The surface states of 3D topological insulators are known to possess a spin texture that can potentially be exploited for spintronics applications. I will provide a perspective on the emergence of "topological spintronics," demonstrating how this spin texture can be engineered using either quantum tunneling between surfaces [1] or by breaking time-reversal symmetry [2]. I will then discuss recent experiments that demonstrate striking spintronic phenomena useful for proof-of-concept devices, including a spin-orbit torque of record efficiency [3] and spin pumping at room temperature [4] and a giant electrically-gated anisotropic magnetoresistance at low temperature [5].

5. A. Kandala et al., in preparation.