

Phys 313

Atomic and Molecular Physics

Atomic spectra

The wavelength structures of atomic spectra and their relations to the atomic energy levels. This will include Zeeman, Stark, hyperfine and x-ray spectra.

The intensities of atomic lines and their relations to the number of atoms producing them.

The profiles of atomic lines and their relations to the physical conditions in the light source.

Molecular spectra

Diatomic and polyatomic molecules. Their electronic structure, and their vibration and rotation as revealed through their spectra and their thermodynamic properties.

Quantum mechanics

At the appropriate places during the course we shall review the wave mechanics of Schrödinger's equation as applied to a central force potential, the harmonic and anharmonic oscillator, and the rigid and nonrigid rotator.