

SPEAKER: Yilun Wu, University of Michigan

TITLE: On rotating star solutions to the Euler-Poisson equations

Abstract:

The Euler-Poisson equations are used in astrophysics to model the motion of gaseous stars. The so called rotating star solutions are density functions that satisfy the Euler-Poisson equations with a prescribed angular velocity configuration. They are one of the many efforts to try to characterize the equilibrium shape of fluids under self gravitation. Auchmuty and Beals in 1971 found a family of rotating star solutions by solving a variational free boundary problem. Recent interests in the astrophysics community require one to extend the picture to include a solid core together with its gravitational fields. In this talk, we will discuss an extension of the Auchmuty and Beals result in this direction. If time permits, we will also explore results on non-existence of solutions for fast rotation, and discuss the effects of gas equation of state.