

SEMINAR: The Elegant Joint Measurement is nonlocal in the triangle network

VICTOR GITTON

July 10, 2024

12:00 to 13:00

Seminar Room

Proving the incompatibility of a distribution with a classical causal structure is generally a difficult task, due to the non-convex nature of the problem. This task needs to be tackled to provide examples of quantum nonlocality, i.e., examples of distributions that are compatible with a quantum causal structure but incompatible with the corresponding classical causal structure. Even in the simple triangle network, few examples of quantum nonlocality are known. A candidate is the Elegant Joint Measurement (EJM) distribution, a highly symmetric distribution that can be obtained using quantum states and measurements in the triangle network. This distribution has been conjectured to be nonlocal 6 years ago. Motivated by this conjecture, we developed an improved implementation of the inflation technique, which allows to certify the incompatibility of a distribution with a causal structure. Our implementation allowed us to produce a computer-assisted proof of nonlocality for the EJM distribution, thereby opening new avenues to advance the state of the art for certifying causal incompatibility in general classical causal structures.

Hosted by: Prof. Dr. Antonio Acín