

SIAM/APPLIED AND NUMERICAL ANALYSIS SEMINAR

Date: February 11, 2020

Speaker: Paul Torrey

Title: Probing the Growth of Cosmic Structure with Numerical Simulations

Abstract: Cosmological simulations are among the most powerful tools available to probe the non-linear regime of cosmic structure formation. They allow us to evolve large swaths of the Universe from soon after the Big Bang until the present day in order to probe the physical processes that are responsible for shaping observable galaxy populations. These simulations require massive dynamic ranges, parallel scalability, a broad range of discretized physical processes, and much more. I will present an overview of modern galaxy formation simulations. I will discuss the various flavors of hydrodynamical solvers that are common throughout our field with a focus on our current efforts that use a moving mesh (Arbitrary Lagrangian-Eulerian) approach. I will aim to give a sense of the physical insight we gain from these simulations, and where avenues for progress still exist.