ASTR 680
Practice questions for lecture 18
Magnetars

1. Consider a magnetar with a constant magnetic field strength of $B = 10^{15}$ G throughout its interior. Below what density will the magnetic field dominate the motion of elections? Assume a constant ratio of two neutrons for every proton, and an equal number of electrons as protons. What does this imply about where the magnetic field has an impact on energy transport?

2. Within a factor of three, what is the largest average magnetic field a neutron star can have without collapsing into a black hole? Assume the baryonic mass of the star is $1.5\,M_\odot$.