26 de outubro de 2023 - 16h00 - Sala F-147 (IFSC/USP)

"Café com Física" – "A False Vacuum Skyrme Model for Nuclear Matter"

A False Vacuum Skyrme Model for Nuclear Matter

The low energy regime of Quantum Chromodynamics (QCD) presents enormous challenges due to its large coupling. Effective field theories, like the Skyrme model, are useful approaches to study properties of strong interaction at hadronic scales. We propose a Skyrme-type model with a self-dual sector and that treats the density of the baryonic charge as a self-interacting fluid. The dynamics reduces to Coleman's false vacuum problem for a scalar field that is a fractional power of that density. The main result is that such a Skyrme-type model is the first one to reproduce, with good accuracy, the experimental values of radii and binding energies for a very wide range of the mass number. The robust and simple properties of the model lead to many possible generalizations with implications not only in nuclear physics but also in other areas of Physics.

Leandro Roza Livramento
IFSC/USP

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