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Scaled Laboratory Experimental Design of Radiation-Driven Cloud Implosions[1] PAUL KEITER, University of Michigan, JAMES STONE, Princeton University, MATT TRANTHAM, University of Michigan, GUY MALAMUD, Nuclear Research Center - Negev, SALLEE KLEIN, University of Michigan
— When hot, massive stars form they ionize and heat the surrounding interstellar medium (ISM), forming an expanding region of hot, high-radiation-pressure, ionized hydrogen gas called an H II region. The H II region itself can then induce further star formation. The two main mechanisms of star formation involving H II regions are collect and collapse [Elmegreen 1977] and radiation-driven implosions [Axford, 1964, Lefloch and Lazareff 1994]. Two persistent questions for this mechanism are when in the compression process and where in the cloud does star formation occur? Our understanding of stellar formation is based on computer simulations and models. To improve our understanding of these models, data are required. We present the design of a scaled experiment to study the interaction of an ionization front with a high-density sphere, which acts as a surrogate for the molecular cloud. Irradiating a high-Z foil with laser beams generates the ionization front. The ionization front will propagate in a low-density medium before interacting with the sphere.

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