Decoherence due to local noise is the worst enemy of quantum information. To eliminate this problem, an elegant scheme has been proposed to encode quantum information globally, and hence stay robust against local perturbations. That is topological quantum computing. In the past five years, breakthroughs have been made towards demonstrating the building blocks of this computing scheme. Among them, a major contribution has come from marrying superconductivity with low-dimensional quantum materials with significant spin-orbit interaction and exotic topological orders. Here in the Yacoby group, we fabricate Josephson junctions and other superconducting devices with materials that exhibit interesting topology, and explore the emerging physics that arise both from the boundary and the bulk. In this talk, I will present results on induced superconductivity both related to the quantum spin Hall effect and to finite momentum pairing controlled by magnetic fields. In the context of the center’s efforts towards topologically protected qubits, I will explain how our results connect to Majorana bound states – a prominent candidate for realizing topologically protected qubits.