

Astr 1020: Test 5 Study Guide

Chapter 23: DARK MATTER, DARK ENERGY & FUTURE OF UNIVERSE

- gravitational influence of Dark Matter
- rotation curves of the Milky Way and other galaxies
- motion in galaxy clusters
- containment of hot gas in galaxy clusters
- gravitational lensing by galaxy clusters
- MACHOs versus WIMPs
- Dark Matter and creation of structure in the Universe
- local structure: filaments, voids, bubbles
- uniform structure on very large scales: quasar distributions
- density and the future of cosmological expansion
- results on change in expansion rate over time from distant supernovae
- acceleration of expansion from Dark Energy
- average mass/energy components in a critical mass Universe

Chapter 24: LIFE BEYOND EARTH

- origin of life on Earth and biological evolution by natural selection
- geological epochs in Earth's history and recent emergence of hominids
- life elsewhere in the Solar System: Mars, Europa, Enceladus
- direct imaging of planets around other stars
- planet detection by Doppler shifts
- planet detection by transits
- NASA Kepler and TESS space missions to find planets
- kinds of planets detected
- habitable zone planets
- incidence of planets around other stars
- conditions for the emergence of life from our example
- Drake equation for number of technical civilizations in the Milky Way
- radio communication
- interstellar travel
- Fermi's paradox