

Investigation of Matter under Extreme Conditions with Ultrafast and Ultraintense Lights

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Abstract

Recent advent of X-ray Free Electron Laser (XFEL) and Peta-watt (PW) class lasers, delivering light with extreme brilliance, opens up the new era for various fields of research. The study of matter at extremely high pressures and temperatures, is one of those benefited enormously from these light sources. As a new subfield of physics intersecting multiple disciplines, such as plasma, condensed matter, and astrophysics, it is a field rich in new physics phenomena and compelling applications, propelled by advances in high performance computing and advanced measuring techniques. In this talk, I'll introduce some examples of MEC experiments using these light sources such as x-ray heating of matter, saturable and reverse saturable x-ray absorptions, ultrafast XANES for warm dense matter. I will also conjecture on some of the future directions in this field that can be exploited with these light sources.

Keywords: *x-ray free electron laser, petawatt laser, extreme matter*

Biography

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