

# CON-quest: dense molecular gas properties in moderately luminous infrared galaxies

*Thursday 21 October 2021 13:40 (10 minutes)*

The growing phase of supermassive black holes (SMBHs) in galaxies is one of the debated topics in modern astronomy.

Recent observations reveal that a fraction of (ultra) luminous infrared galaxies; (U)LIRGs host extremely compact and dusty nuclei.

Such compact obscured nuclei (CONs) are only realised in an environment with extremely high column density of materials surrounding the SMBH, and thus suggests rapid evolution.

A systematic search for CONs (CON-quest) evidently detected CONs in 20-25% of (U)LIRGs, and 0% in its less luminous sample (subLIRGs).

We present ALMA band 6  $\sim$ 100pc resolution observations of 15 subLIRGs, that are a complete sample of galaxies within 15Mpc distance with their FIR luminosity between  $10^{10} L_{\text{solar}}$  and  $10^{11} L_{\text{solar}}$ .

The spectral range covers the HCN and HCO+ emission line that allows us to estimate the dense molecular gas structure and its kinematic properties.

We compare the dense gas properties to the estimated SMBH mass and X-ray luminosity to see the correlation, and also discuss the existence of inflow that will possibly build up CON-like environment in the future.

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**Session Classification:** Cosmology and Extragalactic Astronomy