Shock-compression of solid density targets produces matter under extreme conditions of density, pressure and temperature for inertial confinement fusion research and laboratory astrophysics. Super high densities beyond the single-shock limit are reached through interaction of multiple strong shocks. Determining the space and time resolved physical parameters in the strongly coupled shock compressed matter is a challenge for both theoretical and experimental researchers. Spectrally resolved x-ray scattering of multi keV photons delivered from plasma x-ray sources and free electron lasers has become a standard plasma diagnostic method. X-rays penetrate deep into the plasma providing an in-situ method to probe the bulk properties of these short-lived states of hot and dense matter. Under large scattering angles, the non-collective Compton scattering component yields an accurate measurement of the electron density and temperature. Under small angles, one observes collective plasmon excitations that depend on the electron-ion collisionality and local field effects. The quasi-elastic ion feature reflects the ion-ion structure factor, its total intensity scales with the average ionization. We report on recent theoretical development and experimental applications of x-ray Thomson scattering to investigate the dynamic and static properties of shock-compressed matter. We present a first x-ray scattering experiment performed on counter-propagating shocks colliding in a beryllium target. This technique is shown to compress matter at low entropy increase. Using the Hugoniot relations for colliding shocks, we derive the heat capacity ratio $\gamma = c_p/c_v$ as a function of density and compare the equation of state models.