Spin-Orbit Physics for Low-power Memory and Logic Devices

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4pm-5pm
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Registration Required (Zoom)

The development of materials science and physical concepts has made spintronic a research field that is not only able to reveal fundamental science, but also of great technical relevance. A key concept in spintronics, the spin-orbit coupling (SOC), has proven itself as a mine to explore for rich physics and device applications during the last decade. The emergence of atomically-thin two-dimensional (2D) crystals provides a fantastic playground to further explore the possibilities of tuning device physics through SOC engineering. In this talk, I will first discuss how we use different methods to modulate SOC in 2D crystals and as a result, to tune spin-charge interconversion, magnetism and superconductivity in the crystals.

In the second part, I will discuss my research plan to develop novel and intrinsic spin-orbit physics to address longstanding challenges in spintronic memory and logic devices. Specifically, I will present my strategies, mostly relied on interactions between SOC and other ordered states, to develop more efficient spin-orbit torque enabled magnetization switch devices and spin field-effect transistors.

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