

Quantum complexity in biological and material systems - Where do we stand?

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An overview will be given of our current understanding of quantum complexity and the quantum-classical boundary in biological and material systems. In particular, we will discuss (i) whether “quantum-driven” functionality in these high-dimensional, structured systems is a robust feature or rather an accidental occurrence, (ii) to what extent quantum entanglement “scales up” into these systems that are at the border between the microscopic and macroscopic world, (iii) whether specific environments could act so as to protect low-dimensional subsystems from decoherence, and (iv) to what extent effective descriptions of these systems can be found.

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