

Physics/Astro 562/ Peterson: Problem Set #5
Due: Tuesday, 4/23/2024
Extra-Galactic High Energy Astrophysical Objects

Gamma Ray Bursts: Assume a gamma ray burst has a flux of 2.6×10^5 ergs/s/cm² for 1 seconds and is located at a distance of 1 Mpc. First, estimate the total energy of the burst if the emission occurred isotropically. Then, estimate the effective energy if all the emission occurred in two cones with opening angle of 10 degrees.

Clusters of Galaxies: Consider the intracluster medium where there is some plasma with a density of 10^{-2} particles per sq. cm, and a temperature of 10^7 degrees. If the plasma is distributed in a sphere uniformly of 100 kpc, what would be the mass enclosed to achieve that temperature? Compare that to the mass of the plasma itself.