Time and Time Dependence in Quantum Mechanics

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Message from the Guest Editors

Dear Colleagues,

Time enables us to describe changes and order events in daily life and in the laboratories. Physics takes charge of defining the official time by measuring quantum processes in time-frequency metrology and yet, paradoxically, we keep wondering about fundamental questions such as how the times of events such as the arrival of particles at a detector should be described in quantum theory, the meaning of time operators and time-energy uncertainty principles, or the emergence of irreversibility from time-symmetrical laws. Time is also the basic running parameter to narrate quantum dynamics.

Geometric phases, quantum transients, the Zeno effect, or short and long deviations from exponential decay are concepts and phenomena used to comprehend and possibly modify dynamics. Dynamical control is often implemented based on adiabatic and sudden approximations and also via shortcuts to adiabaticity. This Special Issue of Mathematics aims at offering a broad perspective of recent work to fathom time in quantum theory and harness the evolution of quantum systems.

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Special Issue

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Message from the Editor-in-Chief

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