

Dong Lai – Colloquium seminar March 13, 2025  
Cornell University

**Title:**

Hot Jupiters and Super-Earths: Spin-Orbit Dynamics in Exoplanetary Systems

**Abstract:**

I will discuss two topics on exoplanetary systems. The first concerns hot Jupiters, giant planets with orbital periods of a few days. Observations have revealed that many hot Jupiters have orbits that are highly misaligned with the rotation of their host stars. How did such large stellar obliquities come about? What do they inform about the formation of hot Jupiters? The second topic deals with planetary obliquity, which reflects the planet's dynamical history, and can strongly influence the atmosphere condition and climate of the planet. Many Sun-like stars are observed to host close-in super-Earths (or Earth-like planets) as part of a multi-planetary system. Can such super-Earths (or similar habitable planets around M stars) sustain significant obliquities?

**Description:**

[Professor Dong Lai](#) is an expert in theoretical astrophysics, ranging from compact objects to exoplanets and has a general interest in astrophysical fluid dynamics. Professor Lai earned his undergraduate degree at the University of Science and Technology of China before receiving his Ph.D. in theoretical Physics from Cornell University. He went on to be a postdoctoral research fellow in theoretical astrophysics at CalTech before returning to Cornell as a faculty member. While his home remains in Ithaca, Professor Lai has held several visiting positions at universities and research institutions across the United States, China, and Europe.