

## Abstract:

I will talk about the large-scale distribution, evolution, and dynamics of giant molecular clouds (GMCs) in galaxies. The discussions are based primarily on the recent CO(1-0) observations of M51 with the CARMA interferometer and Nobeyama 45m telescope, and on the recent Galactic plane  $^{13}\text{CO}$  survey. In particular, we detect many GMCs both on spiral arms and in interarm regions in M51, indicating their long lifetime comparable to galactic rotation timescale. The associations of giant molecular clouds (so called GMAs) are found only on spiral arms, and thus, they are likely unbound, short-lived structures, being broken up across spiral arms. A molecular gas fraction is high even in interarm regions; therefore, the GMA destruction is not likely caused by stellar feedback such as strong UV radiation or supernovae, which likely destroy molecules as well as GMAs and GMCs. I will discuss a dynamically-driven GMC evolution -- strong shear motions in spiral arms cause the GMA destruction and trigger GMC evolution.