Université Paris-Saclay
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Séminaire de Physique Nucléaire Théorique

Axion condensation inside neutron stars

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The QCD axion, a fascinating hypothetical particle proposed about 50 years ago, might explain one of the universe's lingering mysteries : why strong interactions don't seem to break CP symmetry. Perhaps more importantly, it remains one of the most exciting dark matter candidates.

In my talk, I will delve into a compelling question : could axions condense inside neutron stars, due to the high baryon densities in their cores ? Using Chiral Perturbation Theory and nuclear interaction models from Chiral Effective Field Theory, I will demonstrate why this exotic phenomenon could indeed be possible.

If we can find evidence for—or against—axion condensation within neutron stars, it could probe vast regions of the axion parameter space. The implications for our understanding of both axions and neutron stars will be significant.

Mardi 6 Mai 2025
14 :00
IJCLab, Bât. 100, Salle Room MXX - Salle des conseils