

# EMMI workshop: Neutron Matter in Astrophysics: From Neutron Stars to the r-Process



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## Modeling Hybrid Stars

*Saturday, 17 July 2010 09:00 (30 minutes)*

We extend the hadronic SU(3) non-linear sigma model to include quark degrees of freedom. The choice of potential for the deconfinement order parameter as a function of temperature and chemical potential allows us to construct a realistic phase diagram from the analysis of the order parameters of the system. These parameters are the chiral condensate, for the chiral symmetry restoration, and the scalar field  $\Phi$  (as an effective field related to the Polyakov loop) for the deconfinement to quark matter. Besides reproducing lattice QCD results, for zero and low chemical potential, we are in agreement with neutron star observations for zero temperature.

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