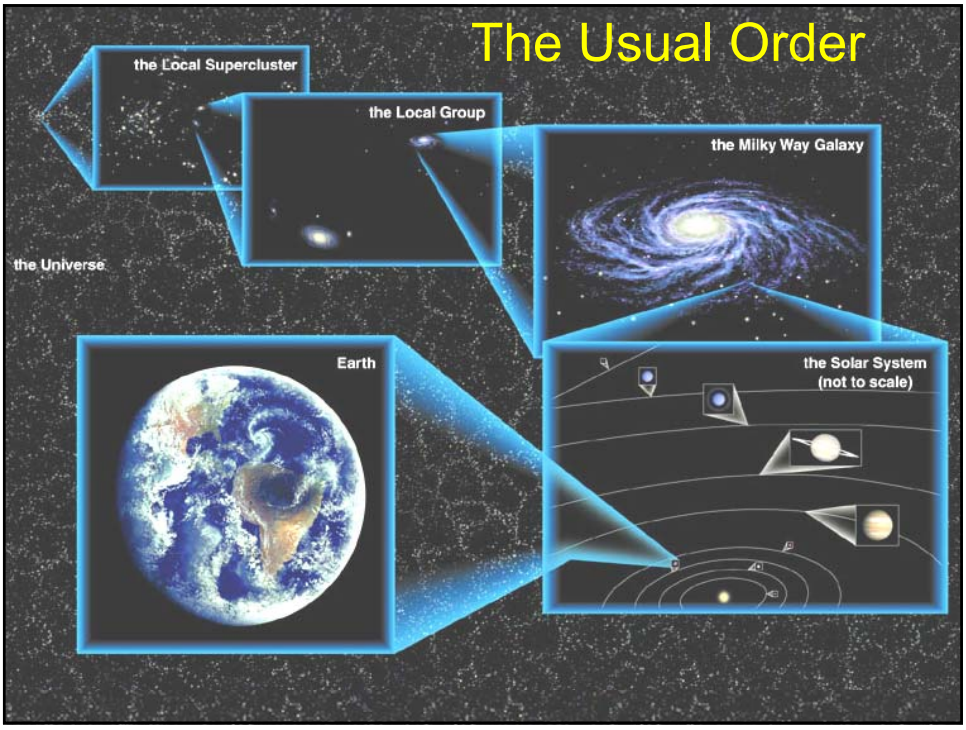
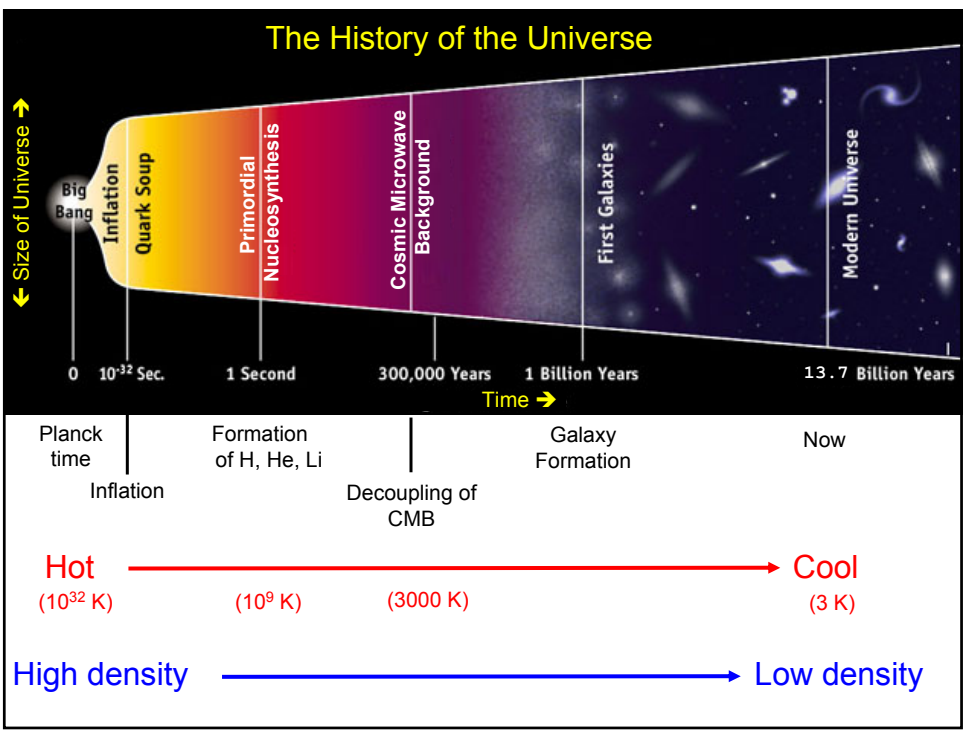
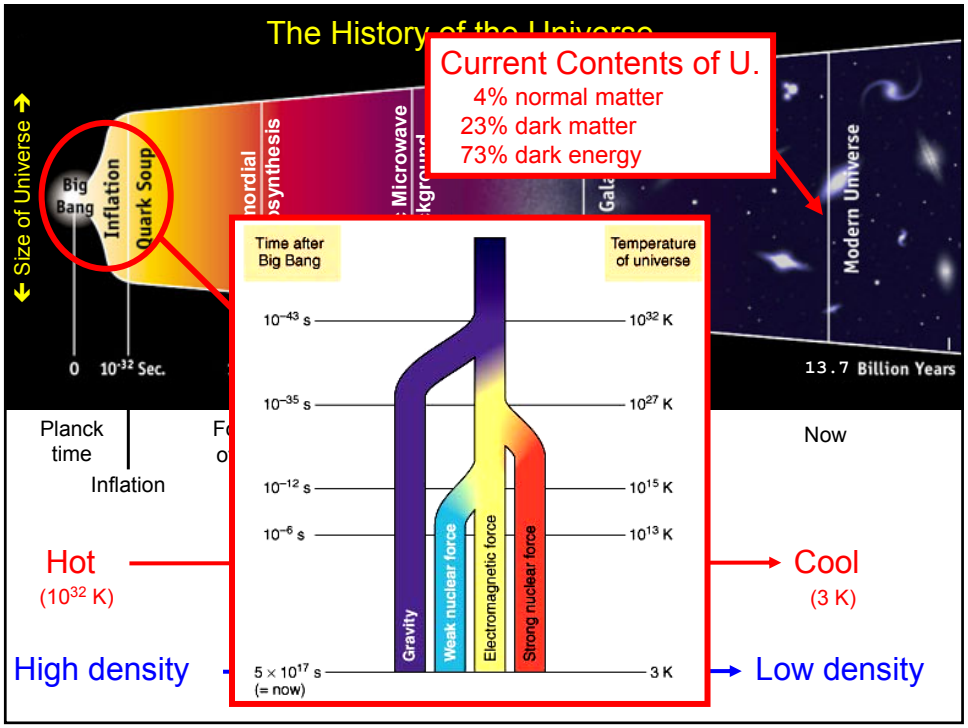
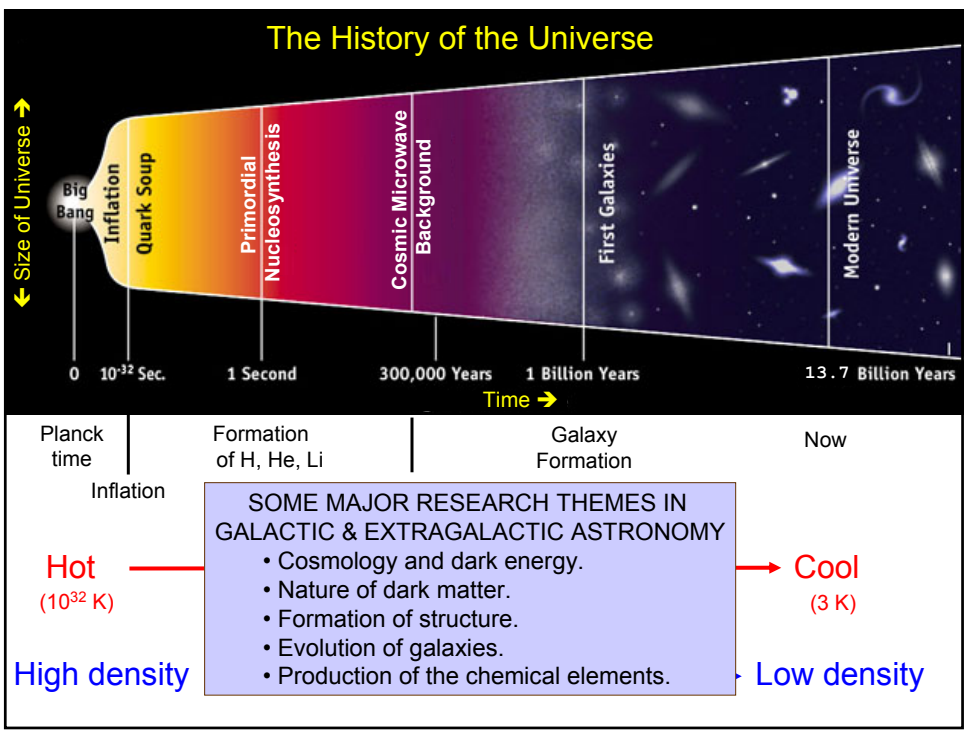

The Usual Order
the Local Supercluster
the Local Group
the Milky Way Galaxy
the Universe
Earth
the Solar System
(not to scale)


The History of the Universe
Size of Universe
Big Bang
Inflation
Quark Soup
Primordial Nucleosynthesis
Cosmic Microwave Background
First Galaxies
Modern Universe
0
10-32 Sec.
1 Second
300,000 Years
1 Billion Years
13.7 Billion Years
Time
Planck time
Inflation
Formation of H, He, Li
Decoupling of CMB
Galaxy Formation
Now
Hot
(10^32 K)
(10^9 K)
(3000 K)
Cool
(3 K)
High density
Low density


The History of the Universe
Current Contents of U.
4% normal matter
23% dark matter
73% dark energy
Size of Universe
Big Bang
Inflation
Quark Soup
Modern Universe
0
10^{-32} Sec.
13.7 Billion Years
Planck time
Inflation
Now
Hot
(10^{32} K)
Cool
(3 K)
High density
Low density
Time after Big Bang
Temperature of universe
10^{-43} s
10^{32} K
10^{-35} s
10^{27} K
10^{-12} s
10^{15} K
10^{-6} s
10^{13} K
5×10^{17} s (= now)
3 K
Gravity
Weak nuclear force
Electromagnetic force
Strong nuclear force


The History of the Universe
Size of Universe
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Planck time
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Formation of H, He, Li
Galaxy Formation
Now
Hot
(10^{32} K)
Cool
(3 K)
High density
Low density
SOME MAJOR RESEARCH THEMES IN GALACTIC & EXTRAGALACTIC ASTRONOMY
• Cosmology and dark energy.
• Nature of dark matter.
• Formation of structure.
• Evolution of galaxies.
• Production of the chemical elements.