

MPIDS Colloquium



MAX-PLANCK-GESELLSCHAFT

Quantifying memory effects in random search processes

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A general question that arises in random walk theory is the quantification of space exploration by a random walker. A key observable is provided by the first-passage time, which quantifies the kinetics of general target search problems, and as such has a broad range of applications from diffusion limited reactions at the molecular scale, to immune cells patrolling tissues to find antigens, or larger scale organisms looking for resources.

I will present asymptotic results which enable the determination of the first-passage time statistics to a target site for a wide range of random processes, and show how these results generalize to non-Markovian processes, which are needed to model complex searchers with memory skills. I will discuss how these results can be used to assess the optimality of general random search processes. An explicit example of a cellular system where long-range memory effects emerge will be given.

Thursday (!), October 7th, 2021 at 2:15 pm

Video conference at www.zoom.us

Meeting ID: 959 2774 3389

Passcode: 651129, [direct link](#)



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