Physics AT QUEENS COLLEGE

Colloquium Notice

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The Fate of Entanglement

Quantum entanglement is a fundamentally non-local correlation between particles. In its simplest realisation, a measurement on one particle is affected by a prior measurement on its partner, irrespective of their separation. For multiple particles, purely collective types of entanglement exist but their detection, even theoretically, remains an outstanding open question. Here, we show that all forms of multi-party entanglement entirely disappear during the typical evolution of a system as it is heats up, evolves in time, or as its parts become separated. These results follow from the nature of the entanglement-free continent in the space of physical states, and hold in great generality. We illustrate these phenomena with a frustrated molecular quantum magnet in and out of equilibrium. In contrast, if the particles are fermions, such as electrons, another notion of entanglement exists that precludes entanglement-free regions, and thus protects quantum correlations. These findings provide fundamental knowledge about the structure of entanglement in quantum matter and architectures, paving the way for its manipulation.

[Parez, Witczak-Krempa, arXiv:2402.06677]

Monday
March 18, 2024
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326
This talk is accessible via **Zoom** or use
meeting ID 829 2687 2594 and **passcode 866995** to join