

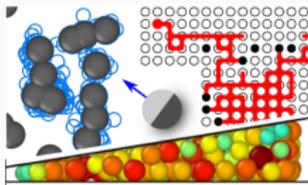
Theoretische Bio-Nano Physik

Prof. Thomas Franosch, Michele Caraglio

13. Jänner, 2022

Vorstellung Arbeitsgruppen

Institut für Theoretische Physik
Universität Innsbruck (UIBK)

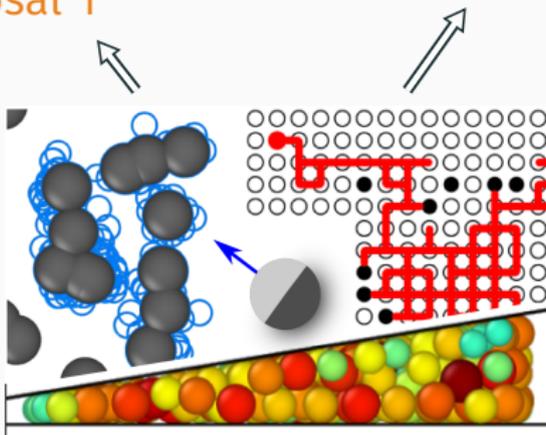


Soft matter / Statistical Physics

Active particles

Proposal 1

Complex transport



Glass transition

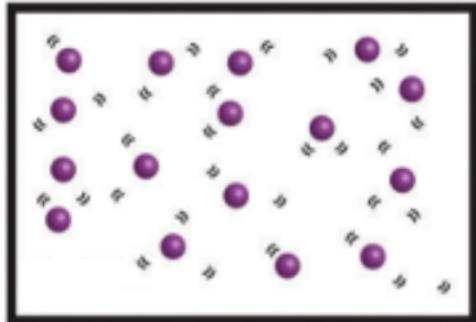


Polymer Physics

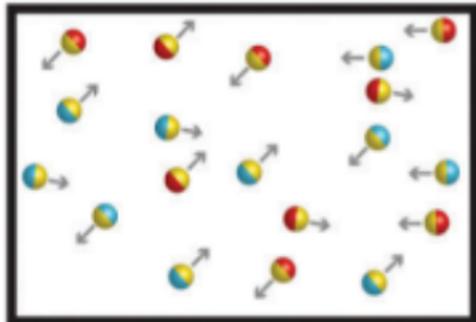
Proposal 2

Active particles

"normal" brownian particles

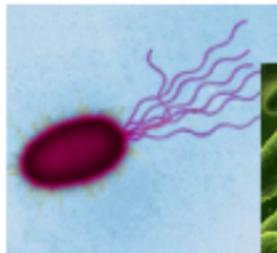


active brownian particles



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E. Coli



many E. Coli



Flock of birds

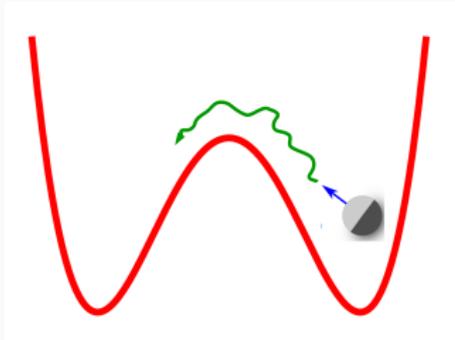


school of fishes



Active particles: Bachelor Proposal 1

Goal: Investigate the first-passage times distribution of an active brownian particle (ABP) in a double-well potential.

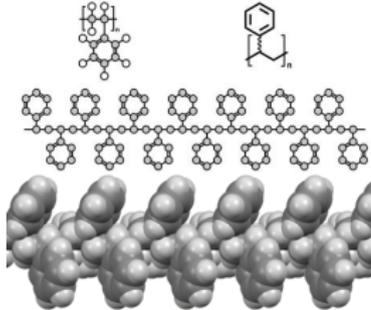


Learning objectives:

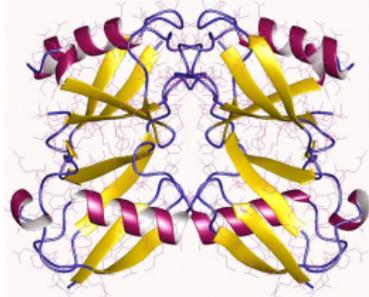
- Perform computer simulations of an ABP moving in a given energy landscape;
- Analyze ABP's behavior through the basic concepts of stochastic processes and probability theory;
- Interpret the results and compare them to those obtained for a passive brownian particle.

Polymers

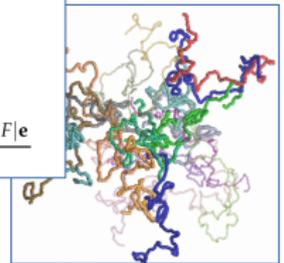
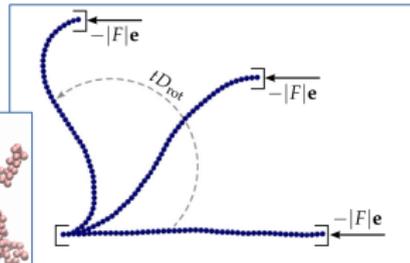
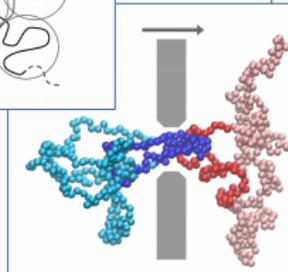
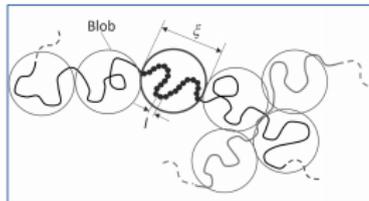
Polystyrene



Proteins

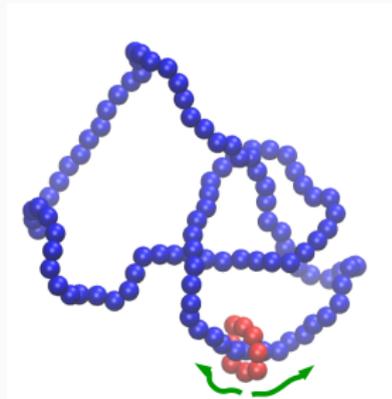


DNA and RNA



Polymers: Bachelor Proposal 2

Goal: Investigate the sliding dynamics of rings along polymeric chains with non-trivial topology.



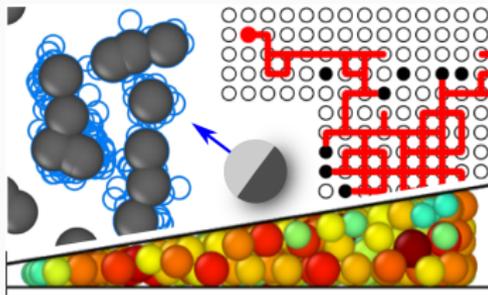
Learning objectives:

- Learn how to simulate polymeric systems through computer simulations;
- Learn basic notions of polymer topology (knots and links);
- Analyze the motion of the ring through the basic concepts of stochastic processes.

Potential Master theses available in various topics

- Glass transition
- Active particles
- Complex transport

**If you are interested, please just
approach us!**



Thank you for your attention!