

R11b **ENvironmental effect study for cluster galaxies with Molecular and Atomic gas observations (ENMA): ALMA observations of NGC 1316 in the Fornax cluster**

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We are conducting $^{12}\text{CO}(J=1-0)$ mapping survey toward 65 Fornax cluster galaxies with ALMA 7-m and total power arrays (Morita array) as a cycle-5 project. In this contribution, we introduce preliminary 7-m array results for NGC 1316 (also known as Fornax A), the 3rd-brightest nearby galaxy in radio wavelength (located at 20.8 ± 0.5 Mpc distance) after NGC 5128 (Centaurus A) and M 87. Previous deep optical images of NGC 1316 show outstanding and extended dust patches, several ripples and loops, suggesting a rich history of interaction events and making this galaxy one of the best targets to study galaxy evolution in a cluster environment. The CO emission is detected and the inferred total molecular gas mass is $3.7 \times 10^8 M_{\odot}$ which is ~ 26 % smaller than the value reported in a previous study with single-dish observations. The high-resolution CO map (beam size of 1.56×0.77 kpc) clearly shows the shell structure at the north-west side for the first time and the marginally resolved concentration at the south-east side from the center. These CO distribution is beautifully matched with the dust distribution presented in the HST optical image. With the CO spatial distribution and its velocity field, we discuss the merging history of NGC 1316 in this contribution.