

Special Issue

Quantum Causal Networks

Message from the Guest Editors

The recent progress in quantum optics experiments allows us to implement quantum information protocols where several distant parties can exchange, measure and process quantum systems. Understanding the limits of what can be experienced in such scenarios, as well as how they differ from their classical counterparts, is the goal of quantum causal network theory. In recent years, we have seen impressive advances towards limiting the correlations which can be achieved within a given causal network. In the classical realm, these advances have inspired powerful new methods to solve the classical inference problem. At the same time, we have identified theoretical configurations involving a number of independent quantum agents whose behavior, despite being logically consistent, cannot be explained by any causal model. Are these scenarios physically realizable? If so, what can we learn from them? In this Special Issue, we solicit both reviews of recent progress and original work on new methods or protocols in quantum causal networks.

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The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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