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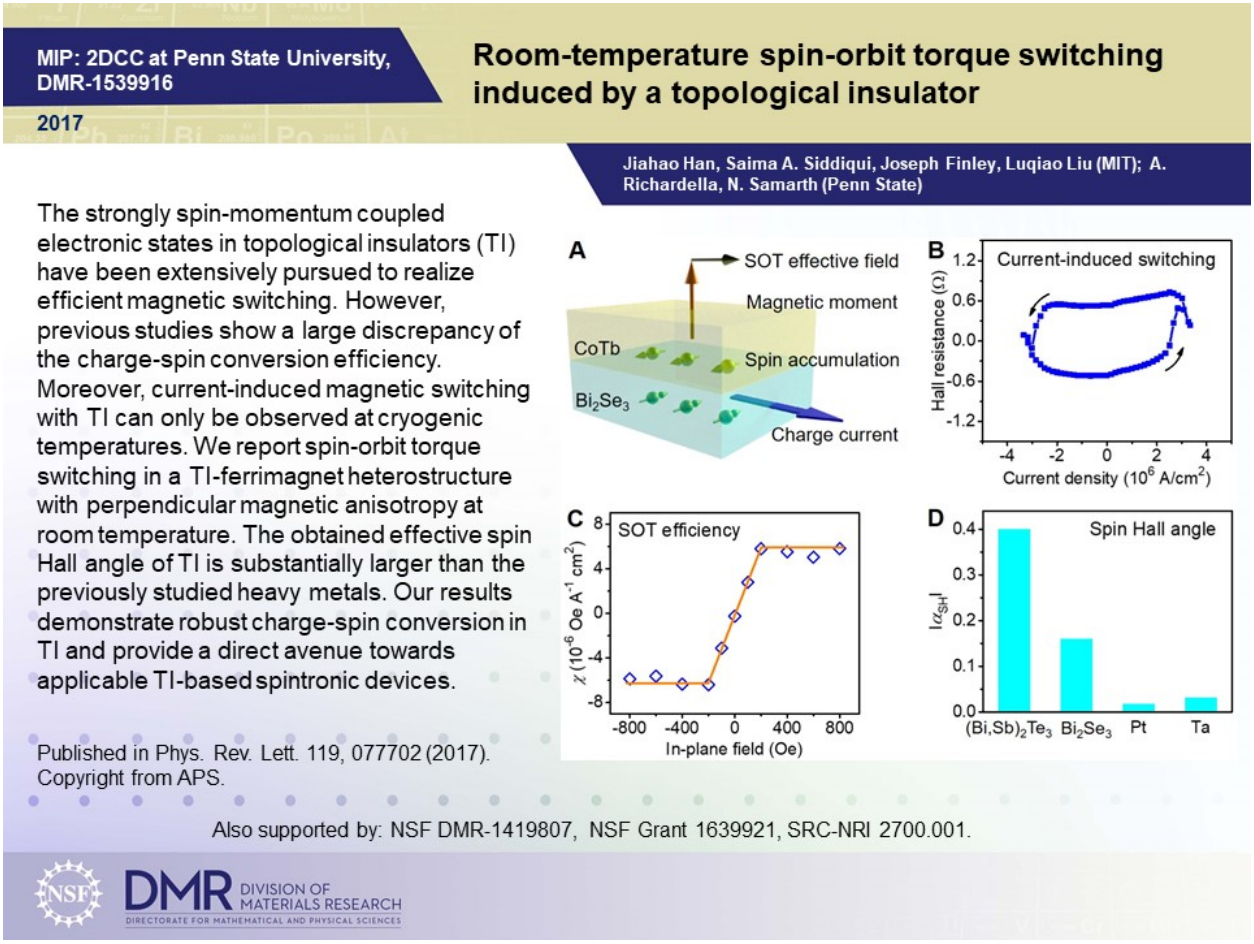

Figure Title: Room-temperature spin-orbit torque switching induced by a topological insulator.

Figure Caption: (A) Schematic of the spin-orbit torque in Bi2Se3/CoTb heterostructure. The spins injected from Bi2Se3 to CoTb exert a torque onto the magnetic moments, which leads to magnetic switching. (B) Room temperature current-induced magnetic switching in Bi2Se3/CoTb. (C) Spin-orbit torque efficiency as a function of the in-plane magnetic field in Bi2Se3/CoTb. (D) Comparison of the effective spin Hall angles of (Bi,Sb)2Te3, Bi2Se3, Pt, and Ta measured by our experiments. TI shows much larger charge-to-spin conversion efficiency.

What Has Been Achieved: The strongly spin-momentum coupled electronic states in topological insulators (TI) have been extensively pursued to realize efficient magnetic switching. However, previous studies show a large discrepancy of the charge-spin conversion efficiency. Moreover, current-induced magnetic switching with TI can only be observed at cryogenic temperatures. We report spin-orbit torque switching in a TI-ferrimagnet heterostructure with perpendicular magnetic anisotropy at room temperature. The obtained effective spin Hall angle of TI is substantially larger than the previously studied heavy metals.

Importance of Achievement: Our results demonstrate robust charge-spin conversion in TI and provide a direct avenue towards applicable TI-based spintronic devices.

Unique Features of the MIP That Enabled Project: MBE growth of high quality topological insulator thin films on GaAs substrates.

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