SEMINAR: A journey to the smallest (and simplest) demonstration of quantum nonlocality in networks

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Seminar Room

After many decades of studying quantum nonlocality in bipartite and "trivial" multipartite scenarios, the field is now showing interest in networks where multiple independent sources distribute physical systems to different sets of parties. The study of nonlocality in networks is resulting very fruitful, with many interesting results, especially at the foundational level. Yet, the need to take into account the independence of the sources makes understanding network correlations difficult in general. In this talk, I will exemplify this difficulty by trying to answer the question "what is the simplest demonstration of quantum nonlocality in networks?". This will take us through a journey that begins at the very start of the field in 2012 and ends by demonstrating that quantum nonlocality in the triangle network without inputs and with binary outcomes is possible. Along the way, we will develop a less costly and more stable method to search for quantum realizations in networks. This demonstration refutes an 8-year-old conjecture in the field, and I will argue that it constitutes a demonstration of nonlocality that, in a sense, is simpler than the traditional demonstration in the bipartite case.

Hosted by: Prof. Dr. Antonio Acin