

# Neutrino-nucleon scattering rates in proto-neutron stars

Lysiane Mornas<sup>1</sup>

<sup>1</sup>Departamento de Física, Universidad de Oviedo, Avda Calvo Sotelo 18, 33007 Oviedo, Spain

**ABSTRACT:** The neutrino-nucleon cross section is calculated in dense nuclear matter at finite temperature, in view of applications to supernovae and proto-neutron stars. The main contribution to this parameter is provided by the axial response function. Nuclear correlations play an important role: while the  $\nu - N$  cross section is usually reduced by correlations, a collective mode in the spin  $S = 1$  channel may be excited. In that case, the cross section diverges and the neutrino mean free path would be drastically reduced. The predictions of various models of the nuclear force commonly used in the literature are compared in relation with possible instabilities.