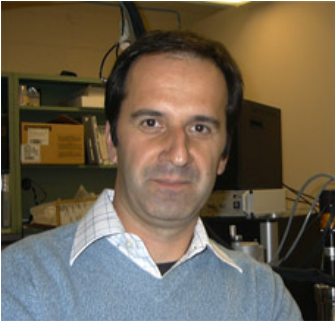


Synthesis and Characterization

of Mesoscopic TMDs



Goran Karapetrov

Keys features

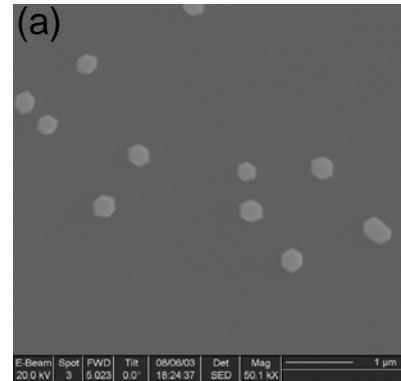
- single crystal growth facilities
- UHV-AFM/STM (30-300K)
- magneto-transport characterization

Scope of effort

- Growth of single crystal TMDs and exfoliation down to a single unit cell
- Evolution of correlated electronic states with temperature using variable temperature AFM/STM
- Magneto-transport measurements and correlation of results from local electronic probes

Challenges to address

- How doping and disorder facilitate competing ground states
- How interlayer interactions and dimensionality affect the competing ground states
- Novel mesoscopic effects in confined TMD structures



(a) SEM image of the nanocrystallites of NbSe₂ grown in our lab; (b) False-color SEM image of the actual Cu_xTiSe₂ few layer flake with two active top gates and a back-gate

