ΛCDM: Lambda - Cold Dark Matter:

The Standard Model of Cosmology

[Λ = cosmological constant, assoc. with **dark energy**]

13.82 bya	**Big Bang**	**Planck Era**

Universe: Planck length = 1.616 255 x 10^{-35} m

10^{-43} sec	**Grand Unified Era**	Gravity splits off; mass-energy fluid
10^{-36} sec	**Inflation begins**	Strong force splits off; great amounts of mass-energy Photons dominate
10^{-32} sec	**Inflation ends**	Particle / antiparticle annihilation Quark / gluon plasma

Universe: Diameter = 1 km; Temperature = 10^{24} C

10^{-24} sec	**Higgs boson**	T = **10^{21} C**
10^{-21} sec		D = **1,000 km**
10^{-16} sec		D = **10^{6} km**
10^{-12} sec	**Final separation of forces:** Today's physics begin	T = **5 x 10^{15} C** D = **10^{8} km**
10^{-6} sec	**Quarks & gluons form protons & neutrons; Antiquarks form antiprotons & antineutrons**	T = **10^{9} C** D = **10^{11} km**
1 sec	**Antimatter freezeout; no new particle / antiparticle production**	
3 min	**Slight excess of particles over antiparticles; First nuclei: H, He-4, trace amounts of H-3, Li-7, deuterium**	T = **10^{9} C**
380,000 y	**First atoms: H, deuterium, He, Li Matter electrically neutral Photons free > Universe is transparent**	T = **2,700 C** D = **10^{8} ly** (5.87 x 10^{18} mi = 30.66 Mpc) >>

Cosmic (now) Microwave Background Radiation [T = -270.4 C]