Panchromatic observations of a rare spiral
Gamma-ray burst host: a detailed view on metals
and dust.

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Abstract

Gamma-ray burst (GRB) 171205A was one of the closest GRBs ever detected at a distance of only 163Mpc. Its location in an outer arm of a barred spiral galaxy is somewhat unique as most GRB hosts are star burst dwarf galaxies. Since long GRBs, such as this one, are connected to massive stars and high star-formation, studying their hosts and environments in detail allows us to get important clues on massive star formation and the role of metallicity. Due to its proximity, we gathered an excellent, multi-wavelength dataset from HST, MUSE, ALMA in CO(1-0) in a resolution comparable to HST and an HI map from GMRT. The galaxy has generally sub-solar metallicity with a very shallow gradient and most of the recent star formation is happening in a kind of ring” of SF regions at a distance of about 5kpc from the center. The CO emission correlates very well with the dust lanes in the spiral arms. The galaxy is dominated by a ~1Gyr old stellar population, but has shown several more recent epochs of star formation. We detect a concentration of atomic gas just East of the GRB location. This might be a large neutral gas cloud inflowing towards the host causing the star-formation at the GRB site, which has a larger galactocentric distance than the SF ring”. Several companions have also been identified in HI. This might be one of the best and most extensive multi-wavelength studies of a galaxy at that distance.

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