

# Recent results in dense astrophysical plasmas

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In this talk, I will review recent results concerning the properties of dense astrophysical plasmas, some of them being also of interest for the domain of Inertial Confinement Fusion. I will first present a new equation of state for hydrogen/helium mixtures aimed at describing the structure and evolution of a wide range of astrophysical bodies, from solar-type stars to low-mass stars, brown dwarfs and (solar and extrasolar) gaseous planets. An application to the derivation of a new internal structure model for Jupiter, constrained by the recent observations of the Juno mission, will be highlighted, as well as comparisons with recent high-pressure Hugoniot experiments for H and He. Then, I will briefly present recent equations of state for heavy elements of interest for stellar and planetary physics, notably water, iron and silicates. Finally, I will present new results concerning the quantum crystallization of the One Component Plasma at finite temperature, a problem of interest not only from the fundamental physics point of view but also for compact astrophysical objects such as massive white dwarfs and neutron stars