Structure and Dynamics of Levitated Liquid Boron and Silicon

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Measurements of liquid structure, dynamics and transport are important in advancing condensed matter theory, in developing predictive models, and in establishing structure-property-process relationships in high temperature materials science. The major experimental difficulties encountered in obtaining structural data on liquids at temperatures above about 1000K are (i) reactions of the samples with container walls, and (ii) influence of the containers on the structural measurements. Recently, a number of research groups around the world have attempted to overcome these problems by employing levitation techniques in conjunction with x-ray and neutron scattering to study the properties of high-melting, corrosive liquids. Several key advantages of these methods include (a) the elimination of container interactions and container-derived impurities, (b) rapid access to high temperatures, (c) localized heating conditions, and (d) access to the supercooled liquid and other metastable states.

This talk will present recent results on levitated boron obtained with x-ray diffraction and inelastic x-ray scattering, and diffraction and *ab initio* molecular dynamic simulation results on liquid silicon in both normal and supercooled liquid states.

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