

Chez Pierre

Presents ...

Thursday, February 19, 2015
12:00pm
MIT Room 4-331



Special Chez Pierre Seminar

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“Spin orbit interaction induced magnetic dynamics”

Controlling magnetic orientation in a fast and energy-efficient way is both fundamentally important and has profound technical implications. Conventional ways of switching magnetic moment include employing magnetic fields from current-carrying coil and using the spin transfer torque effect from spin valve structures. Recent studies show that spin orbit interaction induced phenomena, such as the spin Hall effect and spin momentum locking in topological insulators, can provide effective mechanisms to generate spin currents and to control the orientation of nanomagnets. In this talk, I will discuss various magnetic dynamics that can be excited using spin orbit interactions, including ferromagnetic resonance, reversible magnetic switching and persistent magnetic oscillations. Compared with conventional spin torque devices, a higher current-spin conversion efficiency and lower energy dissipation are exhibited in those experiments. Besides, I will also talk about experimental approaches that can be utilized to identify the origin and quantify the strength of those effects. With the information gained in those studies, further improvement on the spin generation efficiency can be expected.