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## Extreme State of Matter: Shock Experiments and Simulations

VLADIMIR FORTOV, Academia of Sci (IVTAN) — The behavior of matter at extremely high pressures is very interesting for understanding the structure and evolution of astrophysica objects and many modern energy technologies. Dynamic investigations of warm dense matter at extremely high pressures, based on shock loading, adiabatic release of shocked as well as quasi-isentropic compression are considered. To generate shock waves in the terapascal pressure range, the cylindrical and spherical condensed high explosives, laser and corpuscular beams, high velocity impacts, and soft X-rays were used. The high-resolved temporal diagnostics of the extreme states of plasma were carried out with VIZAR technique, fast acting electron-optical transducers, pyrometers, and high-speed spectrometers equipped with the electron-optical transmission lines. The experimental data obtained and the physical models of behavior of plasma at extremely high pressures, temperatures and strain rates are discussed.

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