MPIDS Seminar

MAX-PLANCK-GESELLSCHAFT

Optimizing active random searches in biological environments

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The question of determining the time it takes an active particle performing a persistent random walk to find a target is of particular interest in biological environments. We consider the stochastic motion of active particles in confined geometries and show that the mean first-passage time to a target admits a minimum as a function of the persistency. We clarify how the optimum persistency varies with the system size and boundary conditions, and discuss the optimal search strategy of run-and-tumble random searches. The bacterial spreading will be analyzed as an example. We also address the first-passage problem in other different biological environments such as the transmission of chemical signals in neuronal dendrites.

Friday, May 18th, 2018 at 11:00 am

MPIDS, seminar room 0.79, Am Faßberg 17, Göttingen

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