# Equation of state of high–density matter

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The microscopic composition and properties of matter at super-saturation densities have been a subject of intense investigation for decades. The scarcity of experimental and observational data has lead to the necessary reliance on theoretical models. However, there remains great uncertainty in these models which, of necessity, have to go beyond the over-simple assumption that high density matter consists only of nucleons and leptons. Heavy strange baryons, mesons and quark matter in different forms and phases have to be included to fulfill basic requirements of fundamental laws of physics.

I will survey the latest developments in construction of the Equation of State (EoS) of high-density matter at zero and finite temperature assuming different composition of the matter. Critical comparison of model EoS with available experimental data from heavy ion-collisions and observations on neutron stars, including gravitation mass, radii and cooling patterns and data on X-Ray burst sources and low mass X-ray binaries will be made. Fundamental differences between the EoS of low density, high temperature matter, such as is created in heavy ion collisions and of high–density, low temperature compact objects will be discussed.