



School of Nano Science



IPM Condensed Matter &
Statistical Physics Group

Weekly Seminar

Obstructed Diffusion of a Self-propelled Particle, Simulation Study

Invited speaker:

Dr. Hamid Reza Khalilian

School of Nano Science, Institute for Research in Fundamental Sciences (IPM)

Abstract:

The great majority of natural active particle systems takes place, in the wild, in heterogeneous media: from active transport inside the cell, which occurs in a space that is filled by organelles and vesicles, to bacterial motion, which takes place in heterogeneous environments such as the soil or complex tissues such as in the gastrointestinal tract. Here, diffusion of a self-propelled particle in the presence of randomly distributed obstacles is presented using simulation results. It is found that depending on the magnitude of the propelling force and the particle aspect ratio, the diffusion coefficient can be a monotonically decreasing or a non-monotonic concave function of the obstructed volume fraction. This non-monotonicity is shown to be resulted from interplay of self-propulsion and anisotropy in the particle shape.

Wednesday, 26 Tir 1398 (July 17, 2019), 14:00-15:00

Seminar Room (Classroom A), Farmanieh Building, IPM