Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Development of High Fluence X-Ray Sources on the NIF Using Laser Heated Novel Nano-Wire Metal Foams M. MAY, R. BENJAMIN, G. KEMP, P. POOLE, K. WIDMANN, J. COLVIN, D. THORN, T. FEARS, F. QIAN, B. BLUE, LLNL — High fluence K-shell and L-shell x-ray sources are being developed for high energy density physics experiments. Sources have been produced by laser heating Ag and Au nano-wire foams in the shape of cylinders nominally 4 mm in diameter, 4 mm tall. The manufacture of robust low density foams (6 - 15 mg/cm^3) is now possible through a new technique of freeze casting an aqueous suspension of nano-wires. X-ray conversion efficiency from these laser heated underdense nano-wire foams have been measured to be $\sim$1.0%. 192 laser beams from NIF are used to heat the foams with $\sim$400 TW of 3ω laser light in a 2.5 ns square pulse in time depositing $\sim$1000 kJ into each foam. Experimental results and comparisons with simulations will be presented. This work was done under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract No. DE-AC52-07NA27344.

Mark May
Lawrence Livermore Natl Lab

Date submitted: 02 Jul 2020 Electronic form version 1.4