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Circumnuclear gas torus and star-forming regions in the starburst galaxy NGC 1808 imaged by ALMADragan Salak¹, Yuto Tomiyasu², Naomasa Nakai², Yusuke Miyamoto³, Nario Kuno², and Hiroyuki Kaneko³ (1: Kwansai Gakuin University, 2: University of Tsukuba, 3: NAOJ)

Molecular gas plays an important role in star formation in galaxies. In starburst galaxies, vigorous star formation results in pronounced feedback in the form of stellar winds and supernova explosions that drive large-scale galactic winds. Although the relation between molecular gas and star formation has been studied extensively, high-resolution (< 100 pc), sensitive images of molecular gas in the central 1 kpc are limited to a few galaxies. Here we present our observations of the nearby (11 Mpc) starburst galaxy NGC 1808 carried out with the Atacama Large Millimeter/submillimeter Array in cycle 2. The central 1 kpc region of the galaxy was imaged in bands 3 and 7 at unprecedented angular resolution of $0.5''$ - $1''$ (~ 25 - 50 pc), yielding detections of continuum emission in $\lambda = 1$ mm and $\lambda = 3$ mm bands, and molecular lines CO ($J = 3 \rightarrow 2$) and HCO⁺ ($J = 4 \rightarrow 3$). The molecular gas in the nucleus was resolved for the first time into a circumnuclear torus of radius $r \sim 50$ pc, offset from an unresolved core. The rotation curve in the central 100 pc supports the presence of a massive ($\sim 10^7 M_{\odot}$) central object reported by Salak et al. (2016). The $\lambda = 3$ mm continuum image reveals a ring ($r \sim 200$ pc) located in the region of the nuclear spiral arms of molecular gas. The ring harbors HII regions (young star clusters) embedded in massive clouds. We suggest that star formation in the ring is driven by noncircular (inflow) motion of molecular gas from an outer cold gas reservoir at $r \sim 500$ pc.