Physical Chemistry Seminar

Tuesday, February 24, 2015 | **11:00 am** | **Room 1315 Chemistry Building**

Sub-nano clusters: motors, catalysts, and simply curious entities

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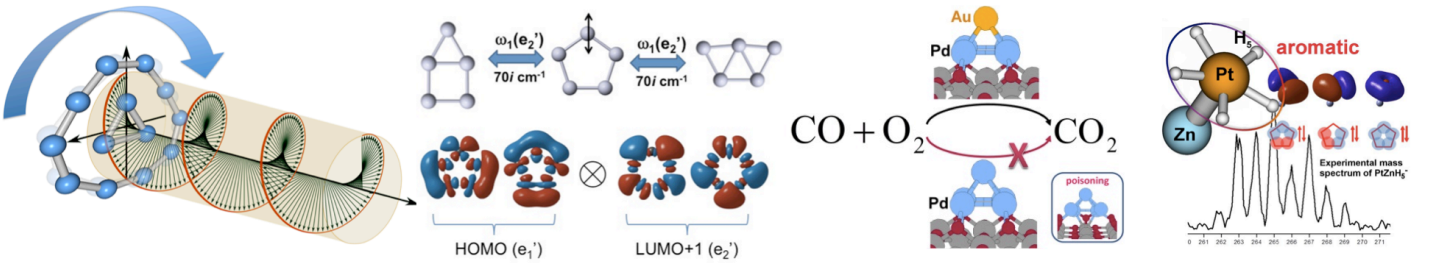
Host: Professor JR Schmidt

Chemical bonding is a set of qualitative tools (such as covalency, aromaticity, hyperconjugation) that always, since the times of Democritus to Kekulé and to this day, enabled chemists to quickly and intuitively rationalize structures and properties of molecules. In this talk, I will introduce novel bonding concepts that we found applicable to inorganic clusters, surfaces of semiconductors decorated with metal clusters, and surface alloys: full and partial covalency, second-order Jahn-Teller effect, multi-fold aromaticity, as well as more subtle effects. All of them are controllable through system composition, and became useful as knobs of design, some precedents of which will be presented. I will show how we span a cluster motor, how we put a golden crown atop of a Pd cluster for improved catalytic activity, how we seem to have found a new class of 2-D materials, and how by choosing the semiconductor support and dopants we can make catalytic clusters flat or globular, lay down or stand upright, phase-separate or stay bimetallic, demonstrating our fundamental understanding and resultant control.



Refreshments will be available prior to the seminar at 10:45 a.m. outside room 1315

Graduate Students may meet with the speaker at 1:00 p.m. in Room 8305F