

30 Years of Photodissociation Regions:

A symposium to honor David Hollenbach's lifetime in science
Asilomar, CA, USA - June 28th to July 3rd, 2015

Staging Experiments for Studying Cometary Pillars

D. A. Martinez¹, J. O. Kane¹, M. W. Pound², R. F. Heeter¹, B. Villette³, A. Casner³,
and R. C. Mancini⁴

¹ Lawrence Livermore National Laboratory

² University of Maryland

³ CEA

⁴ University of Nevada, Reno

e-mail: martinez264@llnl.gov

The pillars of creation are stunningly beautiful and physically puzzling molecular cloud structure in the Eagle nebula. Formation of these pillars has been subject of debate since their observation. Although extensive observation and modeling have attempted to answer the creation of the observed pillars, experiments have not adequately tested the theoretical models surrounding the photoevaporation of the molecular clouds. Experiments on the Omega EP laser at the Laboratory for Laser Energetics in Rochester NY, developed a 30ns x-ray drive using a multiple hohlraum array (Gatling gun approach) to drive the photoevaporation process and test pillar formation. This proof of principle experiment imaged the initial stages of a pillar using Ti area backlighter through a driven 50mg/cc R/F foam with an embedded solid density CH ball. This experimental technique is now being adapted for the National Ignition Facility (NIF) and this presentation will cover the initial staging experiments on Omega EP and the recent results from the NIF.

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.