

CORE-CM SEMINAR

Michigan State University

Luigi Colombo
University of Texas at Dallas, Richardson, TX 75080
lcolombo80@gmail.com

Growth of 2D single crystal materials for electronic applications

Abstract:

Single crystals are at the heart of electronic devices. Silicon and germanium were the first materials to have been manufactured as single crystals for electronic applications and have led to the success of the transistor first and later integrated circuits. Two-dimensional (2D) materials have received a lot of attention over the past decade with the hope that they could be used to for either enabling scaling of transistors beyond CMOS or for new electronic applications. What is common between the multicomponent compounds, III-Vs, IV-VIs, and II-VIs, is that 2D materials can also be grown from solutions. But rather than growing them from liquid solutions they have been grown from solid solutions; for example, graphene, bi-layer graphene, graphite and hexagonal boron nitride can be grown from M-C or M-BN solutions respectively, M = Ni, Co, Fe, and others, using a process very much like liquid phase epitaxy. The principal difference is that the “substrate” is the solvent itself. Some transition metal dichalcogenides can also be grown from solutions. In this presentation, I will review the growth and control of composition of 2D materials and compare the process to that of other compounds semiconductors.

THURSDAY, OCTOBER 18, 2018

12:00 NOON

Room 1400 – Biomedical & Physical Sciences

Professor David Tomanek - Host