

# SEMINAR: Extrapolation of quantum time series

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12:00 to 13:00

Seminar Room

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In this talk, I will consider the problem of predicting future averages of an unknown quantum observable, given a dataset of noisy past values. The observable, the initial state of the physical system and even the nature of the latter are unknown. There is, however, a promise on the energy distribution of the state: with very high probability, it is constrained to be smaller than a threshold. In this mostly unexplored framework, one can find very funny objects, like self-testing datasets, which can only be generated with specific Hamiltonians, states and measurement operators; or *ahali* datasets, where predictability consider bly increases when we add datapoints from an unrelated measurement. More weirdly, ome simple datasets lead to what we call a *fog banki*: complete unpredictability at some extrapolation time  $\tau$ , and exact predictability for time  $\tau' > \tau$ . At the end of the talk, I will present some general no-go results on extrapolation and provide a hierarchy of efficient SDP relaxations of the set of feasible datapoints, with bounds on the speed of convergence.

**Hosted by:** Prof. Dr. Antonio Acin