

Abstract Submitted
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Single Crystal X-ray Diffraction at Megabar Pressures and Temperatures of Thousands Degrees LEONID DUBROVINSKY, NATALIA DUBROVINSKAIA, MARCO MERLINI, MICHAEL HANFLAND — The most reliable information about crystal structures and their response to changes in pressure and temperature is obtained from single crystal diffraction experiments. We have developed a methodology to perform single crystal X-ray diffraction experiments in laser-heated diamond anvil cells and demonstrate that structural refinements and accurate measurements of the thermal equation of state of metals, oxides, silicates from single crystal intensity data are possible in a pressures ranging up to megabars and temperatures of thousands degrees. New methodology was applied to solve *in situ* high-pressure high-temperature structure of iron oxide and study structural variations of iron and aluminum bearing silicate perovskite at conditions of the Earth lower mantle.

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