Physikalisches Kolloquium **Physics Colloquium**

Einladung **Invitation**

Monday, 07 December 2026

Lecture Hall O25/H2, at 16:15
Coffee and cookies will be served in front of the lecture hall from 16:00

A Fresh Perspective on Decoherent Histories: From Foundations to Quantum Chaos

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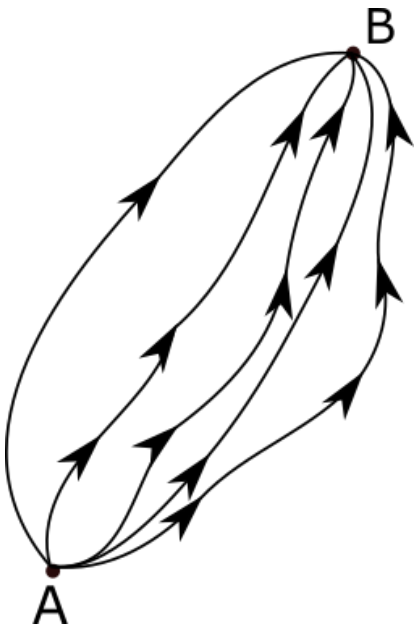
The decoherent histories formalism (developed in the late 80s/early 90s) is a generalization of Feynman's path integral, which expresses the evolution of the wave function as a sum over different histories that a quantum system may take. Similar to Feynman's path integral, also histories contain decisive information about the quantum-to-classical transition, yet in contemporary theoretical physics the decoherent histories formalism seems almost forgotten. This talk gives a broad and pedagogical overview of the formalism with the aim to highlight its hidden connection to a plethora of quantum phenomena. Topics covered include the many worlds interpretation of quantum mechanics, the existence of (redundant) records, consequences for the simulation of quantum systems, quantum paradoxes in Wigner's friend scenarios, the relation to environmentally induced decoherence, as well as the subtle connection between quantum chaos and the emergence of classicality.



Host: Prof. Dr. Susana Huelga, Institute of Theoretical Physics

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