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■Title

Revealing the relation between multi-level molecular gas in elliptical galaxies and their AGN activity

■Summary

It was believed that elliptical galaxies have little molecular gas while they contain hot gas. However, thanks to the recent development of observation techniques, at least some elliptical galaxies have been found to possess molecular gas with $> 10^9$ solar masses. Moreover, it has been indicated that some of the gas forms a circumnuclear disk and is fed to the supermassive black holes. This suggests that molecular gas, not hot gas, may be the fuel for the black holes in elliptical galaxies. However, previous studies have been biased towards some specific elliptical galaxies, and it is not clear whether this idea can be applied to elliptical galaxies in general. In this study, we will make systematic observations of molecular gas in elliptical galaxies with ALMA and compare the results with data of other wavelengths such as X-rays and theoretical models to elucidate the source of AGN activity in elliptical galaxies.