

PHAROS Conference 2019: the multi-messenger physics and astrophysics of neutron stars



Contribution ID : 63

Type : **not specified**

Crustal heating in accreting neutron stars

X-ray observations of soft X-ray transients in quiescence suggest the existence of heat sources in the crust of accreted neutron stars. The heat is thought to be released by electroweak and nuclear processes triggered by the burying of ashes of X-ray bursts.

In this talk, the heating in the crust of accreting neutron stars will be discussed. In particular, the importance of nuclear physics inputs and the impact of the details of the nuclear structure (e.g. shell effects) on the crustal heating will be assessed. Indeed, we will show that the evolution of an accreted matter element and therefore the location of heat sources are governed to a large extent by the existence of nuclear shell closures. The question of the shallow heat sources will also be discussed.

Primary author(s) : Dr FANTINA, Anthea Francesca (Grand Accélérateur National d'Ions Lourds (GANIL))

Co-author(s) : Prof. ZDUNIK, J. Leszek (N. Copernicus Astronomical Center, Polish Academy of Sciences); Prof. PEARSON, John Michael (Dépt. de Physique, Université de Montréal); Prof. CHAMEL, Nicolas (Université Libre de Bruxelles); Prof. HAENSEL, Pawel (N. Copernicus Astronomical Center, Polish Academy of Sciences); Dr GORIELY, Stéphane (Université Libre de Bruxelles)

Presenter(s) : Dr FANTINA, Anthea Francesca (Grand Accélérateur National d'Ions Lourds (GANIL))