

MAS21-2021-000005

Abstract for an Invited Paper
for the MAS21 Meeting of
the American Physical Society

Turbulent Beginnings: A Predictive Theory of Star Formation in the Interstellar Medium¹

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In this talk, I will focus on how interstellar magnetohydrodynamic turbulence and stellar feedback processes affect the long-standing problem of star formation. From scales of giant molecular clouds (GMCs), I will demonstrate how the star formation efficiency and collapsing gas fraction 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 from pc size scales (GMCs) to kpc size scales in galaxies, can be observationally tested, and be used to develop sub-grid recipes for dense gas and star formation in cosmological simulations.

¹Packard Foundation; Sloan Foundation