High-pressure studies in bulk and nanocrystalline semiconductors

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Abstract

Pressure is an important thermodynamic parameter similar in importance to temperature. Application of high pressure permits to increase matter density by reducing volume and the volume change is considerably larger than that obtained by playing with temperature. Therefore, application of high pressure to matter leads to an overall increase of density and to the decrease of interatomic and intermolecular distances. Consequently, high-pressure research has allowed us to explore in detail atomic and molecular interactions and has improved our fundamental understanding of these interactions in solids. The study of the properties of matter under compression is a rapid developing field that is receiving increasing attention due to continuous experimental and theoretical developments. In this talk, a brief description of the state of the art of high-pressure experimental and theoretical methods employed in the study of solid matter, and in particular in bulk and nanocrystalline semiconductors, will be given. Recent discoveries, hot spots, controversial questions, and future directions of research, will be highlighted.