



University  
of Victoria

# PHYSICS AND ASTRONOMY COLLOQUIUM (Online)

**Dr. Frank van den Bosch**  
Yale University

**“New Insight into Cosmology and the Galaxy-Halo Connection  
from Non-Linear Scales”**

## Abstract

“In our LCDM paradigm, galaxies form and reside in dark matter halos. Establishing the (statistical) relation between galaxies and dark matter halos, the ‘Galaxy-Halo connection’, therefore gives important insight into galaxy formation, and also is a gateway to using the distribution of galaxies to constrain cosmological parameters. After a brief introduction to how clustering and gravitational lensing can be used to constrain the galaxy-halo connection, I show that several independent analyses all point towards a significant tension in cosmological parameters compared to the recent CMB results from the Planck satellite. I discuss the potential impact of assembly bias, and present satellite kinematics as a complementary and competitive method to constrain the galaxy-halo connection. After a brief historical overview of the use of satellite kinematics, I present a novel analysis, and show how it improves our knowledge of the galaxy-halo connection. I end with a re-examination of the cosmological tension, this time using satellite kinematics rather than gravitational lensing.”

Wednesday, March 2, 2022

3:30 p.m. PDT

via Zoom: <https://uvic.zoom.us/j/88646977552>