Trent University
Chemistry/Physics Seminar Series

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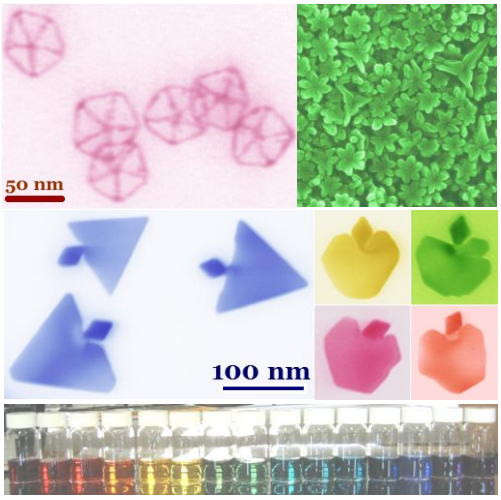
Wilfrid Laurier University
Wednesday, March 8, 2017
11:00 a.m. to 11:50 a.m.
Science Complex Room 115

Nanoscale Building Blocks



Matter confined to nanoscale dimensions displays striking and unusual properties. In my talk I will discuss the special properties of nanoscale materials and our work on nanoscale building blocks: noble metal and metal oxides.

Noble metals feature necessary stability for comfortable nanoscale fabrication through chemical synthesis. Free electrons of metals give rise to surface plasmon resonance, SPR, that is conveniently tuneable through size and shape control. Upon strong quantum confinement (< 2nm), metal nanostructures display discreet electronic transitions and behave like "superatoms" that in many aspects are similar to quantum dots.

My talk will overview general properties of metal nanostructures and our research progress in this field. Noble metal morphologies "nanofabricated" in our laboratory include decahedra, pentagonal rods, icosahedra, prisms/platelets, regularly faceted prisms (flowers), stellated polyhedra and bimorphic nanoparticles. I will also discuss comparative properties of gold and silver nanoparticles and our work in realization of the optimal combination of these metals in plasmonic nanostructures.

Practical aspects of size and shape control in nanoscale building blocks involve diverse novel applications such as catalysis, sensing, biochemical essays, plasmonic devices and environmental remediation.

Finally, the work on shape control offers an opportunity to create and observe beautiful nanostructures. I will share some of these images in my presentation.

All Welcome!