Department of Chemistry
Faculty of exact sciences
Bar-Ilan University

המחלקה לכימיה
הפקולטה למדעים מדויקים
אוניברסיטת בר־אילן

The Department of Chemistry Weekly Seminar

Monday 29/11/21 12:00pm (refreshments 11:45am)

A few lessons that nanoparticles can teach us about non-equilibrium properties of crystallization

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The fact that many crystals are not in equilibrium is quite obvious and not very surprising. Yet, this often complicates our attempts to understand some of their most fundamental properties, such as for instance, their overall morphology. To further add to this complexity, non-equilibrium properties are nowadays studied in crystals made out of building blocks that consume energy and actively propel (i.e., active matter). Despite some complications that exist when trying to make analogies between the behavior of bulk crystals and their nanoscale analogs, the latter offer many advantages when studying kinetic aspects of crystal formation, in both "conventional" as well as "active" crystals. In my talk I will present two different cases where nanocrystals are used in order to shed light on some of these aspects. The first story dates all the way back to the 19th century and the seminal work by Louis Pasteur on crystals that exhibit chiral macroscopic shapes when made out of chiral building blocks. Using a model system of tellurium nanocrystals, I was able to show that the reason for chiral shape formation in crystals composed of chiral building blocks might not always be as trivial as expected. In the second part of the talk, I will present the first steps I took on an ongoing journey to understand the diffusion of extremely small (sub 10 nm) chemically propelled nanocrystals. This is meant to pave the way to ultimately use them as building blocks for non-equilibrium active crystalline matter.

Location: Seminar room 112

Looking forward to seeing you!