

Abstract Submitted  
for the DPP16 Meeting of  
The American Physical Society

**X-ray and gamma ray emission from petawatt laser-driven nanostructured metal targets** MATTHEW HILL, PETER ALLAN, COLIN BROWN, DAVID HOARTY, LAUREN HOBBS, STEVEN JAMES, AWE, UK, CLAYTON BARGSTEN, REED HOLLINGER, JORGE ROCCA, Colorado State University, USA, JAEBUM PARK, HUI CHEN, RICHARD LONDON, RONNIE SHEPHERD, RICCARDO TOMMASINI, LLNL, USA, SAM VINKO, JUSTIN WARK, University of Oxford, UK, ROBIN MARJORIBANKS, University of Toronto, Canada, DAVID NEELY, CHRIS SPINDLOE, RAL, UK — Nano-wire arrays of nickel and gold have been fired at the Orion laser facility using high contrast  $1\omega$  and  $2\omega$  short pulse beams (0.7 ps pulse length,  $>10^{20}$  W cm $^{-2}$  intensity). Time-resolved and time-integrated K-shell and M-shell emission have been characterized and compared to those of flat foils, investigating the capability of these metamaterial coatings to enhance laser-target coupling and X-ray emission. Bremsstrahlung emission of gamma rays and associated pair production via the Bethe-Heitler process have also been investigated by use of 1 mm-thick gold substrates attached to the gold nanowires. We present our latest experimental data and outline some potential future applications.

Matthew Hill  
AWE, UK

Date submitted: 14 Jul 2016

Electronic form version 1.4