NRAO/Socorro Colloquium Series

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Evolution of the interstellar medium in the Milky Way and nearby galaxies

Abstract

I will discuss two key topics on the evolution of the interstellar medium in the Milky Way and nearby galaxies: (1) the evolution of the molecular and atomic gas phases during galactic rotation (i.e., across spiral arms and interarm regions), and (2) the development of dense clumps, the precursors of star formation, in spiral arms. The classic scenario predicts a rapid phase transition from interarm HI gas to giant molecular clouds (GMCs) in spiral arm shocks, then back into the atomic phase by photodissociation. This scenario seems applicable to the outskirts of galactic disks, however, for the inner parts of galactic disks, our analysis shows only little gas phase change across spiral arms -- the gas stays largely molecular both in arms and interarm regions. Therefore, star formation is triggered in pre-existing molecular gas and clouds when entering spiral arms, and indeed, we finds evidence for a development of small-scale clumps in spiral arms in the Milky Way. I will also show a similar, but tentative, development in our new GBT map of M51 in HCN and HCO+, and in star-forming and non-star-forming molecular clouds in the LMC using new ALMA data.

September 18, 2015

11:00 am

Array Operations Center Auditorium

All NRAO employees are invited to attend via video, available in Charlottesville Auditorium, Green Bank Auditorium, and VLA Video Conference Room.