Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

**Studies of $^{3}$He+$^{3}$He, T+$^{3}$He, and p+D nuclear reactions relevant to stellar or Big-Bang Nucleosynthesis using ICF plasmas at OMEGA**[1] ALEX ZYLSTRA, MARIA GATU JOHNSON, JOHAN FRENJE, CHIKANG LI, FREDRICK SEGUIN, HONG SIO, MICHAEL ROSENBERG, HANS RINDERKNECHT, RICHARD PETRASSO, MIT, HANS HERRMANN, YONG HO KIM, GERRY HALE, LANL, DENNIS MCNABB, DAN SAYRE, JESSE PINO, LLNL, CARL BRUNE, Ohio University, ANDY BACHER, Indiana University, CHAD FORREST, VLADIMIR GLEBOV, CHRISTIAN STOECKL, ROGER JANEZIC, CRAIG SANGSTER, LLE — The $^{3}$He+$^{3}$He, T+$^{3}$He, and p+D reactions directly relevant to Stellar or Big-Bang Nucleosynthesis (BBN) have been studied at the OMEGA laser facility using high-temperature low-density 'exploding pusher' implosions. The advantage of using these plasmas is that they better mimic astrophysical systems than cold-target accelerator experiments. Measured proton spectra from the $^{3}$He$^{3}$He reaction are used to constrain nuclear R-matrix modeling. The resulting T+$^{3}$He $\gamma$-ray data rule out an anomalously-high $^{6}$Li production during BBN as an explanation to the high observed values in primordial material. The proton spectrum from the T+$^{3}$He reaction is also being used to constrain the R-matrix model. Recent experiments have probed the p+D reaction for the first time in a plasma; this reaction is relevant to energy production in protostars, brown dwarfs and at higher CM energies to BBN.

[1]This work was partially supported by the US DOE, NLUF, LLE, and GA.

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Date submitted: 10 Jul 2014 Electronic form version 1.4