POM-BASICS Summer School

"Polyoxometalate Chemistry for Fundamentals and Applications"

La Rochelle-France, June 13-15th 2022

Session 5- Functional POM assemblies and processing

POMs as ligands for metal and metal-oxide nanoparticles

Trainer: Ira Weinstock
(Ben Gurion University, Israel)

Abstract of the course:

Metal nanoparticles and metal-oxide nanocrystals find numerous applications, from sensors and high-energy UV photoresists, to chemical, electrochemical and photochemical catalysts. Despite advances in synthesis and assembly, numerous challenges continue to compromise their use in the reproducible fabrication of multi-component devices and functionalized surfaces. From a fundamental perspective, organic protecting ligands block access to surface sites, limiting reactivity; in their absence however, stability to aggregation is severely compromised. These are some of the challenges overcome by replacing organic protecting ligands by POMs. This will be explained and discussed, starting with early reports of POMs as ligands for metal nanoparticles, followed by an outline of progress achieved over recent decades and culminating in the current state-of-the-art and challenges at the frontiers of synthesis, structure and reactivity.