1171-35-108   **Manas Bhatnagar***, Carver 410, Department of Mathematics, Iowa State University, Ames, IA 50011, and **Hailiang Liu**. *Critical thresholds in 1D pressureless Euler Poisson alignment systems with varying background.*

The Euler Poisson equations describe important physical phenomena in many applications such as semiconductor modeling and plasma physics. In this talk, we will first give introduction to critical threshold phenomena: what it is and from where it was motivated. We will advance our understanding of critical threshold phenomena in Euler-Poisson systems in the presence of different forces. We will identify critical thresholds in damped Euler Poisson systems, with spatially varying background state and attractive forcing. We will give respective bounds for subcritical and supercritical regions in the space of initial configuration, thereby proving the existence of a critical threshold for each scenario. We will then also look into the more complicated and interesting repulsive forcing case, where usual comparison techniques do not work. Key tools include comparison with auxiliary systems, phase space analysis of the transformed system. (Received August 09, 2021)