

What is the role of major mergers in galaxy formation and evolution?

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Galaxy mergers play a significant role in triggering star formation and shaping galactic structures. However, many unanswered questions remain regarding the specific impact of mergers on galaxy evolution, such as how and where star-forming molecular clouds form and how they are related to star-formation activities.

To this end, we investigate the properties of the molecular clouds formed in 14 nearby post-merger galaxies through our high-resolution CO(2-1) ALMA data obtained at 50 pc scales. We use PYCPROPS to identify molecular clouds, obtain physical properties such as size, internal pressure, and line-width, and compare them with the isolated galaxies in the PHANGS survey.

From our preliminary analysis toward NGC 34, we find a number of massive molecular clouds with virial parameters less than unity within the central 0.5kpc. This implies that gravitationally unstable molecular clouds form in the central region, allowing nuclear starbursts to occur even after the two galactic nuclei have already merged in the past. This is in contrast to the normal isolated galaxy NGC628 where most of the clouds are distributed up to 7 kpc and their virial parameters are uniform wherever within 7 kpc. These results mean that galaxy mergers could have a significant effect on the molecular cloud properties and subsequent star formation.