SEMINARIO
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TITULO: **Quantum organization in indistinguishable groups: a route towards non-Abelian states of matter**

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ABSTRACT

Topological states of matter represent an exotic organizational form of quantum matter that contradicts the traditional paradigms of condensed matter physics. Our understanding of how topological order emerges from the microscopic degrees of freedom of a quantum many-body system is far from complete. Especially intriguing is the possible formation of non-Abelian topological phases, whose excitations display non-Abelian braiding properties with potential application for quantum computing.
In this talk I will propose a physical mechanism for the formation of topological states: the organization of particles into identical indistinguishable groups. I will argue that such global organization can give rise to topological quasiparticles obeying non-Abelian statistics. To illustrate the construction, I will present a physical realization of this type of order in a spin lattice model. In the ground state, spins are organized in two identical quantum loop condensates. Excitations with non-Abelian braiding properties are created by opening loops in each of the copies.
My proposal might open a door for the understanding of the origin of topological states of matter and for the experimental realization of non-Abelian anyons in the laboratory.