Solids underway to warm dense matter state

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The focus of this talk are diagnostics and modeling of radiation-induced structural transitions in solids. Two recent experiments are discussed in detail: (i) X-ray induced femtosecond graphitization of diamond [1], and (ii) amorphization of diamond by intense X-ray pulses [2,3]. Dedicated simulations reveal complex multistage evolution of these systems which diagnostics tools can confirm. Finally, challenges remaining for accurate modeling of transition of solids to warm dense matter state and the quest for further improvements of the necessary diagnostics tools are explored.

