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Accretion Shocks in the Laboratory: Using the OMEGA Laser to Study Star Formation R.P. YOUNG, C.C. KURANZ, University of Michigan, C.K. LI, Massachusetts Institute of Technology, P. HARTIGAN, Rice University, D. FROULA, Laboratory for Laser Energetics, G. FIKSEL, University of Michigan, J.S. ROSS, Lawrence Livermore National Laboratory, P.-Y. CHANG, Laboratory for Laser Energetics, S. KLEIN, University of Michigan, A. ZYLSTRA, H.W. SIO, Massachusetts Institute of Technology, A. LIAO, Rice University — We present an on-going series of experiments using the OMEGA laser (Laboratory for Laser Energetics) to study star formation. Stars like our Sun experience "magnetospheric accretion" during their formation, wherein material from their surrounding accretion disk hurtles to their surface along magnetic field lines, where it forms an "accretion shock." We have created a scaled "accretion shock" experiment where a plasma jet collides with a solid block; this is meant to mimic a stream of accreting material colliding with the surface of a young star. Visible image data show a dense shocked region forming that may "bore into" the block. We discuss how this may explain observations from young star systems and how the experiment could be further refined. This work is funded by the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0001840, and by the National Laser User Facility Program, grant number DE-NA0002032.

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