Nathan Kaib

University of Oklahoma

Constraining the Past and Present Distant Solar System with Real and Simulated Trans-Neptunian Objects

Tuesday, 26 March 2019 • 3:30 pm

MSI Conference Room • 3550 University

Over the past 2-3 decades our understanding of the outer solar system's history and current state has evolved dramatically. It is now generally accepted that the orbits of the known giant planets have changed significantly over the last 4.5 Gyrs, and it has recently been proposed that an additional, still undiscovered giant planet orbits at several hundred AU from the Sun. These ideas have primarily been spurred by the discoveries of thousands of small icy bodies called trans-Neptunian objects (TNOs) as well as advances in numerical models of orbital dynamics. However, successfully constraining the orbital architecture and evolution of the outer solar system requires accurately comparing simulation results with observational datasets. This process is challenging because observed datasets are influenced by orbital discovery biases as well as TNO size and albedo distributions. Meanwhile, such influences are generally absent from numerical results. Here I will review recent work I and others have undertaken using numerical simulations in concert with catalogs of observed TNOs to constrain the outer solar system's current orbital architecture and past evolution.

Institut Spatial de McGill
McGill Space Institute

MSI Seminar Series