Assignment-12: due on 13 November 2023

1. Derive the eq of conservation of energy and momentum for MHD case as given in the class.
2. Consider a blast waves from a supernova explosion which leaves behind a $1.5M_{\odot}$ neutron star with a radius of 10 km. Calculate the gravitational energy released in the process. Assuming that 1% of this energy goes to KE of the ejecta, which is the outer layers of the original star. Assume that the ejecta has a mass of $5M_{\odot}$, what is the velocity at which it is thrown out? Assuming that the surrounding interstellar medium has a density of 10^{-23} g cm^{-3} find the deceleration radius. How long will it take to reach that stage after the explosion? Find the subsequent evolution of the remnant in the Sedov–Taylor phase.