

Invitation to IQST Seminar

on Thursday, January 18, 2018, 2.30pm
University of Stuttgart
Pfaffenwaldring 57
Room 6.141

Dr. Matthew Hoban
University of Oxford

Title: Quantum Correlations and Causal Networks

Abstract: It is often said that correlation does not imply causation, but clearly empirical science starts from observations of correlations, and then wishes to understand if there is an underlying causal connection. For instance, while there might not be a direct cause between two (correlated) observations, there could be a third, common cause that gives rise to both observations. However, the plot thickens when we come to quantum physics. The loophole-free Bell experiments of a few years ago have now firmly established that Nature is incompatible with a local hidden variable model. In other words, there cannot be a classical, local, causal explanation for quantum correlations produced by local measurements, even accounting for common causes. How can we think about quantum physics causally given Bell's theorem? I will review an approach to causality pioneered in statistics and artificial intelligence, and then show how it gives a generic framework for studying quantum correlations and their applications in quantum networks.

Host: Prof. Dr. Stefanie Barz, FMQ; University of Stuttgart