

What we talk about when we talk about quantum non-Markovianity

Dr. Göktuğ Karpat

ABSTRACT:

Realistic quantum systems are bound to interact with their surroundings. The coupling between the system of interest and its environment consistently results in the loss of characteristic traits of quantum theory, such as coherent phase relations. The effects of this interaction between the system and the environment can be described within the framework of open quantum systems. From the perspective of memory effects, it is conventional to categorize the dynamics of open quantum systems into two groups. Whereas the presence of memory in the environment gives rise to non-Markovian quantum dynamics, its absence leads to Markovian quantum evolution. In this talk, we will first provide a general introduction to the characterization and quantification of non-Markovianity in quantum mechanics. Then, we will elaborate on our contributions to the field from various different angles.