

## P141a A Massive Dense Gas Cloud close to the Nucleus of the Seyfert galaxy NGC 1068

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Using the ALMA archival data of both  $^{12}\text{CO}$  (6–5) line and 689 GHz continuum emission towards the archetypical Seyfert galaxy, NGC 1068, we identified a distinct continuum peak separated by 15 pc from the nuclear radio component S1, the AGN, in projection. The continuum flux gives a gas mass of  $M_{\text{gas}} \sim 2 \times 10^5 M_{\odot}$  and bolometric luminosity of  $L_* \sim 10^8 L_{\odot}$ , leading to a star formation rate (SFR) of  $\sim 0.1 M_{\odot} \text{ yr}^{-1}$ . Subsequent analysis on the line data suggest that the gas has a size of  $2R_{\text{eff}} \sim 10 \text{ pc}$ , yielding to mean  $\text{H}_2$  number density of  $n_{\text{H}_2} \sim 10^5 \text{ cm}^{-3}$ . We therefore refer to the gas as “massive dense gas cloud”: the gas density is high enough to form a “proto starcluster” whose stellar mass of  $M_* \sim 10^4 M_{\odot}$ . We found that the gas stands a unique position between galactic and extragalactic clouds in the diagrams of start formation rate (SFR) vs. gas mass proposed by Lada et al. (2012) and surface density of gas vs. SFR density by Krumholz and McKee (2005). All the gaseous and star-formation properties may be understood in terms of the turbulence-regulated star formation scenario. Since there are two stellar populations with the ages of 300 Myr and 30 Myr in the 100 pc-scale circumnuclear region, we discuss that the nucleus of the galaxy has experienced at least three episodic star formation events with a tendency that the inner star-forming region is the younger. Together with several lines of evidence that the dynamics of the nuclear region is decoupled from the entire galactic disk, we discuss that the gas inflow towards the nuclear region of NGC 1068 may be driven by a past minor merger (Furuya, R. S., & Taniguchi, Y., 2016, PASJ, in press, arXiv:1609.02400).