



University  
of Victoria

# **PHYSICS AND ASTRONOMY SEMINAR (In-Person Only)**

**Dr. Danny Horta**  
Flatiron Institute

**“A glimpse into the Milky Way's distant past: Unravelling the Galaxy's early assembly history with large stellar surveys”**

## Abstract

Unravelling galaxy formation theory requires understanding galaxies both at high and low redshifts.

A possible way to connect both realms is by studying the oldest stars in the Milky Way (i.e., the proto-Galaxy). Our ability to resolve individually millions of stars in the Galaxy provides us with the opportunity to decipher the intricate processes of galaxy formation in a detail that is unmatched by any other galaxy in the Cosmos. Therefore, the time is ripe to study the oldest parts of the Milky Way, and from them unravel its early mass assembly history. Such results, in addition to placing strong constraints on how our Galaxy formed, are also complementary to the new exciting results of the high-redshift Universe delivered by the JWST telescope. In this talk, I will present new findings aiming to piece together the earliest stages of formation of the Milky Way by examining the chemistry, kinematics, and orbits of the oldest stars in the Galaxy. I will also show fresh results concerning the structure and mass of the Milky Way's proto-galactic fragments. I will then place these observational findings in the wider context of the many possible assembly histories by comparing with expectations from cosmological simulations. The findings I will present help answer (but raise more) fundamental questions on the genesis of our Galaxy.

**Wednesday, September 25th  
2:00pm PST  
ECS 108**