



University
of Victoria

PHYSICS AND ASTRONOMY COLLOQUIUM (Online)

Dr. Yuri Levin
Columbia University

“Resonant Friction on Discs in Galactic Nuclei”

Abstract

“Statistical physics has a bad track record in describing large-N gravitational systems. It has become clear over the last several years that there is a remarkable exception to this rule. Resonant relaxation due to orbit-averaged secular dynamics in galactic nuclei drives them to states of thermal and rotational equilibria on an astronomically short timescale.

There are fun applications: phase transitions leading to lopsided precessing equilibria (similar-looking to the nucleus of Andromeda), and strong clustering in eccentricity and inclination of stellar-mass black holes. Following Rauch and Tremaine, I will use statistical physics to argue that secular-dynamical “resonant friction” must exist and that moreover, it likely plays a huge role in galactic nuclei. It controls the dynamics of Intermediate-Mass Black Holes as well as that of stellar and accretion discs. The young stellar disc at the center of our Galaxy presents a good case study for this effect.”

Wednesday, November 29th, 2023

3:30 p.m. PST

Zoom link available on Uvic Event Calendar