FWS21-2021-000061

Abstract for an Invited Paper
for the FWS21 Meeting of
the American Physical Society

Shining Light On High-Pressure Science: Recent advances and emerging opportunities[1]

WILLIAM J. EVANS, Lawrence Livermore National Lab

Recent advances in static high-pressure science have pushed the range of accessible conditions to new extremes (¿600 GPa), which exceeds the pressure of the earths core by a sizeable amount. Along with these capability advances, development of new x-ray synchrotron and X-ray Free Electron Laser diagnostic systems are enabling new classes of investigations into the dynamics of pressure-induced transitions. Time-resolved imaging and diffraction are providing insights into the dynamics of phase transformation and reveal new unexpected phenomena. Results are being interpreted within the context of kinetic models, such as the Avrami model, to develop predictive capabilities and insights. In this presentation I will provide an overview of these new developments and the exciting prospects for transformative science advances.

[1]Portions of this work were performed under the auspices of the US DOE by LLNL under Contract No. DE-AC52-07NA27344. We also acknowledge DESY (Hamburg, Germany), a member of the Helmholtz Association HGF, for the provision of experimental facilities. Portions of this research were supported through the German Science Foundation DFG Research Unit FOR 2440 (Grant No. MA4534/5-1)