

# **ASTRO 1010, Fall 2015, Chapters 4-6 + CHARA**

## **Study Guide**

### **Chapter 4:**

- Speed, velocity, acceleration, gravity
- Mass, weight, momentum
- Newton
- Three laws of motion
- Universal Gravitation
- Conservation of momentum, angular momentum, energy
- Gravitational potential energy, orbital velocity, escape velocity
- Newton's version of Kepler's third law and masses
- Gravity and tides

### **Chapter 5:**

- Light as wave, particle, photons
- Wavelength x frequency = speed of light =  $3 \times 10^5$  km/sec
- Electromagnetic spectrum
- Fahrenheit, Celsius, Kelvin temperature scales
- Planck curve for thermal radiation, color and temperature
- Kirchhoff laws for continuous, emission line, and absorption spectra

- Doppler shift and radial velocity
- Atoms, electron orbitals, energy transitions, molecules, states of matter
- Spectra and temperature, gas composition

## **Chapter 6:**

- Refracting and reflecting telescopes
- Newtonian, Cassegrain, Nasmyth, Coude designs
- Light gathering, angular resolution, magnification powers
- Imaging and spectroscopy
- Interferometry for high angular resolution, CHARA Array
- Atmospheric transmission, turbulence, light pollution
- Telescopes for radio, infrared, ultraviolet, X-ray, gamma-ray light
- Future telescopes