

A Census of Molecular Gas and CO Excitation with Herschel in the Local Universe

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Room 184 Nieuwland Science Hall

I will present early results from the Herschel Beyond The Peak: a FTS spectral mapping survey of ionized, neutral and molecular gas of 22 nearby SINGS galaxies. These observations spatially resolve line emission from [NII], [CI] and ^{12}CO from J(4-3) to J(13-12). A key project goal is to develop diagnostics and an understanding of molecular excitation. This can impact the relation between ground based observations of ^{12}CO and mass density, driving deviations from established relations, like KS, by up to an order of magnitude in different environments. These data provide observational diagnostics of how CO excitation varies inside and between galaxies, and how to use ancillary data needed to correctly interpret low-J observations without mid-J and high-J ^{12}CO transitions.