

Abstract for an Invited Paper
for the TSF06 Meeting of
The American Physical Society

New Findings in Materials Under Pressure

RUSSELL HEMLEY, Carnegie Institution of Washington, Geophysical Laboratory

New static high-pressure techniques provide the ability to tune interatomic and intermolecular interactions in condensed matter over a broad range of conditions, from near zero pressure to >300 GPa and variable temperatures from cryogenic to thousands of degrees. Coupled with the increasing array of measurements that can be performed under extreme $P - T$ conditions, these investigations have resulted in new findings in structure, bonding, and dynamics in solids, liquids, and fluids, as well as allowing the creation and recovery of new materials. Examples include novel transitions in atomic, diatomic, and polyatomic systems; structure and bonding in molecular mixtures; pressure-induced metallization and superconductivity, and unexpected discoveries in soft matter and biological systems.