Blakesley Burkhart

Rutgers University

A Predictive Theory of Star Formation and Turbulence Driving Across Cosmic Time

13 April 2021 • 3:30 pm EST • *Virtual Seminar*

The interstellar medium (ISM) is a multiphase environment where magnetohydrodynamic (MHD) turbulence affects many key processes that govern the evolution of galactic disks include star formation. In this talk, I shall present an overview of new analytic models connecting turbulence, star formation, feedback, and disk instability. I will show that the turbulence in discs can be powered primarily by star formation feedback, radial transport, or a combination of the two. From scales of giant molecular clouds (GMCs), I will demonstrate how the star formation efficiency can be analytically calculated from our understanding of how turbulence, gravity, and stellar feedback induce density fluctuations in the ISM via a probability distribution function analysis. This analytic calculation predicts star formation rates and star formation efficiency from pc size scales (GMCs) to kpc size scales in galaxies and provides predictions for upcoming high-z JWST observations.

Institut Spatial de McGill
McGill Space Institute

MSI Seminar Series