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**Probing lattice dynamics at high pressure with inelastic x-ray scattering** DANIEL FARBER, University of California, Lawrence Livermore National Lab., MICHAEL KRISCH, European Synchrotron Radiation Facility, JAMES BADRO, University of California, Lawrence Livermore National Lab., DANIELE ANTONANGELI, European Synchrotron Radiation Facility, FLORENT OCCELLI, CHANTEL ARACNE, University of California, Lawrence Livermore National Lab. — Inelastic X-ray scattering provides a direct measure of acoustic excitations within the crystalline lattice at pressures to 100 GPa and accuracies to better than a few percent. Inelastic X-ray scattering thus provides an extremely powerful method of determining the elastic moduli and lattice dynamics in earth materials at high-pressure. Furthermore, inelastic X-ray scattering can be performed on oriented single crystals as well as poly-crystals to provide another internal check of the method. We present measurements the single crystal elastic moduli and phonon dispersion curves of molybdenum in oriented single crystal samples to 40 GPa.

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