SPECIAL TIME
JOINT CONDENSED MATTER/ CENTER SOFT MATTER AND BIOLOGICAL PHYSICS SEMINAR

DR. SOPHIE MARBACH
SORBONNE UNIVERSITY, PARIS

THE NANOCATERPILLAR'S RANDOM WALK: OR HOW TO MOVE PRECISELY WITH RANDOM STICKY FEET?

OCTOBER 3 | 9:00 A.M.

VIRTUAL ONLY

ZOOM LINK: HTTPS://VIRGINIATECH.ZOOM.US/J/81878383930

Particles with sticky feet - or nanoscale caterpillars - in biological or artificial systems, beat the paradigm of standard diffusion to achieve complex functions. Some cells (like leucocytes) use ligand-receptor contacts (sticky feet) to crawl and roll along vessels. Sticky DNA (another type of sticky feet) is coated on colloids to design programmable interactions and self-assembly. Predicting the dynamics of such sticky motion is challenging since sticky events (attaching/detaching) often occur on very short time scales compared to the overall motion of the particle. Even understanding the equilibrium statistics of these systems (how many feet are attached in average) is largely uncharted. Yet, controlling the dynamics of such particles is critical to achieve these advanced functions -- for example facilitating rolling is critical for long-range alignment of DNA coated-colloids crystals. Here we present advanced theory and experimental results on a model system. We rationalize what parameters control average feet attachment and how they can be compared to other existing systems. We investigate furthermore how various motion modes (rolling, sliding or skipping) may be favored over one another.
sustainability issues (check out my blog http://sciriousgecko.com/ on carbon footprints).

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