

# 30 Years of Photodissociation Regions:

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

## Molecular Pillars in the Sky and in the Lab (part 2)<sup>†</sup>

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Astronomers at the University of Maryland and scientists at Lawrence Livermore National Laboratory are testing cometary models for the formation of the Pillars of the Eagle Nebula using scaled laboratory astrophysics experiments at the National Ignition Facility (NIF). Because these experiments require the evolution of deeply nonlinear hydrodynamics, the NIF shots feature a new long-duration source mimicking illumination from a cluster of stars. Multiple radiation cavities (hohlraums) are driven with UV laser light in series to create a 30-60 ns 250 kJ x-ray pulse. The pulse illuminates scaled millimeter-size science packages with directional radiation to create shock-driven and ablative hydrodynamic flows behind a clump that represents a gravitational condensation in a molecular cloud. Through an ongoing series of developmental shots at the University of Rochester Laboratory for Laser Energetics Omega EP laser, and now shots at NIF, we are refining an experimental platform and assessing diagnostics.

A preceding companion talk by Marc Pound will review theories and observations of molecular pillars, and a related poster by David Martinez will detail the experimental platform.

In this talk I will present results from the developmental shots at Omega EP, and preliminary results from first NIF shots.

<sup>†</sup>Prepared by LLNL under Contract DE-AC52-07NA27344.

## REFERENCES

- Kane, J., Ryutov, D., Mizuta, B., Remington, B., and Pound, M. (2005) *Astrophys. Space Science*, 298, 261  
Pound, M., (1998) *Ap.J.Lett.*, 493, L113