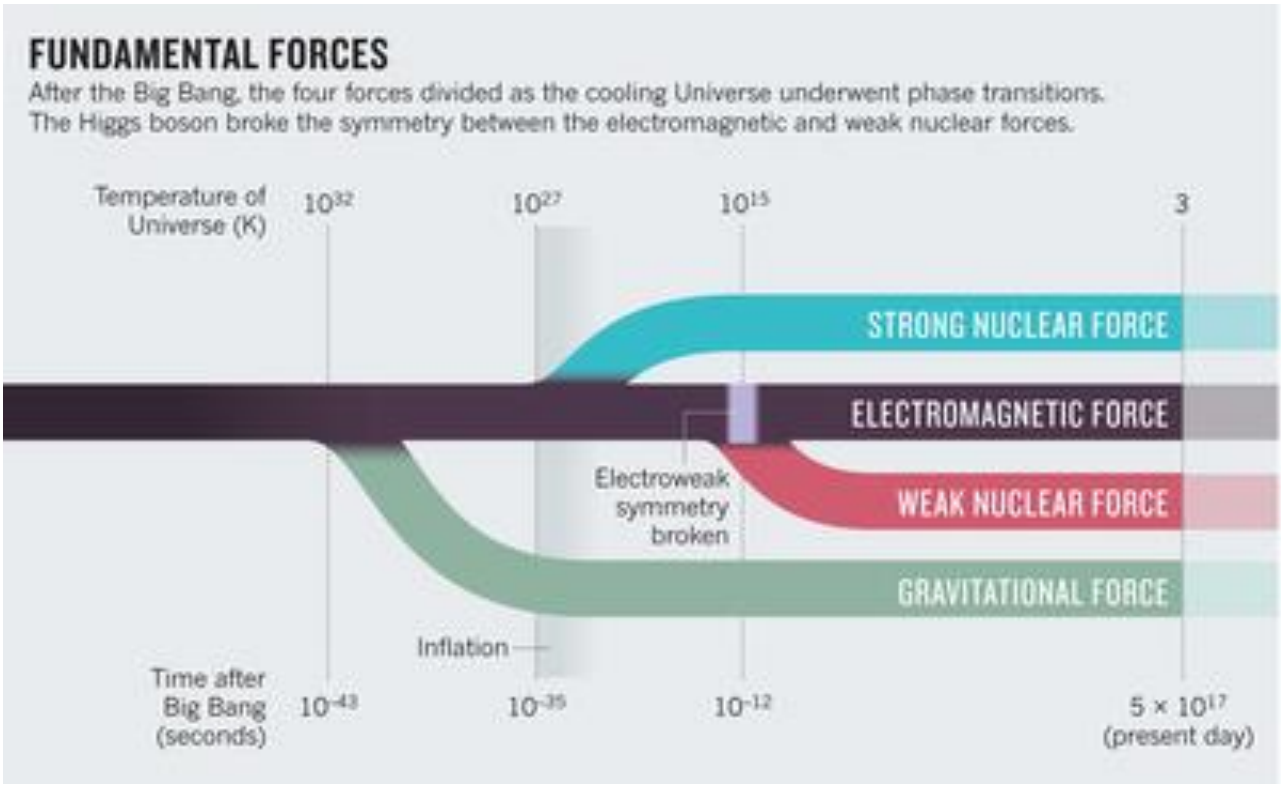
AP Physics
Instructor: Mr. Butler

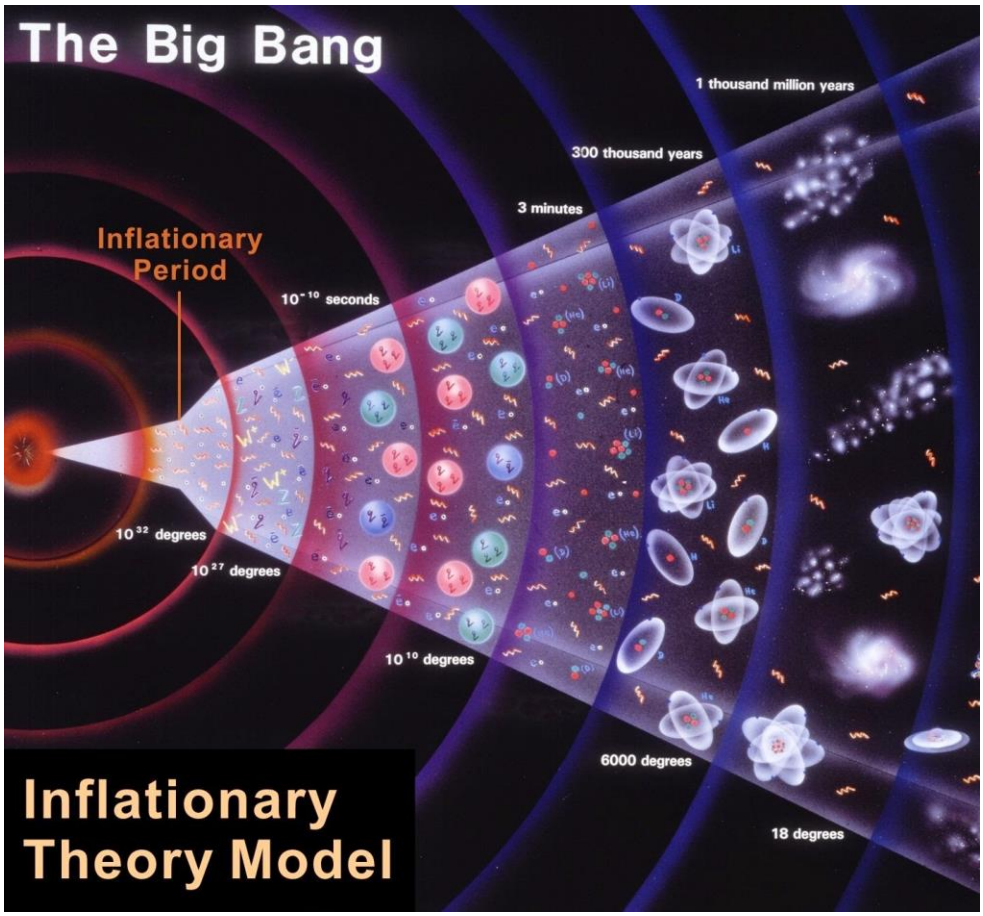
The Standard Model
Fundamental Forces, Particles and Interactions



Fundamental Forces

		Strength	Range (m)	Particle
Strong	Force which holds nucleus togeher	1	10^{-15} (diameter of a medium sized nucleus)	gluons, π(nucleons)
Electro-magnetic		$\frac{1}{137}$	Infinite	photon mass = 0 spin = 1
Weak	neutrino interaction induces beta decay	10^{-6}	10^{-18} (0.1% of the diameter of a proton)	Intermediate vector bosons W^+, W^-, Z_0, mass > 80 GeV spin =1
Gravity		6×10^{-39}	Infinite	graviton ? mass = 0 spin = 2




The Big Bang
1 thousand million years
300 thousand years
3 minutes
Inflationary Period
10^{-10} seconds
10^{32} degrees
10^{27} degrees
10^{10} degrees
6000 degrees
18 degrees
Inflationary Theory Model