4:30 PM - 5:00 PM

[7p-C11-11] [INVITED] Atomic resolution analysis and local property measurements of novel low-dimensional materials

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Properties of low-dimensional material are largely influenced by its structural imperfections, such as defects, impurities, edges or boundaries. Hence, analytical technique at single atom level is becoming crucial to fully understand their physical/chemical performance. In my presentation, state-of-the-art TEMs will be demonstrated to analyze the atomic structures of low-dimensional materials and to correlate with the local optical/transport measurements. Single atom spectroscopy by means of electron energy-loss spectroscopy (EELS) will be shown to discriminate individual atoms in low-dimensional materials at their interrupted periodicities. It is emphasized here that information of the bonding/electronic states has become accessible for single atoms through the EELS fine-structure analysis as well as the spin state. Large variations of local electronic properties of 1D and 2D materials with different atomic coordinates will be investigated.