

Abstract Submitted  
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**Probing Matter at an Atomic Unit of Pressure using convergent compression** JAMES HAWRELIAK, DAMIAN SWIFT, JON EGGERT, DAVE BRAUN, LLNL, STEVE ROTHMAN, AWE, GILBERT COLLINS, LLNL — Geometric confinement significantly increases the shock pressure as a spherically-converging shock approaches the central focus. Inertial confinement fusion is one area where this technique enables the 100 MBar ablation pressure to multiply to the several-GBar pressure required for fusion. We are using x-ray radiography of a spherically convergent shock wave in a solid sphere to explore material equations of state at pressures which exceed the atomic unit of pressure ( $Eh/a_0 = 300\text{MBar}$ ); the energy density of a hydrogen atom. Measuring materials properties above this pressure will breach yet another significant barrier in our quest to understand extreme states, and will open a completely new realm where the atomic nature of matter is very strongly perturbed. We will discuss initial experiments performed on the Omega laser facility and plans for future experiments on the NIF.

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