

Contribution ID: 9

Type: **oral presentation**

## **SU(3) PNJL model with thermomagnetic couplings and compact stars**

*Friday 14 July 2017 14:15 (20 minutes)*

In a recent letter, Physics Letters B 767 (2017) 247–252, we presented an SU(2) NJL model with a coupling which depends on the magnetic field in order to calculate the neutral pion mass at  $T = 0$ . In this work, we improve our model by adding the strange quark, the Polyakov loop and finite temperature. We then build a thermomagnetic dependence for the  $G$  and  $K$  couplings of the SU(3) PNJL model by fitting lattice QCD calculations for the average and the difference of  $u$  and  $d$  quark condensates under a strong magnetic field. With the new couplings, we compute several thermodynamic quantities and generate an equation of state for magnetized quark matter which we use to determine the mass-radius relation for compact stars from the integration of the TOV equations.

### **List of tracks**

Strangeness in astrophysics

**Author:** Prof. TIMÓTEO, Varese (Universidade Estadual de CAMPINAS - UNICAMP)

**Co-authors:** Prof. FARIAS, Ricardo (Universidade Federal de Santa Maria - UFSM); Prof. AVANCINI, Sidney (Universidade Estadual de Santa Catarina - UFSC); Prof. PINTO, Marcus (Universidade Federal de Santa Catarina - UFSC); Mr TAVARES, William (Universidade Federal de Santa Catarina - UFSC)

**Presenter:** Prof. TIMÓTEO, Varese (Universidade Estadual de CAMPINAS - UNICAMP)

**Session Classification:** Parallel Strangeness in Astrophysics

**Track Classification:** Strangeness in astrophysics