Probing the Superconducting Proximity Effect in a Topological Insulator using Scanning Tunneling Microscopy

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— Topological insulators (TI) embody a new state of quantum matter characterized by topological invariants; this contrasts with superconductors (S), as superconductivity arises from a spontaneously broken symmetry of the underlying electron system. When a superconductor is placed on the surface of a topological insulator, the behavior of the superconducting condensate across the S/TI interface offers the opportunity to study the interplay between these two distinct quantum states. In this talk, we present our progress in applying cryogenic Scanning Tunneling Microscopy measurements to probe the local density of states in proximity to Pb/Bi$_2$Se$_3$ interfaces.