30 Years of Photodissociation Regions:
A symposium to honor David Hollenbach's lifetime in science
Asilomar, CA, USA - June 28th to July 3rd, 2015

Far infrared observations of externally illuminated protoplanetary disks with the *Herschel space observatory*

J. Champion[1,2], O. Berné[1,2], S. Vicente[3], I. Kamp[3], A. Gusdorf[4], C. Joblin[1,2] and F. Le Petit[5]

[1] Université de Toulouse, UPS-OMP, IRAP, Toulouse, France
[2] CNRS, IRAP, 9 Av. colonel Roche, BP 44346, 31028 Toulouse Cedex 4, France
[3] Kapteyn Astronomical Institute, Postbus 800, 9700 AV Groningen, The Netherlands
[4] LERMA, UMR 8112 du CNRS, Observatoire de Paris, ENS, 61 Av. de l'Observatoire, 75014 Paris, France
[5] Observatoire de Paris, LUTH and Université Denis Diderot, Place J. Janssen, 92190 Meudon, France

e-mail: jason.champion@irap.omp.eu

Most low and intermediate mass stars seem to be born within transient OB associations (Lada and Lada 2003), and very likely the Solar System too. In such environments, protoplanetary disks around young stars are ionized and photoevaporated by ultraviolet photons arising from nearby massive stars, forming objects known as "proplyds" (O'Dell et al. 1993). These harsh conditions likely have an impact on the formation of planets within such disks. Here, we present the first infrared observations of such objects obtained with the *Herschel space telescope* as part of an open time program dedicated to proplyds (PI: O. Berné). Our study focused on a candidate proplyd located in the Carina nebula, for which several gas lines ([CII], [OI] and some high-J CO lines) have been detected with PACS and HIFI. We also derived the spectral energy distribution of dust emission from PACS data. We modelled the gas emission using the Meudon photodissociation region code (Le Petit et al. 2003) while the dust emission was modelled with simple modified black-bodies plus a component from the polycyclic aromatic hydrocarbon (PAH) emission based on the DustEM model (Compiègne et al. 2011). This study suggests the presence of a diffuse atomic envelope, surrounding a massive (few tenth of a solar mass) and hot molecular region which could correspond to a photoevaporating protoplanetary disk. We will discuss the implications of our results on the understanding of the physical conditions and evolution of proplyds in the context of planet formation.

REFERENCES

Compiègne, M., Verstraete, L., et al. (2011) Astronomy and Astrophysics, 525, A103
Lada, C. J., and Lada, E. A. (2003) Annual Review of Astronomy and Astrophysics, 41, 57
Le Petit, F., Nehmé, C., et al. (2006) Astrophysical Journal Supplement, 164, 506
O'Dell, C. R., Wen, Z., and Hu, X. (1993) Astrophysical Journal, 410, 696