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Melting and recrystallization of Pb on nanosecond timescales<sup>1</sup> AMY LAZICKI, CHRISTOPHER WEHRENBERG, JON EGGERT, Lawrence Livermore Natl Lab, RYAN RYGG, University of Rochester, JAMES MCNANEY, FEDERICA COPPARI, JOEL BERNIER, RICHARD KRAUS, Lawrence Livermore Natl Lab — We have developed a platform on the NIF laser facility to monitor nanosecond changes in crystal structure using x-ray diffraction, by shaping laser drive pulses to compress a material along a desired path in phase space and probing it at multiple steps along the path with nanosecond-duration x-ray pulses. We will present work to demonstrate shock melting and recrystallization along compression in Pb. *In situ* observation of melting and recrystallization from a liquid phase provide an important constraint on the high pressure melting curve as well as on the kinetics of crystal nucleation and growth.

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