

Abstract Submitted  
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**NIF Discovery Science Eagle Nebula**<sup>1</sup> JAVE KANE, Lawrence Livermore Natl Laboratory, DAVID MARTINEZ, Lawrence Livermore National Laboratory, MARC POUND, University of Maryland, ROBERT HEETER, Lawrence Livermore National Laboratory, ALEXIS CASNER, CEA/DAM/CESTA, BRUNO VILLETTE, CEA, ROBERTO MANCINI, University of Nevada — The University of Maryland and LLNL are investigating the origin and dynamics of the famous Pillars of the Eagle Nebula and similar parsec-scale structures at the boundaries of HII regions in molecular hydrogen clouds. The National Ignition Facility (NIF) Discovery Science program Eagle Nebula has performed NIF shots to study models of pillar formation. The shots feature a new long-duration x-ray source, in which multiple hohlraums mimicking a cluster of stars are driven with UV light in series for 10 to 15 ns each to create a 30 to 60 ns output x-ray pulse. The source generates deeply nonlinear hydrodynamics in the Eagle science package, a structure of dense plastic and foam mocking up a molecular cloud containing a dense core. Omega EP and NIF shots have validated the source concept, showing that earlier hohlraums do not compromise later ones by preheat or by ejecting ablated plumes that deflect later beams. The NIF shots generated radiographs of shadowing-model pillars, and also showed evidence that cometary structures can be generated. The velocity and column density profiles of the NIF shadowing and cometary pillars have been compared with observations of the Eagle Pillars made at the millimeter-wave BIMA and CARMA observatories.

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