

ICFO Colloquium | A geometrical approach to Quantum Information Theory: facts and problems

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12:00 to 13:00

ICFO Auditorium

PROFILE: ?

Prof. Sanpera earned her PhD from the Universitat Autònoma de Barcelona in 1992, moving to the University of Oxford in 1993 first as a research fellow and then as Fleming fellowship. In 1996, she moved to Saclay (Paris) as an European Post-Doctoral Research Fellow, and in 1999 was appointed research fellow at the Leibniz University, in Hannover (Germany) where she did her habilitation and became Professor Assistant. Since 2005 she is an ICREA Research Professor. Her research interests are quite interdisciplinary and range from quantum information theory, to quantum gases and more recently condensed matter. Presently, she is working in the interface between quantum information and condensed matter. She has stable collaborations with different research groups both at national and international level. Otherwise, she is fond of literature, sports and children.

ABSTRACT:

The study of Quantum Information Theory is strongly based on geometrical tools. Convex sets and cones, polytopes, hyperplanes, and distances are, among others, crucial concepts to characterize quantum states and quantum resources. Interestingly, a similar approach can be used to study the set of local Hamiltonians describing many-body systems, helping to elucidate which is the entanglement capability of many-body Hamiltonians.

In this talk I will discuss the use of such geometrical approach to showcase some advances on the characterization of quantum states and resources, and their application in the symmetric subspace. I will present as well some open problems and challenges in quantum information theory, whose solution remains elusive after thirty years of intense research.

Hosted by: Prof. Dr. Maciej Lewenstein