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# Surface tension of quark matter droplets in compact stars

*Monday 19 March 2018 16:00 (1 hour)*

We study the surface tension and curvature energy of quark matter in astrophysical conditions, focusing specifically on the thermodynamic conditions prevailing in cold neutron stars and in hot lepton rich protoneutron stars. We analyze quark matter in chemical equilibrium under weak interactions, which is relevant for understanding the internal composition of hybrid stars, as well as "just deconfined" quark matter out of chemical equilibrium, which is the relevant thermodynamic state for describing the nucleation process of quark matter in compact stars. We explore the role of temperature, density, trapped neutrinos, droplet size and magnetic fields within the multiple reflection expansion formalism (MRE). Quark matter is described within the frame of different effective models: the MIT bag model and the SU(3)f Nambu-Jona-Lasinio model (NJL), including color superconductivity and neutrino trapping in both cases. We used as well a mixture of free Fermi gases composed of u, d, s quarks and electrons in chemical equilibrium under weak interactions, for studying magnetized quark matter. We explore some astrophysical consequences of our results.

## Summary

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