

Chez Pierre

Presents ...

Monday, November 27, 2017

10:30am

MIT Room 4-331

Special Chez Pierre Seminar



Klaus Ensslin – ETH, Zurich

“Quantum devices in 2D material”

Quantum devices made with 2D materials have the unique advantage of thin layers, which should lead to strong confinement and coupling between devices. For previous graphene-based etched devices this advantage has not been explored because transport is dominated by localized states at the edge. Here we demonstrate that carrier confinement can be induced in bilayer graphene by local vertical electric fields. In contrast to previous experiments we can create unalike tunnelling barriers with pinch-off resistances exceeding GOhms, observe quantized conductance in smooth quantum point contact potentials and create quantum dots containing down to 1 electron or 1 hole. This allows to investigate valley and spin states in details. For TMDCs we have realized unalike constrictions in MoS₂ and also observed Coulomb blockade in quantum dot devices.