

# 30 Years of Photodissociation Regions:

A symposium to honor David Hollenbach's lifetime in science  
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## Witnessing the Effects of Massive Star Formation in 30 Doradus of the LMC

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We will present a far infrared view of the spectacular nearby star forming region, 30 Doradus in the Large Magellanic Cloud (LMC), commonly considered to contain our nearest super star cluster, R136. This region offers the best laboratory to zoom into the interplay between stellar activity and metal-poor ISM due to its proximity (50kpc) and half-solar metallicity. The new Herschel/PACS and SPIRE/FTS observation of far infrared (FIR) fine structure lines, combined with Spitzer IRS spectroscopic maps, provide constraints for modeling the gas in the photodissociation regions (PDR) with the Meudon PDR code (Le Petit et al., 2006), as well as the ionized gas, thus allowing us to construct a comprehensive, self-consistent picture of the density, radiation field, and ISM structure in this well-studied region and to quantify the effect of intense star formation on the low metallicity ISM. Effects of the intense star formation activity and lowering the metal abundance, hence decreasing the shielding necessary for the formation of molecular gas, can be witnessed throughout.

The extreme luminosity of the 30Dor region makes it the only region of the Magellanic Clouds that can be extensively studied on large scales. Observations of the FIR fine structure lines in 30Dor ([CII] 157  $\mu\text{m}$ , [OI] 63  $\mu\text{m}$ , [OI] 145  $\mu\text{m}$  and [OIII] 88  $\mu\text{m}$ ) over the entire 6'  $\times$  5' region (90pc  $\times$  75pc), covering the full range of contiguous PDR and ionized conditions influenced by the massive cluster will provide the most complete 3D picture of a well-resolved (4pc scales) star-forming region divulging the structure and physical conditions of the diverse gas phases throughout the low metallicity ISM in a powerful starburst.

## REFERENCES

Le Petit, F., Nehme, C., Le Bourlot, J., and Roueff, E. (2006) The Astrophysical Journal Supplement Series, 164(2), 506-529