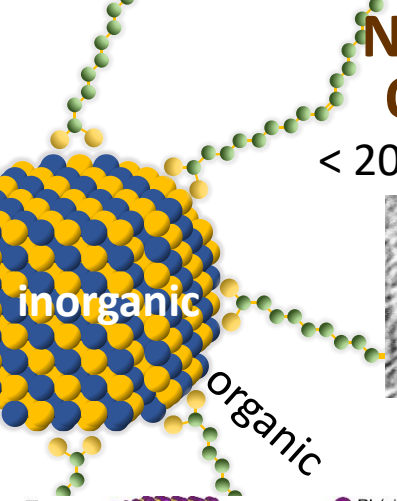
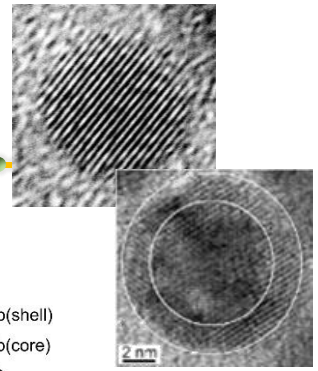
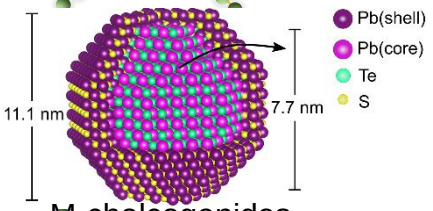
Nanoparticles Quantum Dots

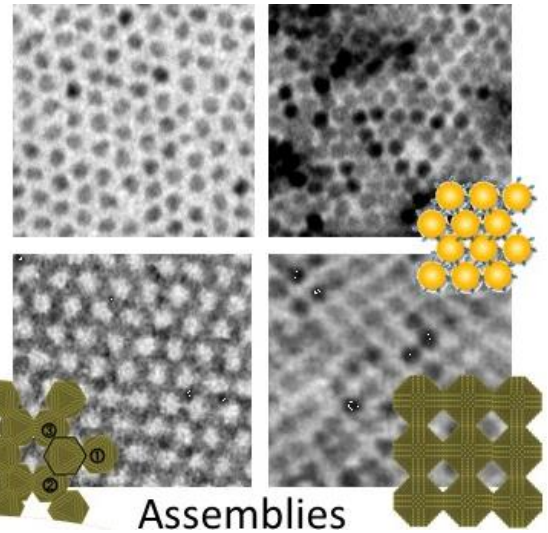
< 20 nm size





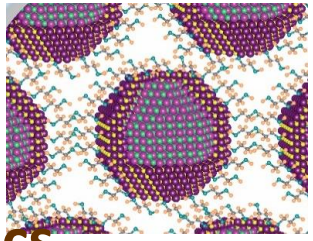


M-chalcogenides
M-oxides
Sustainable minerals

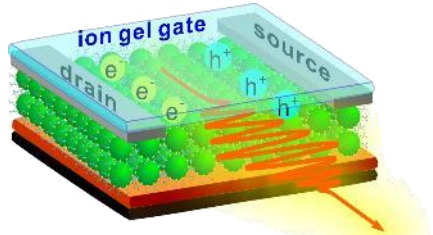


"Designer`s hybrid materials"

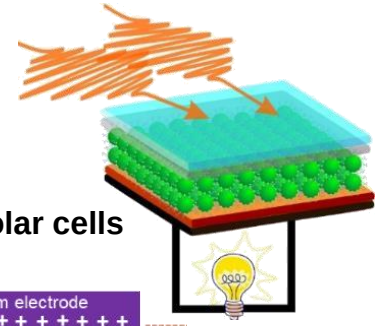
- Size dependent properties
- Large surface/volume ratio
- Quantum effect
- Solution processable



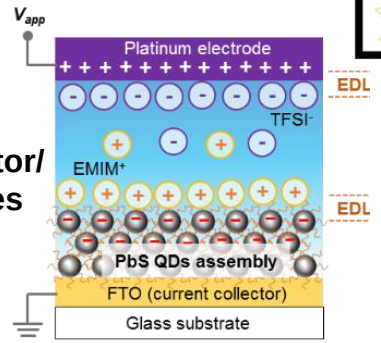
Functional Optoelectronic and Energy Devices



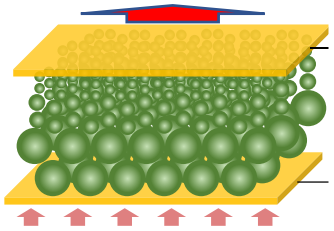
Transistors and Light-emitting Transistors (QD-LET, QD-lasers)



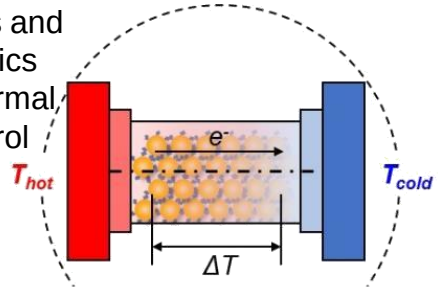
Solar cells



New Supercapacitor/ battery electrodes

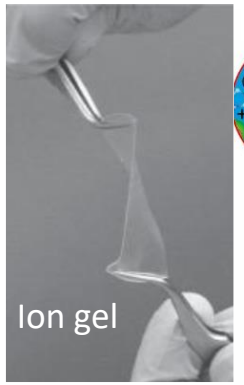


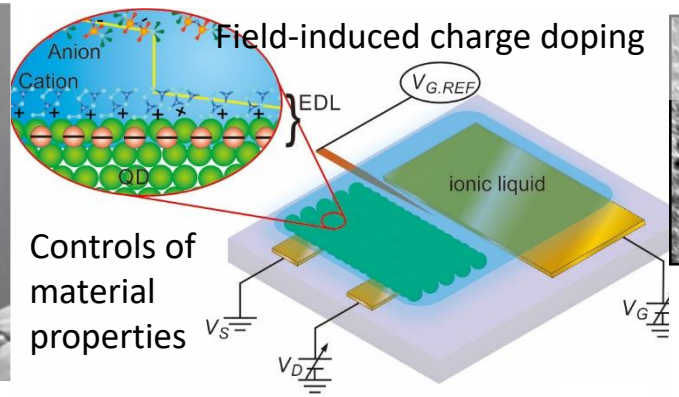
(Nano)Photonics and (Nano)Phononics light, heat & thermal transport control



Thermoelectric Devices
New concepts

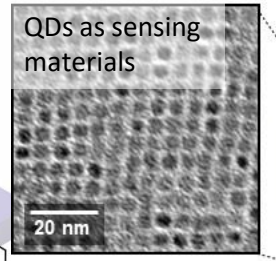
Iontronics: Ion-controlled electronics

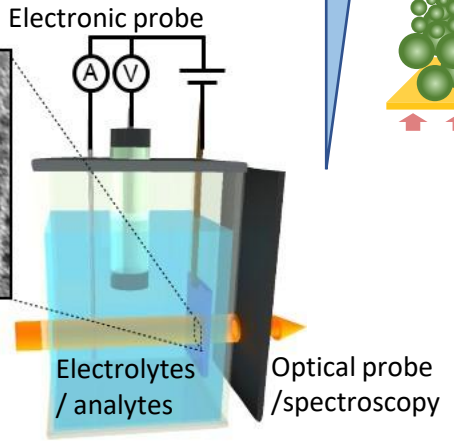




Field-induced charge doping

Controls of material properties





Sensors

Material controls, surface controls, assembly controls → functional devices

Fundamental research with strong consideration of practical uses

SEMANTICS
SustainablE quantuM nANomaTerials and devICeS